

**East John Street-Old Monroe Road (SR 1009) Improvements**

From Trade Street (SR 3448-SR 3474) in the Town of Matthews in Mecklenburg County to  
Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail in Union County

Federal Aid Project No. STPDA-1009(16)

WBS No. 39078.1. 1

**STIP Project No. U-4714**

**Administration Action**

**ENVIRONMENTAL ASSESSMENT**

UNITED STATES DEPARTMENT OF TRANSPORTATION

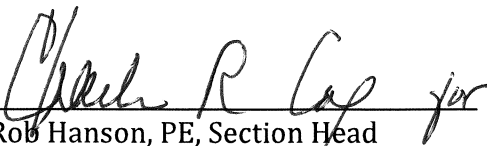
FEDERAL HIGHWAY ADMINISTRATION

&

NC DEPARTMENT OF TRANSPORTATION

Submitted Pursuant to the National Environmental Policy Act 42 USC 4332(2)(C)

**Approved**

7/13/12   
Date Rob Hanson, PE, Section Head

NCDOT – Project Development and Environmental Analysis Unit

7/18/12   
Date John F. Sullivan, III, PE, Division Administrator

Federal Highway Administration





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**July 2016**

UNITED STATES DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
&  
NC DEPARTMENT OF TRANSPORTATION

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## PROJECT COMMITMENTS

### East John Street-Old Monroe Road (SR 1009) Improvements

From Trade Street (SR 3448-SR 3474) in the Town of Matthews in Mecklenburg County to  
Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail in Union County

STIP Project No. U-4714  
Federal Aid Project No. STPDA-1009(16)  
WBS No. 39078.1. 1

*This “Green Sheet” lists the project commitments made to minimize, mitigate, or avoid project impacts beyond those necessary to comply with applicable federal and state requirements and regulations.*

#### PDEA Unit, Roadway Design Unit, Division 10

1. The NCDOT will coordinate U-4714 and I-5507 for costs, scheduling, and construction related to the I-485 bridge widening and associated interchange modifications.

#### Roadway Design Unit, Division 10

1. The final design and construction within Section A shall avoid any impacts to the Four Mile Creek Greenway entrance on East John Street west of the I-485 interchange.
2. The NCDOT will coordinate with all three Towns during final project design to determine posted speed limits.
3. The NCDOT will coordinate with all three Towns regarding median and berm landscaping. Municipal agreements will be prepared, as applicable, prior to project construction.
4. Prior to and during construction, the NCDOT shall coordinate with Union County Public Schools and Emergency Services to identify appropriate detour routes for Sun Valley school buses and fire/emergency response services for Stallings Volunteer Fire Station 20 located at 4616 Old Monroe Road and Union County’s MED 51 Base at 100 Williams Rescue Road.

#### PDEA Unit, Roadway Design Unit, Division of Bicycle and Pedestrian Transportation, Division 10

1. Pedestrian and bicycle accommodations will be further coordinated with the Towns during final design. The Towns will participate in the cost of new sidewalks and multi-use paths where they do not currently exist. A municipal agreement will be prepared prior to project construction. The NCDOT will coordinate with all three Towns regarding the type and location of pedestrian/bicycle crossings at major intersections.

**PDEA Unit, Roadway Design Unit, Geotechnical Engineering Section, Division 10**

1. The NCDOT Geotechnical Engineering Section will provide soil and groundwater assessments on the 23 properties identified as potential hazardous material sites, as applicable, after identification of the selected alternative, which occurs in the Finding of No Significant (FONSI) and prior to right of way acquisition.

**PDEA Unit, NCHPO, Roadway Design Unit**

1. Prior to the FONSI, additional studies will be completed for the property at 4800 Old Monroe Road to determine eligibility for the NRHP. If the property is determined eligible, an effects determination will be required prior to the FONSI. Any applicable design changes and additional conditions will need to be identified prior to the FONSI and implemented during final design and construction. During final design, designs will be reviewed to ensure applicable conditions are met to maintain the “No Adverse Effect” determinations for the Reid House, Banks H. Funderburk Store, and Carolyn Funderburk House.

**Hydraulics Unit, Division 10**

1. The NCDOT Hydraulics Unit will coordinate with FEMA and local authorities to ensure compliance with applicable floodplain management ordinances. Since this project involves construction on or adjacent to FEMA regulated streams, the NCDOT Division 10 shall submit sealed as-built construction plans to the NCDOT Hydraulics Unit upon completion of project construction, certifying that the drainage structures and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

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## P PREFACE AND GENERAL DOCUMENT INFORMATION

### P.1. What's in this document?

The North Carolina Department of Transportation (NCDOT) prepared this environmental document in accordance with the requirements set forth in the National Environmental Policy Act (NEPA) of 1969, as amended. The NCDOT and Federal Highway Administration (FHWA) are joint lead agencies for the proposed project. This Environmental Assessment (EA) documents the examination of potential environmental impacts and benefits of the proposed widening improvements for East John Street-Old Monroe Road in Mecklenburg County and Union County, North Carolina. The EA explains why the project is being proposed, what alternatives were considered for the project, the potential impacts of the proposed project, and the proposed avoidance, minimization, and/or mitigation measures that would lessen impacts.

### P.2. What should you do?

- The NCDOT would like to hear your comments about the project and this EA.
- Copies of this document are available for review at the following locations and internet sites:

| Physical Address                         |   |
|--|---|
| NCDOT Division 10 Office                 | 716 West Main Street, Albemarle, NC 28001                           |
| Town of Matthews Planning Department     | 232 Matthews Station Street, Matthews, NC 28105                     |
| Town of Stallings Planning Department    | 315 Stallings Road, Stallings , NC 28104                            |
| Town of Indian Trail Planning Department | 130 Blythe Drive Indian Trail. NC 28079                             |
| Website Address                          |   |
| Town of Matthews Website                 | <a href="http://www.matthewsnc.gov">http://www.matthewsnc.gov</a>   |
| Town of Stallings Website                | <a href="http://www.stallingsnc.org">http://www.stallingsnc.org</a> |
| Town of Indian Trail Website             | <a href="http://www.indiantrail.org">http://www.indiantrail.org</a> |

- NCDOT will hold a public hearing after publication of the document to receive comments. The public hearing will be advertised.
- If you have any comments about the proposed project, please send your comments to:

John F. Sullivan, III, P.E.  
Federal Highway Administration  
310 New Bern Avenue, Suite #410  
Raleigh, NC 27601

Robert P. Hanson, P.E.  
NCDOT, Project Development Section Head  
1548 Mail Service Center  
Raleigh, NC 27699-1548

Or via email to Mr. Elmo Vance at [eevance@ncdot.gov](mailto:eevance@ncdot.gov).

### **P.3. What happens next?**

After comments are received from the public and reviewing agencies, the NCDOT and FHWA will consider the input received, as well as the evaluation summarized in this EA, to identify the Selected Alternative. This could be the Preferred Alternative identified in this EA, the No-Build Alternative, or another alternative. The decision, and responses to comments received, will be published in a Finding of No Significant Impact (FONSI), unless additional environmental studies are determined to be required in an Environmental Impact Statement (EIS).

Upon completion of the FONSI, the NCDOT will be authorized to commence with the final design, acquisition of required permits, right of way acquisition, and construction for all or part of the project.

In addition to this document, an Interstate Access Report (IAR) is being completed for modifications to the East John Street/I-485 interchange. The FHWA requires this report in order to approve proposed changes to interstate access.

## S Summary

### S.1. Proposed Action

The NCDOT proposes to widen the existing two-lane East John Street-Old Monroe Road (SR 1009) to a multi-lane facility from Trade Street (SR 3448-SR 3474) in the Town of Matthews in Mecklenburg County to Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail in Union County. The project is approximately 6.5 miles long. **Figure S-1** shows the project location and project study area.

The project is included in the North Carolina Department of Transportation's (NCDOT) current federally-approved *2016-2025 State Transportation Improvement Program (STIP)* (January 2016) as STIP No. U-4714. The project is divided into three sections:

*The STIP is the 10-year State and Federal-mandated plan that identifies the construction funding for and scheduling of transportation projects throughout the state.*

- U-4714A – Trade Street to I-485
- U-4714B – I-485 to Waxhaw-Indian Trail Road (SR 1008)
- U-4714C – Waxhaw-Indian Trail Road to Wesley Chapel-Stouts Road (SR 1377)

Currently, all three sections are programmed for right-of-way acquisition in fiscal year (FY) 2020 and construction in FY 2022.

The project also is included in the Charlotte Regional Transportation Planning Organization's (CRTPO) (formerly Mecklenburg-Union Metropolitan Planning Organization (MUMPO)) *2040 Metropolitan Transportation Plan (MTP)* (April 2014).

### S.2. Project Setting

As shown in **Figure S-1**, the project is located in the Charlotte metropolitan area, approximately 12 miles southeast of Uptown Charlotte. The project is entirely within the Charlotte Regional Transportation Planning Organization's (CRTPO) planning area.

The project is located in a rapidly growing area and traverses three municipalities (Matthews, Stallings, and Indian Trail) in two counties (Mecklenburg and Union). All three Towns provide housing for workers who predominantly travel northwest to Charlotte on a daily basis. The corridor's location in the Charlotte metro region, accessibility to/from I-485, and good quality of life amenities, continues to attract development activity.

The East John Street-Old Monroe Road corridor is important for commuters in southeast Mecklenburg County and northwest Union County. According to the US Census Bureau American Community Survey 5-year data, about 80 percent of Matthews, Stallings, and Indian Trail residents commute to work by car (drive alone). Commuters who live in the subdivisions along the corridor use the corridor to travel to work and activity centers, generating high volumes of traffic, particularly during the weekday peak hours.

More retail and commercial market activity has followed the area's growth, bringing amenities closer to communities along the corridor. The project corridor is also used to access retail, services, and

destinations/activity centers within and surrounding the project study area. These are shown on **Figure S-2**. Activity centers have become notable traffic generators along this corridor.

The project is within an area that is suburban to rural, with area land uses generally consisting of a mixture of residential uses, active agriculture, several churches, a fire station, and activity or retail/commercial shopping centers. The Old Monroe Road intersections with Stallings Road, Waxhaw Indian Trail Road, and Wesley Chapel-Stouts Road contain small to major commercial or activity centers. All of these activity centers are recognized in local land use plans as activity nodes.

### **S.3. Purpose and Need for the Project**

The purpose of the project is to improve existing and projected traffic flow and operational efficiency on this section of East John Street-Old Monroe Road.

Heavy traffic occurs daily along East John Street-Old Monroe Road through the project study area, and capacity deficiencies result in frequent congestion and delays. In addition, the existing roadway does not adequately serve bicyclists and pedestrians.

The proposed project would address the need to increase capacity for vehicles and enhance mobility for pedestrians and bicyclists along the corridor. The project would improve existing and projected traffic flow and operational efficiency on this section of East John Street-Old Monroe Road. Another desirable outcome for this project is to enhance the overall travel safety in the project study area.

**Chapter 1** summarizes the purpose and need for the project and includes information on current and future corridor conditions.

### **S.4. Alternatives Process and Preferred Alternative**

A multi-step process was used in developing and evaluating alternatives. Options were screened for their ability to meet the project's purpose and need, public/agency opinion, and any issues that would render an alternative unreasonable or infeasible. Alternatives were compared and evaluated on factors such as future traffic operation conditions, potential for community resources impacts, and public/agency opinion.

**Chapter 2** describes the alternatives development, screening, and analysis process, including why certain alternatives were carried forward for detailed analysis and what factors led to the elimination of options.

The 4-Lane Superstreet is the Preferred Alternative. The project would include the following improvements:

- Upgrading the existing two-lane uncontrolled access roadway to a four-lane median divided urban roadway
- Non-traditional specific design treatments (mostly Superstreet design) at intersections
- Access management (e.g. signalization, median, control of access at intersections)
- Modification of the existing diamond interchange at East John Street/I-485 to a partial cloverleaf

The Preferred Alternative best balances the needs, impacts, and costs. This is not a final decision. After the EA comment period ends, the FHWA and NCDOT will identify a Recommended Alternative. In making this decision, the FHWA and NCDOT will consider agency and public comments on this EA.

**Chapter 3** contains detailed information on the Preferred Alternative, which will be presented at the public hearing.

## S.5. Summary of Environmental Effects

The project is not anticipated to cause significant and adverse community, economic, or other environmental impacts at a level that would warrant an Environmental Impact Statement (EIS). Therefore, unless significant impacts are identified during the public review, a Finding of No Significant Impact (FONSI) for the Preferred Alternative will be issued by the NCDOT and FHWA.

This section summarizes the estimated direct and indirect impacts to the human, physical, cultural, and natural environments from the Preferred Alternative, and identifies proposed mitigation to lessen or avoid impacts associated with the Preferred Alternative.

Impacts for the Preferred Alternative are summarized in **Table S-1** in the order they appear in this EA, along with a notation of the EA chapters/section where they are described in more detail.

**Table S-1: Summary of Impacts from the Preferred Alternative**

| Resource   | Impact  | Proposed Mitigation  |
|--|---|--|
| <b>HUMAN ENVIRONMENT</b>                         |   |  |
| Land Uses and Land Use Plans<br>(4.1.1)          | Project would change the character of the existing facility, but it would not substantially contribute to changes in land use.<br>Project would not likely influence the intensity of development activities.<br>Land use will continue to be guided by adopted zoning and land use plans<br>The project is generally consistent with local land use plans. | Not applicable.  |
| Consistency with Transportation Plans<br>(4.1.2) | Project identified in, and generally consistent with local (Matthews, Stallings, Indian Trail) land use and transportation plans.<br>Only a minor inconsistency between how bicycle accommodations are provided in the preliminary design compared to the local plans.  | Not applicable.  |
| Community Resources                              | Minor property impacts to adjacent resources and change in access to/from the roadway.  | Impacts will continue to be minimized to the extent feasible during final design |

**Table S-1: Summary of Impacts from the Preferred Alternative**

| Resource  | Impact   | Proposed Mitigation   |
|---|--|---|
| Neighborhoods/Community Cohesion<br>(4.1.4)     | No permanent negative impacts to community cohesion/stability.<br><br>Sidewalk and/or multi-use path would improve mobility and connectivity for pedestrians and bicyclists. These improvements could enhance community cohesion by providing more options for interaction.                              | Not applicable.   |
| Relocations and Property Acquisition<br>(4.1.5) | 45 total residential displacements (20 residential owners and 25 tenants).<br><br>13 total business displacements (1 business owner and 12 tenants).<br><br>17 additional parcels would necessitate acquisition of parking spaces, which may or may not result in additional business relocation claims. | NCDOT will use three programs to minimize the inconvenience of relocation: Relocation Assistance, Relocation Moving Payments, and Relocation Replacement Housing Payments or Rent Supplement. These programs are in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. Comparable replacement housing and business space is available in the Project area for displaced homeowners, tenants, and businesses. |
| Environmental Justice<br>(4.1.6)                | No disproportionately high and adverse impacts to minority and low-income populations. No disparate impacts anticipated under Title VI and related statutes.   | Not applicable.   |
| Visual/Aesthetic<br>(4.1.7)                     | No adverse visual impacts anticipated. Opportunity for landscaped median (and berms) along the corridor would provide a benefit.   | Not applicable.   |
| <b>PHYSICAL ENVIRONMENT</b>                     |  |   |
| Noise<br>(4.2.1)                                | 96 traffic noise impacts due to future predicted noise levels that would approach or exceed FHWA noise abatement criteria.<br><br>Temporary and localized construction noise impacts would likely occur as a result of construction activities, including earth removal, hauling, grading, and paving.   | Noise barriers were determined not reasonable due to the lack of access control along the corridor. This limits the ability to construct a noise barrier long enough to provide adequate noise reduction.<br><br>For construction noise, low cost and easily implemented construction noise control measures will be incorporated during construction to the extent practicable.  |
| Air Quality<br>(4.2.2)                          | No air quality impacts are anticipated due to implementation of the Preferred Alternative  | Not applicable.   |
| Farmland<br>(4.2.3)                             | The entire project study area is recognized by the US Census Bureau (2010 Census) as an urban area.  | Not applicable.   |



**Table S-1: Summary of Impacts from the Preferred Alternative**

| Resource   | Impact  | Proposed Mitigation  |
|--|---|--|
| Utilities<br>(4.2.4)                               | The project would require gas, water, electric pole, sewer, telephone and cable television relocations.   | NCDOT will coordinate with all utility providers during final design and construction to prevent damage to utility systems and to minimize disruption and degradation of utility service to local customers.   |
| Hazardous Materials<br>(4.2.5)                     | Thirteen sites within the project corridor may contain petroleum USTs.<br>Eight dry cleaners and two car washes (of concern due to potential for oil-water separators on sites) are within the project limits.<br>All sites have a low potential for geoenvironmental impacts.  | The NCDOT Geoenvironmental Unit will complete further assessments on each property prior to right of way acquisition, as necessary.  |
| Floodplains and Floodways and Hydrology<br>(4.2.7) | Existing culverts will be extended to accommodate the widened roadway.<br>Two locations along the project corridor where the project crosses a stream are located within a FEMA regulated special flood hazard area.<br>Two existing crossings would have to be replaced by a major drainage structure (one of these sites is within the FEMA regulated floodplain).<br>An existing stormwater management pond may be impacted.   | NCDOT Hydraulics Unit will coordinate with FEMA and local authorities to ensure compliance with applicable floodplain management ordinances. Since this project involves construction on or adjacent to FEMA regulated streams, the NCDOT Division 10 shall submit sealed as-built construction plans to the NCDOT Hydraulics Unit upon completion of project construction, certifying that the drainage structures and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.  |
| <b>CULTURAL ENVIRONMENT</b>                        |   |  |
| Historic Architectural Resources<br>(4.3.1)        | A determination of:<br><br>No Effect - Matthews Historic District<br>No Effect - Rowland Clay House<br>No Adverse Effect with Conditions - Reid House<br>No Adverse Effect with Conditions - Banks H Funderburk Store (Rock Store BBQ)<br>No Adverse Effect with Conditions - Carolyn Funderburk House<br><br>The residence at 4800 Old Monroe Road requires additional study to determine eligibility for the NRHP. Currently the preliminary design has a minor right of way encroachment on this property. | During final design, designs will be reviewed to ensure applicable conditions are met to maintain the No Adverse Effect determinations for the Reid House, Banks H Funderburk Store, and Carolyn Funderburk House.<br><br>Prior to the FONSI, additional studies will be completed for the property at 4800 Old Monroe Rd to determine eligibility for the NRHP. If the property is determined eligible, an effects determination will be required prior to the FONSI. Any applicable design changes and additional conditions will need to be identified prior to the FONSI and implemented during final design and construction. |
| Archaeological Resources<br>(4.3.2)                | The Office of State Archaeology determined the project area is unlikely to contain intact and significant archaeological resources.   | Not applicable.  |

**Table S-1: Summary of Impacts from the Preferred Alternative**

| Resource   | Impact   | Proposed Mitigation  |
|--|--|--|
| Section 4(f) and 6(f)(3) Resources<br>(4.3.3)              | One Section 4(f) resource is in the project study area; Fourmile Creek Greenway. Preliminary design avoids impacts to the greenway.<br>If the house at 4800 Old Monroe Rd is determined eligible for the NRHP, and there is an Adverse Effect determination, a Section 4(f) evaluation for this property will be required prior to the FONSI.<br>There are no Section 6(f)(3) resources in the project study area. | If the house at 4800 Old Monroe Rd is determined eligible for the NRHP, and there is an Adverse Effect determination, a Section 4(f) evaluation for this property will be required prior to completion of the FONSI.   |
| <b>NATURAL ENVIRONMENT</b>                                 |  |  |
| Biotic Communities and Wildlife<br>(4.4.1; 4.4.2)          | The project area is predominantly comprised of maintained/disturbed habitat. No substantially adverse impacts to wildlife or biotic communities.   | Not applicable.  |
| Water Resources and Water Quality<br>(4.4.3)               | Project construction activities such as clearing and grubbing, tree removal, in-water construction, and fertilizer and pesticide use during revegetation, could impact surface water quality in the absence of appropriate Best Management Practices (BMPs).   | An erosion and sedimentation control plan will be prepared during final design and implemented during construction. The plan will identify appropriate BMPs.   |
| Waters of the US (wetlands, streams, and ponds)<br>(4.4.4) | A total of 1,820 linear feet of stream impacts at 12 crossings.<br>A total of 0.38 acre of wetland impacts from 5 wetlands.<br>A total of 0.11 acre of one pond.   | A permit from the USACE will be required for impacts to Waters of the US. Regional General Permit 198200031 (effective April 2015) is anticipated to be applicable to the project. The permit must be obtained prior to construction. The NCDOT will investigate potential on-site stream and wetland mitigation opportunities after approval of the FONSI. If on-site mitigation is not feasible, mitigation will be provided by NCDEQ Division of Mitigation Services. |
| Protected Species<br>(4.4.5)                               | The Preferred Alternative has been determined to have no effect on protected species listed for the area.  | Not applicable.  |

# 1 PURPOSE AND NEED FOR THE PROJECT

## 1.1 Summary of Project Need and Purpose

The *East John Street-Old Monroe Road (STIP No. U-4714) Purpose and Need Statement* (Atkins, May 2014) documents the purpose of the project and why the proposed action is needed. Supporting information in the *Purpose and Need Statement* includes a description of the existing roadway network and how it operates now and in the future; data on population and employment trends; discussion of other transportation modes; and review of area transportation and land use plans. The project needs and purpose are summarized below.

The needs for the project are:

- Capacity Deficiencies – Heavy traffic occurs daily along East John Street-Old Monroe Road through the project study area, resulting in frequent congestion and delays.

The approximately 6.5-mile segment of East John Street-Old Monroe Road in the project study area is a two-lane roadway with no control of access, no shoulders, and numerous stop controlled roadway crossings and direct driveway connections. Overall, the existing volumes approach or exceed the typical maximum AADT (about 17,000) for an acceptable level of service for a two-lane undivided arterial (that includes exclusive left turn lanes) in an urbanized area (*2012 Quality/Level of Service Handbook, Table 1, FDOT*). Existing (2013) average annual daily traffic (AADT) of 15,200-27,000 vehicles is too high for this two-lane roadway to handle, constraining traffic flow. Future AADT volumes within the project study area are projected to increase by up to 22 percent between 2013 and 2035.

Several intersections along the corridor operate over capacity, contributing to “stop and go” or “slow and go” conditions. Travelers regularly experience congestion during the peak periods of the day, and this is projected to worsen through 2035.

- The existing roadway configuration does not adequately serve pedestrians and bicycles.

Transportation and land use plans for the area include recommendations for bicycle and pedestrian facilities along the entire corridor. The existing roadway has no shoulders and no bicycle facilities. For pedestrians, there are only small sections of sidewalks that are intermittently present along the corridor, providing no continuous connections between numerous neighborhoods, community resources, and area destinations such as downtown Matthews, Mecklenburg County Sportsplex, Providence Produce Market/Rock Store Bar-B-Q, and Sun Valley Commons shopping center.

The purpose of the project is to improve existing and projected traffic flow and operational efficiency on this section of East John Street-Old Monroe Road. The project will address the need to increase capacity and enhance mobility for pedestrians and bicyclists along the corridor.

## 1.2 Other Potential Benefits

Traffic congestion on East John Street-Old Monroe Road through the project study area is a daily occurrence during peak travel periods, causing unpredictable delays and increased travel time for

commuters and travelers. The corridor experiences a high percentage of rear-end collisions (stop or slow), which can be caused by congested conditions. Another desirable outcome for the project is to enhance the overall travel safety in the project study area.

Matthews, Stallings, and Indian Trail have plans for their jurisdictions, and view improvements to this corridor as an essential component of these plans. These plans all include a vision for the corridor as an aesthetically pleasing “complete street” that is sensitive to the community resources of the area.

***What is a “Complete Street”?***

*Complete streets are streets for everyone. They are designed to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all abilities. There is no singular design prescription for Complete Streets; each one is unique and responds to its community context. Complete Streets can include features such as sidewalks, bike lanes (or wide paved shoulders), multi-use paths, frequent and safe crossing opportunities, median islands, lighting, and landscaping/planters.*

### 1.3 Existing and Projected Corridor Conditions

The combination of high volumes of traffic, lack of left turn and/or right turn lanes at many intersections, and numerous direct driveway connections, create congested conditions along the corridor. Vehicles must stop or slow down in the single travel lane to make their desired turn, affecting the level of service. During peak periods, turning vehicles, especially left-turning vehicles, can create queues along the corridor and substantially slow average travel speeds. These conditions are anticipated to worsen into the future.

Results of the no-build traffic forecasts and intersection operations evaluations are documented in the *U-4714 Traffic Forecasts Memorandum* (NCDOT Transportation Planning Branch, July, 2013) and the *Preliminary No Build Analysis for STIP No. U-4714 Memo* (NCDOT Congestion Management Unit, June 2013), respectively. The information contained in those reports is summarized below.

**Traffic Volumes.** Figure 1-1 presents existing (2013) and projected (2035) annual average daily traffic (AADT) volumes for East John Street and Old Monroe Road within the project study area. The 2013 traffic (AADT) volumes range from 15,200 to 27,000 vehicles per day along the East John Street-Old Monroe Road corridor. Existing AADT volumes approach or exceed the typical maximum AADT (about 17,000) for an acceptable level of service for a two-lane undivided arterial (that includes exclusive left turn lanes) in an urbanized area (*2012 Quality/Level of Service Handbook, Table 1, FDOT*). Existing volumes for 80 percent of the corridor already exceed the maximum AADT for an acceptable level of service.

Traffic volumes are predicted to increase by the year 2035, with volumes ranging from 16,300 to nearly 29,500 vehicles per day. The highest percentage (22 percent) increase in traffic volumes is projected on Old Monroe Road between Midway Road and Wesley Chapel-Stouts Road, which is likely related to the build out of the Sun Valley Commons area. The other substantial increase is near the I-485 interchange in Matthews near a proposed large mixed use site.

**Intersections.** Figure 1-2 shows the evening peak period intersection levels of service (LOS) on a map. The evening peak hours are the most congested. Nearly half of the intersections currently are operating at an unacceptable LOS (E or F) during peak hours. Future (2035) conditions are projected to worsen without the project, with over 60 percent of the intersections projected to operate at an unacceptable LOS by 2035.

*During morning and evening “rush hour” there are long lines of cars waiting to cross intersections along the corridor. Drivers typically wait through several green light cycles before passing through intersections. Traffic engineers define these conditions as “Level of Service (LOS) F.” Like a school report card, the LOS measurement ranks intersection operations on a scale ranging from “A” (best possible performance) to “F” (worst possible performance).*

**Crash Data.** A crash analysis was performed to identify crash rates, the type of crashes, and to determine if there are any crash hot spots occurring along the corridor. The NCDOT Traffic Survey Unit provided segment crash data for five years of crash history from June 1, 2008 - May 31, 2013 between milepost 7.180 (around Wesley Chapel Stouts Road) and 13.699 (around Trade Street). Of the total 990 crashes reported, there were no fatalities. Rear end, left turn, and angle crashes comprised 57 percent, 11 percent, and 11 percent, respectively. There was one pedestrian crash and three bicycle crashes reported during the five year study period.

Segment crash data analysis revealed that nearly half of the analysis area is above the critical crash rate, and that there are crash issues along the corridor. This is likely attributable to congestion along the corridor, as almost half of the crashes occurred during peak hours (6am-9am and 4pm-7pm).

*The **critical crash rate** are rates that are based on other roads with similar characteristics (i.e. all of two-lane undivided roads in the state). The critical crash rate is a “check” to determine if the rate at a specific location is higher in comparison to other locations.*

## 1.4 Transportation and Land Use Plans

Various plans developed to guide land use and transportation planning decisions emphasize the importance of the East John Street-Old Monroe Road corridor for both commuter and local travel.

### **State Transportation Improvement Program (STIP).**

The project is in the current NCDOT 2016-2025 STIP. Other STIP projects, as well as local projects in the project vicinity are shown in **Figure 1-3**.

*The current NCDOT STIP can be found at:*  
[https://connect.ncdot.gov/projects/planning/STIPDocuments1/LIVE\\_STIP.pdf](https://connect.ncdot.gov/projects/planning/STIPDocuments1/LIVE_STIP.pdf)

**Regional and Local Plans.** Numerous transportation plans reference improvements to East John Street-Old Monroe Road either in its entirety or through specific jurisdictions. These plans not only discuss the importance of congestion relief for the corridor, but also for enhancing mobility for alternative modes of transportation. These plans that contain recommendations applicable to the project study area are listed below and discussed in more detail in the *Purpose and Need Statement*. (Note: the list below reflects updated versions or plan name changes since the *Purpose and Need Statement*).

- CRTPO 2040 Metropolitan Transportation Plan (April 2014)
- CRTPO Comprehensive Transportation Plan (Draft, May 2015)
- CRTPO 7-Year Transportation Improvement Program 2016-2022 (Last Amended March 2016)

- Town of Matthews and Town of Stallings Comprehensive Transportation Plan (2012)
- Town of Matthews Comprehensive Bicycle Plan (2006)
- Town of Stallings Pedestrian Plan (2008)
- Town of Indian Trail Bicycle Master Plan (June 2011)
- Town of Indian Trail Park and Greenway Master Plan (February 2010)
- Town of Indian Trail Comprehensive Pedestrian Plan (January 2009)

Municipalities along the project corridor have developed land use plans that include the East John Street-Old Monroe Road study area:

- Town of Matthews Land Use Plan 2012-2022 (December 2012)
- Town of Matthews Downtown Plan (January 2013)
- Town of Stallings Land Use Plan (March 2007)
- Town of Indian Trail Comprehensive Plan (November 2013)

## 2 ALTERNATIVES CONSIDERED

This chapter documents the analysis process used to screen potential alternatives and to ultimately identify the Preferred Alternative.

### 2.1 Alternatives Development Process Overview

**Figure 2-1** depicts the overall alternatives development process in a flowchart. As shown in the figure, a multi-step process was used to identify the alternative(s) to study in detail in this EA. The public, local government representatives and state and federal environmental resource and regulatory agencies had integral roles in developing the project alternatives. The process can be summarized as follows:

#### Initial Options

Initial options considered included the No-Build option, transportation management options, improving the existing roadway and building a new location roadway. For improving the existing roadway, an additional step was included in the process. Several 4-lane and 6-lane variations were assessed along with several types of intersection configurations (listed in **Figure 2-1**). These options were screened for their ability to meet the project's purpose and need, public/agency opinion, and any issues that would render an option unreasonable or infeasible.

#### Preliminary Alternatives

Three variations of the Improve Existing Roadway option passed the screening evaluation described in the first step. These three preliminary alternatives were then compared for traffic operations, qualitative impact assessment, and public/agency opinion.

#### Detailed Study Alternative

Based on analysis results of the preliminary alternatives, the Detailed Study Alternative (Preliminary Alternative 3) was selected for detailed study and evaluation. In addition, the No-Build Alternative was carried forward in the EA as a basis for comparison.

### 2.2 Initial Options

In addition to the No-Build option, three Transportation Management options, Improve Existing Roadway option, and New Location Roadway option were considered. Transportation Management options includes Transportation Demand Management, Transportation System Management, and Mass Transit/Multi-Modal. A screening of the initial options consisted of a "pass or fail" determination of the alternative's ability to address transportation problems, as documented in the *Purpose and Need Statement* (Atkins, May 2014). If the approach "passed" by meeting all elements of the purpose and need, then it was retained for the next step in the alternatives process. **Table 2-1** summarizes the results of the initial screening, which is discussed in more detail in the following sections.

**Table 2-1: Summary of Initial Screening**

| Initial Option                         | Primary Elements of the Project Purpose                           |  |                              |
|--|---|--|------------------------------|
|  | Improves Existing & Projected Traffic Flow and Increases Capacity | Enhances Mobility for Pedestrians and Bicyclists | Retain for Additional Study? |
| No-Build                               | ✗   | ✗  | Yes - See Note               |
| Improve Existing Roadway               | ✓   | ✓  | Yes                          |
| New Location Roadway                   | ✓   | ✓  | No                           |
| Transportation Demand Management (TDM) | ✗   | ✗  | No                           |
| Transportation System Management (TSM) | ✓   | ✗  | No                           |
| Mass Transit/Multi-Modal               | ✓   | ✗  | No                           |

✗ - means the alternative approach cannot meet this element of purpose and need.

✓ - means the alternative approach does meet, or could be designed to meet, this element of purpose and need.

**Note:** No-Build Alternative would not meet the project purpose and need, but retained as a baseline for comparison, in accordance with 40 CFR 1502.14(d) and FHWA guidance (FHWA Technical Advisory T 6640.8A, 1987).

### 2.2.1 No-Build

The No-Build or “no action” option would not construct any improvements on East John Street-Old Monroe Road as part of Project U-4714. It is assumed other separate projects included in the STIP and CRTPO’s TIP (see **Figure 1-3**) would be implemented, as they are independent of Project U-4714.

The No-Build or “no action” option is not consistent with the purpose and need for the project nor local plans, but has been retained through the project environmental review with other alternatives, in accordance with the National Environmental Policy Act (NEPA) (40 CFR 1502.14(d)) and FHWA guidance (FHWA Technical Advisory T 6640.8A; p. 16).

### 2.2.2 Transportation Management

**Travel Demand Management (TDM).** TDM emphasizes regional means of reducing vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. It includes measures and activities that change traveler behavior by expanding traveler options in terms of travel method, travel time, travel route, travel costs, and travel quality/convenience. TDM usually does not involve major capital improvements. The TDM Alternative can include employer-based measures such as staggered work house or flex time and ridesharing (i.e. carpools/vanpools).

TDM measures would not result in a notable capacity increase or improvement in traffic flow along the project corridor, and would not provide mobility for pedestrians and bicyclists. Therefore, the TDM alternative would not meet the project purpose and was eliminated from further study.

**Transportation System Management (TSM).** The TSM Alternative approach typically consists of low-cost, minor transportation improvements to increase the capacity of an existing facility. TSM



improvements can be operational (i.e. traffic law enforcement, access control, turn prohibitions, speed restrictions, traffic signal timing optimization) or physical (adding median or turn lanes, intersection realignment, installing new or optimizing existing signals, and other measures) to improve traffic flow. These measures generally have less impacts on the environment, shorter implementation schedules, and lower costs.

The NCDOT has implemented TSM improvements on the corridor, including at the Old Monroe Road-Wesley Chapel-Stouts Road intersection (additional signal at Mustang Drive and crosswalks) and Old Monroe Road-Pleasant Plains Road intersection (addition of westbound left turn lane). Additional TSM improvements at specific intersections could enhance mobility due to increased intersection capacities. However, these TSM projects and additional improvements would not address the substantial congested conditions caused by corridor capacity constraints, nor would they address mobility for pedestrians and bicyclists. Therefore, the TSM approach was eliminated from further consideration for Project U-4714.

**Mass Transit/Multi-Modal.** The Mass Transit Alternative includes bus or rail passenger services. Mass transit can provide high-capacity, energy-efficient movement in densely traveled corridors. In addition, mass transit serves high density areas by offering an option for automobile owners who do not wish to drive, as well as service to those without access to an automobile.

Public transportation services are provided by Charlotte Area Transit System (CATS) and Union County in the project study area. Three CATS routes provide service to the Town of Matthews in the northern vicinity of the project. Two of the routes provide service to Uptown Charlotte and the other connects to Carolina Place Mall in Pineville and Central Piedmont Community College (CPCC) Levine Campus.

Two bus stops are located at the western end of the study area, one on West John Street and one on Trade Street. In addition, the Matthews Presbyterian Church park and ride lot is located on the south side of West John Street near the western end of the study area.

Increased transit services would provide benefits by offering additional options for commuters. However, the Mass Transit Alternative was eliminated from further study for this project because it would not address the substantial congested conditions caused by capacity constraints, nor would it address mobility for pedestrians and bicyclists. Enhancing bus transit opportunities would have minimal effect on reducing existing and projected traffic volumes on the corridor because it would not divert enough people from private vehicles to transit to create a noticeable reduction in traffic volumes on East John Street-Old Monroe Road. About 80 percent of Matthews, Stallings, and Indian Trail residents commute to work by car (drive alone) (US Census Bureau American Community Survey).

### 2.2.3 Improve Existing Roadway

The Improve Existing Roadway option includes capacity improvements to the corridor, including the addition of through travel lanes and turn lanes at intersections, as well as accommodations for bicyclists and pedestrians. Improving the existing corridor would meet all the elements of the purpose and need. This approach was carried forward to identify options for improving the corridor, including the roadway typical section, alignment, and intersection treatments.

## 2.2.4 New Location Roadway

The New Location Alternative concept would involve the construction of a highway on new location somewhere in the vicinity of the project, or an upgrade of nearby roadways. Due to the urbanized, densely developed nature of the area surrounding the corridor, this alternative would have substantial impacts to the built environment and was therefore eliminated from further study.

## 2.2.5 Results of Initial Option Screening

As shown in **Table 2-1** and **Figure 2-1**, the Improve Existing Roadway option was retained for additional study due to its ability to meet the project purpose and need. TDM, TSM, and Mass Transit/Multi-modal options were eliminated from consideration because they would not fully meet the purpose and need.

## 2.3 Additional Screening of Options for Improving Existing Roadway

This section describes the additional screening of the Improve Existing Roadway option and how roadway and intersection options were developed, evaluated for reasonableness, and combined to form the three Preliminary Alternatives shown in **Figure 2-2**.

The NCDOT collaborated with the public and town representatives to develop various options for improving existing East John Street-Old Monroe Road. The collaborative process included a project planning event (called a design charrette) early in the alternatives development stage; a public meeting; and ongoing quarterly municipal meetings.

The roadway and intersection options developed in collaboration with the public and municipal representatives included the following project and design elements:

- Typical section (e.g. how the road should look/function) (**Section 2.3.1**)
- Roadway alignment (e.g. location of improvement footprint) (**Section 2.3.2**)
- Intersection types (e.g. how improved intersections should be designed) (**Section 2.3.3**)
- I-485/East John Street interchange (**Section 2.3.4**)

**Section 2.3.6** presents the three Preliminary Alternatives. Further evaluation and comparison of the Preliminary Alternatives is presented in **Section 2.4**, and the Preferred Alternative is identified in **Section 2.5**.

### 2.3.1 Typical Section

From August 27-29, 2013, residents, business owners, and government officials in Matthews, Stallings, and Indian Trail gathered with the NCDOT to participate in a three-day planning and design charrette. Nearly 100 participants joined small groups at different times during the three-day event to discuss specific topics important for developing the design alternatives.

The charrette is described in more detail in **Section 5.2.1** and summarized in the *STIP No. U-4714 Multi-Day Design Charrette Summary* (Atkins, October 2013).

Charrette input was used to identify and prioritize key features inside the right-of-way. During a typical street section small group activity, participants were provided puzzle-like pieces that represent key features for building a typical street section that met their vision for the corridor. Puzzle pieces included options for a center median, number of travel lanes, landscaping, and shoulder treatments. Ideas for the ideal street cross section were captured on boards and shared with the project team for identifying potential design concepts.



The charrette generated nine different concepts: four 4-lane median divided concepts (which vary in their provisions for bicyclists and pedestrians and in curb and gutter versus paved shoulders/ditches), two Superstreet concepts (one with curb and gutter and one with paved shoulders/ditches), a 4-lane undivided concept, a 5-lane concept, and a 6-lane median divided concept.

Overall, most participants saw a need to accommodate bicyclists and pedestrians. However, there was much less support for shared or designated bike lanes next to the travel lanes. There was more support to accommodate bicyclists on a multi-use path, and pedestrians on sidewalks on one or both sides of the roadway.

Coordination meetings were held with the Towns of Matthews, Stallings, and Indian Trail to discuss the preferences that were gathered during the charrette on how the road should look and function. All of the charrette design concepts generated meet the project purpose to increase capacity and improve operations in the corridor to some degree, but the concepts varied in their ability to enhance mobility for pedestrians and bicyclists, their impacts, and their ability to provide the additional benefit to improve safety conditions along the corridor. Each design concept was reviewed using the following questions:

1. *Is it consistent with local plans/visions?*
2. *Is there potential for it to worsen safety conditions in the project study area?*
3. *Is it likely to face strong public opposition as an alternative?*
4. *Are there any issues that would make it unreasonable or infeasible to implement?*

The four-lane undivided typical section and the five-lane typical section were eliminated because:

- The four-lane undivided roadway and the five-lane roadway would not be consistent with local plans that call for a median-divided facility.
- An undivided roadway has the potential for worsening safety conditions on the corridor and would not achieve adequate operational improvement.
- Available research suggests that in comparison, a four-lane divided roadway is safer than a five-lane roadway.

- Overall, five-lane typical roadways have inferior vehicle safety and operational performance compared to median-divided facilities.
- Crash rates, projected traffic volumes, speed limit, and corridor land uses suggest that a five-lane section would not enhance the overall travel safety conditions in the project study area.

### 2.3.2 Roadway Alignment

A “best-fit” roadway alignment was developed based on a four-lane median divided typical section. The existing right of way width varies throughout the project study area, and additional right of way would be needed to improve the existing roadway. Consideration was given to minimizing impacts to surrounding resources and development.

There are several resources and activity centers adjacent to both sides of East John Street-Old Monroe Road for the length of the project study area, including residential neighborhoods, retail shopping centers, the Four Mile Creek greenway, fire station/rescue, and churches.

Early on, including at the design charrette and project coordination meetings, the Towns and public expressed concern with a wider six-lane footprint alternative. Development of an initial “best-fit” alignment was useful in qualitatively comparing potential impacts between the four-lane and six-lane median divided footprints. The NCDOT presented the initial alignment at a public workshop in January 2014. The initial “best-fit” option shown at the January 2014 public meeting is described below from west to east and shown in **Appendix A**.

Widening was shown symmetrically (widen approximately equally on both sides of roadway) from Trade Street to the Matthews Church of God in order to minimize or avoid impacts to adjacent businesses and homes, the US Post Office, and the Matthews Church of God. From around the church to east of Greylock Ridge Road, the widening was proposed to the north to avoid the Four Mile Creek Greenway. From there to I-485, the widening was symmetrical to make use of the existing right-of-way surrounding the existing I-485 interchange.

Just beyond the easternmost ramps of I-485, widening was generally to the north to avoid a pond, then transitioning to the south to avoid Duke Energy transmission towers. Before entering Stallings, widening was to the north to avoid the Eastwood Forest neighborhood, Eastwood Forest Baptist Church, gas stations/businesses in the southwest and southeast quadrants of the Old Monroe Road/Potter Road-Stallings Road intersection, and the Rock Store Bar-B-Q. Beginning west of Chestnut Lane, widening was to the south to just west of Waxhaw-Indian Trail Road to make use of vacant land on the south side.

Around Waxhaw-Indian Trail Road, widening was symmetric in order to minimize impacts to Union Festival Shopping Center. Then, widening was shown transitioning to the south to avoid homes on the north side. Just west of South Fork Road, widening was shown transitioning to the north to avoid Creekside Bible Church. Then, beginning east of Kennerly Drive, widening was to the south to avoid Living Way Church and Grace Baptist Church properties. From Picketts Circle to the end of the project, widening was symmetric to minimize impacts to the Sun Valley Commons and The Shops at Sun Valley.

### 2.3.3 Intersection Options

The corridor intersects with five major roadways: Trade Street, I-485, Stallings Road-Potter Road, Waxhaw-Indian Trail Road, and Wesley Chapel-Stouts Road. The proposed project also would include connections with the future Buckley Way, Greylock Ridge Road Extension, and McKee Road Extension in Matthews, and with the Chestnut Connector in Indian Trail. The cross streets already carry or are projected to carry moderate to substantial traffic volumes, so operations at these intersections affect overall operations along the corridor.

Due to high existing and projected through-traffic volumes and turning movement volumes at the major intersections, the NCDOT evaluated both traditional intersection types (e.g. full movement) and other concepts, including the Superstreet and a variation of the Superstreet, known as a Michigan Left.

Throughout the alternatives process, coordination efforts included additional requests to evaluate other options. For example, Matthews staff requested investigation of a tunnel and roundabout options for the intersection with Trade Street. The NCDOT also considered a quadrant intersection at Wesley Chapel-Stouts Road. These options were eliminated due to unacceptable operations, constructability, potential impacts, and/or cost considerations.

In the Superstreet configuration, side-street traffic can only turn right at the intersection. Vehicles that want to continue straight on the side street or go left on the main road must first turn right, then access a U-turn a short way down the main road to then be able to travel in their desired direction.

The Superstreet provides the following benefits:

- Increased safety by reducing conflict points at major intersections
- Time savings by reducing signal phasing
- Increased capacity
- Access management
- Improved traffic flow
- Land use and corridor protection (e.g. smaller roadway footprint than interchange or six-lanes)
- Enhanced signal coordination
- Dedicated U-turns for efficiency

The municipalities expressed various concerns and requests for major intersections within their jurisdictions, and asked the NCDOT to consider these in the alternatives development for the project. A summary of the design considerations requested or noted by local staff, agencies, and/or the public during alternatives development are summarized in **Table 2-2**.

**Table 2-2: Intersection Design Considerations**

| Project Section/<br>Intersection | Design Consideration/Request   |
|----------------------------------|--|
| <b>East John Street</b>          |  |
| Trade Street                     | <ul style="list-style-type: none"> <li>• Avoid nationally eligible historic Reid House (west of Trade Street)</li> <li>• Maximize access to adjacent destinations</li> <li>• Maintain pedestrian access and on-street parking in downtown area</li> </ul>  |
| I-485                            | <ul style="list-style-type: none"> <li>• Accommodate bicyclists and pedestrians</li> <li>• Avoid total interchange reconstruction</li> <li>• Minimize right of way impacts to adjacent developable land</li> <li>• Maximize traffic flow during peak periods</li> </ul>  |
| <b>Old Monroe Road</b>           |  |
| Stallings Road/Potter Road       | <ul style="list-style-type: none"> <li>• Allow flexibility for future improvements</li> <li>• Optimize traffic flow, but maintain ability to implement Stallings Downtown Plan</li> <li>• Provide appropriate pedestrian island for people to cross the intersection</li> </ul>  |
| Waxhaw-Indian Trail Road         | <ul style="list-style-type: none"> <li>• Maintain access to existing shopping centers</li> <li>• Balance substantial volumes along Waxhaw-Indian Trail Road</li> <li>• Accommodate incoming development east of intersection</li> </ul>  |
| Wesley Chapel-Stouts Road        | <ul style="list-style-type: none"> <li>• Balance high volume movements for both Old Monroe Road and along Wesley Chapel-Stouts Road</li> <li>• Balance movements for closely spaced signalized intersection to the west and east of intersection</li> <li>• Accommodate proposed anchor store development in northeast quadrant</li> </ul> |

### 2.3.4 I-485/East John Street Interchange Options

The existing diamond interchange at East John Street and I-485 currently operates near capacity. East John Street has two through-lanes in each direction within the interchange that taper down to one lane in each direction outside of the interchange. Preliminary traffic operations analysis revealed that the ramp intersections with East John Street will operate at unacceptable levels of service (LOS) and have queuing issues by 2025 with the existing configuration.

The project team completed detailed analysis of the interchange to identify an interchange concept that would provide an acceptable LOS and operations in the design year. The *I-485 Interchange Concepts Analysis Memo* (Atkins, May 2014) documents the evaluation and comparison of alternative interchange forms.

In addition to traffic operations analysis, other factors were considered for the interchange form, including ability to accommodate bicycle and pedestrian elements on East John Street, construction costs, and right-of-way impacts. One option considered was improving the existing diamond interchange by providing dual left turn lanes from East John Street to the I-485 ramps, but there still would be substantial operational issues. More importantly, that configuration cannot accommodate pedestrian and bicycle facilities along East John Street because there is not enough space under the existing dual bridges that carry I-485 over East John Street.

Other options considered to improve traffic operations were the Diverging Diamond Interchange (DDI), Partial Cloverleaf A (ParCloA) with loop ramps in the northeast and southwest quadrants, and ParCloB (loop ramps in the southeast and northwest quadrants). The ParClo options would require more right of way in the quadrants where loop ramps are added. The Diamond, DDI and ParCloB would likely require new I-485 bridges in order to fit the widened East John Street underneath with bicycle and pedestrian provisions. The ParCloA option would accommodate a widened East John Street and bicycle and pedestrian accommodations without having to entirely replace the I-485 bridges, but the dual I-485 bridges would need to be widened to add an acceleration lane and deceleration lane on I-485 that connect to the loop ramps.

The ParCloA interchange was identified as the best option for the East John Street interchange at I-485. It would improve operations, would not require replacement of the existing bridge, and would accommodate pedestrian and bicycle elements. The ParCloA would require widening of the bridges (adding an extra lane) to accommodate the loop and there would be an auxiliary lane to US 74 that would need to be added along both directions of I-485. There would still be signals at the ramp termini, but the ParCloA design reduces signal phases by relocating the left turn movements from East John Street to the loop ramps. This would allow for more green time for the other movements at the signals.

### 2.3.5 Results of Additional Screening of Improve Existing Roadway Options

The following factors were considered in determining which options to advance for further comparison:

- Four-lane capacity could improve traffic flow overall, but queuing conditions could still cause delays at major intersections.
- Six-lane capacity could address high volumes forecasted, but result in greater impacts.
- Addressing congestion may require corridor-wide recommendations (e.g. applying non-traditional improvements to an entire corridor rather than at a single intersection).

Staff from all three Towns in the project corridor expressed concern with the use of non-traditional intersection forms, but also expressed opposition to a six-lane divided roadway.

Three preliminary alternatives were developed for additional local and public input, comparisons of potential impacts, and detailed traffic operations.

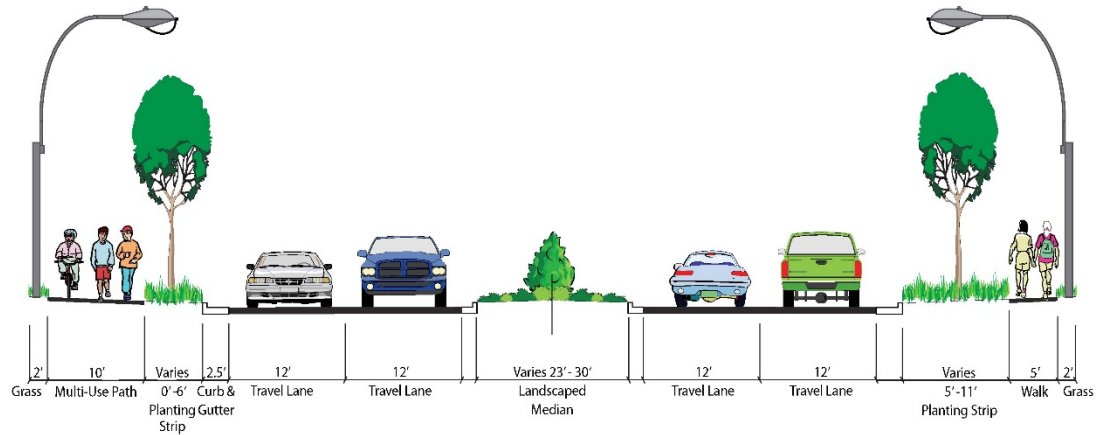
**Figure 2-2** presents a summary of Preliminary Alternatives 1, 2, and 3.

The typical sections for each are provided below.



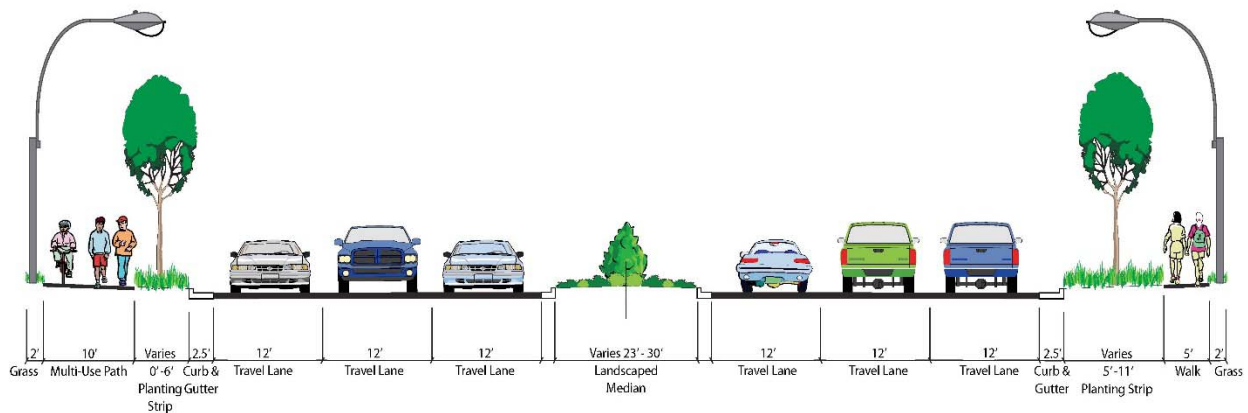
**Preliminary Alternative 1 (4-Lane Divided Roadway)** – As shown in **Exhibit 2-1**, a four-lane median divided roadway and a combination of intersection types, including full movement, leftover (allows left from primary street to side street, but no left from side street to primary street), and right-in/right-out intersections with U-turn locations.

**Exhibit 2-1: Preliminary Alternative 1: 4-Lane Divided Roadway**



**Preliminary Alternative 2 (6-Lane Divided Roadway)** – As shown in **Exhibit 2-2**, a six-lane median divided roadway and a combination of intersection types, including full movement, leftover, and right-in/right-out intersections with U-turn locations.

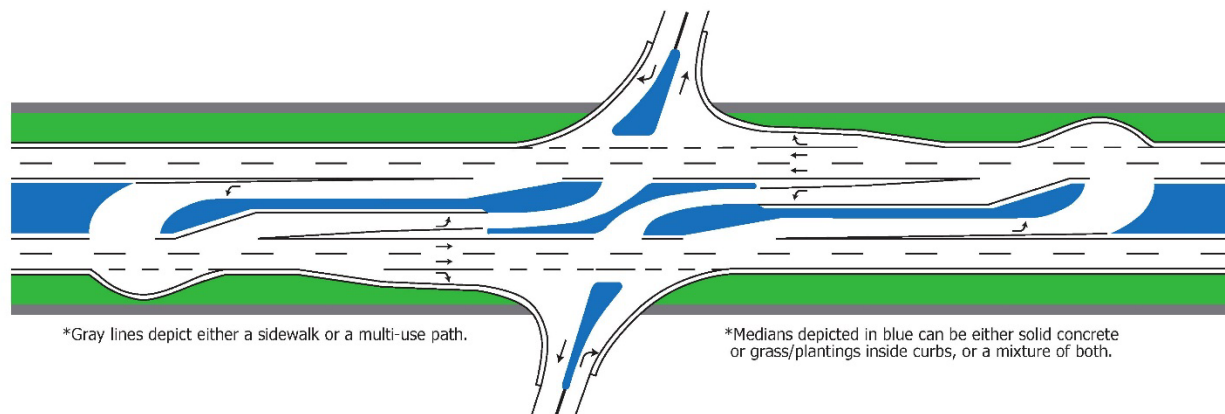
**Exhibit 2-2: Preliminary Alternative 2: 6-Lane Divided Roadway**





**Preliminary Alternative 3 (4-Lane Superstreet)** – As shown in **Exhibit 2-3**, the typical section between intersections would generally match that of Alternative 1 (the 4-Lane Divided Roadway), but redirects side-street left-turns and through traffic at some intersections. This option would also include a combination of some full movement, leftover, and right-in/right-out intersections with U-turn locations. In a superstreet configuration, all side-street traffic makes a right turn, then uses a nearby U-turn location to proceed to their desired destination. The superstreet intersection would allow eastbound and westbound East John Street-Old Monroe Road to operate independently, allowing for better signal coordination compared to conventional intersections. A variation of the superstreet intersection, referred to as a Michigan left intersection, would redirect all left-turn traffic from an intersection to a nearby U-turn location. After completing the U-turn, traffic would then make a right-turn at the original intersection to reach desired destination. A superstreet intersection redistributes the side street left-turn and through movements, while the Michigan Left intersection redistributes the main street and sidestreet left-turn movements.

**Exhibit 2-3: Preliminary Alternative 3: 4-Lane Superstreet**



## 2.4 Preliminary Alternatives Comparison

### 2.4.1 Qualitative Comparison

Functional engineering designs were developed for each preliminary alternative and included vertical and horizontal alignments, edges of pavement, slope stake (construction) limits, and preliminary right of way limits.

A qualitative comparison of the alternatives' functional designs showed that:

- The 4-Lane Divided Roadway and 4-Lane Superstreet concepts (Preliminary Alternatives 1 and 3) would have similar impacts to surrounding resources.
- The 6-Lane Divided Roadway would have greater direct impacts to adjacent property owners and resources than the 4-Lane Divided Roadway and 4-Lane Superstreet due to a wider footprint.

In addition, the 6-Lane Divided Roadway is not consistent with local plans, which call for a 4-lane roadway, and had lower public support at the project design charrette and the public meeting.

#### 2.4.2 Public and Local Opinion

The NCDOT coordinated and collaborated extensively with the Towns along the corridor throughout the alternatives process. Regular quarterly meetings were held between spring 2013 and fall 2014 to exchange information and obtain input on key elements at each phase of the project, including purpose and need and alternatives development and evaluation. **Section 5.2** includes more detail on public involvement and local coordination.

The NCDOT considered all alternative and design requests, but due to traffic operations, necessary avoidance of cultural resources, and/or compliance with design standards (i.e. spacing requirements), were not able to incorporate all requests into the project designs (see **Section 5.2.6** and **Table 5-1**).



As noted in **Section 2.3.2**, a public meeting was held on January 21, 2014 to present and receive input on the preliminary project alternatives, including feedback on typical section options and variations on pedestrian and bicycle elements (see also **Section 5.2.2**). Although the 6-lane Divided Roadway concept did not garner considerable support at the August 2013 project design charrette, due to projected traffic volumes it was carried forward for comparative traffic analysis and additional public scrutiny.

The preliminary alternatives were shown on displays and summarized in a meeting handout. Comment forms were included in the handout to gauge support/opposition of the preliminary alternatives. Just over half of the comment forms received specified support for the 4-Lane Divided Roadway. About one-quarter of the comment forms had support for the 6-Lane Divided Roadway concept, and about 16 percent support for the 4-Lane Superstreet concept. Three-quarters of respondent comments noted disapproval of the 6-Lane Divided Roadway and 4-Lane Superstreet options. About half of the respondent comments specified support for a 4-Lane Divided Roadway concept for all three sections of the project.

Since bicycle and pedestrian accommodations are key features of the project, and because there are different ways to include these features, the public was asked for feedback on bicycle and pedestrian elements. Similar to the charrette feedback, there was lower support for shared or designated bike lanes adjacent to travel lanes. Most participants felt that it was more important to accommodate non-advanced type recreational cyclists with a multi-use path, and to accommodate pedestrians either through sidewalk on one or both sides of the roadway and/or with a multi-use path.

### 2.4.3 Design Year (2035) Traffic Volumes and Operational Analysis

As shown in **Table 2-3**, (and in a comparison of **Figure 1-1** and **Figure 2-3**), the projected Build traffic volumes along the corridor will increase substantially over the No-Build in the 2035 design year. In one area (Trade Street to I-485), this increase is as much as 101 percent. The Build annual average daily traffic (AADT) along the corridor (NCDOT, July 2013) was based on capacity improvements from a two-lane to a four lane facility. The projected traffic volumes for the project as well as for other roadways within the project vicinity are included in **Appendix B**. The AM and PM peak hour intersection turning movement volumes also were developed from the forecasts.

**Table 2-3: Year 2035 No-Build and Build AADT Volumes**

| Segment of East John Street-Old Monroe Road                                   | 2035 No-Build | 2035 Build |
|---|---------------|------------|
| North Trade Street/South Trade Street to I-485                                | 27,100        | 54,500     |
| I-485 to Campus Ridge Road  | 29,500        | 43,000     |
| Stallings Road/Potter Road to Pleasant Plains Road                            | 16,300        | 23,200     |
| Proposed Chestnut Connector/Chestnut Lane to Waxhaw-Indian Trail Road         | 21,400        | 37,500     |
| Garmon Drive/Southfork Road to Midway Drive/Brandon Oaks Parkway              | 26,300        | 43,000     |
| Mustang Drive/Sun Valley Commons Shopping Center to Wesley Chapel-Stouts Road | 21,000        | 31,800     |

Source: *Traffic Forecast for U-4714* (NCDOT, July 2013). \*Note: Traffic forecasts based on four-lane capacity constrained facility.

AADT = Annual Average Daily Traffic

Traffic operations were analyzed for the three preliminary alternatives. The analysis included extensive investigation of intersection options to help uncover which designs could achieve acceptable operations in the design year. Numerous design options were developed for intersections associated with the 4-Lane Divided Roadway and 4-Lane Superstreet alternatives, including the following intersections:

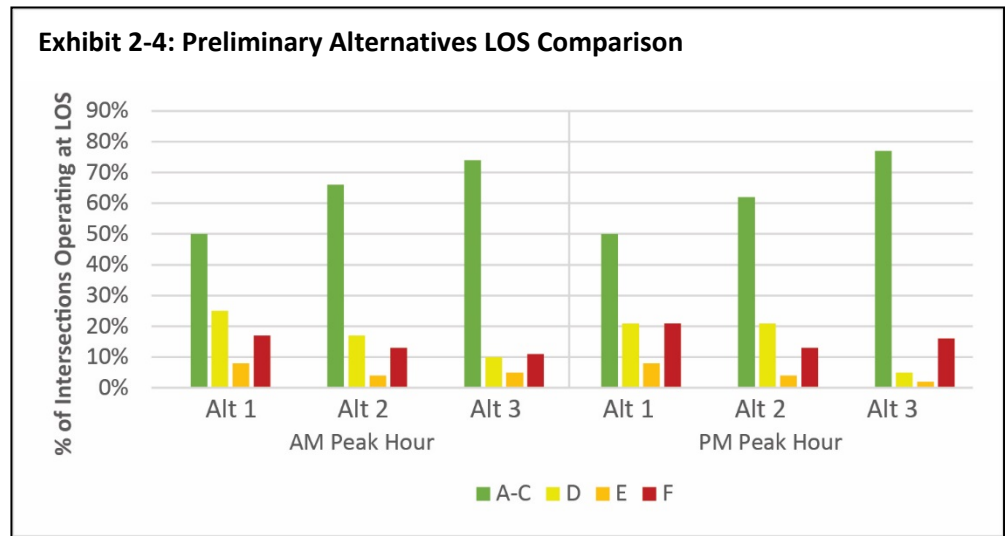
- East John Street/I-485 Interchange
- East John Street/Trade Street
- Old Monroe Road /Pleasant Plains Road/Kerry Greens Neighborhood Entrance
- Old Monroe Road/Stallings Road-Potter Road
- Old Monroe Road/Waxhaw-Indian Trail Road
- Old Monroe Road/Wesley Chapel-Stouts Road

Results of the individual intersection analyses are documented in the *I-485 Interchange Concepts Analysis Memo* (Atkins, May 2014) and *Trade Street/Waxhaw-Indian Trail Road/Wesley Chapel-Stouts Road Alternative Intersection Analysis Memo* (Atkins, August 2014), which are included in **Appendix B**.

For each alternative, overall traffic operations were evaluated. Results of the analysis are documented in the *Build Traffic Operations Technical Memorandum* (Atkins, July 2015), which is incorporated by reference. The report includes recommendations for signalization, number of turn lanes, and turn lane lengths required to provide acceptable operations in the design year. The analysis was based on the intersection options shown in **Figure 2-2**. **Appendix B** includes the analysis results.

All intersections and median breaks were analyzed for the three Preliminary Alternatives. The 4-Lane Divided Roadway and 6-Lane Divided Roadway included 24 intersections and U-turn locations. The 4-Lane Superstreet included 62 intersections and U-turn locations. There are more intersections/U-turns for the Superstreet because eastbound and westbound turning movements are separated and additional U-turns are needed compared to the other alternatives.

As shown in **Exhibit 2-4**, in the AM peak hour, the 4-Lane Superstreet (Alternative 3) has the highest percentage of intersections that would operate with a good LOS (LOS A to LOS C) and the lowest percentage with a fair LOS (LOS D) and poor LOS



(LOS E or LOS F). Similarly in the PM peak hour, it has the highest percentage of intersections that would operate with a good LOS and the lowest percentage with a fair LOS.

The 4-Lane Superstreet has a lower percentage of intersections that would operate with a poor LOS than the 4-Lane Divided Roadway (Preliminary Alternative 1), but would have a slightly higher percentage, by one percent, than the 6-Lane Divided Roadway (Preliminary Alternative 2).

For all three Preliminary Alternatives, only one intersection, East John Street/Trade Street at the western terminus of the project, would operate at unacceptable LOS. Further improvements to achieve LOS D or better are not proposed for this intersection because the Town of Matthews expressed concern about impacts to their downtown, and there are historic resources in proximity to the intersection. The remaining intersections that would operate at LOS E or F are not considered unacceptable because they are yield- or stop-controlled with a critical movement volume less than 100 vehicles per hour or with a queue length less than 250 feet. The yield- or stop-controlled movements would experience substantial delay due to high opposing volumes, but the movement volume itself is not high enough to warrant further improvements (e.g. a traffic signal).

**Figure 2-4** provides a comparison of the LOS for the major intersections. All three preliminary alternatives would provide substantial benefits over the 2035 No-Build condition. Furthermore, it should be noted that the 6-Lane Divided Roadway does not show substantial operational benefits over the 4-Lane Divided Roadway, which is likely due to the high turning volumes at the cross streets.

The 4-Lane Superstreet would result in the best operations overall by allowing better progression along the corridor, as a superstreet intersection substantially reduces the number of potential conflict points

at each intersection. This provides safety and operational benefits by reducing the number of signal phases and conflicting volumes at a single location.

## 2.5 Identification of Preferred Alternative

After a comparison of the benefits and potential impacts of the preliminary alternatives, **Preliminary Alternative 3 – 4-Lane Superstreet** was identified as the preferred alternative. It was carried forward for preliminary design and a detailed study of impacts. **Chapter 3** describes the Preferred Alternative in more detail and **Chapter 4** discusses potential impacts to the environment.

Although all three preliminary alternatives would improve corridor conditions by increasing capacity, improving intersection operations, enhancing safety, and accommodating bicyclists and pedestrians, the Project Team identified the 4-Lane Superstreet as the Preferred Alternative because:

- The 6-Lane Divided Roadway would provide only marginal operational benefits over the 4-Lane Divided Roadway and 4-Lane Superstreet alternatives in the design year.
- The 6-Lane Divided Roadway would have greater direct impacts to adjacent property owners and resources due to a wider footprint and therefore, greater right-of-way requirements. The 4-Lane Superstreet comparatively meets the project purpose and need while minimizing impacts to the cultural, community, and natural environment.
- The 6-Lane Divided Roadway is not consistent with local plans that call for a four-lane roadway.
- There was lower public support for a six-lane roadway than a four-lane roadway at the project design charrette and the public meeting.
- Regarding bicycle and pedestrian accommodations, there was lower public support for shared or designated bike lanes adjacent to travel lanes. Overall, there was more support to accommodate non-advanced recreational cyclists via a multi-use path, and pedestrians either through sidewalk on one or both sides of the corridor.
- The 4-Lane Superstreet would generally have the same typical section as the 4-Lane Divided Roadway throughout the corridor, with differences around key intersections where design treatments are needed to achieve acceptable operations. The 4-Lane Superstreet comparatively provides better overall projected traffic operations than the 4-Lane Divided Roadway, while maintaining a locally-desired four-lane typical section throughout most of the corridor.



### 3 PREFERRED ALTERNATIVE (ALTERNATIVE 3)

The 4-Lane Superstreet is the Preferred Alternative. The Preferred Alternative best balances needs, impacts, and costs compared to the other alternatives studied. This is not a final decision. After the EA comment period ends, the FHWA and NCDOT will either 1) decide to prepare an EIS, or 2) identify a Recommended Alternative and prepare a Finding of No Significant Impact (FONSI). In making this decision, FHWA and NCDOT will consider agency and public comments on this EA and the proposed design submitted during the comment period and at the public hearing.

#### 3.1 Preferred Alternative Description

**Appendix C** contains the preliminary design for the Preferred Alternative. The mapping showing the Preferred Alternative includes the preliminary proposed alignment, preliminary right-of-way limits, preliminary travel lanes, preliminary areas of ground fill and cut, and preliminary proposed easements. The preliminary design was developed in accordance with the *Roadway Design Guidelines* (NCDOT, 2002) and the *A Policy on Geometric Design of Highways and Streets* (or “Green Book”) (AASHTO, 2011).

The Preferred Alternative includes the following:

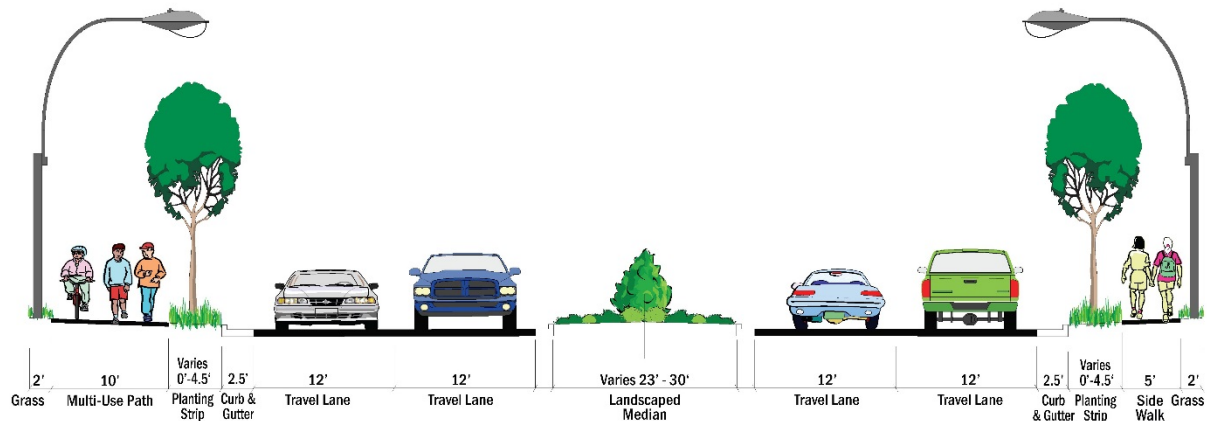
- Upgrading the existing two-lane uncontrolled access roadway to a four-lane median divided urban roadway
- Non-traditional specific design treatments (mostly Superstreet design) at intersections
- Access management (e.g. signalization, median, control of access at intersections)
- Modification of the existing diamond interchange at East John Street/I-485 to a partial cloverleaf
- Bicycle and pedestrian accommodations
- Opportunity for median landscaping and within the berm adjacent to the roadway (type to be determined)

#### 3.2 Right of Way and Typical Section

The Preferred Alternative has the same overall four-lane cross section along the length of the mainline. As seen in the proposed preliminary designs, variations in the right-of-way width would occur to accommodate intersection improvements (see **Figure 2-2** and **Section 3.4**) and U-turn bulb locations.

The proposed typical section for East John Street-Old Monroe Road, as shown in **Exhibit 3-1**, consists of a four-lane, raised median divided roadway with curb and gutter. The standard median width is 23 feet and includes curb and gutter on each side. The median width varies in sections to facilitate turn lanes.

### Exhibit 3-1: Proposed Four-Lane Median Divided Roadway



For the mainline overall, the proposed right-of-way width along East John Street-Old Monroe Road is approximately 104 feet to 111 feet. At U-turn locations, the right of way widens to 240 feet to provide extra width for turning vehicles. Additional easements may also be acquired as needed for drainage, utilities, and construction.

Lane widths for the proposed cross section consist of two 12-foot travel lanes. A berm on each side is incorporated into the typical section to provide space for a planting strip and either a 5-foot sidewalk or 10-foot multi-use path. However, minor design variations are included for the section in Matthews between Trade Street and Buckley Way to minimize impacts. East of Trade Street, the proposed design includes a reduced median, 11-foot lanes, a 5-foot sidewalk directly behind the back of curb, and no multi-use path. From around Buckley Way, the design transitions to a wider median, 10-foot multi-use path, with 12-foot lanes beginning east of Buckley Way. Then, the sidewalk is no longer at the back of curb and a planting strip is proposed beyond Buckley Way.

### 3.3 Alignment

The alignment shown in **Appendix C** minimizes potential impacts to the environment such as community, natural, and cultural resources such as those described in **Chapter 4**. Other factors considered in alignment placement included right of way and construction costs, potential residential and business relocations and opportunities for utilizing existing pavement.

As preliminary design progressed for the Preferred Alternative, additional adjustments and shifts in the alignment were made to avoid and minimize impacts to adjacent resources, including historic properties (see **Section 4.3**).

### 3.4 Interchanges/Intersections

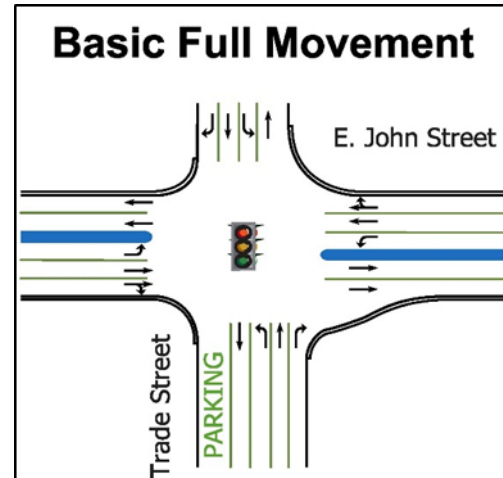
A description of the proposed intersection designs by project section are provided below. The proposed location of U-turns and traffic signals are subject to change through final design following public hearing feedback and to further minimize impacts.



**Section A (Trade Street to I-485)** – The Trade Street intersection in Matthews would remain a full movement with right-in/right-out for adjacent properties beginning west of Trade Street. The full movement intersection would have no separate right turn lanes from East John Street to Trade Street, would include no improvements to Trade Street, and would include a six-foot concrete median (see **Exhibit 3-2**).

The full movement design addresses Matthews staff concerns (discussed in **Section 2.3.3**) regarding impacts to the downtown entrance and historic district, including probable relocations and impacts to the existing on-street parking along Trade Street. The proposed intersection design would balance traffic operations to the extent possible while minimizing impacts to this narrow section of the corridor.

**Exhibit 3-2: Basic Full Movement**

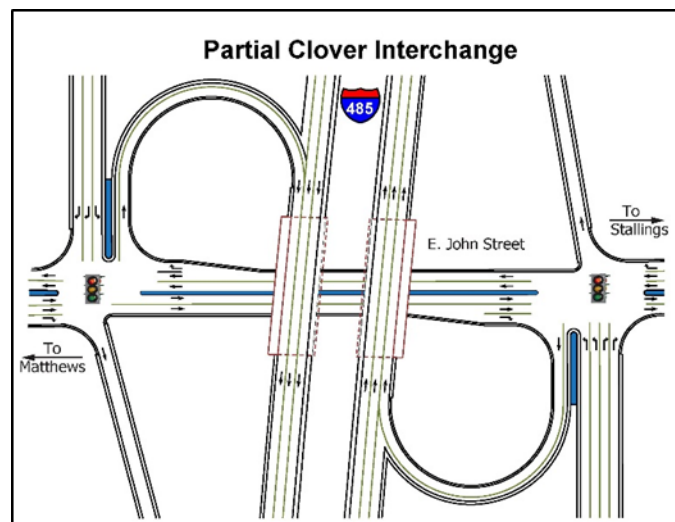


Continuing east from the intersection with Trade Street, access would be right-in/right-out for adjacent properties, with three exceptions where a left-over would be provided. These include an eastbound left-over for the post office, an eastbound left-over for Matthews Sportsplex/Greylock Ridge Road Extension (future), and a westbound left-over for Council Place. Section A also includes six U-turn locations: Trade Street, west of Buckley Way (future), west of Edgeland Drive/east of Buckley Way (future), between Clearbrook Road and Greylock Ridge Road, and at Council Place (east of the interchange). The U-turn for Council Place would not be located to the west of the interchange due to spacing requirements.

**Section B (I-485 to Waxhaw-Indian Trail Road (SR 1008))** – A Partial Cloverleaf A

(ParCloA) interchange design is proposed for the East John Street interchange with I-485 (see **Exhibit 3-3**). The design would accommodate pedestrian and bicycle provisions on East John Street without having to replace the existing I-485 bridges over East John Street. There would be traffic signals at the ramps, but this design reduces signal phases by moving the left turns from East John Street to the loop ramps. This would allow for more green time for the other movements at the signal.

**Exhibit 3-3: Partial Clover Interchange**

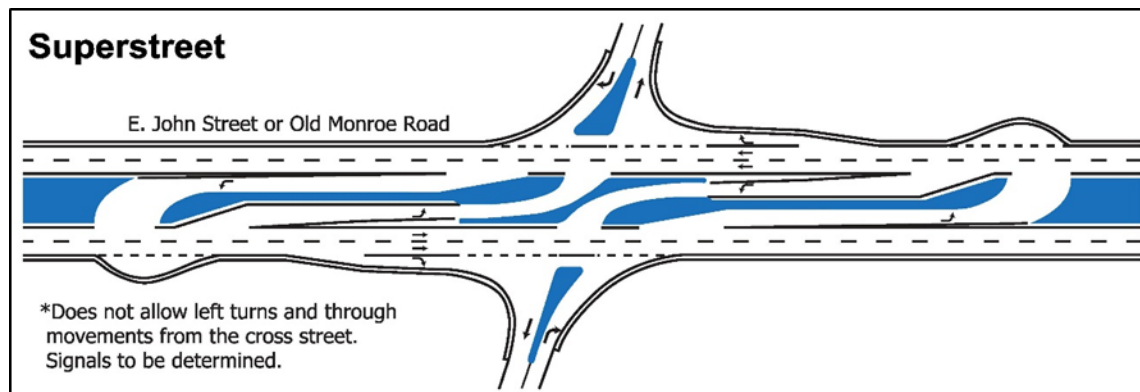


Between I-485 and Stallings Road/Potter Road, cross streets and driveways would include right-in/right-out only or a left turn at future locations to be determined (e.g. future access to adjacent vacant parcels).

The Stallings Road/Potter Road intersection would be a Superstreet design (see **Exhibit 3-4**). The design would include eastbound to westbound U-turn full lanes, meaning the U-turn lanes would extend back to the Potter Road/Stallings Road intersection to allow for direct access from the side street.

Further east, the Pleasant Plains Road intersection also would be designed as a Superstreet. The left turn and through movements from the side street would be redirected to the U-turn for safety and efficiency. The proposed design includes two right-turn lanes on Pleasant Plains Road, and Kerry Greens would remain stop-controlled. From that intersection until the proposed Indian Trail Chestnut Connector project, access would be restricted, allowing only right-in/right-out (or with a left-over). The Chestnut Connector intersection would also be designed as a Superstreet.

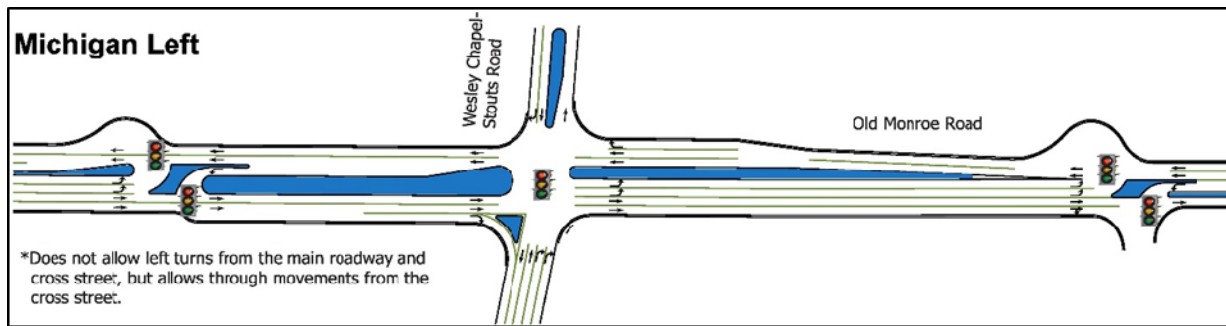
**Exhibit 3-4: Superstreet**



**Section C (Waxhaw-Indian Trail Road to Wesley Chapel-Stouts Road (SR 1377))** – The proposed design at the Waxhaw-Indian Trail Road intersection is a Superstreet (see **Exhibit 3-4**). The left turn and through movements from the side street would be redirected to the U-turn for safety and efficiency. There would be additional turn lanes constructed on Waxhaw-Indian Trail Road. The Brandon Oaks Parkway/Midway Drive intersection and Mustang Drive intersections are also proposed as a Superstreet with access restricted in between these two intersections, allowing only right-in/right-out (or with a left-over).

The proposed design at the Wesley Chapel-Stouts Road intersection is a Michigan Left (see **Exhibit 3-5**). As with the Superstreet, this design would redistribute movements away from the intersection, but would allow through movements at Wesley Chapel-Stouts Road (as well as right turns). The option would not allow left turns from Old Monroe Road or Wesley Chapel-Stouts Road and would include a free-flow right turn movement off Old Monroe Road to Wesley Chapel-Stouts Road.

**Exhibit 3-5: Michigan Left**



### 3.5 Speed Limit and Design Speed

The design speed for East John Street-Old Monroe Road is 50 mph. At this time, the proposed posted speed limit along East John Street-Old Monroe Road is 45 mph. The Town of Stallings has requested to maintain the posted 35 mph speed limit. The NCDOT will coordinate with all three towns during final design to determine posted speed limits.

### 3.6 Structures

The Preferred Alternative includes modification of the existing I-485 diamond interchange at East John Street to a partial cloverleaf (ParClo A). Improvements for the interchange require detailed study, which is documented in a federally-required Interstate Access Report (IAR) that must be approved before final design can begin for the proposed project.

The I-485 bridges would be widened to add a lane on each side to accommodate the loops. However, the actual construction for widening the bridges would occur with another project, STIP No. I-5507.

**Section 4.2.7** summarizes structure requirements for drainage crossings.

### 3.7 Bicycle and Pedestrian Accommodations/Greenways

A berm on each side is incorporated into the typical section to accommodate a 5-foot sidewalk or 10-foot multi-use path. For most of the project, the typical section includes sidewalk on one side and multi-use path on the other. The exception to this is a small portion in Matthews from downtown to the proposed Buckley Way (future local project) where, in order to minimize impacts to adjacent properties, a sidewalk is proposed on both sides directly at the back of the curb.

At Buckley Way, sidewalk is proposed on the north side and multi-use path is proposed on the south side to allow for connectivity with the Four-Mile Creek Greenway for the remainder of the corridor in Matthews. The multi-use path is transitioned to the north side of Old Monroe Road at Stallings Road-Potter Road to facilitate access to the Town Park, as requested by the Town of Stallings. In Indian Trail, the multi-use path then transitions to the south side at the Chestnut Connector (future local project) until the end of the project.

Pedestrian and bicycle accommodations will be further coordinated with the Towns during final design. In accordance with NCDOT Pedestrian Policy, NCDOT will bear the full cost to replace any existing

sidewalks to be relocated by the project along existing streets. The Towns will participate in the cost of new sidewalks and multi-use paths where they do not currently exist. A municipal agreement will be prepared prior to project construction.

The NCDOT will coordinate with all three Towns regarding the type and location of pedestrian/bicycle crossings at major intersections. During the process, all three Towns expressed the importance of providing safe and effective pedestrian and bicycle movement at the major intersections along the corridor. The type and location of crossings will be coordinated and determined with the Towns and the NCDOT Division of Bicycle and Pedestrian Transportation staff during final design, particularly in the following areas:

- Major intersections where sidewalk and multi-use path are proposed at the back of curb
- Wesley Chapel-Stouts Road intersection - eastbound Old Monroe Road right turn to southbound Wesley Chapel-Stouts Road where there is a free flow movement and short storage distance

The proposed project design incorporates to the extent possible the initial Carolina Thread Trail (CTT) concept (see **Figure 4-1a-b**). The future CTT would link recreational resources in Union and Mecklenburg County, and would utilize existing infrastructure and greenways to help realize recreational and transportation potential. For example, a proposed conceptual trail alignment on the north side (Matthews Sportsplex property) in the project vicinity would use the existing Four-Mile Creek Greenway. In addition, the Old Monroe Road corridor from Campus Ridge Road to Wesley Chapel-Stouts Road is identified as a connection opportunity for the Carolina Thread Trail network (Carolina Thread Trail, *Master Plan for Union County and Participating Municipalities*, May 2011).

### 3.8 Cost Estimates

The total project cost in the STIP is \$87.5 million, with \$1 million as prior year expenditures and \$86.5 million available for Right of Way and Construction. The total funding available in the STIP is included in **Table 3-1**.

**Table 3-1: U-4714 Project Cost**

| Phase                     | Cost                |
|---------------------------|---------------------|
| Prior Expenditures        | \$1,000,000         |
| Right-of-way              | \$48,000,000        |
| Construction*             | \$38,500,000        |
| <b>Total Cost in STIP</b> | <b>\$87,500,000</b> |

Notes: Estimated costs of right-of-way, utilities, and construction are being prepared for the U-4714 Preferred Alternative and will be included in the FONSI. The ParCloA interchange cost would be constructed with Section B. STIP No. I-5507 NEPA document will include construction cost of bridge widening, as well as the auxiliary lanes and gore areas, as those improvements would be part of that project.

### **3.9 Project Schedule, Status, and Construction**

The NCDOT proposes to construct all three sections at the same time. The current schedule for constructing U-4714 includes right-of-way acquisition beginning in 2020 and construction beginning in 2022.

The bridge widening and auxiliary lanes would be included in STIP No. I-5507. The current schedule for I-5507 is right-of-way acquisition and construction beginning in 2016.

Specific work zone, traffic control, and construction phasing plans will be prepared during final design.



## 4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The existing conditions within the project study area related to the human, physical, cultural, and natural environments are described below, along with discussions of the potential impacts of the project to these resources. Potential impacts associated with the No-Build Alternative are included for comparison purposes, as appropriate. A discussion of avoidance, minimization, and/or mitigation measures for identified impacts is included where appropriate.

### 4.1 Human Environment

This chapter discusses potential effects on the human environment, including impacts to land use and consistency with local and regional planning documents; impacts to community facilities; and impacts to communities and neighborhoods, including community cohesion, right-of-way acquisition, and environmental justice considerations.

#### 4.1.1 Land Use and Land Use Plans

The project is within an area that is suburban to rural, with land uses generally consisting of a mixture of residential uses, active agriculture, several churches, a fire station, and activity or retail/commercial shopping centers at major intersections. Due to its proximity to Charlotte and I-485, much of the project study area has transitioned, or is transitioning, from agricultural and rural uses to suburban areas. People are drawn to the reasonable cost of living, housing choices, quality schools, and surrounding activity centers in fast-growing western Union County and nearby South Charlotte areas.

All three Towns in the project study area provide housing for workers who predominantly commute northwest to Charlotte on a daily basis. Retail and commercial market activity has followed the area's growth, bringing options and amenities closer to homes on the corridor. The corridor is used to access services and activity centers within and surrounding the project study area. Growing activity centers have become notable traffic generators for commuters who live in the subdivisions along the corridor.

As shown in **Figure S-2**, activity centers in the project study area include Downtown Matthews, Mecklenburg County Sportsplex, and commercial and office clusters at the intersections of Old Monroe Road with Stallings Road and Waxhaw Indian Trail Road (Union Festival and Food Lion shopping centers). In addition, Sun Valley High School and the newer Sun Valley commercial area at the intersection with Wesley Chapel-Stouts Road draw from nearby communities in Union County.

The municipalities along the project corridor have developed land use plans that include the East John Street-Old Monroe Road study area. These are listed below and discussed in more detail in the *Community Characteristics Report* (Atkins, October 2013) and *Community Impact Assessment* (Atkins, August 2015), incorporated by reference. These plans all account for the widening of East John Street-Old Monroe Road.

- Town of Matthews Land Use Plan 2012-2022 (December 2012)
- Town of Matthews Downtown Plan (January 2013)
- Town of Stallings Land Use Plan (March 2007)
- Town of Indian Trail Comprehensive Plan (November 2013)

As noted in the *Indirect and Cumulative Land Use Effects Screening Report* (Atkins, June 2014), there is a demand for additional development in the project vicinity. Development trends in the project vicinity include conversion of adjacent vacant, agricultural, and/or underutilized properties. Within the project study area, there are several projects in the early stages of planning or under construction. **Table 4-1** lists known projects, which were provided by municipal planning staff. In addition to these projects, there is space for additional outparcel development in larger existing developments such as Sun Valley Commons.

**Table 4-1: Planned Development in the Project Area**

| Name                  | Jurisdiction | Description/Use   | Status  |
|-----------------------|--------------|---|---|
| Wingate Commons       | Matthews     | 60-acre site in the northwest quadrant of I-485 interchange. Planned for Mixed use.   | Approved site plan but timeline for development is unknown. |
| Village of Sage Croft | Indian Trail | Commercial center with single family detached and attached residential development and town park West of Sun Valley Commons.  | Approved site plan.   |
| Glenn Oaks Apartments | Indian Trail | 204 multi-family units on 17 acres southeast of Old Monroe Road intersection with Waxhaw-Indian Trail Road.   | Site plan approval process.                                 |
| Shoppes at Hanfield   | Indian Trail | Proposed shopping center on 22 acres in northeast corner of Old Monroe Road and Wesley Chapel-Stouts Road. Anchored by 49,000 square foot Publix grocery store with retail shops and restaurants. | Approved. Opening 2017.                                     |
| Small Office Complex  | Indian Trail | 20-40 key main offices.   | Nothing submitted for review.                               |
| Blanchard Circle      | Indian Trail | Residential community (~11.5 acres).  | Site plan approval process.                                 |

### ***No-Build Alternative***

Under the No-Build Alternative, it is anticipated that the current patterns of development will likely continue, consistent with local land use and zoning regulations. Numerous land use plans developed to guide and manage anticipated growth in the area acknowledge the attractiveness of the corridor for continued development.

### ***Preferred Alternative***

The Preferred Alternative would require additional right of way from surrounding parcels, which would convert this land from its existing use to a transportation use. Right of way acquisition needs are discussed in **Section 4.1.3**. The conversion of some land to roadway right of way would be compatible with the remaining lands, which would benefit from having access to a more efficient roadway.

The Preferred Alternative also would be consistent with the local land use plans of Matthews, Stallings, and Indian Trail. Each plan includes widening of East John Street-Old Monroe Road.

Development projects in the area and changes in land use for parcels along the corridor are not necessarily dependent upon construction of the Preferred Alternative since the corridor already provides access to the undeveloped land in the area. Development in the area is more dependent upon



market conditions. The Preferred Alternative would change the character of the existing facility, but it would not solely contribute to changes in land use. Under the Preferred Alternative, land use would continue to be guided by adopted zoning and land use plans.

#### 4.1.2 Consistency with State, Regional, and Local Transportation Plans

Numerous transportation plans reference improvements to East John Street-Old Monroe Road either in its entirety or through specific jurisdictions. These plans not only discuss the importance of congestion relief for the corridor, but also for enhancing mobility for alternative modes.

- NCDOT 2016-2025 State Transportation Improvement Program
- CRTPO 2040 Metropolitan Transportation Plan (April 2014)
- CRTPO Comprehensive Transportation Plan (Draft, May 2015)
- CRTPO 2012-2018 Transportation Improvement Program (July 2011)
- Town of Matthews and Town of Stallings Comprehensive Transportation Plan (2012)

#### *No-Build Alternative*

The No-Build Alternative is not consistent with the adopted state, regional, and local transportation plans, all of which include the proposed project.

#### *Preferred Alternative*

The proposed project is identified in, and generally consistent with, local transportation plans. The only inconsistency between the Preferred Alternative and local plans is in the provision of bicycle lanes. Specifically, the Town of Matthews and the Town of Stallings *Comprehensive Transportation Plan* (CTP) (2012) recommends bike lanes on East John Street-Old Monroe Road for the entire length of the corridor within the Towns' limits. The Town of Matthews *Composite Bicycle and Pedestrian Plan* (May 2015) recommends either a multi-use path on both sides of East John Street, or a multi-use path on one side and a sidewalk on the other side. Although the proposed typical section doesn't fully match the concepts recommended in the CTP, the Towns and the public were involved in identifying the proposed typical section. Based on input received during public involvement forums, the proposed typical section does not include bike lanes, but instead provides sidewalk and multi-use path.

#### 4.1.3 Community Resources

Community resources located near the project study area are shown on the mapping provided in **Figure 4-1a-b**. The DCIA, or direct community impact area identified in **Figure 4-1a-b** is the area surrounding a project that is likely to be directly affected in any way during and after project construction. Factors considered in delineating this boundary include proximity to the project, potential changes in access, neighborhood boundaries, and land use patterns.

Community resources were identified using GIS data from Union County, Mecklenburg County, NCDOT, NCONEMAP, and ESRI, as well as information gathered from local stakeholders, public involvement activities, and field reviews. Community resources shown on the mapping include the following:

### **Schools**

- Sun Valley Middle School and High School are adjacent to each other at the eastern boundary of the project study area in the southeastern quadrant of the East John Street-Old Monroe Road (Old Charlotte Highway) intersection with Wesley Chapel-Stouts Road.

### **Churches and Cemeteries**

- Matthews Presbyterian Church is located at 207 West John Street at the western terminus of the project in the Town of Matthews.
- Matthews Church of God is located on the corridor at 517 East John Street in the Town of Matthews.
- Eastwood Forest Baptist Church is located at 112 Aurora Boulevard at the corner of Aurora Boulevard and Old Monroe Road.
- Creekside Bible Church is located at 212 Garmon Road in the Town of Indian Trail.
- Living Way Foursquare Church is located at 5501 Old Monroe Road in the Town of Indian Trail (corner of Midway Drive and Old Monroe Road).
- Grace Baptist Church South is located at 5739 Old Monroe Road in the Town of Indian Trail.
- Church of the Redeemer holds services in Sun Valley High School.

### **Other Community Facilities**

- A US Post Office is located at 301 East John Street.
- My Little Scholars Daycare is located at 4216 Old Monroe Road in the Town of Indian Trail.

### **Emergency Management Facilities**

- Union County's MED 51 Base is located north of Old Monroe Road at 100 Williams Rescue Road in Indian Trail.
- Stallings Volunteer Fire Station 20 is located at 4616 Old Monroe Road on the south side of Old Monroe Road in Stallings.

### **Parks, Greenways, and Recreation Facilities**

- Stumptown Park is an approximately one-acre park located at 120 South Trade Street in the Town of Matthews in the western portion of the DCIA. The park includes a performance stage, sand play/dance area, outdoor grill, picnic areas, playground, sand volleyball court, a Veteran's Memorial site, and restrooms.
- Baucom Park is an approximately one-acre park located at 601 Sadie Drive in the Town of Matthews. The park includes a picnic shelter with tables, outdoor grills, and playground with swings.

- Four Mile Creek Greenway is located in the western DCIA and links downtown Matthews with Squirrel Lake Park and connects neighborhoods from East John Street to South Trade Street. Access to the greenway is provided at East John Street north of the I-485 interchange. The greenway is an asphalt trail with boardwalk and is approximately 2 miles long.



Four Mile Creek Greenway

- The proposed Carolina Thread Trail would utilize existing infrastructure and greenways to help realize recreational and transportation potential. A proposed conceptual trail alignment within the DCIA would use the existing Matthews Four Mile Creek Greenway. The Old Monroe Road corridor from Campus Ridge Road to Wesley Chapel-Stouts Road is identified as a connection opportunity for the Carolina Thread Trail network (Carolina Thread Trail, *Master Plan for Union County and Participating Municipalities*, May 2011).

#### **Other Notable Community Features**

- The Matthews Commercial Historic District, which was listed in the National Register of Historic Places (NRHP) in 1996, is centered on Trade Street to the north of East John Street near the western DCIA boundary, as shown on **Figure 4-1a**. The district is part of an active and cohesive downtown area with such destinations as the farmers market, community center, library, and Town Hall.
- The Banks H Funderburk Store (Rock Store Bar-B-Q) is a local landmark in the Town of Stallings and is eligible for listing in the National Register of Historic Place (NRHP). The building is located at 3116 Old Monroe Road, as shown on **Figure 4-1a**. According to their website, beginning in 1936 the building was the only gasoline service station for miles serving the Town of Stallings and became known to locals as the “Rock Store”. Today the building serves as a restaurant (<http://www.rockstorebarbq.com/>). The Rock Store Bar-B-Q is an important community resource and gathering place to Stallings, as evidenced by its inclusion on the Town seal. A popular produce stand (Providence Produce) is located next to Rock Store Bar-B-Q.

#### ***No-Build Alternative***

Under the No-Build Alternative, there would be no impacts to community resources.

#### ***Preferred Alternative***

The Preferred Alternative would change access for several community resources along the corridor during and following construction of the project. The project would change direct/driveway access to right-in/right-out or leftover (due to change from two lanes with no control of access to a four-lane median divided roadway) for many adjacent resources.

Prior to and during construction, the NCDOT shall coordinate with Union County Public Schools and Emergency Services to identify appropriate detour routes for Sun Valley (middle and high school) school buses and fire/emergency response services for Stallings Volunteer Fire Station 20 at 4616 Old Monroe Road and Union County's MED 51 Base at 100 Williams Rescue Road.

The Matthews Presbyterian Church property would be impacted by right-of-way acquisition and a temporary construction easement. Other churches along the project corridor would have similar minor right-of-way impacts, but no church buildings would be displaced by the Preferred Alternative. My Little Scholars Daycare would likely be relocated by the Preferred Alternative.

Additional information about right-of-way acquisition and relocations is provided in **Chapter 4.1.5**.

#### 4.1.4 Neighborhoods and Community Cohesion

Multiple neighborhoods are located in the project study area, as shown on **Figure 4-1a-b**. GIS data from Mecklenburg and Union counties were used to identify the approximate date of housing construction along the corridor. Most of the neighborhoods along the corridor were constructed prior to the year 2000. The largest neighborhood in the project study area is the Brandon Oaks development located on the west side of Old Monroe Road between Waxhaw Indian Trail Road and Wesley Chapel-Stouts Road in the Town of Indian Trail. Construction of housing in the neighborhood began in the 1990s and continues today. Newer residential construction (post 2000) in the project study area is in the Greylock neighborhood (Matthews), Parkside at Stallings, and the Morningside neighborhood (Stallings). The following is a list of named neighborhoods from west to east that have access to/from the corridor, with approximate dates of housing construction.

- Deer Creek – 1960s through 1980s
- Greylock – Post 2000
- Bexley – Post 2000
- Eastwood Forest – 1960s through 1980s
- Camelia Park – 1960s
- Parkside at Stallings – Post 2000
- Kerry Greens – 1990s
- Cherokee Woods – 1970s through 1990s
- Lakewood Knolls – 1960s through 1990s
- Morningside – Post 2000
- Poplar Glen – 1990s
- Bryson Village – 1980 through 1990s
- Rushing Park – 1960s through 1970s
- Indian Trail Park – 1970s
- Midway Park – 1960s
- Brandon Oaks – 1990s through present
- Valley Estates – 1980s and 1990s

Effects on communities and neighborhoods can include the physical acquisition of land, homes, and businesses (see **Section 4.1.5**); the construction of physical or psychological barriers that can result from new transportation facilities that divide or isolate a section of the community; or changes in access or travel patterns within a community.

### ***No-Build Alternative***

Under the No-Build Alternative, there would be no impacts to neighborhoods and no changes in community cohesion.

### ***Preferred Alternative***

Permanent negative impacts to community cohesion and stability are not anticipated as a result of the Preferred Alternative. Although right-of-way acquisition would be required for the proposed widening, no cohesive neighborhoods/communities in the project study area would be bisected. Community impacts would be limited to homes and businesses immediately adjacent to the corridor and would include minor to moderate right-of-way acquisitions, displacement of homes and businesses, and access modifications to/from existing neighborhoods and businesses. The Preferred Alternative is not anticipated to impact any unique resources that contribute to community cohesion.

The Preferred Alternative would also have beneficial impacts on community cohesion. Sidewalk and/or multi-use path are proposed along East John Street-Old Monroe Road throughout the project corridor. This would improve mobility and connectivity for pedestrians and bicyclists. These improvements could enhance community cohesion by providing more options for interaction among neighborhoods and for accessing community resources, activity centers, and commercial nodes along the corridor, such as Downtown Matthews, Rock Store Bar-B-Q/Providence Produce Stand, and Sun Valley Commons.

## **4.1.5 Relocations and Property Acquisition**

Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, commonly called the Uniform Relocation Act, is the primary law for acquisition and relocation activities on Federal or Federally-assisted projects. The law provides uniform policy and procedures for the acquisition of real property by all agencies that receive financial assistance for any program or project of the United States Government. If Federal funds are used in any phase of the program or project, the Uniform Relocation Act applies.

The NCDOT's relocation assistance program is based on the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and Title 49 CFR Part 24. The NCDOT Right of Way Branch is responsible for acquisition of land and right of way for the construction and improvements of all roads and highways that are part of the State Highway System. The Right of Way branch ensures that persons displaced as a result of a project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate impacts as a result of projects designed for the benefit of the public as a whole. **Appendix D** contains the Relocation Reports for U-4714.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 USC 2000d, et seq), per NCDOT's Title VI Policy Statement.

### **No-Build Alternative**

Since there would be no construction activities under the No-Build Alternative, there would be no right-of-way acquisition or relocations.

### **Preferred Alternative**

It is estimated that the Preferred Alternative would displace 20 residential owners and 25 residential tenants and 1 business owner and 12 business tenants. The Preferred Alternative would not displace farms or non-profit organizations. Measures to minimize relocations will be investigated during final design.

According to the relocation study, land being used for parking spaces may need to be acquired from 17 additional parcels, which may or may not result in additional business relocation claims. The relocation potential for these parcels will be assessed during the right-of-way phase of the project by an appraiser.

**Table 4-2: Residential and Business Relocations**

| Estimated Displacements  | Preferred Alternative |
|--|-----------------------|
| Residential Displacements<br>(Total includes owners and tenants) | 45                    |
| Business Displacements<br>(Total includes owners and tenants)    | 13                    |
| Total Displacements  | 58                    |

Source: *Relocation Report for U-4714* (Provided by NCDOT, December 2015)

It is anticipated that there is comparable replacement housing in the area for displaced owners and tenants. The NCDOT relocation and right-of-way acquisition policies ensure that comparable replacement housing is available for relocatees prior to construction of State and/or Federally-assisted projects. Furthermore, NCDOT will use three programs to minimize the inconvenience of relocation: Relocation Assistance, Relocation Moving Payments, and Relocation Replacement Housing Payments or Rent Supplement.

The relocation program for the proposed action will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) and the North Carolina Relocation Assistance Act (NCGS 133-5 through 133-18).

More information on right-of-way acquisition and relocation is available in the following two NCDOT brochures: *Relocation Assistance* and *The Real Estate Acquisition Process Brochure*, which can be found:

- [http://www.ncdot.gov/download/construction/roadbuilt/RelocationBooklet\\_07.pdf](http://www.ncdot.gov/download/construction/roadbuilt/RelocationBooklet_07.pdf)
- <https://connect.ncdot.gov/resources/row/Resources/ROW%20Brochure%20-%20Single%20Page%20Layout.pdf>

#### 4.1.6 Environmental Justice

An assessment of environmental justice populations in the project study area is included in the *Community Impact Assessment* (Atkins, August 2015), incorporated by reference and summarized below.

Title VI of the Civil Rights Act of 1964 protects individuals from discrimination on the grounds of race, age, color, religion, disability, sex, and national origin. Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations" directs federal agencies to identify and address any disproportionately high and adverse effects on minority and/or low-income populations. The Order also directs federal agencies to provide minority and low-income communities with access to public information and meaningful public participation.

The guiding environmental justice principles followed by USDOT are:

1. To ensure the full and fair participation of all potentially affected communities in the transportation decision-making process;
2. To avoid, minimize or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority or low income populations; and
3. To fully evaluate the benefits and burdens of transportation programs, policies, and activities, upon low-income and minority populations.

No minority populations meeting the criteria for environmental justice were identified in the project study area. Census data indicates one Block Group with a near-poor population meeting the criteria for environmental justice. However, no low-income communities were observed within the project study area or noted by local planners.

#### *No-Build Alternative*

The No-Build Alternative would not impact any populations, including environmental justice populations.

#### *Preferred Alternative*

Based on available data, no environmental justice population areas would be affected by construction of the project. Therefore, impacts to minority and low-income populations would not be disproportionately high and adverse. Benefits and burdens resulting from the project are anticipated to be equitably distributed throughout the community. No disparate impacts are anticipated under Title VI of the Civil Rights Act and related statutes.

#### 4.1.7 Visual/Aesthetic Resources

The visual landscape for most of the East John Street-Old Monroe Road corridor is typical of suburban areas, including residential neighborhoods with commercial and retail nodes as major intersections. There are short stretches of more rural landscapes with agricultural fields and wooded areas, mostly in the eastern portion of the project corridor. No prominent scenic vistas or unique visual resources are located along the project corridor.



### **No-Build Alternative**

Under the No-Build Alternative, there would be no change to, and therefore no impact to, visual or aesthetic resources in the project study area.

### **Preferred Alternatives**

The Preferred Alternative proposes to widen an existing roadway, so properties along the corridor that currently have views of the roadway would continue to have views of the roadway following construction of the Preferred Alternative. Similarly, motorists on the roadway that currently have views of residential neighborhoods, commercial nodes, and agricultural fields would continue to have these views. No new bridges or noise walls are proposed as part of the Preferred Alternative. New loop ramps are proposed in two quadrants of the existing I-485 interchange. However, these new loops are proposed in the same location as the existing diamond interchange, so the new ramps would not change the overall visual quality of the area and no adverse visual impacts are anticipated.

While no adverse visual impacts are anticipated to result from the Preferred Alternative, it may have beneficial visual impacts due to the addition of a landscaped median along portions of the corridor.

NCDOT will coordinate with the Towns regarding median and berm landscaping. Municipal agreements will be prepared, as applicable, prior to project construction.

## **4.2 Physical Environment**

This section includes a description of noise, air quality, farmland, utilities, hazardous materials, mineral and energy resources, and floodplains and floodways within the project study area.

### **4.2.1 Noise**

Traffic noise and temporary construction noise can be a consequence of transportation projects, especially in areas near high-volume and high-speed existing steady-state traffic noise sources. For transportation projects with FHWA involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project.

This section is a summary of the traffic noise analysis documented in the *STIP Project U-4714 Traffic Noise Analysis* (VHB, January 2016), which is incorporated by reference.

### **Background**

Noise is basically defined as unwanted sound. It is emitted from many natural and man-made sources. Highway traffic noise is usually a composite of noises from engine exhaust, drive train, and tire-roadway interaction.

The magnitude of noise is usually described by a common unit of reference called the “decibel” (dB). The A-weighted decibel scale is used almost exclusively when measuring vehicle noise because it places an emphasis on the frequency range to which the human ear is most sensitive (1,000–6,000 Hertz) and minimizes the frequencies to which human hearing is not as sensitive. Sound levels that are measured using the A-weighted decibel scale are written as dB(A).



Examples of noise levels expressed in dB(A) are shown in **Exhibit 4-1**. Most individuals are exposed to fairly high noise levels from many sources daily. In order to perceive sounds of greatly varying pressure levels, human hearing has non-linear sensitivity to sound pressure exposure. For example, doubling the sound pressure results in a three decibel change in the noise level, but variations of 3dB(A) or less are commonly considered “barely perceptible” to normal human hearing. A 5 dB(A) change is more readily noticeable. By definition, a ten-fold increase in the sound pressure level correlates to a 10 dB(A) noise level increase, but it is judged by most people as only a doubling of the loudness, sounding “twice as loud”. The degree of disturbance or annoyance from exposure to noise depends upon: 1) the amount, nature, and duration of the intruding noise 2) the relationship between the intruding noise and the existing (ambient) sound environment and 3) the situation in which the disturbing noise is heard.

**Exhibit 4-1. Examples of Noise Levels**

| Common Outdoor Activities                          | Noise Level (dBA) | Common Indoor Activities                    |
|--|-------------------|---|
| Jet Fly-over at 300 m (1000 ft)                    | 110               | Rock Band                                   |
| Gas Lawn Mower at 1 m (3 ft)                       | 100               |   |
| Diesel Truck at 15 m (50 ft),<br>at 80 km (50 mph) | 90                | Food Blender at 1 m (3 ft)                  |
| Noisy Urban Area, Daytime                          | 80                | Garbage Disposal at 1 m (3 ft)              |
| Gas Lawn Mower at 30 m (100 ft)                    | 70                | Vacuum Cleaner at 3 m (10 ft)               |
| Commercial Area                                    | 70                | Normal Speech at 1 m (3 ft)                 |
| Heavy Traffic at 90 m (300 ft)                     | 60                |   |
| Quiet Urban Daytime                                | 50                | Large Business Office                       |
|  | 50                | Dishwasher Next Room                        |
| Quiet Urban Nighttime                              | 40                | Theater, Large Conference Room (Background) |
| Quiet Suburban Nighttime                           | 40                |   |
|  | 30                | Library                                     |
| Quiet Rural Nighttime                              | 30                | Bedroom at Night                            |
|  | 20                | Concert Hall (Background)                   |
|  | 20                | Broadcast/Recording Studio                  |
|  | 10                |   |
| Lowest Threshold of Human Hearing                  | 0                 | Lowest Threshold of Human Hearing           |

### Noise Abatement Criteria

The FHWA has established Noise Abatement Criteria (NAC) and procedures to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis and associated sensitivities to noise. For example, the NAC for residences (67 dB(A)) is lower than the NAC for commercial areas (72 dB(A)). **Table 4-3** lists the noise abatement criteria for use in the NEPA 23 CFR 772 analysis. Most land uses in the project area are in Activity Category B.

**Table 4-3: Noise Abatement Criteria (NAC)**

| Activity Category | Activity Criteria <sup>1</sup><br>dB(A) $L_{eq(h)}$ <sup>2</sup> | Evaluation Location | Activity Description  |
|-------------------|--|---------------------|---|
| A                 | 57   | Exterior            | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.   |
| B <sup>3</sup>    | 67   | Exterior            | Residential   |
| C <sup>3</sup>    | 67   | Exterior            | Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings |
| D                 | 52   | Interior            | Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios   |
| E <sup>3</sup>    | 72   | Exterior            | Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F   |
| F                 | --   | --                  | Agriculture, airports, bus yards, emergency services, industrial, logging maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing  |
| G                 | --   | --                  | Undeveloped lands that are not permitted  |

1. The  $L_{eq(h)}$  Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
2. The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with  $L_{eq(h)}$  being the hourly value of  $L_{eq}$ .
3. Includes undeveloped lands permitted for this activity category.

Title 23 CFR Section 772.11(a) states, "In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit."

### Ambient Noise Levels

Ambient noise is all noise present in a particular area. Ambient noise is all around us, caused by natural and manmade events. It includes the wind, rain, thunder, birds chirping, insects, household appliances, commercial operations, lawn mowers, airplanes, automobiles, etc.

Existing traffic noise exposure varies along the corridor. The western end of the study area is more urban in nature, while the eastern end is more sparsely developed and more residential in nature. With the variations in land use and vehicle speeds, the ambient traffic noise ranges from approximately 55 dB(A) to 65 dB(A).

### **Traffic Noise Impacts**

Traffic noise impacts occur when the predicted traffic noise levels either: 1) approach or exceed the FHWA NAC (with “approach” meaning within 1 dB(A) of the NAC values listed in **Table 4-3**), or 2) represent a substantial increase over existing noise levels as defined by NCDOT. An impact that represents a “substantial increase” according to NCDOT is based on a comparison of the existing noise level to the predicted increased noise levels with respect to a change in noise levels in the design year of between 10 dB(A) and 15 dB(A) or more, as shown in **Table 4-4**.

**Table 4-4: NCDOT Definition of Substantial Increase in Noise Levels**

| Existing Average Noise Level<br>dB(A) Leq(hour) | Predicted Design Year Noise Level<br>Increase dB(A) Leq(hour) |
|---|---|
| ≥55   | 10 or more  |
| 54  | 11 or more  |
| 53  | 12 or more  |
| 52  | 13 or more  |
| 51  | 14 or more  |
| ≤50   | 15 or more  |

Source: NCDOT Traffic Noise Abatement Policy

FHWA and NCDOT require that feasible and reasonable measures be considered to abate traffic noise at all predicted traffic noise impacts. Mitigation measures include the highway alignment selection, traffic systems management, buffer zones, noise walls, and earth berms.

The traffic noise analyses utilized the FHWA Traffic Noise Model software (TNM v.2.5), validated to field-collected traffic noise monitoring data, to predict existing and future noise levels at all noise-sensitive receptors potentially impacted by noise in the project area.

*A **receptor** is a noise-sensitive location where human activity (i.e. dwelling unit or other site where frequent human use occur) may be adversely affected by project-related noise. The Federal Highway Administration (FHWA) has established noise impact criteria for various categories of noise sensitivity. These various land use or activity categories are listed in the FHWA’s noise abatement criteria (NAC) (see Table 4-3).*

### **No-Build Alternative**

The traffic noise analysis considered traffic noise impacts for the No-Build Alternative. The impacts predicted for the Existing (2013) conditions are the same for the No-Build Alternative. If the proposed project does not occur, eight (8) receptors (residences) are predicted to experience traffic noise impacts due to predicted noise levels that will approach or exceed FHWA noise abatement criteria.

### **Preferred Alternative**

The Preferred Alternative is predicted to create 96 traffic noise impacts due to predicted noise levels that would approach or exceed FHWA NAC under the 2035 conditions. A total of 94 receptors would be impacted based on approaching or exceeding FHWA NAC per the activity category (90 for Category B and 4 for Category C). Ten receptors would be impacted based on a substantial noise level increase. Of these ten, eight receptors would be impacted based on both criteria (approach or exceed the FHWA NAC and represent a substantial increase over existing noise levels as defined by NCDOT.

**Construction Impacts.** Temporary and localized construction noise impacts would likely occur as a result of construction activities, including earth removal, hauling, grading, and paving. Generally, low-cost and easily implemented construction noise control measures should be incorporated into the project plans and specifications to the extent practicable. These measures include, but are not limited to, work-hour limits, equipment exhaust muffler requirements, haul-road locations, elimination of “tail gate banging”, ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication.

**Traffic Noise Abatement Measures.** FHWA and NCDOT require that feasible and reasonable noise abatement measures be considered and evaluated for the benefit of all predicted build-condition traffic noise impacts. Feasibility is the consideration as to whether noise abatement measures *can* be implemented and reasonableness is the consideration as to whether noise abatement measures *should* be implemented. Certain conditions regarding feasibility and reasonableness must be met in order for noise abatement to be justified and incorporated into the project design.

Per NCDOT policy, traffic noise abatement measures were considered, including highway alignment selection, traffic systems management, buffer zones, noise barriers (earth berms and noise walls), and noise insulation of Activity Category D land use facilities. These abatement measures are described in more detail in the referenced traffic noise analysis report and are also summarized below.

The highway alignment selection for traffic noise abatement measures involves modifying the horizontal and vertical geometry of the proposed facility to minimize traffic noise to noise-sensitive receptors. The selection of alternative alignments for noise abatement purposes must consider the balance between noise impacts and other engineering/environmental parameters. Because the project is an improvement along an existing alignment and not a new-location project, there is little room for change to the existing alignment for noise abatement purposes.

Traffic management measures such as prohibition of truck traffic, lowering speeds limits, limited of traffic volumes, and/or limited time of operation were considered, but the limitations associated with this type of abatement would result in a change in use of the roadway that would no longer serve the purpose and need of the improvements.

Buffer zones are typically not practical and/or cost effective for noise mitigation due to the substantial amount of right-of-way required, and would not be a feasible or reasonable noise mitigation measure for this project due to the proximity of surrounding developed land.

Noise barriers are passive noise abatement measures that are effective because they absorb sound energy, extend the source-to-receptor sound transmission path, or both. The source-to-receptor path is extended by placement of an obstacle, such as a wall, that sufficiently blocks the transmission of sound waves that travel from the source (e.g. the roadway) to the receptor. Highway noise barriers are primarily constructed as earth berms or solid-mass walls adjacent to limited-access freeways that are in proximity to noise-sensitive land use(s). To be effective, a noise barrier must be long enough and tall enough to shield the benefitted receptors. On roadway facilities with direct access for driveways, noise barriers are typically not feasible because the openings render the barrier ineffective in impeding the transmission of traffic noise. Due to the required lengths for effectiveness, noise barriers are typically not economical for isolated or most low-density areas.

Because of the desire to maintain access to East John Street-Old Monroe Road for the numerous residential and commercial developments along the project corridor, specifically near the impacted receptors, noise barriers were not considered a viable abatement measure for the impacted receptors because there would need to be too many openings in the barrier needed to provide access. Openings in the barrier reduce the barrier's ability to effectively block noise. In addition, noise abatement did not meet preliminary reasonableness criteria as the potential wall square footage per benefitted receiver would exceed the minimum allowable threshold. All other identified impacts were either to commercial businesses or an individual isolated residence that did not meet applicable preliminary feasibility and reasonableness criteria for consideration of a noise barrier.

Noise insulation for interiors was not considered for the proposed project, as there are no traffic impacts predicted to occur for the interior noise-sensitive areas (NAC "D" in **Table 4-3**).

In accordance with NCDOT Traffic Noise Abatement Policy, the Federal/State governments are not responsible for providing noise abatement measures for new development for which building permits are issued after the Date of Public Knowledge. The Date of Public Knowledge of the proposed highway project will be the approval date of the Finding of No Significant Impact (FONSI). For development occurring after this date, local governing bodies are responsible to insure that noise compatible designs are utilized along the proposed facility.

#### 4.2.2 Air Quality

A project-level air quality analysis was prepared for this project. A copy of the unabridged version of the full technical report entitled *Air Quality Analysis, East John Street-Old Monroe Road Improvement Project (STIP No. U-4714)* (Atkins, January 2016), is incorporated by reference.

#### *North Carolina and National Ambient Air Quality Standards*

Air pollution originates from various sources. Emissions from industry and internal combustion engines are the most prevalent sources. The impact resulting from highway construction ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. Motor vehicles emit carbon monoxide (CO), nitrogen oxide (NO), hydrocarbons (HC), particulate matter, sulfur dioxide (SO<sub>2</sub>), and lead (Pb) (listed in order of decreasing emission rate).

The Federal Clean Air Act of 1970 established the National Ambient Air Quality Standards (NAAQS). These were established in order to protect public health, safety, and welfare from known or anticipated effects of air pollutants. The most recent amendments to the NAAQS contain criteria for sulfur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>10</sub>, 10-micron and smaller, PM<sub>2.5</sub>, 2.5 micron and smaller), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), and lead (Pb). North Carolina has adopted the same standards.

The primary pollutants from motor vehicles are unburned hydrocarbons, NO<sub>x</sub>, CO, and particulates. Hydrocarbons (HC) and nitrogen oxides (NO<sub>x</sub>) can combine in a complex series of reactions catalyzed by sunlight to produce photochemical oxidants such as ozone and NO<sub>2</sub>. Because these reactions take place over a period of several hours, maximum concentrations of photochemical oxidants are often found far downwind of the precursor sources. These pollutants are regional problems.

### ***Attainment Status and Transportation Conformity***

Attainment Status. An area that exceeds the NAAQS for one or more criteria pollutants is said to be in "non-attainment" of the NAAQS enforced under the CAA. The designation of an area is determined on a pollutant by pollutant basis. The Environmental Protection Agency (EPA) classifies areas as either in attainment or non-attainment. Ozone, CO, and some particulate matter non-attainment areas are further classified based on the degree of exceedance(s) over the NAAQS (e.g. marginal, moderate, serious, severe, and extreme). Attainment areas can be further categorized as in attainment or as a maintenance area for attainment; which means that the urban area has exceeded NAAQS levels for one or more pollutants in the past. Efforts in these maintenance areas must be made in order to maintain the status quo and not exceed the NAAQS.

The project is located in Union County and Mecklenburg County. These counties are in attainment for CO, Pb, NO<sub>2</sub>, particle pollution, and SO<sub>2</sub>.

For ozone, the project is within the Charlotte-Gastonia-Rock Hill area, as defined by the EPA. The North Carolina portion of this area is designated a maintenance area for the 2008 O<sub>3</sub> standard as defined by the EPA. This area was originally designated marginal nonattainment for O<sub>3</sub> under the 2008 eight-hour ozone standard on July 20, 2012. However, due to improved monitoring data, the North Carolina portion of the area was redesignated maintenance for the 2008 eight hour ozone standard on July 28, 2015 (effective August 27, 2015).

The proposed project is not expected to create any adverse effects on the attainment status of the NAAQS.

Transportation Conformity. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). Conformity requirements apply to transportation plans, programs, and projects funded or approved by the FHWA or the Federal Transit Administration (FTA) in areas that do not meet, or previously have not met, NAAQS for O<sub>3</sub>, CO, particulate matter, or NO<sub>2</sub> (FHWA Website: [www.fhwa.dot.gov/environment/air\\_quality/conformity/](http://www.fhwa.dot.gov/environment/air_quality/conformity/)).



The current SIP does not contain any transportation control measures for Mecklenburg County or Union County. The Charlotte Region Transportation Planning Organization (CRTPO) 2040 Metropolitan Transportation Plan (MTP) and the 2016-2025 Transportation Improvement Program (TIP) conform to the intent of the SIP. The USDOT made a conformity determination on the MTP on October 1, 2015 and the TIP determination is October 1, 2015. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93.

The project is included in the MTP and TIP, and there are no significant changes in the project's design concept or scope, as used in the conformity analyses.

### ***Mobile Source Air Toxics (MSAT)***

Background. Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the US Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (EPA Website: [www.epa.gov/iris/](http://www.epa.gov/iris/)).

In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (<http://www.epa.gov/ttn/atw/nata1999/>). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOVES2010b model, even if vehicle activity (vehicle-miles traveled, VMT) increases by 102 percent as assumed, from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

MSAT analyses are intended to capture the net change in emissions within an affected environment, defined as the transportation network affected by the project. The affected environment for MSATs may be different than the affected environment defined in the NEPA document for other environmental effects, such as noise or wetlands. Analyzing MSATs only within a geographically-defined "study area" will not capture the emissions effects of changes in traffic on roadways outside of that area, which is particularly important where the project creates an alternative route or diverts traffic from one roadway class to another. At the other extreme, analyzing a metropolitan area's entire roadway network will result in emissions estimates for many roadway links not affected by the project, diluting the results of the analysis.

Incomplete or Unavailable Information for Project Specific MSAT Health Impact Analysis. In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due

to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA Website, [www.epa.gov/iris/](http://www.epa.gov/iris/)). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents* (FHWA Website: [www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/policy\\_and\\_guidance/aqintguidmem.cfm](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm)). Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Website: <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI Website: <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways (to determine the portion of time that people are actually exposed at a specific location and to establish the extent attributable to a proposed action), especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (HEI Website: <http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-



response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (EPA Website: [www.epa.gov/risk/basicinformation.htm#g](http://www.epa.gov/risk/basicinformation.htm#g)) and the HEI (HEI Website: <http://pubs.healtheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA, as provided by the Clean Air Act, to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health, or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires the EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in one million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than one in one million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than one in one million; in some cases the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in one million. In a June 2008 decision, the US Court of Appeals for the District of Columbia Circuit upheld the EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities, plus improved access for emergency response, which are better suited for quantitative analysis.

**MSAT Conclusion.** Based on the qualitative analysis completed, in the design year it is expected there would be higher MSAT emissions along the project corridor under the Build Alternative relative to the No Build Alternative. However, in considering the entire project study area, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause area-wide MSAT levels to be significantly lower than today. In comparing the study alternatives, MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify them.

### **Construction Air Quality**

Air quality impacts resulting from roadway construction activities are typically not a concern when contractors utilize appropriate control measures. During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the Contractor. Any burning conducted will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Also during construction, measures will be taken to

reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents.

### *Air Quality Summary*

Vehicles are a major contributor to decreased air quality because they emit a variety of pollutants into the air. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. New highways or the widening of existing highways increase localized levels of vehicle emissions, but these increases could be offset due to increases in speeds from reductions in congestion and because vehicle emissions will decrease in areas where traffic shifts to the new roadway. Significant progress has been made in reducing criteria pollutant emissions from motor vehicles and improving air quality, even as vehicle travel has increased rapidly.

The project is located in Mecklenburg and Union Counties, which comply with the NAAQS. The project also is part of a conforming transportation plan. Therefore, it is not anticipated to create any adverse effects on the air quality of this attainment area. This evaluation completes the assessment requirements for air quality of the 1990 CAAA and the NEPA process, and no additional reports are necessary.

#### **4.2.3 Farmland**

The Farmland Protection Policy Act (FPPA, 7 United States Code [USC] 4201-4209 and its regulations, 7 CFR Part 658) require federal agencies to coordinate with the Natural Resources Conservation Service (NRCS) to assess whether their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Adherence to the FPPA is required unless certain conditions are met, one of which is that the project is within an urban area as defined by the US Census. The entire project study area is recognized by the US Census Bureau (2010 Census) as an urban area, and therefore is not subject to the FPPA.

#### **4.2.4 Utilities**

Utilities in the project study area include natural gas, electric, telephone, water/sewer, and fiber optics and cable. Utilities and utility service providers in the project study area are listed in **Table 4-5**.

**Table 4-5: Utility Providers**

| Utility                | Provider(s)  |
|------------------------|--|
| Electricity            | Duke Energy<br>Union Power Cooperative<br>City of Monroe   |
| Water/Sewer            | Charlotte-Mecklenburg Utility Department<br>Carolina Water Services of NC<br>Union County Public Works<br>*Note: Private sewer companies support some subdivisions in Union County |
| Natural Gas            | Piedmont Natural Gas   |
| Telephone              | Windstream   |
| Fiber Optics and Cable | Time Warner Cable  |

Sources: <http://www.unioncountycoc.com/utilities/>  
<http://www.matthewsnc.gov/Departments/PublicWorks/OtherUtilities.aspx>  
<http://www.stallingsnc.org/282/Utility-Providers>

### **No-Build Alternative**

There would be no impact to existing utilities under the No-Build Alternative.

### **Preferred Alternative**

Construction of the Preferred Alternative would impact existing utilities. The project would require gas, water, electric pole, sewer, telephone, and cable television (CCTV) relocations and construction.

NCDOT will coordinate with all utility providers during final design and construction to prevent damage to utility systems and to minimize disruption and degradation of utility service to local customers. Where impacts cannot be avoided, NCDOT will coordinate with utility owners and operators to identify construction requirements and financial responsibility for relocations based upon easements, license agreements, ownership, or other existing agreements covering the use of affected utilities.

#### **4.2.5 Hazardous Materials**

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use. The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as “Superfund,” is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for “cradle to grave” regulation of hazardous waste generated by operating entities.

The NCDOT GeoEnvironmental Section (GES) of the Geotechnical Engineering Unit investigated the project to identify hazardous material sites of concern in the project study area. The *Hazardous Materials Report* (NCDOT Geotechnical Engineering Unit, March 2014), which is incorporated by reference, identifies properties that are, or may be, contaminated and therefore may result in

potentially increased project costs and future liability if acquired by NCDOT. These properties may include active and abandoned underground storage tank (UST) sites, hazardous waste sites, regulated landfills and unregulated dumpsites. A search of appropriate environmental agencies' databases and field reconnaissance were used in evaluating sites identified during the hazardous materials investigation.

Findings from the investigation include:

- 13 sites may contain petroleum USTs within the project limits
- No Hazardous Waste Site were identified within the project limits
- No landfills were identified within the project limits
- Ten other concerns were identified within the project limits, including eight dry cleaners, and two dedicated car washes. Three of the UST sites also have car washes. Car washes are a concern because they may have oil water separators in the proposed construction area.

#### **No-Build Alternative**

There would be no construction activities under the No-Build Alternative and therefore no impacts from hazardous material sites would occur.

#### **Preferred Alternative**

Anticipated impacts from hazardous material sites were assessed as follows:

- Of the 23 total sites of concern identified within the project area, including 13 UST facilities, two car washes, and eight dry cleaners, the NCDOT GES anticipates low monetary and scheduling impacts resulting from these sites.
- No additional contaminated properties were uncovered during the field reconnaissance and records search.

The NCDOT GES will provide soil and groundwater assessments on each of the properties after identification of the selected alternative (which occurs in the Finding of No Significant Impact (FONSI)), and prior to right of way acquisition. If any UST or other potential source of contamination is discovered during construction activities, NCDOT should be notified of their presence immediately upon discovery. An assessment will then be conducted to determine the extent of any contamination and identify the potential impacts.

#### **4.2.6 Mineral and Energy Resources**

The project study area does not contain mineral resources or quarries. There are no energy resource activities such as oil wells or mines in the project study area. Therefore, no impacts to mineral and energy resources would result from implementation of the No-Build or Preferred Alternative.

#### **4.2.7 Floodplains and Floodways and Hydrology**

A preliminary hydraulic study was conducted and documented in the *Preliminary Hydraulic Technical Memorandum* (Atkins, July 2015), which is incorporated by reference. Floodplain and floodway protection is required under several federal, state, and local laws. Executive Order (EO) 11988

(Floodplain Management) directs federal agencies to avoid making modifications to and supporting development in floodplains wherever practical. Both Mecklenburg County and Union County participate in the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA).

Larger streams in the project area, and floodplains and floodways, are shown on **Figure 4-1a-b** and in **Appendix C**. The hydraulic study evaluated potential impacts to major drainage structures at crossings along the project corridor to determine the preliminary sizes of major drainage structures that would be needed to adequately carry floodwaters. There are fourteen total existing locations where streams cross under East John Street-Old Monroe Road in culverts. There are no bridges over streams in the project corridor. Six box culverts and eight pipe culverts were initially identified. Two locations along the project corridor where East John Street-Old Monroe Road crosses a stream are located within a FEMA regulated special flood hazard area (SFHA). The two streams with associated regulated floodplains and floodways that cross the corridor include Fourmile Creek north of I-485 and an unnamed tributary to Price Mill Creek near the southern end of the project.

### *No-Build Alternative*

There would be no construction activities associated with the No-Build Alternative. Under the No-Build Alternative, no impacts to floodplains and floodways would occur and no major drainage structure improvements would be necessary.

### *Preferred Alternative*

The result of the preliminary hydraulic study indicate that there are no major hydraulic design issues associated with the Preferred Alternative. The results of the hydraulic analysis indicate that two existing crossings are not performing to NCDOT standards and would likely have to be replaced by a structure equivalent to 72 inches diameter or larger. One of these sites is within the FEMA regulated floodplain. Coordination with the North Carolina Floodplain Mapping Program (NCFMP) for crossings at the two FEMA regulated crossings will be required. More detailed studies will be completed for the Preferred Alternative final hydraulic designs for the fourteen crossing sites (as well as the one stormwater pond that may be impacted) that were evaluated in the preliminary study.

The NCDOT Hydraulics Unit will coordinate with FEMA and local authorities to ensure compliance with applicable floodplain management ordinances. This coordination will occur under the Memorandum of Agreement (MOA) between NCDOT and the NC FMP, which has been delegated by FEMA to maintain current Flood Insurance Rate Maps and handle map revisions or obtain a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

Since this project involves construction activities on or adjacent to FEMA-regulated streams, the NCDOT Division 10 offices shall submit sealed as-built construction plans to the NCDOT Hydraulics Unit upon completion of project construction, certifying that the drainage structures and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

The Hydraulics Unit will coordinate with the NC FMP to determine status of project with regard to applicability of NCDOT'S Memorandum of Agreement, or approval of a CLOMR and subsequent final LOMR.

## 4.3 Cultural Resources and Section 4(f) and Section 6(f)(3) Resources

### 4.3.1 Historic Architectural Resources

**Background Information.** Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, requires federal agencies to take into account the effects of their undertakings on historic properties (including archaeological sites). Historic properties are districts, sites, buildings, structures, and objects associated with American history, architecture, archaeology, engineering, and culture listed on or eligible for listing on the National Register of Historic Places (NRHP).

Historic properties are generally 50 years old or older and are considered eligible for listing on the NRHP if they possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet the following criteria:

- Criterion A: Resources that are associated with events or broad patterns of history that have made a significant contribution; or
- Criterion B: Resources that are associated with the lives of persons significant in our past; or
- Criterion C: Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: Resources that have yielded, or may be likely to yield, information important in prehistory or history.

**Historic Architectural Resources in the Study Area.** NCDOT conducted a survey to identify historic architectural resources located within an Area of Potential Effect" (APE) for the project in compliance with the NHPA. The APE was delineated during an initial field survey conducted in January 2014. The survey identified a total of ninety-six (96) resources that were built prior to 1965. These findings were presented to the North Carolina Historic Preservation Office (NCHPO) on February 18, 2014. Nine resources required an in-depth evaluation of eligibility. Detailed survey evaluations are documented in the *Final Historic Architecture Report* (MAA, 2014), which is appended by reference.

As a result of the in-depth investigations, one property was identified as being on the NRHP and four properties were determined as individually eligible for the NRHP. These are listed below:

- **Matthews National Register Commercial Historic District.** This listed historic district is centered on Trade Street to the north of East John Street, as shown on **Figure 4-1a** and **Appendix C** (sheet 01).

- **Reid House (MK1191) (Study List 1987) (Local Landmark 1987).** This home located west of the western project terminus east of Trade Street at 134 West John Street in Matthews is eligible for listing under Criterion C for architecture. (**Appendix C**, sheet 01).
- **Rowland-Clay House (MK2301) (Study List 2202) (Local Landmark 2005).** This home is located at the eastern outskirts of the historic center of Matthews in the community of Crestdale, and is eligible for listing under Criterion A (Event) for Ethnic Heritage-African American as an important and tangible reminder of the Tank Town community, the African American community that arose at the eastern outskirts of Matthews in the late nineteenth and early twentieth centuries, and under Criterion C (Design/Construction) for the most stylish and substantial of the remaining dwellings built during the rise of Tank Town (now Crestdale) in the late nineteenth and early twentieth centuries. (**Appendix C**, sheet 01).
- **Banks and Carolyn Funderburk House (UN12).** This resource located at 3001 Old Monroe Road is eligible for listing under Criterion C (Design/Construction) for a particularly well-preserved example of a Midcentury Modern split-level house in rural Union County. (**Appendix C**, sheet 07).
- **Banks H. Funderburk Store (UN0125) (Local Landmark 2003) also known as the Rock Store.** This resource located at 3116 Old Monroe Road is eligible for listing under Criterion A (Event) for its commercial significance and Criterion C (Architecture) for its well-preserved and unique example of roadside architecture from the interwar years in Union County. (**Appendix C**, sheet 07).



The NCHPO concurred in a letter dated July 17, 2014 (and corrected letter dated July 18, 2014) that the four resources identified in the surveys are eligible for listing on the NRHP. The eligibility concurrence of these resources was made pursuant to Section 106 of the NHPA and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800. For the purposes of the project undertaking, cultural resources determined eligible for listing in the NRHP are considered to have the same status as listed resources. These resources are shown in **Appendix C** and in **Appendix E** (see NCHPO Effects Meeting Summary and signed Concurrence Form).

In the July 2014 letter, NCHPO recommended additional study to evaluate three additional homes for National Register eligibility if it appears that the project may impact them. These properties are shown on mapping in **Appendix E** and include:

- House 33 located at 230 Morris Road
- House 68 located at 4800 Old Monroe Road
- House 72 located at Old Monroe Road/Radiator Road

Preliminary design plans indicate a minor right-of-way encroachment on House 68 located at 4800 Old Monroe Road. NCDOT is currently undertaking a National Register eligibility evaluation for this



property. If the property is determined eligible for listing on the National Register, an Effects Consultation meeting with NCDOT, NCHPO, and FHWA will be needed.

### **No-Build Alternative**

There would be no construction activities under the No-Build Alternative and therefore no impacts to historic resources would occur.

### **Preferred Alternative**

Preliminary design of the Preferred Alternative included avoidance measures for the four historic architectural resources determined eligible for the NRHP listed above.

A historic effects meeting was held on October 20, 2015 to review the Preferred Alternative preliminary engineering design in relation to properties listed on or determined eligible for listing on the NRHP to concur on the project effects to these properties. The meeting included a discussion and effects determination for each resource as well as for three properties flagged for additional study to more fully evaluate should the project appear to impact them. The meeting materials and summary are included in **Appendix E**.

The NCHPO reviewed the Preferred Alternative preliminary design and the NCHPO, FHWA, and NCDOT concurred on the effects findings listed in **Table 4-6**. There were no historic resources determined to be adversely affected by the Preferred Alternative preliminary design.

### **4.3.2 Archaeological Resources**

A review and discussion of potential presence and effects to archaeological resources was determined in consultation with the Office of State Archaeology (OSA) in July 2014. In a letter dated August 5, 2014, it was noted that the OSA determined that the project study area is unlikely to contain intact and significant archaeological resources based on a review of soil/landscape conditions, current commercial and residential development, previous archaeological survey results, and the nature and extent of the proposed project. In addition, OSA did not recommend an archaeological survey be conducted for the project. The letter is included in **Appendix E**.



**Table 4-6: Preferred Alternative Historic Effects Findings**

| Property No. | Property Name   | Site No.  | Listed or Eligible Under Criterion | Effects Finding/ Conditions  |
|--------------|---|---|------------------------------------|--|
| 1            | Matthews National Register Commercial Historic District | MK1417  | Listed                             | No Effect<br>Resource outside corridor   |
| 3            | Reid House  | MK1191<br>(Study List 1987/Local Landmark 1987) | C                                  | No Adverse Effect with Conditions<br>(No construction in ROW; no drainage easements; no PUEs; only replace curb and gutter; keep existing sidewalk; no tree removal) |
| 31           | Rowland-Clay House                                      | MK2301<br>(Study List 2002/Local Landmark 2005) | A/<br>Possibly C                   | No Effect.<br>Resource outside corridor  |
| 55           | Banks H. Funderburk Store (a.k.a. Rock Store Bar-B-Q)   | UN0125 (Local Landmark)                         | C                                  | No Adverse Effect with Conditions<br>(no ROW; no permanent drainage easements)   |
| 95           | Banks and Carolyn Funderburk House                      | UN1200  | C                                  | No Adverse Effect with Conditions<br>(No ROW; no easements; minimize tree removal; no PUEs; no PDEs)   |
| 68           | House – 4800 Old Monroe Road                            | N/A   | Potentially eligible               | Eligibility and effect to be determined prior to FONSI   |

#### 4.3.3 Section 4(f) and Section 6(f)(3) Resources

**Section 4(f) Regulations.** Section 4(f) of the US Department of Transportation Act of 1966 and Federal regulations 23 CFR 771.135 (49 U.S.C. 303) protect publicly owned parks, recreation areas, and refuges, as well as historic sites (whether publicly or privately owned) that are listed in or eligible for the National Register of Historic Places. Section 4(f) prohibits the use of any Section 4(f)-protected resource for a transportation project, unless (1) there is no feasible and prudent alternative to the use of such land, and (2) the project includes all possible planning to minimize harm.

**Section 6(f)(3) Regulations.** The Land and Water Conservation Fund Act of 1965 established funding to provide matching cooperative agreement assistance to states and local governments for the planning, acquisition, and development of outdoor public recreation sites and facilities. Section 6(f)(3) of the Act prohibits the conversion of property acquired or developed with these cooperative agreements to a non-recreational purpose without the approval of the Department of the Interior’s National Park Service (NPS). Section 6(f)(3) also requires that any applicable land converted to non-recreational uses be replaced with land of equal or greater value, location, and usefulness.

**Section 4(f) Resources.** Two public parks, which are owned and operated by the Town of Matthews, are located outside of the project study area. Stumptown Park is an approximately one-acre park located at 120 S. Trade Street. Baucom Park is an approximately one-acre park located at 601 Sadie Drive.

There is one existing greenway, Four Mile Creek, and one proposed greenway in the project study area (Carolina Thread Trail, which is described in **Section 4.1.3**), as shown on **Figure 4-1a-b**.

The Four Mile Creek Greenway links downtown Matthews with Squirrel Lake Park and connects neighborhoods from East John Street to South Trade Street. Access to the greenway is provided at East John Street north of the I-485 interchange. The greenway is an asphalt trail with a boardwalk and is approximately two miles long.

**Section 6(f)(3) Resources.** Coordination conducted with John Poole, the NC Department of Environment and Natural Resources Land and Water Conservation Fund Coordinator, in August 2012 identified no known Section 6(f)(3) resources in the project study area. (See **Appendix E**, NCDENR email Correspondence dated August 3, 2012).

### *No-Build Alternative*

There would be no impact to Section 4(f) or Section 6(f)(3) resources under the No-Build Alternative.

### *Preferred Alternative*

Neither Stumptown Park nor Baucom Park would be impacted by the Preferred Alternative.

In the area around the Four Mile Creek Greenway crossing, the improvements are within the existing right of way. The proposed alignment for the Preferred Alternative is shifted north in this area to avoid encroachment to the Four Mile Greenway access. In addition, a retaining wall is proposed as an additional measure to avoid impacts to the greenway.

## **4.4 Natural Environment**

Information for this section was obtained from the project's *Natural Resources Technical Report (NRTR)* (Atkins, July 2014), the *I-5507 NRTR* (ESI, March 2015), and the *NRTR Addendum* (Atkins, November 2015), which are appended by reference. The existing natural environment, including natural communities, wildlife, wetlands and streams, protected species and their habitat, and potential permit requirements are documented in the NRTRs.

Scientists conducted natural systems field inventories/investigations for the original study area in September and October 2013. The original project study area was expanded in the vicinity of the East John Street-I-485 interchange following preliminary design of the Preferred Alternative. The expansion area follows the I-485 mainline just beyond the interchange on both sides, incorporating the ramp realignments from the preliminary design.

Field work for the area included in the project study area expansion was conducted by Environmental Services, Inc. (ESI) staff in March 2014 and January 2015 as part of the STIP No. I-5507 project and documented in the *I-5507 NRTR*. STIP No. I-5507 (known as the I-485 Express Lanes project) includes improvements to approximately 17 miles of I-485 from I-77 to US 74 (Independence Boulevard) in Mecklenburg County and Union County. Jurisdictional areas identified in the I-5507 NRTR were field verified by the US Army Corps of Engineers (USACE) and North Carolina Division of Water Resources (NCDWR) on August 26, 2014.

#### 4.4.1 Terrestrial Communities and Wildlife

The project study area is comprised of different vegetative communities, depending on the soils, topography, hydrology, and disturbance. Four terrestrial communities were identified in the study area: maintained/disturbed, mixed pine/hardwood forest, ruderal pine/hardwood forest, and mesic mixed hardwood forest. These communities cover about 1,058 acres. A brief description of each community type follows.

**Maintained/Disturbed** - Maintained/disturbed areas dominate the study area and occur in places where the vegetation is periodically mowed or maintained, such as roadside shoulders, fields, highway interchanges, commercial grounds, and residential lawns. This community type represents nearly half of the project study area. Plant species are generally comprised of planted grasses and ornamental plants, although many opportunistic weedy herbs, vines, and shrubs also occur.

**Mixed Pine/Hardwood Forest** – This plant community is characterized by co-dominance of pines and hardwoods in the canopy. Pines such as Virginia pine, shortleaf pine and loblolly pine, are present along with a mix of hardwood species.

**Mesic Mixed Hardwood Forest** - This plant community occurs in intact upland fragments as well as along streams and other low areas where development has had little influence. The largest inclusions of this plant community occur within the I-485 interchange section of the study area. Canopy species include red maple, sweetgum, loblolly pine, tulip poplar, American sycamore, American elm, white oak, willow oak, green ash, and blackgum.

**Ruderal Pine/Hardwood Forest** - This plant community represents early-successional, disturbed forested habitats that are common throughout the study area. The occurrences include highway buffers, cultivated pine forests, empty lots, and dry or early-successional inclusions within or bordering the more natural community of mesic mixed hardwood forest. Plant species include loblolly pine, red maple, sweetgum, tulip poplar, black cherry, and white oak in the canopy.

**Terrestrial Wildlife.** Terrestrial communities in the study area are comprised of disturbed habitats that support wildlife species adapted to urban and suburban environments (those species actually observed are indicated with \*). Mammal species that may exploit wooded habitats and stream corridors found within the study area include gray fox, raccoon\*, opossum, and white-tailed deer\*. Birds that commonly use forest and forest edge habitats include the American crow, blue jay, Carolina chickadee, tufted titmouse, and northern cardinal\*. Birds that may use the disturbed, open habitats or water bodies within the study area include belted kingfisher, eastern bluebird, and turkey vulture\*, along with mammals like eastern pipistrelle, red fox, and eastern cottontail. No reptile and amphibian species were observed, but species that may use terrestrial communities located in the study area include the eastern box turtle, eastern fence lizard, five-lined skink, and brown snake.

#### ***No-Build Alternative***

There would be no construction activities under the No-Build Alternative and therefore no impacts to biotic resources.

### *Preferred Alternative*

Impacts from the project would occur in an area that is already disturbed by urban development.

Impacts to wildlife habitat would be largely confined to the disturbed (maintained) areas along existing right of way. Habitat for small or disturbance-adapted wildlife species would not change as a result of the Preferred Alternative.

#### **4.4.2 Aquatic Communities and Wildlife**

Aquatic communities in the study area consist of both perennial and intermittent piedmont streams, as well as still water ponds. Perennial streams in the study area could support American eel, whitefin shiner, bluehead chub, creek chub, goldfish, spotted sucker, margined madtom, and green sunfish. Intermittent, headwater streams predominate in the study area and would support aquatic communities of spottail shiner, bluehead chub, eastern mosquitofish, tessellated darter, and crayfish.

### *No-Build Alternative*

There would be no construction activities under the No-Build Alternative and therefore no impacts to aquatic communities and wildlife.

### *Preferred Alternative*

Temporary and permanent impacts to aquatic communities could result from increased sedimentation. Sediments have the potential to affect fish and other aquatic life, including clogging gills or other respiratory surfaces, affecting habitat through scouring and filling of pools and riffles, altering water chemistry, and smothering different life stages.

In accordance with the North Carolina Sedimentation Pollution Control Act of 1973 (NCGS Chapter 113A), as amended, and NC Administrative Code Title 15A, Chapter 4 (Sedimentation Control), an erosion and sedimentation control plan must be prepared for land-disturbing activities that cover one or more acres to protect against runoff. Prior to construction, an erosion and sedimentation control plan will be developed in accordance with NCDOT standards and will incorporate best management practices for erosion and sedimentation control.

#### **4.4.3 Water Resources and Water Quality**

Most of the water resources in the study area are within the Catawba River basin (US Geological Survey (USGS) Hydrologic Unit (HUC) 03050103), with other stream reaches in the eastern portion of the study area within the Yadkin River basin (USGS HUC 03040105). There are multiple stream crossings from Downtown Matthews to just south of the county line. At this point, the corridor runs generally along the ridge that divides the two river basins.

Twenty six (26) jurisdictional streams, three (3) open water ponds, and sixteen (16) jurisdictional wetlands were identified within the project study area (see **Appendix C**).

There are no designated classifications for Outstanding Resource Waters (ORW), High Quality Waters (HQW), anadromous fish waters, or Primary Nursery Areas (PNA) present within 1.0 mile downstream of the project study area. There are no streams within the project corridor that are listed on the 2014 Final 303(d) list as impaired due to sedimentation or turbidity. However, South Fork Crooked Creek, located

less than one mile downstream of the project corridor to the east, is on the 2014 Final 303(d) list as impaired due to water quality impairment as measured in fish and benthic macroinvertebrate assemblages.

#### **No-Build Alternative**

There would be no construction activities under the No-Build Alternative and therefore no impacts to water quality.

#### **Preferred Alternative**

Short-term impacts to water quality within the project study area may result from soil erosion and sedimentation from areas disturbed by construction of the project. Uncontrolled erosion can potentially impact aquatic communities and habitats.

In accordance with the North Carolina Sedimentation Pollution Control Act of 1973 (NCGS Chapter 113A), as amended, and NC Administrative Code Title 15A, Chapter 4 (Sedimentation Control), an erosion and sedimentation control plan must be prepared for land-disturbing activities that cover one or more acres to protect against runoff. Prior to construction, an erosion and sedimentation control plan will be developed in accordance with NCDOT standards and will incorporate best management practices for erosion and sedimentation control.

#### **4.4.4 Jurisdictional Topics**

Jurisdictional topics include impacts to Waters of the United States (wetlands, streams, and ponds) and riparian buffer rules.

Section 404 of the CWA prohibits discharges of dredged or fill material into “Waters of the United States”, except in accordance with a permit. The term Waters of the United States has broad meaning and incorporates both wetlands and surface waters. The US Army Corps of Engineers (USACE) is responsible for issuing permits and enforcing permitting requirements under Section 404 of the CWA. The US EPA issues the regulations, known as Section 404(b)(1) Guidelines, that the USACE must follow when issuing Section 404 permits. The US EPA also participates in the permitting process.

The USACE regulatory program is defined in 33 CFR 321-330. In addition, Executive Order 11990 requires that new construction in wetlands be avoided to the extent possible, and that all practical measures be taken to minimize or mitigate impacts to wetlands.

Water bodies such as rivers, streams, lakes, and ponds are subject to jurisdictional consideration under the Section 404 Program. By regulation, wetlands also are considered Waters of the United States. Wetlands are described as:

*“Those areas that are inundated or saturated by groundwater at a frequency and duration sufficient to support, and that under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (33 CFR 328.3(b)).*

The NCDWR also has regulatory input through Section 401 of the CWA, Water Quality Certification. Section 401 requires an applicant for a Section 404 permit to obtain certification from the State that the project complies with State water quality standards.

Delineated streams, wetlands, and ponds are shown on the maps in **Appendix C**. The majority (19) of streams are intermittent and seven (7) are perennial. All jurisdictional streams in the study area have been designated as warm water streams for the purposes of stream mitigation.

Written verification from the USACE on final jurisdictional determinations is pending.

For the sixteen jurisdictional wetlands in the study area, USACE wetland delineation forms and NCDWR wetland rating forms are included in the U-4714 and I-5507 NRTRs. Wetland sites are located within the Mixed Pine/Hardwood Forest community, the Mesic Mixed Hardwood Forest community, the Ruderal Pine/Hardwood Forest, and the Maintained/Disturbed community.

Three ponds are located within the project study area, and are impoundments of three different streams. The surface area of these ponds is 0.06 acre, 1.14 acres, and 0.25 acre, respectively.

North Carolina River Basin Buffer Rules do not apply to the project study area.

### ***No-Build Alternative***

There would be no construction activities under the No-Build Alternative and therefore no impacts to jurisdictional resources would occur.

### ***Preferred Alternative***

**Wetlands, Streams, and Ponds.** **Tables 4-7 and 4-8** identify potential impacts to jurisdictional resources. These preliminary impact estimates were calculated using a 25-foot buffer from the slope stake limits, per the guidelines in the *Wetland, Stream, and Riparian Buffer Impact Calculations* memorandum (NCDOT, September 2006). As shown in **Tables 4-7 and 4-8**, the project has the potential to impact an estimated 1,821 linear feet of jurisdictional streams and 0.11 acres of wetlands.

Construction activities may include extending existing culverts. The construction activities will follow the NCDOT's BMPs for Construction and Maintenance Activities and Protection of Surface Waters. Sedimentation control guidelines will be strictly enforced during construction activities.

**Permits.** Based upon the impacts to waters of the U.S. (including wetlands) presented in **Tables 4-7 and 4-8**, several permitting scenarios remain possible depending on the impacts associated with final design. The current impacts are estimated from a 25-foot buffer of preliminary design slope stakes. Since this project was not required to go through the interagency Merger Process, this project can be considered as authorized activity (c) of the Regional General Permit for "minor widening projects." All stream impacts for each single and complete project (unique crossing of an independent water body) presented in **Table 4-7** are below 500 feet, which is the maximum impact threshold for minor widening projects associated with Regional General Permit 198200031 of the Wilmington District of the USACE. Preliminary wetland impacts, as presented in **Table 4-8**, also fit within the impact threshold

requirements of the Regional General Permit since no individual impact at a unique crossing exceeds the one acre threshold.

In the event that the USACE exercises its authority and not permit this project under the Regional General Permit, Nationwide Permit (NWP) 14 for Linear Transportation projects would also be applicable to impacts of the magnitude presented in **Tables 4-7** and **4-8**. In order to use a NWP, the cumulative impacts of any unique crossing must remain below 300 linear feet and/or 0.5 acre for all waters of the US, including wetlands. However, the Regional General Permit seems to be most applicable at the current stage of the roadway design process. Even if final impacts do not exceed the thresholds for the Regional General Permit and applicable NWPs as described herein, the USACE always retains the authority to evaluate the project under an Individual Permit if they feel the project presents special issues to the protection of the environment and its waters.

Regardless of the Section 404 permit type issued by the USACE, any 404 permit will also require a 401 Water Quality Certification to be issued by the NCDWR. NCDWR certification 3886 would apply to both the Regional General Permit and NWP 14. An Individual Certification would be required if the USACE determines that an Individual 404 permit is required.

**Avoidance, Minimization, and Mitigation.** The US EPA and USACE regulations governing wetlands mitigation embrace a policy of “no net loss of wetlands” and sequential consideration of avoidance, minimization, and mitigation. Compensatory mitigation typically consists of the restoration of existing degraded wetlands or waters, or the creation of Waters of the US of equal or greater value than the waters to be impacted. This mitigation is only undertaken after avoidance and minimization actions are exhausted and should be undertaken, when practicable, in areas near the impact site (i.e., on-site compensatory mitigation).

During final design, the NCDOT will continue to investigate ways to avoid and minimize impacts to streams and wetlands. For remaining impacts, if on-site mitigation is not feasible, mitigation will be provided by North Carolina Department of Environment Quality (NCDEQ) (formerly NCDENR) Division of Mitigation Services (DMS). A final determination regarding mitigation to the Waters of the US rests with the USACE and the NCDWR, and compensatory mitigation for impacts will be resolved during the permitting phase.

**Table 4-7: Potential Stream Impacts**

| NRTR Resource   | Impact       | Description                                   |                |
|---|--------------|---|----------------|
| Jurisdictional Streams<br>(labels on maps in<br>Appendix C) | Linear Feet  | Stream Name                                   | Classification |
| SA  | 53           | Unnamed Tributary to Fourmile Creek           | Intermittent   |
| SB  | 150          | Unnamed Tributary to Fourmile Creek           | Perennial      |
| SC  | 94           | Unnamed Tributary to Fourmile Creek           | Perennial      |
| SH  | 387          | Fourmile Creek                                | Perennial      |
| SI  | 46           | Unnamed Tributary to Fourmile Creek           | Perennial      |
| SN  | 240          | Unnamed Tributary to Fourmile Creek           | Perennial      |
| SO  | 218          | Unnamed Tributary to Fourmile Creek           | Perennial      |
| SQ  | 40           | Unnamed Tributary to South Fork Crooked Creek | Intermittent   |
| SR  | 304          | Unnamed Tributary to Davis Mine Creek         | Intermittent   |
| ST  | 104          | Unnamed Tributary to Price Mill Creek         | Intermittent   |
| SV  | 19           | Unnamed Tributary to Price Mill Creek         | Intermittent   |
| SW  | 166          | Unnamed Tributary to Price Mill Creek         | Perennial      |
| <b>Total</b>  | <b>1,821</b> |   |                |

Notes: Estimates calculated using 25-foot buffer of preliminary design slope stakes (July 2015)  
Impact calculations for streams SAI, SAH, and SAR included as part of STIP No. I-5507

**Table 4-8: Potential Wetland Impacts**

| NRTR Named Resource                                      | Impact      |
|--|-------------|
| Wetland Communities<br>(labels on maps in<br>Appendix C) | Acres       |
| WK   | 0.03        |
| WL   | 0.30        |
| WM   | 0.02        |
| WN   | 0.02        |
| WO   | 0.01        |
| <b>Total</b>   | <b>0.38</b> |
| Open Water (Ponds)                                       | Acres       |
| P2   | 0.11        |

Notes: Estimates calculated using 25-foot buffer of preliminary design slope stakes (July 2015)  
Impact calculations for wetland WAC included as part of STIP No. I-5507



#### 4.4.5 Protected Species

**Regulatory Background.** Some populations of plants and animals are declining either as a result of natural forces or as a result of human activities. Plants and animals with the federal classification of Endangered (E), Threatened (T), or Threatened due to Similarity of Appearance (T[S/A]) are protected under the Endangered Species Act, as amended (16 USC 1531 et seq.). The Endangered Species Act requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species and their critical habitats.

Species classified under the ESA as Candidate (C) species are taxons under consideration for which there is insufficient information to support a listing. Candidate species are afforded no federal protection under the ESA.

Another law that protects bald eagles and golden eagles is the Bald and Golden Eagle Protection Act. This act prohibits the “take, possession, sale, or purchase” of these eagles. It also prohibits the “offer to sell, purchase, export, or import” these species.

**Species Listed on the Endangered Species Act.** As of April 2, 2015 and March 25, 2015, the US Fish and Wildlife Service (USFWS) lists five federally protected species in Mecklenburg County and three in Union County, respectively (see **Table 4-9**). A brief description of each species’ habitat requirements follows, along with the Biological Conclusion based on survey results in the study area.

**Table 4-9: Federally Protected Species for Mecklenburg County and Union County**

| Species                               |  | Federal Status | Habitat Present | Biological Conclusion |
|---------------------------------------|--|----------------|-----------------|-----------------------|
| Scientific Name                       | Common Name                            |                |                 |                       |
| <u><b>Lasmigona decorata</b></u>      | Carolina heelsplitter <sup>M, U</sup>  | E              | No              | No Effect             |
| <u><b>Rhus michauxii</b></u>          | Michaux’s sumac <sup>M, U</sup>        | E              | Yes             | No Effect             |
| <u><b>Helianthus schweinitzii</b></u> | Schweinitz’s sunflower <sup>M, U</sup> | E              | Yes             | No Effect             |
| <u><b>Myotis septentrionalis</b></u>  | Northern long-eared bat <sup>M</sup>   | T              | Yes             | May Affect            |
| <u><b>Echinacea laevigata</b></u>     | Smooth coneflower <sup>M</sup>         | E              | Yes             | No Effect             |

E - Endangered

T - Threatened

M - Listed for Mecklenburg County

U - Listed for Union County

- **Carolina heelsplitter** - The Carolina heelsplitter is a mussel. Prior to conducting in-stream surveys, a review of the NC Natural Heritage Program database was conducted on March 7, 2014, to determine if there were any records of rare mussels within the proposed project study area or receiving waters. This review indicated that there is no known occurrence of the federally endangered Carolina heelsplitter in Fourmile Creek or any unnamed tributaries. The closest occurrence of this species is in the Sixmile Creek, approximately 8 miles from the proposed project.

Fourmile Creek is the largest stream crossed by the project. The unnamed tributaries are all small headwater streams. Therefore, Fourmile Creek was the only waterbody assessed. A mussel survey

was conducted on March 10, 2014, by NCDOT biologists at the Fourmile Creek crossing of Trade Street (SR 3448). This site is approximately one mile downstream from the Fourmile Creek crossing of John Street). No mussels or mussel shells were found.

In a memo dated July 30, 2014 (see **Appendix E**), NCDOT scientists concluded that due to the lack of appropriate substrate for Carolina heelsplitter, and the fact that no Carolina heelsplitters were found during surveys, this project would have no effect on this species.

- **Michaux's sumac** - Within the study area, areas that are kept free of trees and shrubs by mowing or other maintenance provide habitat for this plant species. Approximately 50 acres of good habitat exists in the project study area, located in utility right-of-ways, access easements, and other areas that are regularly but infrequently maintained. A review of NC Natural Heritage Program (NC NHP) records, updated October, 2013, indicates no known Michaux's sumac occurrences within 1.0 mile of the study area. On September 30 and October 1-2, 2013, scientists surveyed the Project Study Area and no individuals of Michaux's sumac were found. Resurveys for this species were conducted by NCDOT biologists on October 21, 2015, and no individuals were found. This project would have no effect on this plant species.
- **Schweinitz's sunflower** - Within the study area, areas that are kept free of trees and shrubs by mowing or other maintenance provide habitat for this plant species. Approximately 50 acres of good habitat exists in the project study area, located in utility right-of-ways, access easements, and other areas that are regularly but infrequently maintained. A review of NC NHP records, updated October, 2013, indicates no known Schweinitz's sunflower occurrences within 1.0 mile of the study area. On September 30 and October 1-2, 2013, scientists surveyed the study area and no individuals of Schweinitz's sunflower were found. Resurveys for this species were conducted by NCDOT biologists on October 21, 2015, and no individuals were found. This project would have no effect on this plant species.
- **Smooth coneflower** - Suitable habitat for smooth coneflower may be available in portions of the study area that are kept free of trees and shrubs by mowing or other maintenance. A review of NC NHP records, updated October, 2013, indicates no known smooth coneflower occurrences within 1.0 mile of the study area. On September 30 and October 1-2, 2013, scientists surveyed the project study area and no individuals of smooth coneflower were found. Resurveys for this species were conducted by NCDOT biologists on October 21, 2015, and no individuals were found. This project would have no effect on this species.
- **Northern long-eared bat** - The northern long-eared bat was added to the list of protected species in Mecklenburg County in April 2015. In a memo dated June 15, 2016 (see **Appendix E**), NCDOT biologists documented that NCDOT satisfied the 4(d) requirements for this project. This memo was sent to the USFWS on June 16, 2016. No response from the USFWS was received within 30 days, therefore Section 7 has been satisfied for the northern long-eared bat.

In addition to the protected species listed above, as of April 2, 2015 and March 25, 2015, the USFWS lists one Candidate species for Mecklenburg County and Union County, Georgia aster (*Symphotrichum georgianum*). A review of the NC NHP records, updated October 2013, indicates no known occurrences of Georgia aster within one mile of the study area.

**Bald Eagle and Golden Eagle Protection Act.** A desktop-GIS assessment of the project study area, as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed on September 26, 2013, using 2010 color aerials. No suitable large bodies of water occur within this area that might provide feeding or nesting habitat for the eagle. The few small ponds (up to seven acres) that occur in the vicinity are surrounded by residential or commercial development and provide little forested cover. A review of the NCNHP database on September 26, 2013, revealed no known occurrences of this species within 1.0 mile of the project study area. Due to lack of habitat and lack of known occurrences, it has been determined that this project would not affect this species.

#### ***No-Build Alternative***

There would be no construction activities under the No-Build Alternative and therefore no impacts to protected plant and animal species would occur.

#### ***Preferred Alternative***

Based on the surveys described above, it was concluded that the project would have no effect on protected plant and animal species.

### **4.5 Indirect and Cumulative Effects**

The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with the National Environmental Policy Act (NEPA) of 1969, require evaluation of the potential environmental effects of all proposed federal activities and programs. This provision includes a requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) refer to these consequences as indirect impacts. Indirect impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The extent of potential indirect land use project effects are documented in the *Indirect & Cumulative Effects Screening Report* (Atkins, June 2014). These effects would be largely dependent upon several key variables, including: the future local economy and market for development, public infrastructure expansion projects, and the completion of other transportation improvements in the area.

The project area is poised to undergo considerable growth by 2035 and Matthews, Stallings, and Indian Trail have worked to develop and implement land use and infrastructure plans to accommodate this growth. These plans include a comprehensive approach that addresses growth, land use, and transportation-specific small area plans as well as a comprehensive transportation plan. Comprehensive planning efforts by Matthews, Stallings, and Indian Trail have put the policies and procedures in place that show the vision and intent for development in the area of the project, to provide the adequate infrastructure to support this growth, and to protect the natural and human environment during the growth.

The U-4714 project is not likely to influence the intensity of development activities since each jurisdiction has a strong commitment to maintaining low-density, single-family residential development within their portion of the project area - with the exception of commercial centers at major intersections along the project corridor. The timing of development activities in the area of the project is not necessarily dependent upon construction of the project, but rather upon market conditions. Planned development is not dependent upon construction of the project.

The proposed project would have minimal indirect and cumulative effects because the project would not create a new transportation link that would markedly reduce travel times, change travel patterns, or expose properties to greater traffic volumes. The cumulative effect of this project when considered in the context of other past, present, and future actions, and the resulting impact on the notable human and natural features, is expected to be minimal. Forecast development would be the predominant contributor to cumulative effects. Development is already occurring in the area and that development is anticipated to continue with or without Project U-4714.

## 4.6 Impacts Summary

**Table 4-10: Summary of Impacts from the Preferred Alternative**

| Resource                              | Impact  | Proposed Mitigation   |
|---------------------------------------|---|---|
| <b>HUMAN ENVIRONMENT</b>              |   |   |
| Land Uses and Land Use Plans          | <p>Project would change the character of the existing facility, but it would not substantially contribute to changes in land use.</p> <p>Project would not likely influence the intensity of development activities.</p> <p>Land use will continue to be guided by adopted zoning and land use plans.</p> <p>The project is generally consistent with local land use plans.</p> | Not applicable.   |
| Consistency with Transportation Plans | <p>Project identified in, and generally consistent with local (Matthews, Stallings, Indian Trail) land use and transportation plans.</p> <p>Only a minor inconsistency between how bicycle accommodations are provided in the preliminary design compared to local plans.</p>   | Not applicable.   |
| Community Resources                   | Minor property impacts to the Matthews Presbyterian Church.   | Impacts will continue to be minimized to the extent feasible during final design. |

**Table 4-10: Summary of Impacts from the Preferred Alternative**

| Resource                             | Impact   | Proposed Mitigation   |
|--------------------------------------|--|---|
| Neighborhoods/Community Cohesion     | No permanent negative impacts to community cohesion/stability.<br><br>Sidewalk and/or multi-use path would improve mobility and connectivity for pedestrians and bicyclists, which could enhance community cohesion by providing more options for interaction.   | Not applicable.   |
| Relocations and Property Acquisition | 45 total residential displacements (20 residential owners and 25 tenants).<br><br>13 total business displacements (1 business owner and 12 tenants).<br><br>17 additional parcels would necessitate acquisition of parking spaces, which may or may not result in additional business relocation claims. | NCDOT will use three programs to minimize the inconvenience of relocation: Relocation Assistance, Relocation Moving Payments, and Relocation Replacement Housing Payments or Rent Supplement. These programs are in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. Comparable replacement housing and business space is available in the Project area for displaced homeowners, tenants, and businesses. |
| Environmental Justice                | No disproportionately high and adverse impacts to minority and low-income populations. No disparate impacts anticipated under Title VI and related statutes.   | Not applicable.   |
| Visual/Aesthetic                     | No adverse visual impacts anticipated. Opportunity for landscaped median (and berms) would provide a benefit.  | Not applicable.   |
| <b>PHYSICAL ENVIRONMENT</b>          |  |   |
| Noise                                | 96 traffic noise impacts due to future predicted noise levels that would approach or exceed FHWA noise abatement criteria.<br><br>Temporary and localized construction noise impacts would likely occur as a result of construction activities, including earth removal, hauling, grading, and paving.   | Noise barriers were determined not reasonable due to the lack of access control along the corridor. This limits the ability to construct a noise barrier long enough to provide adequate noise reduction.<br><br>For construction noise, low cost and easily implemented construction noise control measures will be incorporated during construction to the extent practicable.  |
| Air Quality                          | No air quality impacts are anticipated with the Preferred Alternative.   | Not applicable.   |
| Farmland                             | The entire project study area is recognized by the US Census Bureau as an urban area.  | Not applicable.   |

**Table 4-10: Summary of Impacts from the Preferred Alternative**

| Resource                         | Impact   | Proposed Mitigation   |
|----------------------------------|--|---|
| Utilities                        | The project would require gas, water, electric pole, sewer, telephone and cable television relocations.  | NCDOT will coordinate with all utility providers during final design and construction to prevent damage to utility systems and to minimize disruption and degradation of utility service to local customers.  |
| Hazardous Materials              | <p>13 sites within the project corridor may contain petroleum USTs.</p> <p>Eight dry cleaners and two car washes (of concern due to potential for oil-water separators on sites) are within project limits.</p> <p>All sites have a low potential for geoenvironmental impacts.</p>  | The NCDOT Geoenvironmental Unit will complete further assessments on each property prior to right of way acquisition, as necessary.   |
| Hydrology and Floodplains        | <p>Existing culverts will be extended to accommodate the widened roadway.</p> <p>Two locations along the project corridor where the project crosses a stream are located within a FEMA regulated special flood hazard area.</p> <p>Two existing crossings would have to be replaced by a major drainage structure (one of these sites is within the FEMA regulated floodplain).</p> <p>An existing stormwater management pond may be impacted.</p>   | NCDOT Hydraulics Unit will coordinate with FEMA and local authorities to ensure compliance with applicable floodplain management ordinances. Since this project involves construction on or adjacent to FEMA regulated streams, the NCDOT Division 10 shall submit sealed as-built construction plans to the NCDOT Hydraulics Unit upon completion of project construction, certifying that the drainage structures and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.   |
| <b>CULTURAL ENVIRONMENT</b>      |  |   |
| Historic Architectural Resources | <p>A determination of:</p> <p>No Effect - Matthews Historic District</p> <p>No Effect - Rowland Clay House</p> <p>No Adverse Effect with Conditions - Reid House</p> <p>No Adverse Effect with Conditions - Banks H Funderburk Store (Rock Store BBQ)</p> <p>No Adverse Effect with Conditions - Carolyn Funderburk House</p> <p>The residence at 4800 Old Monroe Road requires additional study to determine eligibility for the NRHP. Currently the preliminary design has a minor right of way encroachment on this property.</p> | <p>During final design, designs will be reviewed to ensure applicable conditions are met to maintain the No Adverse Effect determinations for the Reid House, Banks H Funderburk Store, and Carolyn Funderburk House.</p> <p>Prior to the FONSI, additional studies will be completed for the property at 4800 Old Monroe Road to determine eligibility for the NRHP. If the property is determined eligible, an effects determination will be required prior to the FONSI. Any applicable design changes and additional conditions will need to be identified prior to the FONSI and implemented during final design and construction.</p> |

**Table 4-10: Summary of Impacts from the Preferred Alternative**

| Resource  | Impact  | Proposed Mitigation  |
|---|---|--|
| Archaeological Resources                        | The Office of State Archaeology determined the project area is unlikely to contain intact and significant archaeological resources.   | Not applicable.  |
| Section 4(f) and 6(f)(3) Resources              | <p>One Section 4(f) resource is in the project study area; Fourmile Creek Greenway. Preliminary design avoids impacts to the greenway.</p> <p>If the house at 4800 Old Monroe Rd is determined eligible for the NRHP, and there is an Adverse Effect determination, a Section 4(f) evaluation for this property will be required prior to the FONSI.</p> <p>There are no Section 6(f)(3) resources in the project study area.</p> | If the house at 4800 Old Monroe Rd is determined eligible for the NRHP, and there is an Adverse Effect determination, a Section 4(f) evaluation for this property will be required prior to completion of the FONSI.   |
| <b>NATURAL ENVIRONMENT</b>                      |   |  |
| Biotic Communities and Wildlife                 | The project area is predominantly comprised of maintained/disturbed habitat. No substantially adverse impacts to wildlife or biotic communities.  | Not applicable.  |
| Water Resources and Water Quality               | Project construction activities such as clearing and grubbing, tree removal, in-water construction, and fertilizer and pesticide use during revegetation, could impact surface water quality in the absence of appropriate Best Management Practices (BMPs).  | An erosion and sedimentation control plan will be prepared during final design and implemented during construction. The plan will identify appropriate BMPs.   |
| Waters of the US (wetlands, streams, and ponds) | <p>A total of 1,821 linear feet of stream impacts at 12 crossings.</p> <p>A total of 0.38 acre of wetland impacts from 5 wetlands.</p> <p>A total of 0.11 acre of one pond.</p>   | A permit from the USACE will be required for impacts to Waters of the US. Regional General Permit 198200031 (effective April 2015) is anticipated to be applicable to the project. The permit must be obtained prior to construction. The NCDOT will investigate potential on-site stream and wetland mitigation opportunities after approval of the FONSI. If on-site mitigation is not feasible, mitigation will be provided by NCDEQ Division of Mitigation Services. |
| Protected Species                               | The Preferred Alternative has been determined to have no effect on protected species listed for the area.   | Not applicable.  |





## 5 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

The project process included early and continuous coordination amongst NCDOT, the Towns, the public, and federal, state, and local agencies. The coordination efforts assisted in determining the scope of analysis and documentation, the alternatives, and the identification of potential impacts and mitigation measures. The NCDOT developed a Public Involvement Plan and implemented the plan for use in project decision-making. The following sections summarize key components of the overall public involvement program.

### 5.1 Scoping and Agency Coordination

#### 5.1.1 Start of Study Notification

At the initiation of this Environmental Assessment, NCDOT sent a formal request for input on the scope of the project (known as “project scoping”) to federal and state regulatory/resource agencies and local officials on April 26, 2013. The purpose of the project scoping process, which is required by NEPA, was to solicit comments and collect pertinent project information early in the preliminary engineering/environmental review process. The scoping process input assisted with the development of the purpose and need statement, identifying the range of alternatives, and defining the scope of the environmental analyses.

The agencies and officials listed below received the project scoping request. In addition to agencies’ standard general comments submitted for all projects, several responses included comments related directly to STIP U-4714. An asterisk (\*) indicates that a written response was received from the agency.

**Appendix F** contains all project scoping response letters in their entirety along with a brief summary of the comments.

#### Agencies

- Centralina Council of Governments
- Charlotte Mecklenburg Police Department
- Charlotte-Mecklenburg Schools
- Federal Emergency Management Agency
- Federal Highway Administration
- Mecklenburg County Commission
- Mecklenburg EMS Agency
- Mecklenburg County Fire Marshall\*
- Mecklenburg County Planning Department
- Charlotte Regional Transportation Planning Organization\*
- NC Department of Cultural Resources, State Historic Preservation Office\*
- NC Department of Environment and Natural Resources (NCDENR)
- NCDENR, Division of Waste Management\*
- NCDENR, Division of Water Resources, Public Water Supply Section\*
- NCDENR, Division of Water Quality and Division of Air Quality ( Mooresville Office)\*
- NC Department of Public Safety and Emergency Management, Geospatial and Technology Management Office\*
- NCDOT - Division 10
- NC State Clearinghouse
- NCDOT - Transportation Planning Branch\*
- NC Wildlife Resources Commission\*
- Town of Indian Trail\*
- Town of Indian Trail Planning Department
- Town of Indian Trail Town Council
- Town of Matthews\*
- Town of Matthews Fire & EMS Departments
- Town of Matthews Police Department

- Town of Matthews Town Council
- Town of Stallings\*
- Town of Stallings Police Department
- Town of Stallings Town Council
- Town of Stallings Volunteer Fire Department
- Union County
- Union County Commission
- Union County EMS\*
- Union County Fire Marshall
- Union County Planning Department
- Union County Public Schools
- Union County Sheriff
- Union County Transportation
- US Army Corps of Engineers\*
- US Environmental Protection Agency\*
- US Fish and Wildlife Service

### **Elected Officials**

- Robert Pittenger – US Congress District 9
- Richard Burr – US Senate
- Kay Hagan – US Senate
- Jeff Tarte – NC Senate District 41
- Tommy Tucker – NC Senate District 35
- Dean Arp – NC House District 69
- Craig Horn – NC House District 68
- William Brawley – NC House District 103

### **Appointed Officials**

- Ferrell Blount – NCDOT Board of Transportation, At Large
- Andrew Perkins – NCDOT Board of Transportation, At Large
- John Collett – NCDOT Board of Transportation, Division 10

## **5.1.2 Resource Agency Coordination**

NCDOT initiated a meeting with the four primary resource agencies to the Merger Memorandum of Agreement to determine if the project should follow the Section 404/NEPA Merger process. A Merger Screening meeting was held on July 24, 2013. A summary of this meeting is included in **Appendix F**.

It was the recommendation at the meeting that the project not be inserted into Merger due to minimal resources in the project area and the anticipation of similar impacts for all the build alternatives. The US Army Corps of Engineers (USACE), FHWA, NCDENR-Division of Water Resources, and NCDOT agreed that the project would not follow the merger process.

## **5.2 Public Involvement and Local Coordination**

### **5.2.1 Project Planning Event**

In August 2013, a three-day planning event, called a project design charrette, was held to provide opportunity for community-led input to alternatives development. The event brought together stakeholders from all three Towns along with the NCDOT to develop concepts that reflected their desires for how the corridor should look and function.

*From August 27-29, 2013, residents, business owners, and government officials in Matthews, Stallings, and Indian Trail gathered together with the NCDOT to participate in a three-day planning and design event. The event was used to contemplate early alternatives for future transportation improvements to a 6.5-mile stretch of East John Street-Old Monroe Road.*

The project team used several methods to ‘get the word out’ and invite people to attend the design charrette, including:

- E-blasts, phone calls, and mailings to homeowners associations (HOAs), businesses, and landowner contacts provided by the three municipalities
- Press releases, newspaper advertisements, and media coverage leading up to, and during, the three-day event
- Large posters (photo to the right) displayed throughout the corridor in high-traffic areas (with permission from business owners).
- Key information and an event schedule posted on the official websites for the Towns of Matthews, Stallings, and Indian Trail.
- Two Dynamic Message Signs in the Towns of Matthews (east of Trade Street) and Indian Trail (west of the Waxhaw-Indian Trail Road intersection) displaying day-of-event times for public meetings each day.



In addition, event organizers encouraged people to spread the word among neighborhoods, other businesses, etc. in the study area.

The design charrette used a drop-in any time, open studio policy to engage as many participants as possible. Nearly 100 people (i.e., residents, property owners, business owners, municipal staff, etc.) participated in the event. Participation varied by day and time of day, with many people attending multiple events: 45 signed in for Tuesday, 30 signed in for Wednesday, and 18 signed in for Thursday. Representatives from the NCDOT and their consultant team were present throughout the event to make presentations, lead small group discussions, provide technical opinions, and generally participate in the planning process.



Participants were asked to provide input in several ways: comment cards, writing on maps, small group activities, small group discussions, question and answer periods, and a large group voting exercise. Comments were recorded by activity and shared with project team members throughout the three-day event for building possible design concepts. A detailed summary of the event can be found in the *STIP No. U-4714 Multi-Day Design Charrette Summary* (Atkins, October 2013), which is incorporated by reference.

Topic-specific small group activities and discussions were held throughout the three-day event to solicit feedback critical to forming ideas for design alternatives to evaluate for the project. The small-group discussions were focused on seven key topics: corridor aesthetics, business and landowner concerns, location of improvements, typical street section, access management, community and neighborhood concerns, and a local government round table. Each meeting was led by a facilitator with help from topic experts from the project team.



Results from breakout sessions provided an opportunity for the project team to understand:

- Overall preferences for if/how bicyclists and pedestrians should be accommodated
- The prospect for consensus on project design elements
- If certain concepts were likely to face strong opposition in the alternatives process
- Which alternatives were likely favored to move into detailed study

### 5.2.2 Public Meeting

A public meeting was held on January 21, 2014 at the South Piedmont Community College to provide an additional opportunity for the public to learn about the project following the August 2013 design charrette. A Local Officials Meeting was held just prior to the meeting. The purpose of the public meeting was to present and receive input on preliminary concept alternatives.



On January 7, 2014, a total of 3,117 postcards were sent out to announce the public meeting. In addition, the meeting was announced via press release, newspaper advertisements, and via municipal websites. A total of 79 citizens signed in at the meeting. The meeting is summarized, and comment forms are included, in the *Public Meeting #1 Summary* (Atkins, May 2014), which is incorporated by reference.

The January 2014 public meeting was an informal open-house format. Attendees were encouraged to sign-in, read the handouts, view project displays, discuss the project one-on-one with project team representatives, and fill out comment forms. Comment forms gauged opinions on different project sections, including various improvement concepts and “best fit” location of improvements by section, and roadway elements (e.g. bicycle and pedestrian accommodations). A total of thirty-eight (38) comment forms were submitted during the comment period, which ended on February 11, 2014.



Handouts and project display boards included information on the project location/scope, the planning process, meeting purpose, project purpose and need, existing/future traffic volumes, the definition and local vision for a “Complete Street”, preliminary project alternatives, preliminary best fit widening, and environmental features mapping, alternatives no longer under consideration, and material on superstreet intersections.



Although most participants were concerned about sections of the project in which they lived, about a quarter of the feedback indicated that all sections of the project are equally important. Over half of the comment forms indicated support for the 4-Lane Median Divided Roadway concept, followed by about a quarter supporting the 6-Lane Median Divided Roadway, and about 21 percent in support of the 4-Lane Superstreet concept or other preference. The comment forms included reasons for/against various concepts. About one-third of participants felt that the corridor should have the same typical section throughout, but most suggested that it was warranted to have differing concepts for each section. The four-lane concept was most supported in each section.

The preliminary best fit widening display provided information on existing features in the project study area such as neighborhoods, schools, recreational resources, places of worship, historic sites, municipal boundaries, natural features, and activity centers. Of the comment forms submitted, about two-thirds agreed with the “best fit” option shown at the meeting.

Participants were asked which roadway and design elements were most important for the proposed project in developing alternatives. There was varying opinions on these elements. Most supported adding capacity and a multi-use path. There were differing opinions on how to accommodate bicyclists.

### 5.2.3 Small Group Meetings

Throughout the NEPA process, the project team was available to meet with small groups upon their request. A brief summary of these meetings is included below.

**Kerry Greens HOA Meeting - April 14, 2014.** The Kerry Greens neighborhood asked NCDOT to speak to residents about the project at one of their scheduled HOA meetings. This large neighborhood is accessed from Old Monroe Road in Stallings. The entrance is on the north side of the road in Section B of the project, just west of Pleasant Plains Road.

About 100 neighborhood residents attended the meeting to ask questions and discuss concerns regarding the proposed project. The project team members provided a brief overview of the project and environmental review process and supporting studies, then participants asked specific questions. Related questions at the meeting included: Rock Store Bar-B-Q historic resource protection (e.g.

relocating this resource to avoid neighborhood impacts), typical section options (e.g. six lanes versus four lanes), noise impacts and mitigation, right-of-way/relocations, and project schedule.

**Morningside HOA Meeting - June 18, 2014.** The Morningside neighborhood asked NCDOT to speak to residents about the project at one of their scheduled HOA meetings. Morningside is a small neighborhood accessed from Old Monroe Road in Stallings. The neighborhood entrance is on the north side of the road in Section B of the project, east of Pleasant Plains Road and across the street from the Poplar Glen neighborhood. About 30 residents attended the meeting.

Project team members provided a brief overview of the project and environment review process and supporting studies. Then team members answered questions provided in advance of the meeting covering the following topics: Right-of-way/relocation impacts, alignment decisions, walls/landscape buffers, noise mitigation, signalization, lighting, speed limit, truck traffic, typical section, and project schedule.

**Arista Development, LLC - November 4, 2014.** Indian Trail and the project owner for the proposed Shoppes at Hanfield Village requested a meeting to discuss the intersection configuration options at Old Monroe Road and Wesley Chapel-Stouts Road. Hanfield Village is a proposed large retail development in the northeast quadrant at Old Charlotte Highway and Wesley Chapel-Stouts Road in Indian Trail. The project owner expressed support only for a conventional/full movement intersection at this location. This support was also expressed by Town Council in a Resolution adopted on October 14, 2014.

#### 5.2.4 Newsletter Update

In January 2015, NCDOT distributed a project update via newsletter. The newsletter noted project activities in support of the environmental review process since the January 2014 public meeting, including field reviews and other studies (e.g. natural resources, historic architectural resources, traffic). The newsletter also summarized project challenges and Town input that the NCDOT was considering in the development of project alternatives. Finally, the newsletter presented recommendations for the proposed improvements at major intersections along the corridor: Trade Street, Council Place, I-485, Stallings Road-Potter Road, Pleasant Plains Road, Waxhaw-Indian Trail Road, and Wesley Chapel-Stouts Road. A copy of the newsletter is included in **Appendix G**.

#### 5.2.5 Elected Officials Meetings/Briefings

Multiple meetings were held with municipal staff, technical committees, and elected officials regarding the proposed project, as listed below. These meetings were held as requested to discuss project alternative elements such as roadway alignment and typical sections, traffic operations, and intersection configurations.

- Stallings Town Council – May 20, 2013
- Matthews Board Briefing – January 13, 2014
- Matthews Town Board, Planning Board and TAC – June 9, 2014
- Stallings TAC – June 12, 2014
- Indian Trail Staff Meeting – June 16, 2014
- Matthews Staff Meeting – June 16, 2014

- Indian Trail Town Council Briefing – June 17, 2014
- Indian Trail TAC – July 8, 2014
- Matthews Town Board, Planning Board and TAC – September 8, 2014
- Matthews Staff Meeting (and property owner) – October 6, 2015
- Matthews Staff Meeting – February 8, 2016
- Matthews Town Board Presentation – April 25, 2016

### 5.2.6 Municipal Partnering and Coordination

NCDOT partnered with the three Towns during the NEPA process, beginning with a Project Symposium in May 2013. The symposium served as the formal kick-off and brought together Town officials, planning/engineering department staffs, and the NCDOT to discuss key components for the planning process. Major discussion topics for the project symposium included: setting a winning strategy, current state of affairs, local visions and tools, partner identification, and logistics for the future multi-day design charrette discussed in **Chapter 5.2.1**. The Symposium meeting summary is included in **Appendix G**.

Regular quarterly meetings were held to exchange information and obtain input on key elements at each phase of the project, including purpose and need and alternatives development and evaluation. Several meetings were held during specific milestones such as review of concepts and preliminary design, and to discuss concerns specific to individual or all municipalities. The meetings are listed below.

- Town of Indian Trail – September 14, 2012
- Town of Indian Trail – September 24, 2012
- Municipal Kick-off Meeting – December 4, 2012
- Municipal Coordination Meeting – March 5, 2013
- Project Symposium – May 8, 2013
- Municipal Coordination Meeting – June 4, 2013
- Municipal Coordination Meeting – July 26, 2013
- Project Design Charrette – August 27-29, 2013
- Municipal Coordination Meeting – September 10, 2013
- Municipal Coordination Meeting – March 4, 2014
- Municipal Coordination Meeting – June 2, 2014
- Municipal Coordination Meeting – August 28, 2014
- Town of Matthews Decision Meeting – September 16, 2014
- Town of Stallings Decision Meeting – September 16, 2014
- Town of Indian Trail Decision Meeting – September 16, 2014
- Municipal Coordination Meeting – March 13, 2015

**Table 5-1** summarizes local requests made during the alternatives development process. Requests included access points and modifying roadway elements to minimize impacts to adjacent properties/resources.

**Table 5-1: Local Requests**

| Project Section/Area                                | Town Request  | Reason Incorporated/Not Incorporated   |
|---|---|--|
| <b>Matthews</b>                                     |   |  |
| West of Trade Street                                | Trees in front of the Reid House are dying. Shift the alignment away from the new veterinary hospital.                        | Proposed design avoids the established boundaries of the Reid house historic resource, as directed by the State Historic Preservation Office (SHPO) during an internal preliminary effects meeting in September 2014 and the SHPO Effects Meeting in October 2015.   |
|   | Omit the proposed six-foot concrete median.   | This is needed to provide pedestrian refuge and property channelization for left turn.   |
| Trade Street  | Do not include the U-turn at Trade Street.  | With a signal, the U-turn provides a safe maneuver for passenger cars in this tightly-spaced/high-volume area.   |
| East of Trade Street                                | Provide a left turn in to Finz and BB&T or a break in the median  | Not able to accommodate due to spacing/operational issues with this option. The U-turn movement at Trade Street would accommodate the access or they can access via Sadie Way. A leftover is currently proposed in to the post office.   |
| Trade Street to Buckley Way (through downtown area) | Modify the footprint/design elements to minimize impacts.   | Design includes 11-ft.lanes, 5-ft. sidewalks on the back of curb on the south side, and no multi-use path in this section. Just west of Buckley Way design transitions to a 10-ft. multi-use path and 12-ft. lanes east of Buckley Way. Beyond Buckley Way sidewalk is no longer at the back of curb and there will be a planting strip. |
| Clearbrook  | Provide full access at Clearbrook.  | While full turning movements cannot be provided, a leftover is proposed here. U-turn bulb minimizes relocation potential and accommodates traffic from the Sportsplex.   |
| Greylock Ridge Road Extension/Sportsplex            | Provide full access.  | Due to projected volumes and close spacing near the interchange, Superstreet is proposed at this location, which provides the best overall traffic operations.   |
| Council Place                                       | Provide full access.  | Leftover is proposed and the left turn to westbound East John street is redirected to the U-turn east of the I-485 interchange for safety and efficiently. Locating the U-turn west of the interchange would result in spacing issues.   |
| <b>Stallings</b>                                    |   |  |
| Stallings Road                                      | Transition multi-use path to north side east of Stallings Road to provide connection to downtown/park area and neighborhoods. | Design incorporates this request.  |
| Through Stallings                                   | Requests 35 mph posted speed limit.   | The design speed is 50 mph, but the posted speed limit would be coordinated with the Towns in the future.  |



**Table 5-1: Local Requests**

| Project Section/Area             | Town Request   | Reason Incorporated/Not Incorporated   |
|----------------------------------|--|--|
| <b>Indian Trail</b>              |  |  |
| Waxhaw-Indian Trail              | Provide full movement design and purchase enough right-of-way to build a superstreet in 10-15 years or when needed.      | This option would increase construction costs and require the public to endure construction twice. In addition, the full movement would require widening of the cross streets beyond the intersection, which would result in greater impacts. The Superstreet option balances the high volumes through the intersection.   |
| East of Waxhaw-Indian Trail Road | Avoid impacts to the new Family Dollar and hold the new curb line and transition the multi-use path to the back of curb. | Proposed alignment avoids new Family Dollar and the footprint is transitioned back to 23-ft. median east of intersection.  |
| Wesley Chapel-Stouts Road        | Provide full movement design to accommodate the large commercial development planned at this intersection.               | The full movement would require widening of the cross streets beyond the intersection, which would result in greater impacts. The Michigan Left option balances the high volumes through the intersection in the design year. NCDOT will continue to work with the Town/property owner regarding access to this site. It is anticipated that when U-4714 is constructed, the intersection across from Sun Valley High School would convert full access to Michigan Left. |

In July 2014 and October 2014, the Town of Stallings and Indian Trail, respectively, provided formal requests to NCDOT regarding alignment alternatives and intersection treatments. Stallings expressed support for the superstreet configuration for intersections through the town. Indian Trail provided recommendations via a formal letter and a formal resolution to express opposition to a Michigan Left or Superstreet design and strong support for a full movement intersection at both Waxhaw-Indian Trail Road and Wesley Chapel-Stouts Road. Both letters are included in **Appendix G**.



## 6 SUPPORTING PROJECT DOCUMENTATION AND REFERENCES

### 6.1 Supporting Project Documentation

|                |   |
|----------------|---|
| 2013, April    | Public Involvement Plan (Revised January 2014). Prepared by Atkins.   |
| 2013, June     | STIP No. U-4714 Preliminary No Build Analysis Memo. Prepared by NCDOT Congestion Management Unit.                           |
| 2013, July     | STIP No. U-4714 Traffic Forecasts Memorandum. Prepared by NCDOT Transportation Planning Branch.                             |
| 2013, October  | Community Characteristics Report (CCR). Prepared by Atkins.   |
| 2013, October  | STIP No. U-4714 Multi-Day Design Charrette Summary. Prepared by Atkins  |
| 2014, March    | GeoEnvironmental Report for Planning. Prepared by NCDOT GeoEnvironmental Section.   |
| 2014, May      | STIP No. U-4714 East John Street-Old Monroe Road Purpose and Need Statement. Prepared by Atkins.                            |
| 2014, May      | Historical Architectural Resources Survey Report. Prepared by Mattson, Alexander and Associates, Inc.                       |
| 2014, May      | I-485 Interchange Concepts Analysis Memo. Prepared by Atkins.   |
| 2014, May      | Public Meeting #1 Summary. Prepared by Atkins.  |
| 2014, June     | Indirect and Cumulative Land Use Effects Screening Report. Prepared by Atkins.  |
| 2014, July     | Natural Resources Technical Report (NRTR). Prepared by Atkins.  |
| 2014, August   | Trade Street/Waxhaw-Indian Trail Road/Wesley Chapel-Stouts Road Alternative Intersection Analysis Memo. Prepared by Atkins. |
| 2014, August   | STIP No. U-4714 Archaeological No Survey Letter. Prepared by NCDOT HES/Archaeological.                                      |
| 2015, March    | STIP No. I-5507 Natural Resources Technical Report (NRTR). Prepared by ESI.   |
| 2015, July     | Preliminary Hydraulic Technical Memorandum. Prepared by Atkins.   |
| 2015, July     | Build Traffic Operations Technical Memorandum. Prepared by Atkins.  |
| 2015, August   | Community Impact Assessment. Prepared by Atkins.  |
| 2015, August   | STIP No. U-4714 Utility Estimate. Prepared by NCDOT Utilities Section.  |
| 2015 November  | NRTR Addendum. Prepared by Atkins.  |
| 2016, January  | STIP No. U-4714 Traffic Noise Analysis. Prepared by VHB.  |
| 2015, December | STIP No. U-4714 Relocation Report and Compensation Study. Prepared by Integra Realty Resources.                             |
| 2016, January  | STIP No. U-4714 Air Quality Analysis, East John Street-Old Monroe Road Improvement Project. Prepared by Atkins              |

## 6.2 References

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AASHTO/American Council of Engineering Companies Committee in Cooperation with the FHWA, *Improving the Quality of Environmental Documents*, May, 2006.

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[http://www.fhwa.dot.gov/environment/air\\_quality/conformity/](http://www.fhwa.dot.gov/environment/air_quality/conformity/) .

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NCDOT/NCDENR, Guidance for Assessing the Indirect and Cumulative Impacts of Transportation Projects in North Carolina – Volume II: Practitioner’s Handbook (Section II: Pre-Screening Projects for Applying Indirect & Cumulative Impact Assessment) – the ICI Guidance, January 2004.

NCDOT, Traffic Noise Abatement Policy.

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NCDOT, Wetland, Stream, and Riparian Buffer Impact Calculations, September 2006.

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Carolina Thread Trail Master Plan for Union County and Participating Municipalities, May 2011

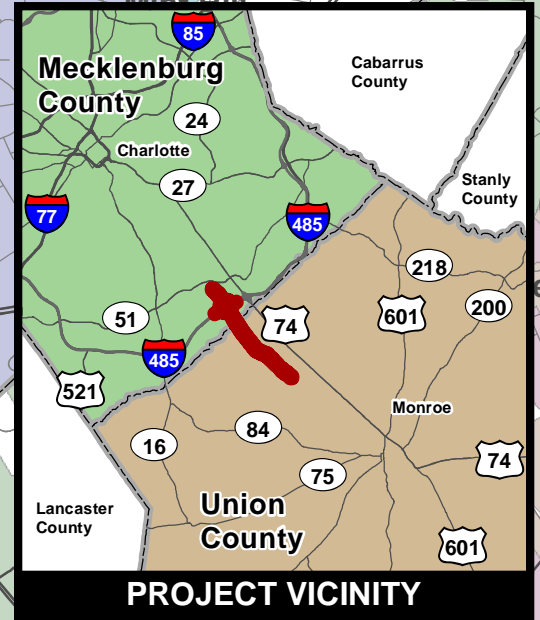
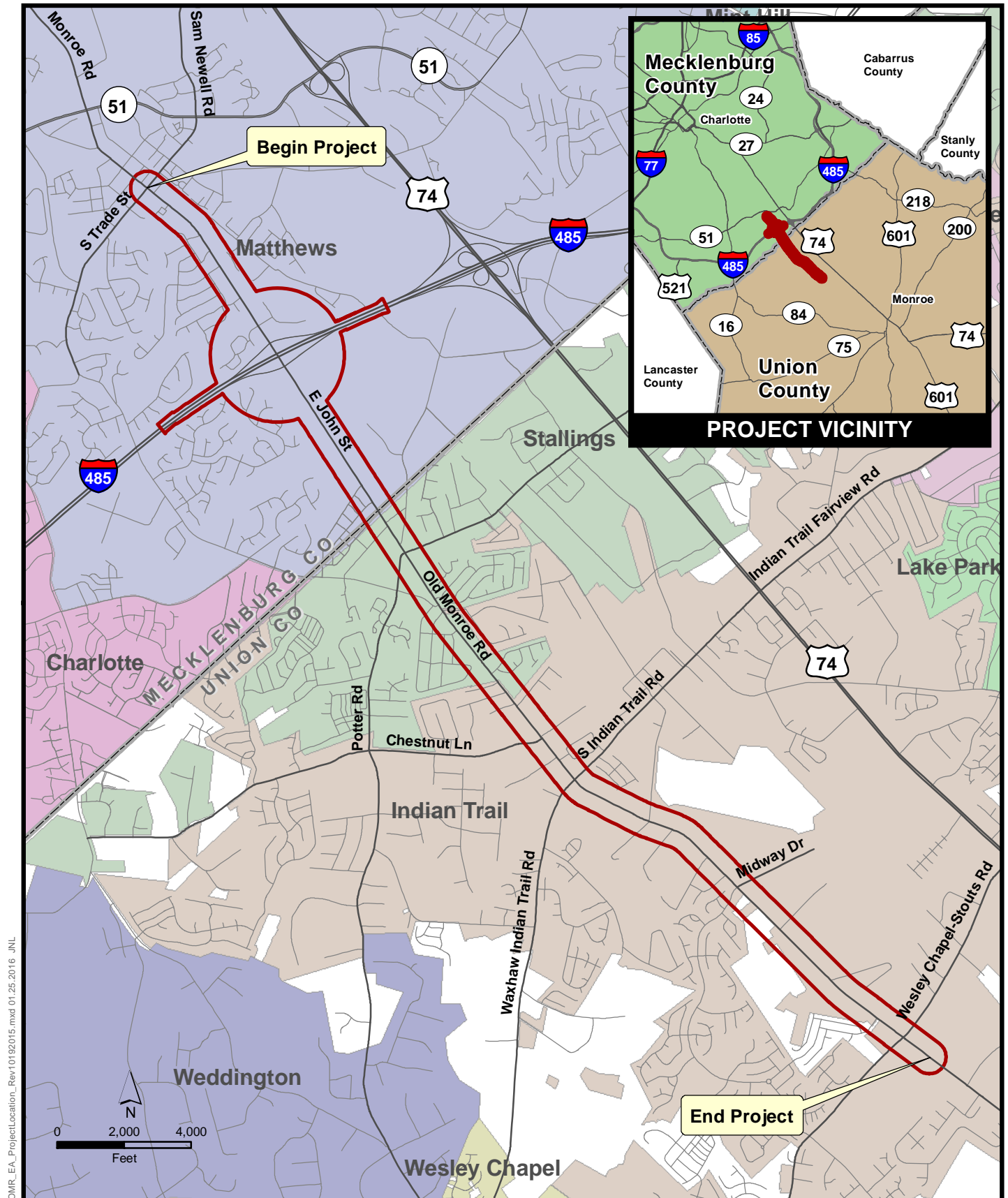
US Census Bureau: [www.census.gov](http://www.census.gov).

U.S. Department of Transportation FHWA, Environmental Document Checklist, Environmental Justice, April 2013.

U.S. Department of Transportation FHWA, Guidance for Preparing and Processing Environmental and Section 4 (F) Documents, FHWA Technical Advisory T 6640.8A, p. 16, October 1987

U.S. Department of Transportation FHWA, FHWA Guidance on Environmental Justice and NEPA, December 2011.

2012 Quality/Level of Service Handbook, Table 1, Florida Department of Transportation.



OMR\_EA\_ProjectLocation\_Rev10192015.mxd 01.25.2016 JNL

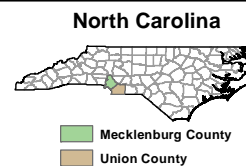


**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

**Legend**

Project Study Area

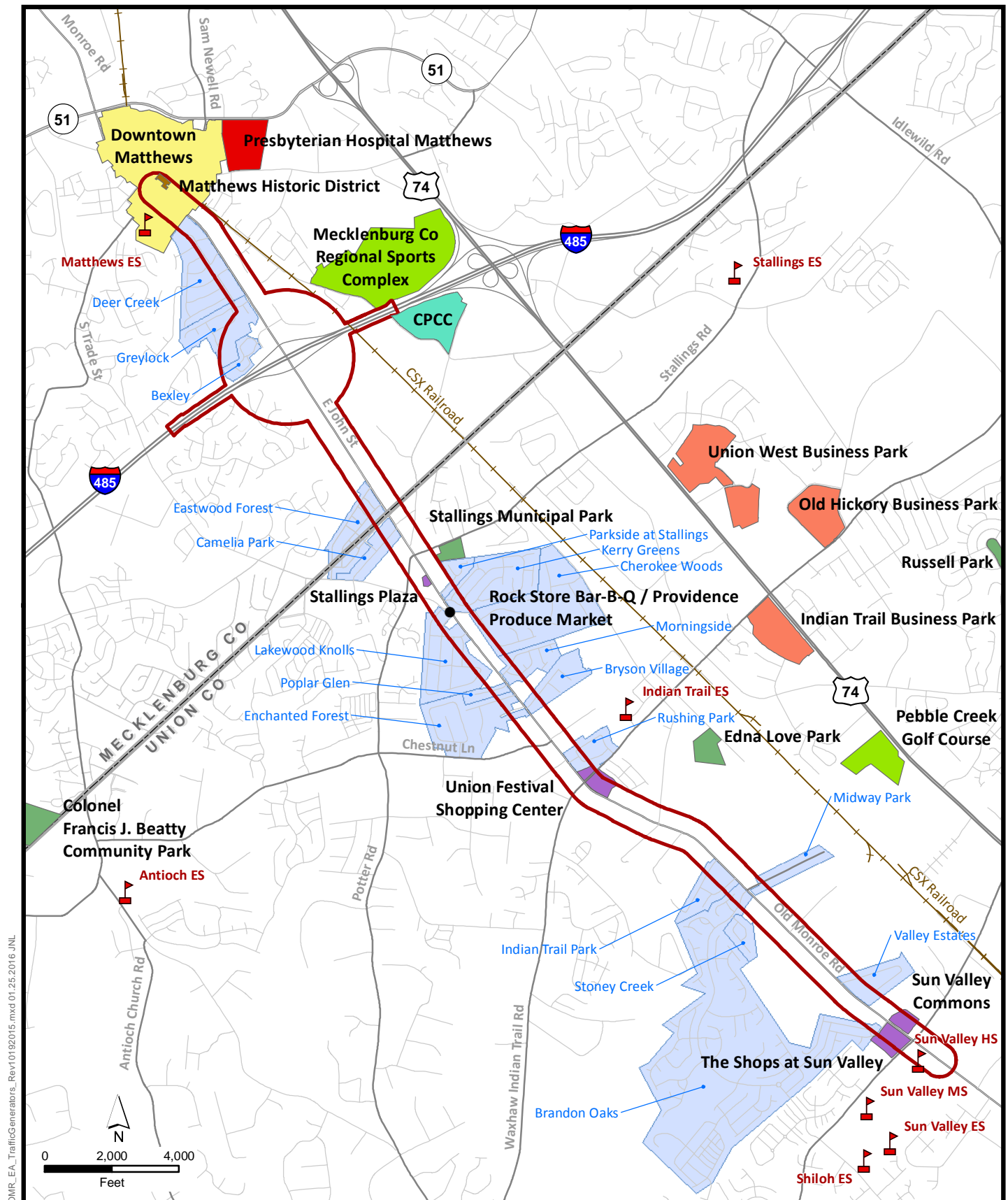
Source: Union County, NCDOT, Mecklenburg County



**PROJECT VICINITY  
AND LOCATION**

**FIGURE S-1**





OMR\_EA\_TrafficGenerators\_Rev10192015.mxd 01.25.2016 JNL



**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

### Legend

- |   |  |  |
|---|--|--|
| <span style="border: 2px solid red; padding: 2px;"> </span> Project Study Area                | <span style="background-color: black; color: black;">●</span> Notable Feature  | <span style="color: red;">▲</span> Public Schools                          |
| <span style="background-color: yellow; border: 1px solid black;"> </span> Historic District   | <span style="background-color: red; color: black;">■</span> Hospital           | <span style="background-color: green; color: black;">■</span> Park         |
| <span style="background-color: yellow; border: 1px solid black;"> </span> Special Destination | <span style="background-color: lightblue; color: black;">■</span> University   | <span style="background-color: purple; color: black;">■</span> Retail      |
| <span style="background-color: green; border: 1px solid black;"> </span> Sports/Entertainment | <span style="background-color: lightblue; color: black;">■</span> Subdivisions | <span style="background-color: orange; color: black;">■</span> Office Park |

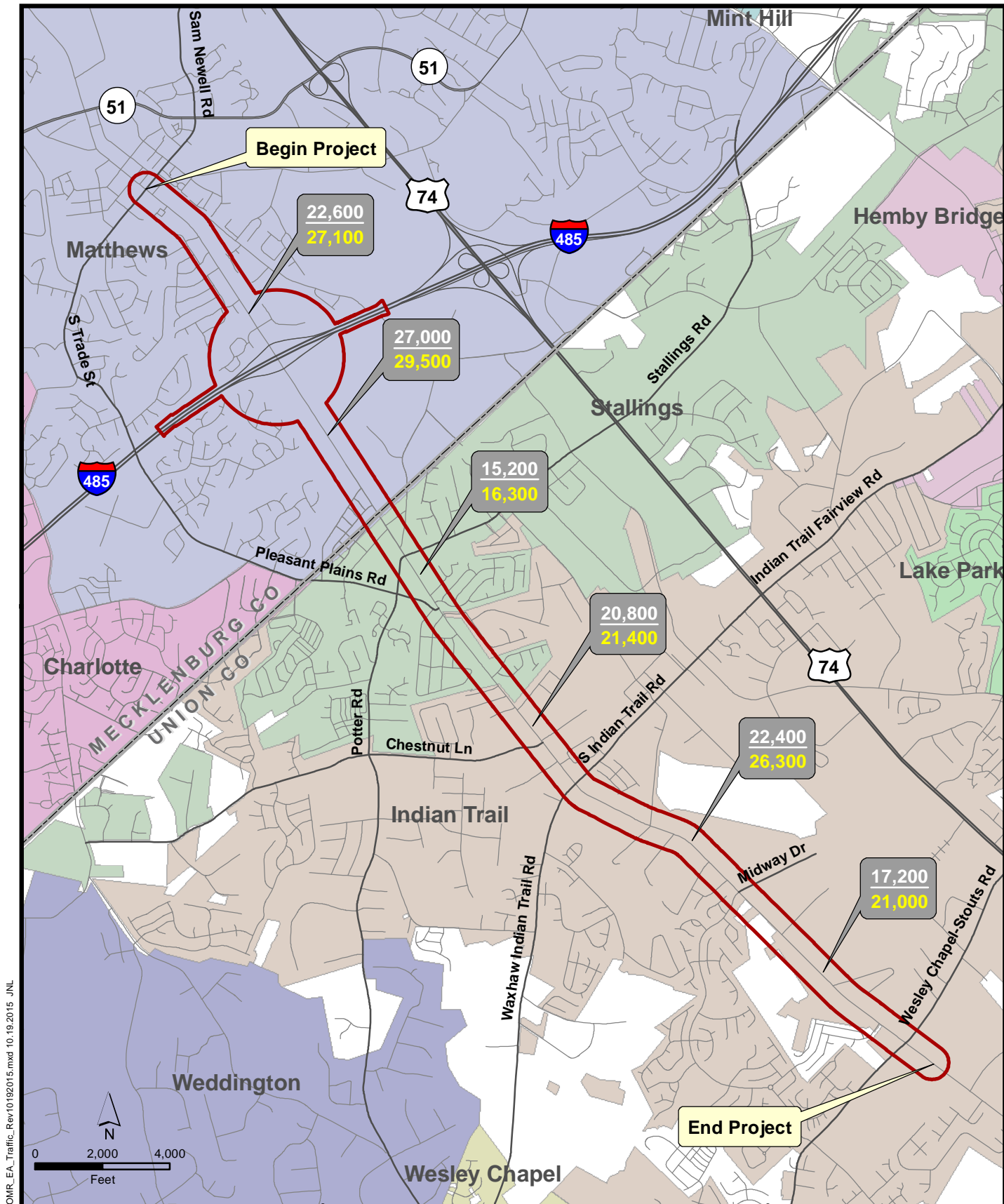
Source: NCDOT, Union County, Mecklenburg County

### TRAFFIC GENERATORS FOR THE CORRIDOR

**FIGURE S-2**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

#### Legend

  Project Study Area

XX,XXX  
XX,XXX

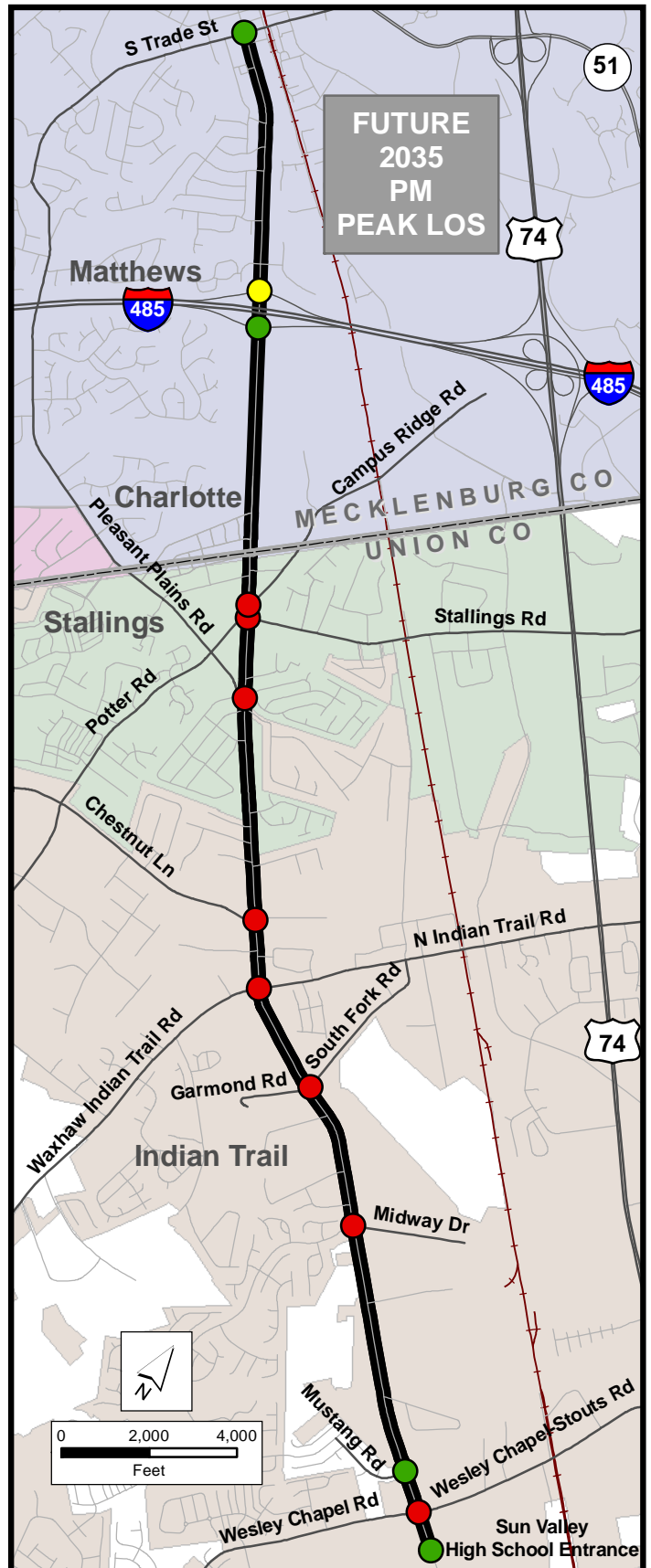
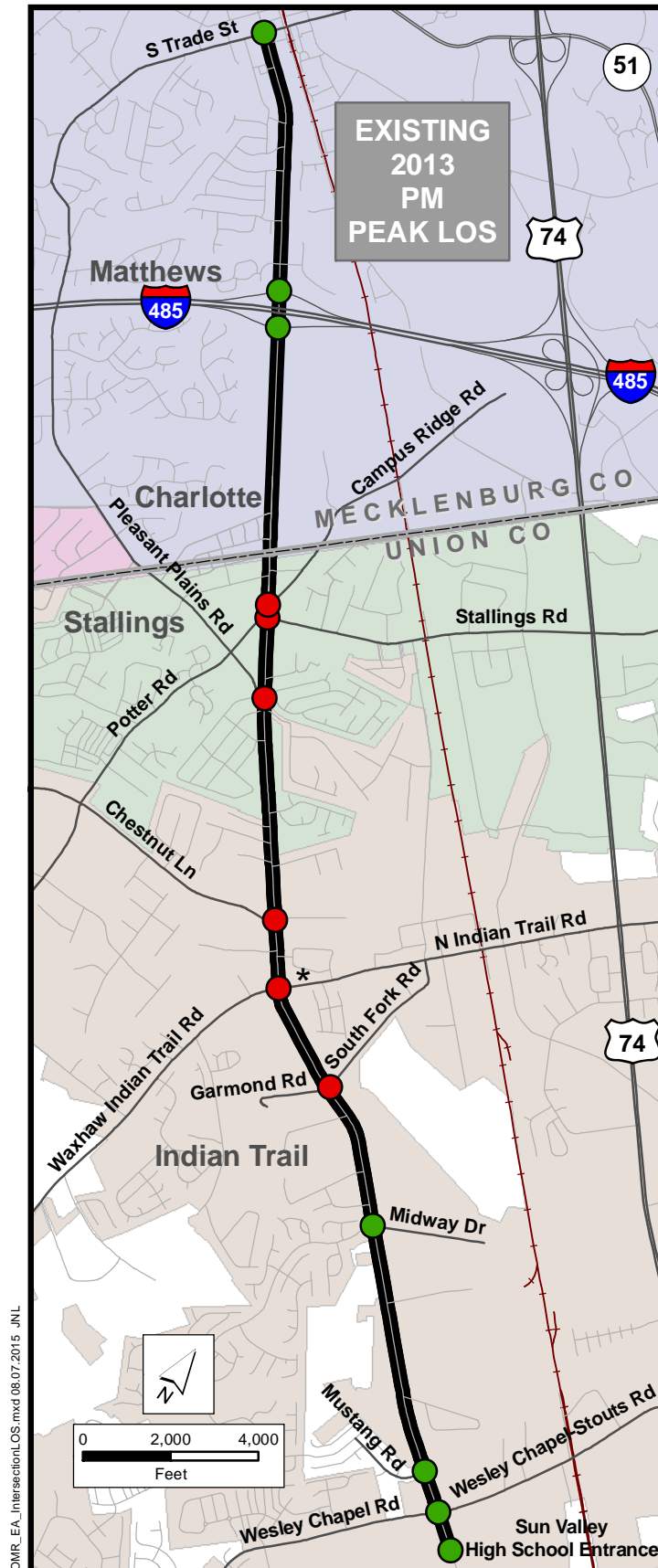
2013 Existing AADT  
2035 No Build AADT

Source: Union and Mecklenburg County GIS Departments,  
AADT from NCDOT Transportation Planning Branch Traffic Forecasts (2/9/13).

**2013 AND 2035  
ANNUAL AVERAGE  
DAILY TRAFFIC (AADT)**

**FIGURE 1-1**





OMR\_EA\_IntersectionLOS.mxd 08.07.2015 JNL



**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

- Legend**
- LOS A, B, C
  - LOS D
  - LOS E, F

- Project Limits
- Railroad

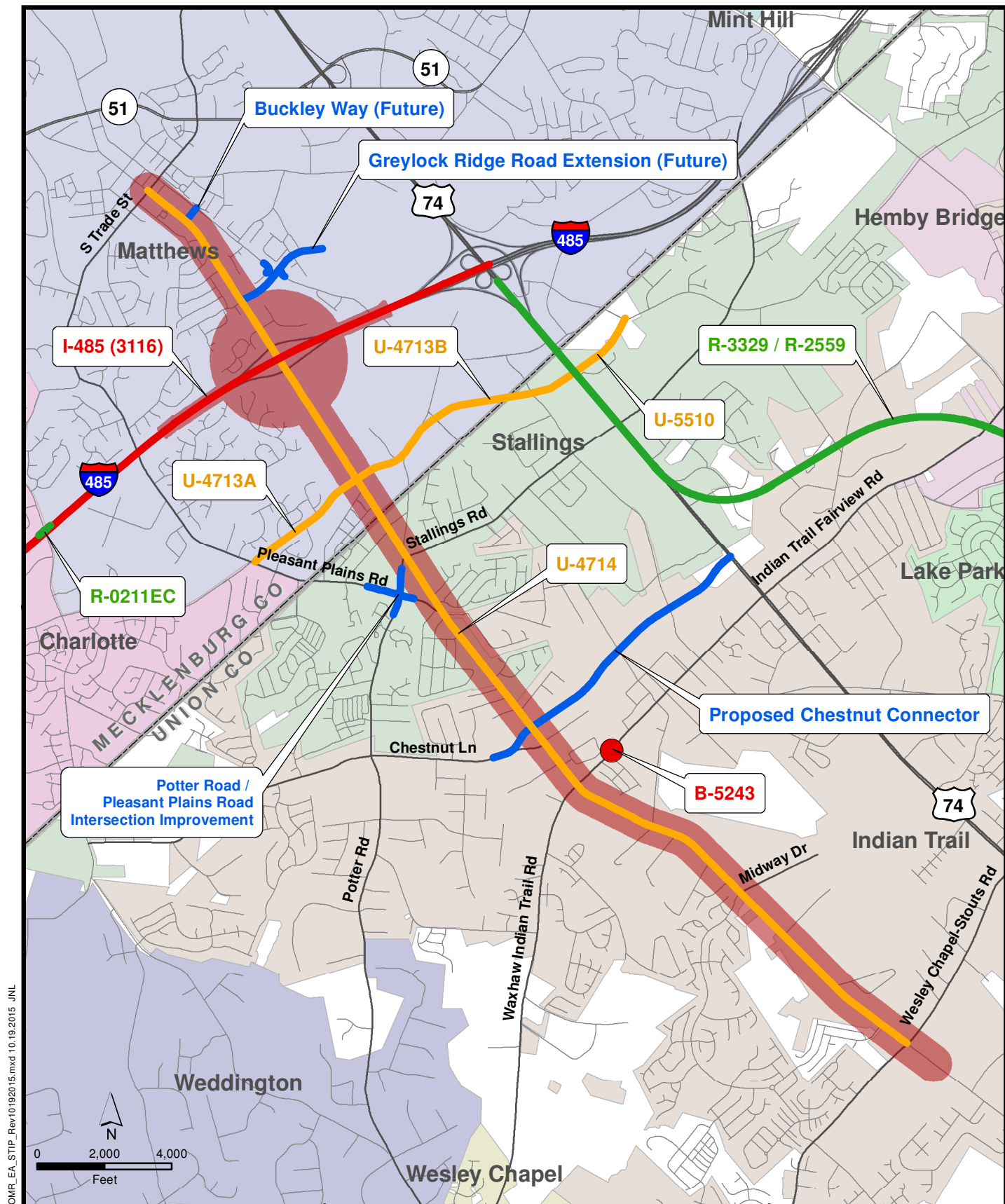
\* For existing (2013), the AM condition is shown. PM condition at this intersection is LOS D.

Source: Traffic Analysis for U-4714 by NCDOT Project Development and Environmental Analysis Branch (2/19/13); Union and Mecklenburg Counties GIS Departments.

**INTERSECTION  
LEVELS OF  
SERVICE (LOS)**

**FIGURE 1-2**





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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

- 2035 LRTP Project \*
- Rural STIP Project
- Urban STIP Project
- Local Project

- Bridge Replacement Projects
- Project Study Area

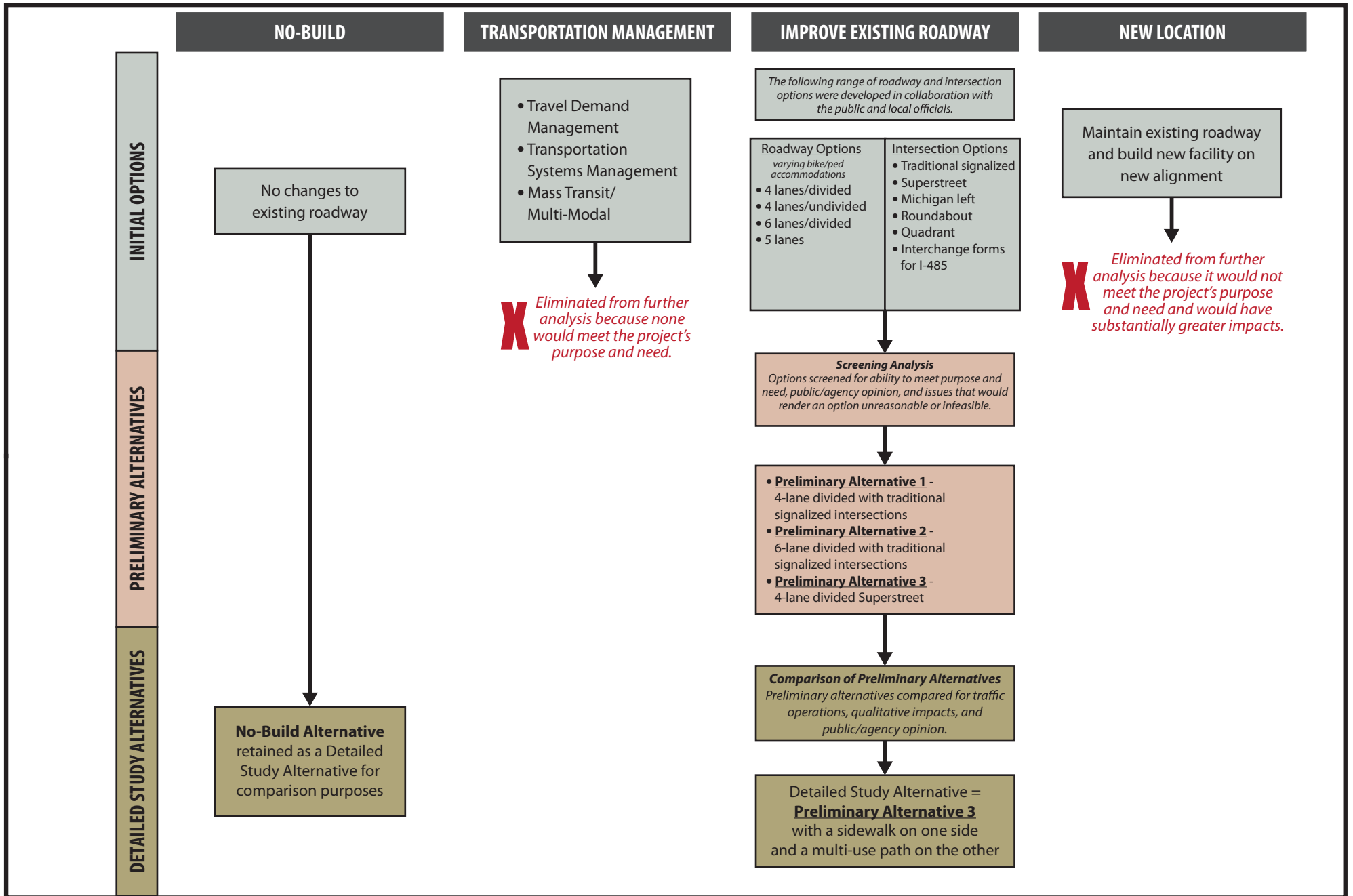
\* Long Range Transportation Plan

Source: 2013-2023 NCDOT State Transportation Improvement Program, Mecklenburg - Union MPO Draft Comprehensive Transportation Plan, November 30, 2012.

**AREA  
TRANSPORTATION  
PROJECTS**

**FIGURE 1-3**

















**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

**ALTERNATIVES  
DEVELOPMENT  
PROCESS**

**FIGURE 2-1**





| E. JOHN ST. /<br>OLD MONROE RD.   |   | PRELIMINARY<br>ALT 1: 4-LANE<br>DIVIDED | PRELIMINARY<br>ALT 2: 6-LANE<br>DIVIDED | PRELIMINARY<br>ALT 3: 4-LANE<br>SUPERSTREET |
|---|---|---|---|---|
| TRADE ST.   |    | Traditional<br>signalized               | Traditional<br>signalized               | Traditional<br>signalized                   |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| GREYLOCK RIDGE RD./<br>SPORTSPLEX (FUTURE)  |    | Traditional<br>signalized               | Traditional<br>signalized               | Superstreet                                 |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| I-485 INTERCHANGE RAMPS<br>(*Evaluated Partial Cloverleaf<br>interchange design for all<br>Preliminary Alternatives)          |    | *Traditional<br>signalized              | *Traditional<br>signalized              | *Traditional<br>signalized                  |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| McKEE RD. EXT (FUTURE)  |    | Traditional<br>signalized               | Traditional<br>signalized               | Superstreet                                 |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| STALLINGS RD/POTTER RD.   |    | Traditional<br>signalized               | Traditional<br>signalized               | Superstreet                                 |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| PLEASANT PLAINS RD.<br>(*Also evaluated full intersection<br>realignment with Kerry Greens<br>entrance for 4-lane and 6-lane) |    | *Traditional<br>signalized              | *Traditional<br>signalized              | Superstreet                                 |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| CHESTNUT CONNECTOR<br>(FUTURE)  |  | Traditional<br>signalized               | Traditional<br>signalized               | Superstreet                                 |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| WAXHAW-INDIAN TRAIL RD.   |  | Traditional<br>signalized               | Traditional<br>signalized               | Superstreet                                 |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| BRANDON OAKS PKWY.  |  | Traditional<br>signalized               | Traditional<br>signalized               | Superstreet                                 |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| MUSTANG DR.   |  | Traditional<br>signalized               | Traditional<br>signalized               | Superstreet                                 |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| WESLEY CHAPEL-STOUTS RD.  |  | Traditional<br>signalized               | Traditional<br>signalized               | Michigan left                               |
|   |   | 4-lane divided                          | 6-lane divided                          | 4-lane divided                              |
| SUN VALLEY HIGH SCHOOL ENTRANCE   |  | Traditional<br>signalized               | Traditional<br>signalized               | Superstreet                                 |

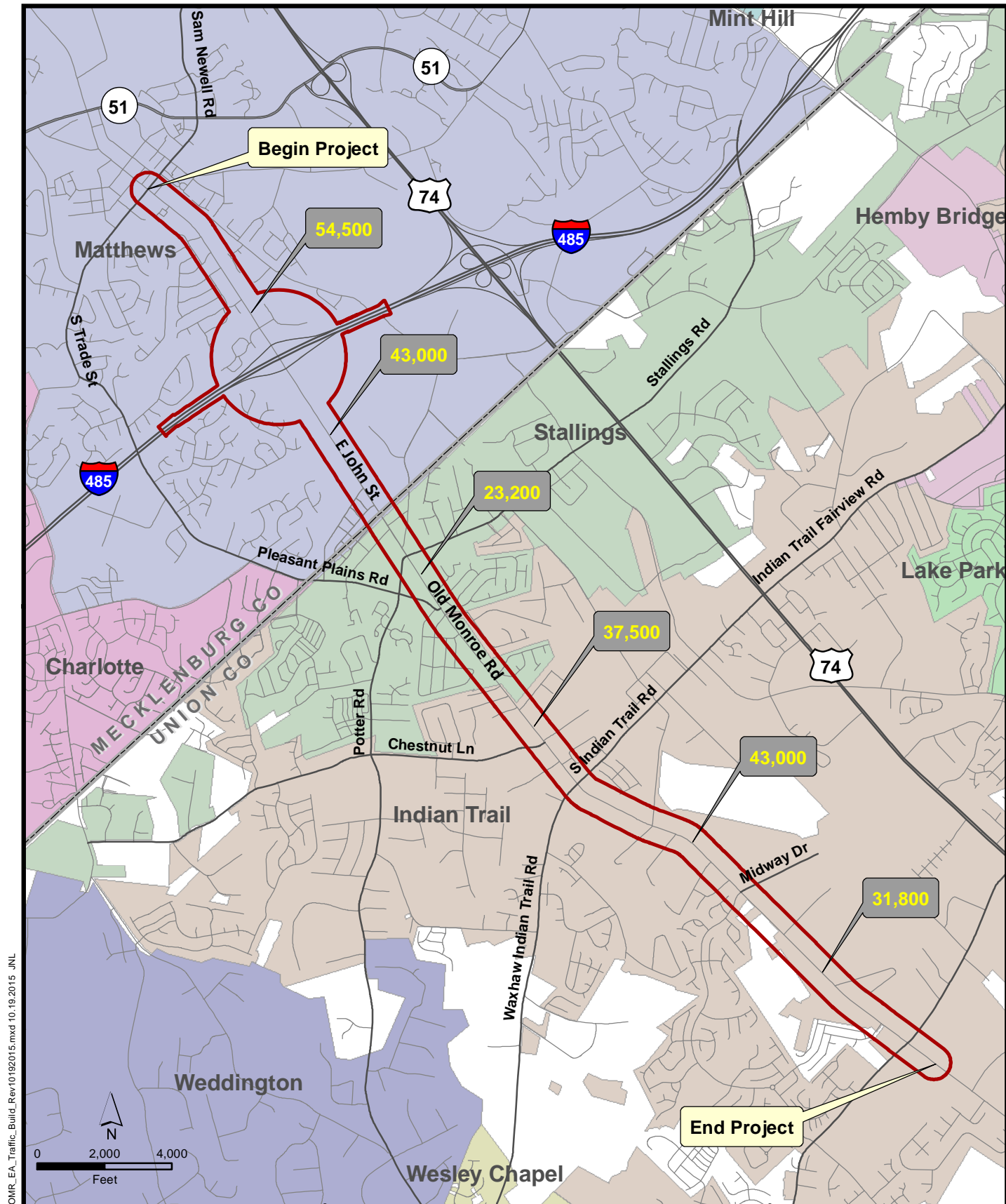


**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

**PRELIMINARY  
ALTERNATIVES**

**FIGURE 2-2**





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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

**Legend**

  Project Study Area

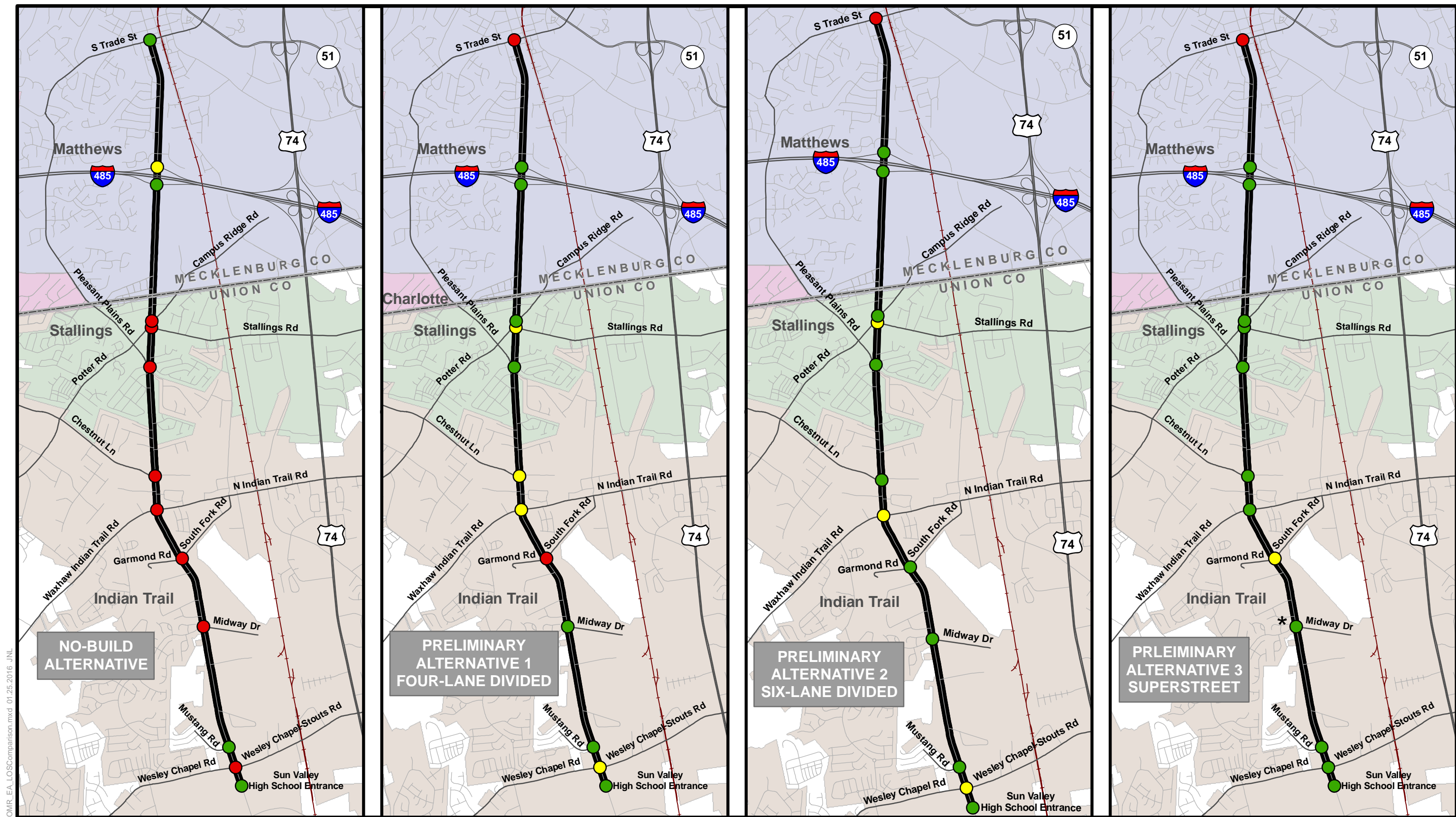
XX,XXX 2035 Build AADT

Source: Union and Mecklenburg County GIS Departments,  
AADT from NCDOT Transportation Planning Branch Traffic Forecasts (7/22/13).

**2035 BUILD  
ANNUAL AVERAGE  
DAILY TRAFFIC (AADT)  
(with Chestnut Connector)**

**FIGURE 2-3**

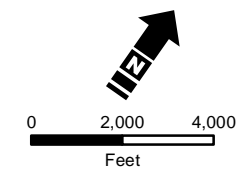




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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
 STIP PROJECT NO. U-4714  
 Mecklenburg and Union Counties,  
North Carolina



**Legend**

**2035 PM Peak Level of Service**

- LOS A, B, C
- LOS D
- LOS E, F

**Project Limits**

— Railroad

Source: Traffic Analysis for U-4714 by NCDOT Project Development and Environmental Analysis Branch (2/19/13); Union and Mecklenburg Counties GIS Departments.

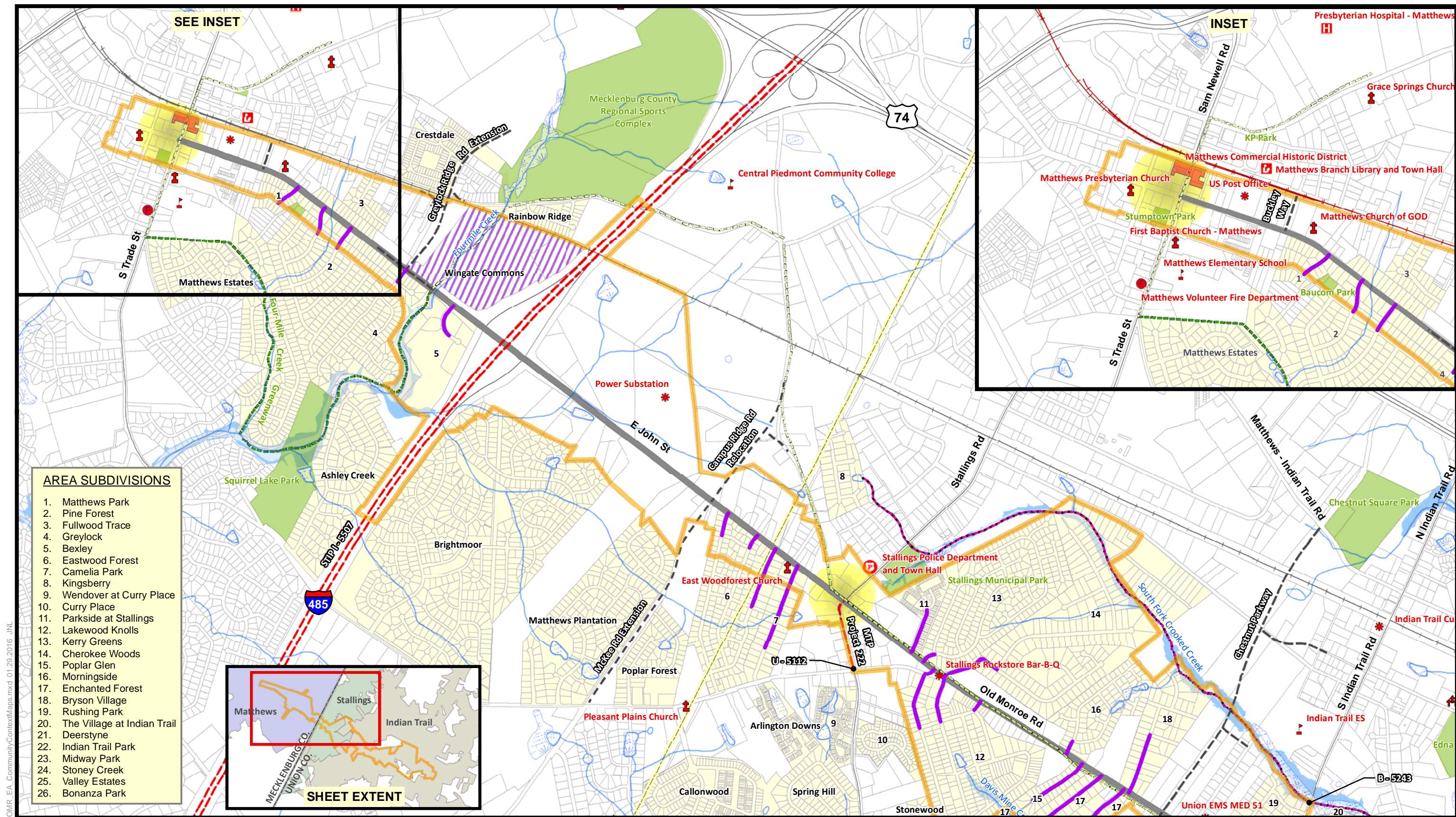
- Charlotte
- Indian Trail
- Matthews
- Stallings

**\* Stop-controlled side street at this location would operate at LOS F but considered acceptable because of low volume.**  
(Intersections that would operate at LOS E or F are not considered unacceptable because they are yield or stop-controlled with a critical movement volume less than 100 vehicles per hour or the queue length less than 250 feet.)

**2035 INTERSECTION  
LEVELS OF SERVICE (LOS)  
COMPARISON**  
  
**FIGURE 2-4**





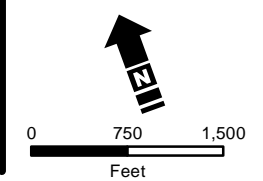


### AREA SUBDIVISIONS

1. Matthews Park
2. Pine Forest
3. Fullwood Trace
4. Greylock
5. Bexley
6. Eastwood Forest
7. Camelia Park
8. Kingsberry
9. Wendover at Curry Place
10. Curry Place
11. Parkside at Stallings
12. Lakewood Knolls
13. Kerry Greens
14. Cherokee Woods
15. Poplar Glen
16. Morningside
17. Enchanted Forest
18. Bryson Village
19. Rushing Park
20. The Village at Indian Trail
21. Deerstyne
22. Indian Trail Park
23. Midway Park
24. Stoney Creek
25. Valley Estates
26. Bonanza Park



**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina



|                           |                   |                |                   |                                |                             |
|---------------------------|-------------------|----------------|-------------------|--------------------------------|-----------------------------|
| DCIA                      | Widening Projects | Cemetery       | Hospital          | Subdivision                    | County Line                 |
| Project Limits            | Notable Feature   | Church         | Historic District | Planned Development            | CSX Railroad                |
| Proposed Roadway          | School            | Fire Station   | Parks             | Proposed Carolina Thread Trail | 303(d) Streams              |
| Neighborhood Connectivity | Library           | Police Station | Parcels           | Four Mile Creek Greenway       | Stream                      |
|                           |                   |                |                   | NW1 Wetlands                   | Floodway                    |
|                           |                   |                |                   | 100 Year Floodplain            | Pedestrian Activity Centers |

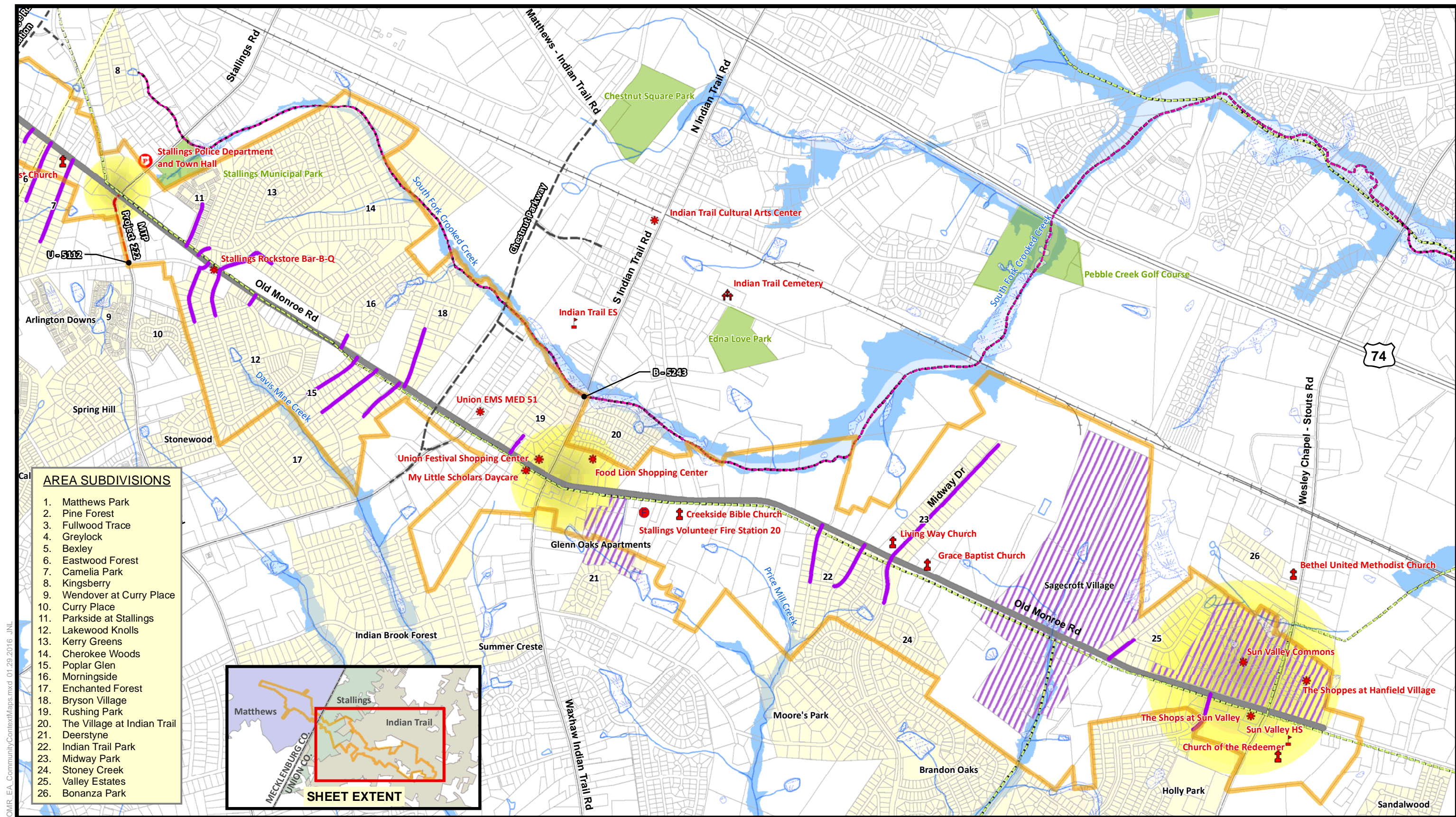
### COMMUNITY CONTEXT MAP

FIGURE 4-1a





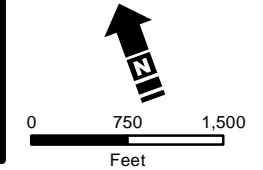




OMR\_EA\_CommunityContextMaps.mxd 01/29/2016 JNL



**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina



**COMMUNITY  
CONTEXT MAP**  
  
**FIGURE 4-1b**





## **APPENDICES**



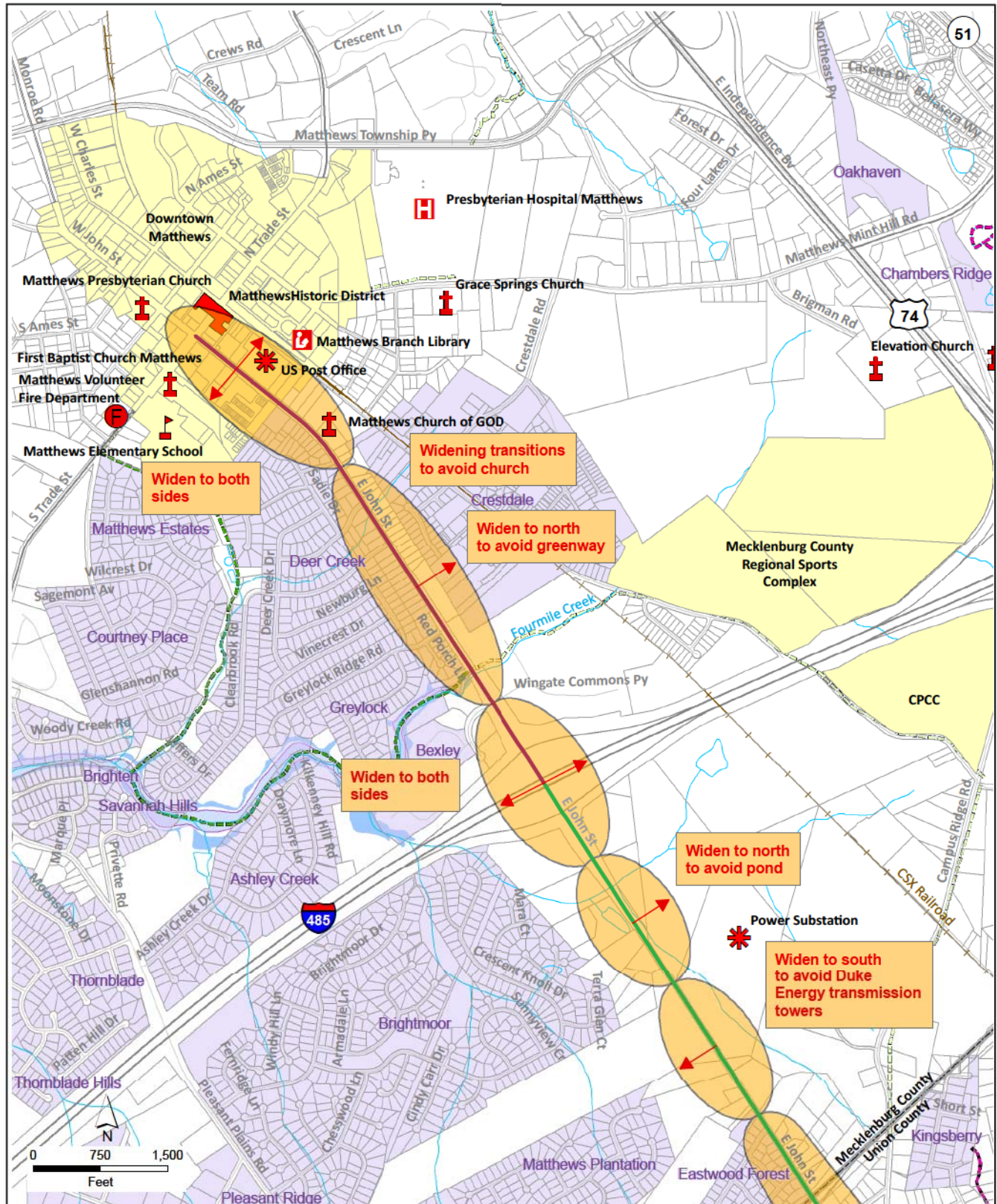
## **Appendix A**

### **Initial Best Fit Widening (by section)**

### **Initial Best Fit Widening (with notable features)**



# E. John Street/Old Monroe Road Improvements



- Proposed Areas of Widening
- Section A
- Section B
- Section C
- Special Destination
- Parcels

- ✱ Notable Feature
- 📖 Public Library
- 🎓 Public Schools
- ⛪ Church
- ⚡ Subdivisions

- ⛪ Cemetery
- 🚓 Police Station
- 🚒 Fire Station
- 🏥 Hospital
- 🏡 Historic District

- Proposed Carolina Thread Trail
- Four Mile Creek Greenway
- 303(d) Streams
- Streams
- Floodway
- 100 Year Floodplain

**BEST FIT**  
**WIDENING**  
**Four-Lane Median**  
**Divided Concept**  
**SECTION A**



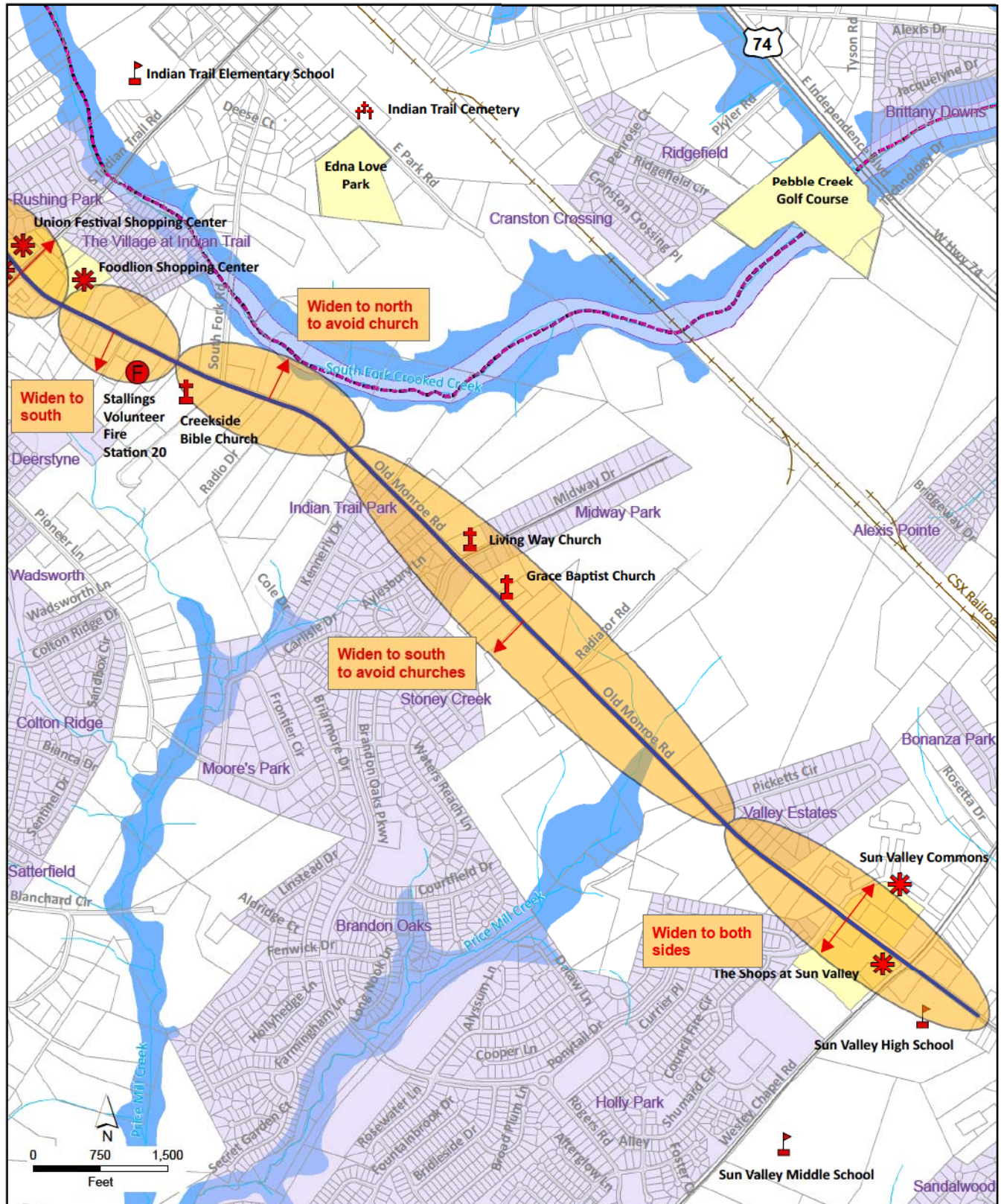


**BEST FIT  
WIDENING**  
Four-Lane Median  
Divided Concept  
**SECTION B**





# E. John Street/Old Monroe Road Improvements



- Proposed Areas of Widening
- Section A
- Section B
- Section C
- Special Destination
- Parcels

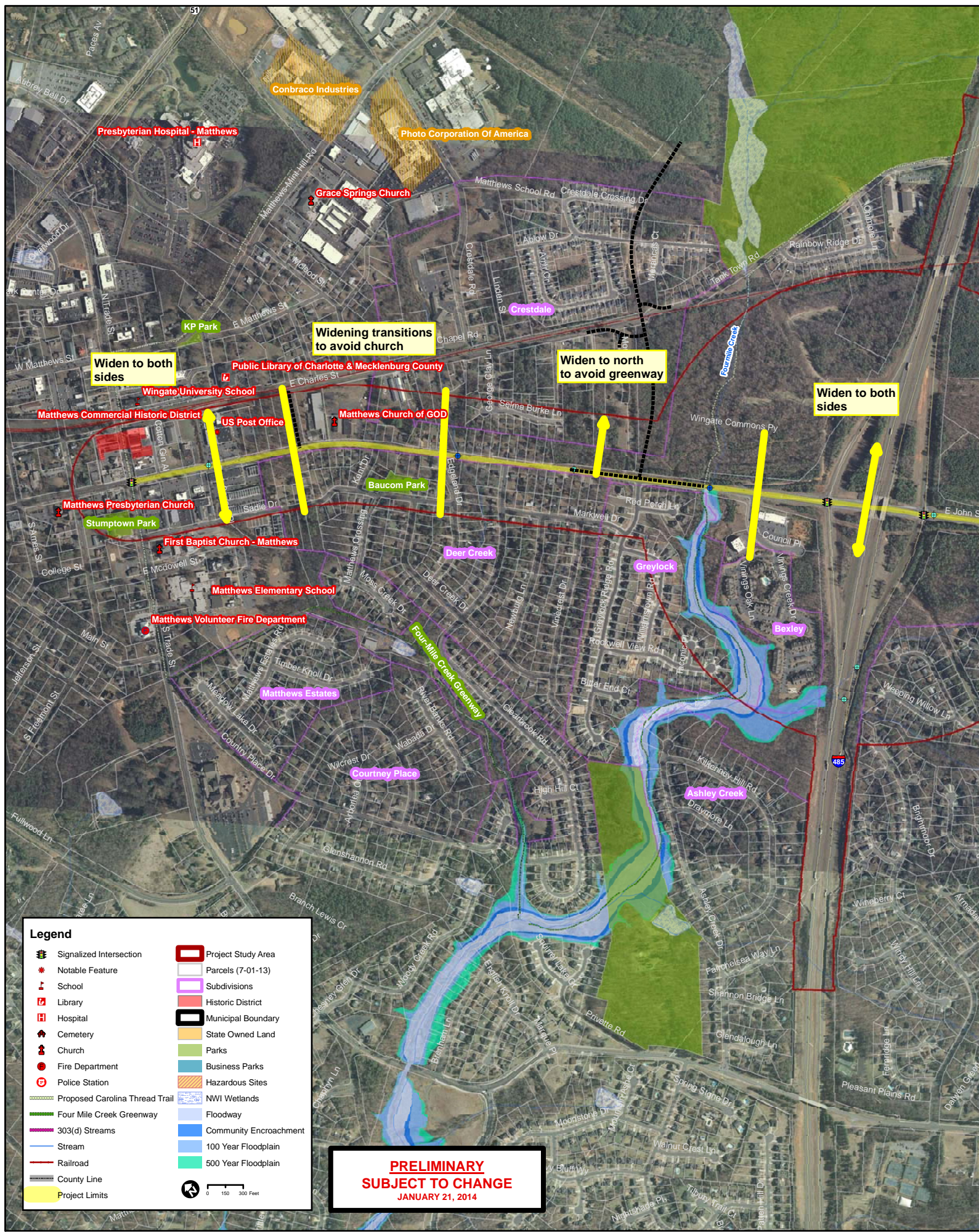
- ✱ Notable Feature
- P Public Library
- S Public Schools
- C Church
- H Cemetery
- H Hospital
- H Historic District

- P Police Station
- F Fire Station
- H Hospital
- H Historic District
- P Proposed Carolina Thread Trail
- Four Mile Creek Greenway
- 303(d) Streams
- Streams
- Floodway
- 100 Year Floodplain

**BEST FIT**  
**WIDENING**  
**Four-Lane Median**  
**Divided Concept**  
**SECTION C**















Central Piedmont Community College

Matthews

Stallings

Academy Steel Drum

Power Substation

Kingsberry

Widen to north to avoid church

Widen to north to avoid gas stations

Stallings Police Department

Eastwood Forest Baptist Church

Widen to south to avoid Duke Energy transmission towers

Brightmoor

Matthews Plantation

Savannah Hills

Eastwood Forest

Camelia Park

Arlington Downs

Wendover at Cur







**E. JOHN STREET/OLD MONROE ROAD  
STIP NO. U-4714  
BEST FIT WIDENING**

# Stallings

## Widen to north to avoid gas stations

**Widen to north  
to avoid Rockstore  
BPO**

## Widen to north

**Widen to south**

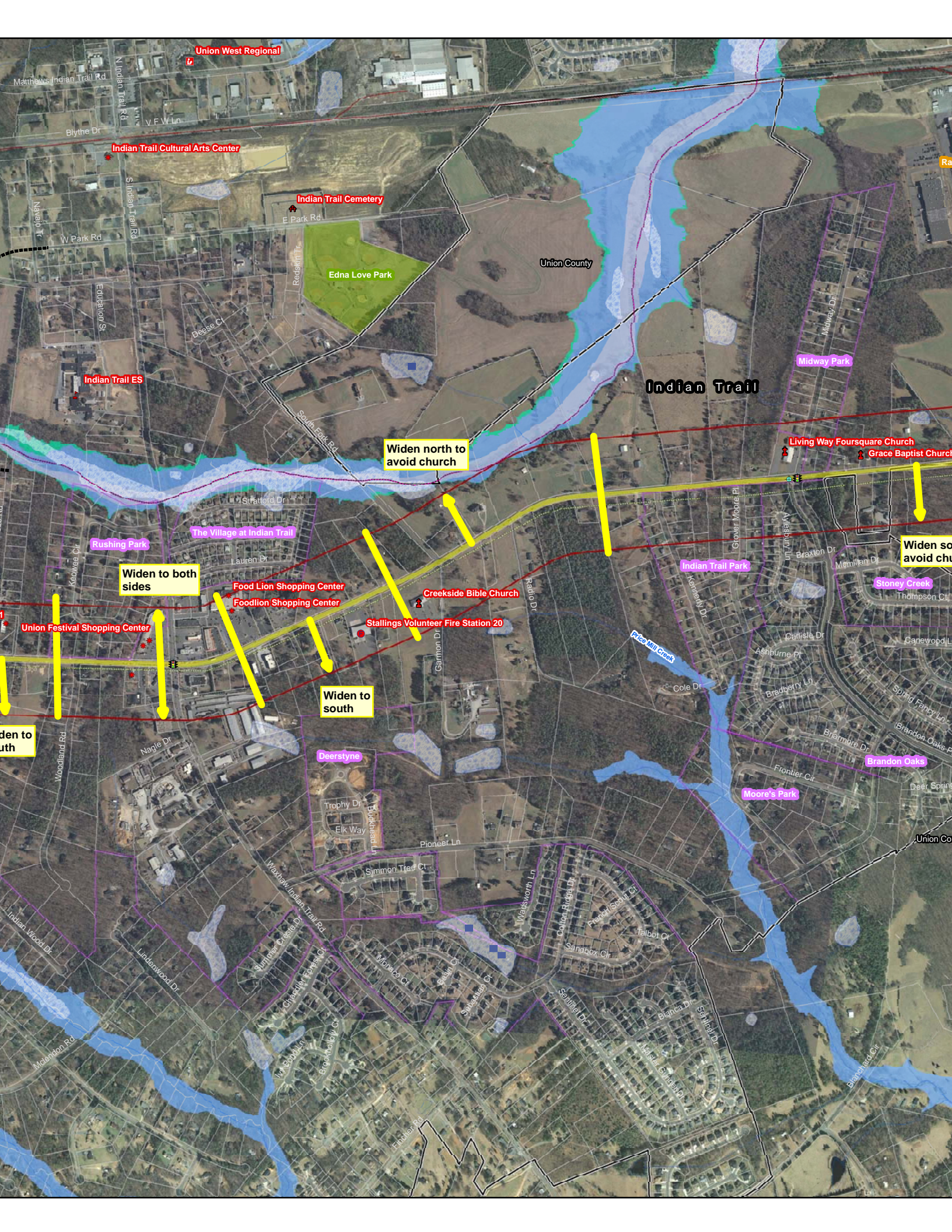
## ington Downs

## ington Downs









Union West Regional

Indian Trail Cultural Arts Center

Indian Trail Cemetery

Edna Love Park

Union County

Indian Trail ES

Indian Trail

Midway Park

Widen north to avoid church

Living Way Foursquare Church

Grace Baptist Church

Widen to both sides

Widen so avoid ch

Union Festival Shopping Center

Food Lion Shopping Center

Foodlion Shopping Center

Creekside Bible Church

Stallings Volunteer Fire Station 20

Widen to south

Deerstyne

Indian Trail Park

Stoney Creek

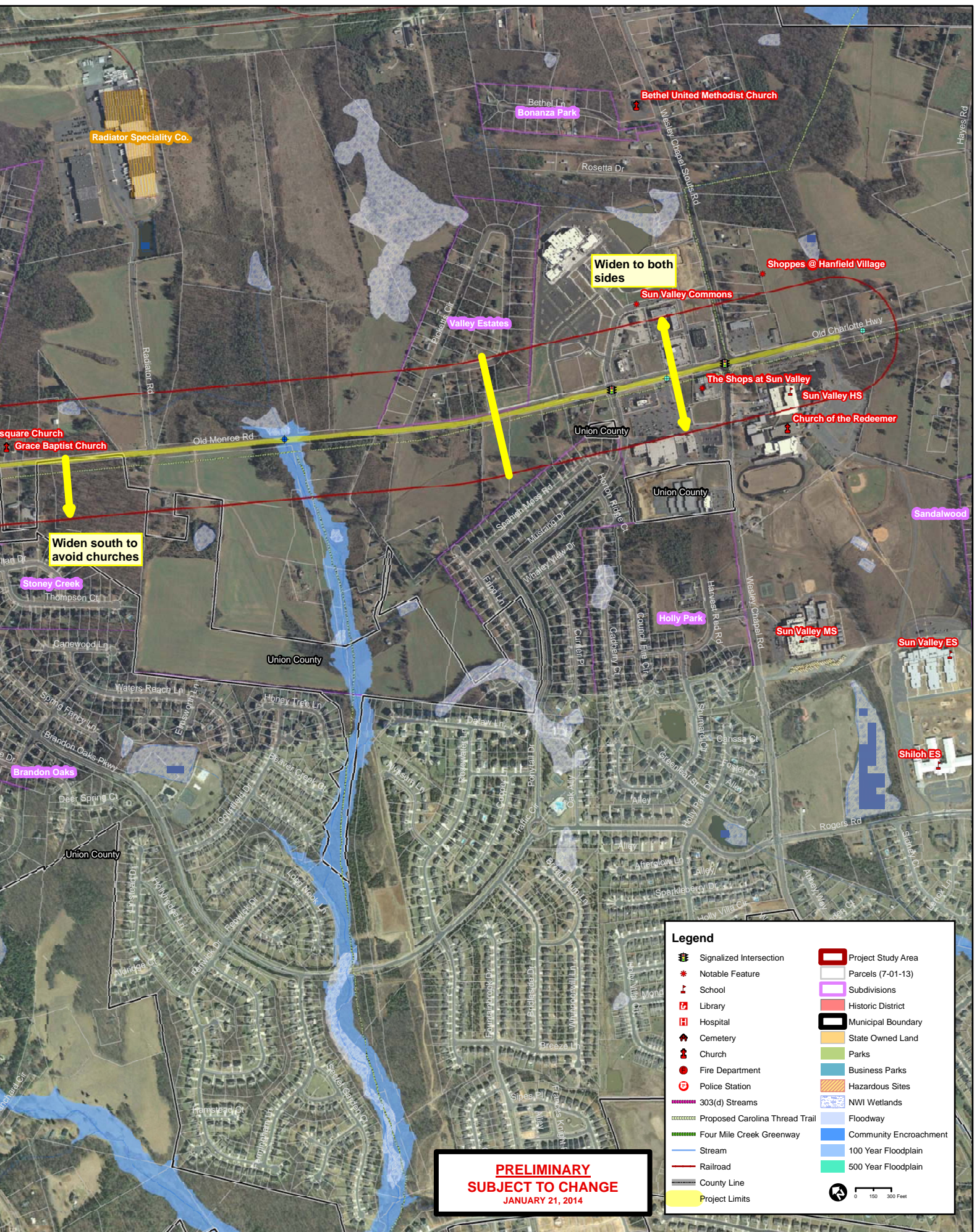
Moore's Park

Brandon Oaks















## **Appendix B**

### **Traffic Volumes and Supporting Traffic Analyses**

- 2035 AADT Build Traffic Forecast (NCDOT TPB, July 2013)
- Preliminary Alternatives Traffic Operations Analysis Results
- I-485 Interchange Concepts Analysis Results Memo (May 2014)
- Alternative Intersection Analysis Results Memo (August 2014)

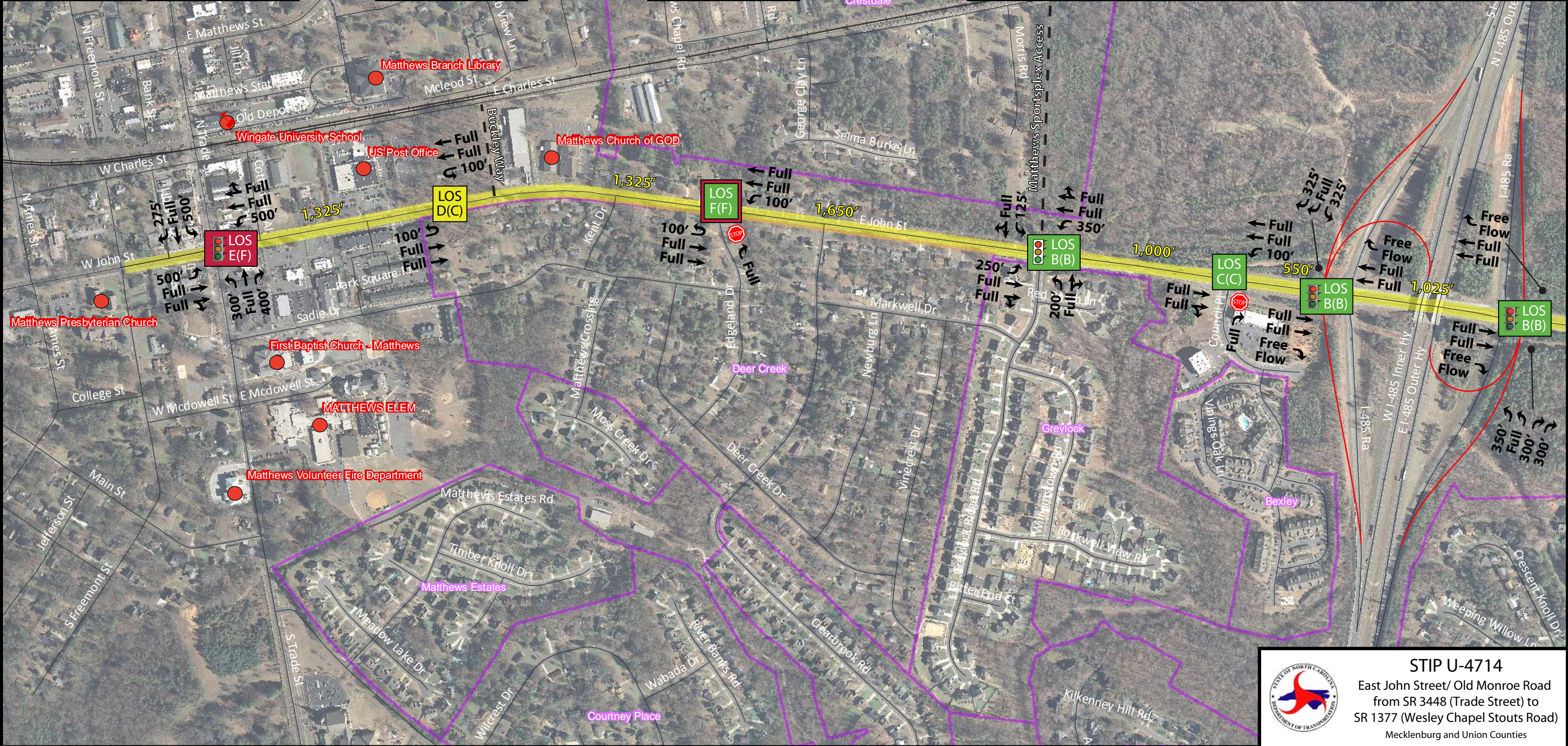








| Intersection   | N. Trade St   | U-Turn West of Edgeland   | Edgeland Dr  | Greylock/Sportsplex   | Council Place   | I-485 Inner Ramps   | I-485 Outer Ramps   |
|--|---|---|--|---|---|---|---|
| <b>Peak Hour Turning Movement Volumes</b><br><br>XX (XX) AM (PM)<br>↶ Right-Turn<br>↷ Through<br>↶ Left-Turn<br>↷ U-Turn | <div><div>↶ 118 (120)<br/>↷ 44 (63)<br/>↶ 388 (502)</div><div>↶ 502 (388)<br/>↷ 910 (714)<br/>↶ 280 (311)<br/>↷ 51 (85)</div></div> <div><div>(118) 120<br/>(910) 714<br/>(100) 70</div><div>↶ 70<br/>↷ 100<br/>↶ 44 (63)<br/>↷ 280 (311)</div></div> | <div><div>↶ 1,856 (1,492)<br/>↷ 23 (43)</div><div>(84) 52<br/>(1,857) 1,493</div></div> | <div><div>↶ 2,018 (1,575)<br/>↷ 11 (27)</div><div>(21) 46<br/>(2,026) 1,588<br/>(16) 5</div></div> <div><div>↶ 17 (29)</div></div> | <div><div>↶ 5 (35)<br/>↷ 4 (4)<br/>↶ 4 (42)</div><div>↶ 5 (77)<br/>↷ 2,056 (1,578)<br/>↶ 26 (70)</div></div> <div><div>(26) 36<br/>(94) 5<br/>(2,006) 1,672<br/>(68) 17</div><div>↶ 42 (79)<br/>↷ 4 (4)<br/>↶ 40 (51)</div></div> | <div><div>↶ 2,087 (1,725)<br/>↷ 32 (35)</div><div>(2,046) 1,700<br/>(42) 27</div></div> <div><div>↶ 73 (60)</div></div> | <div><div>↶ 522 (400)<br/>↷ 288 (271)</div><div>(1,403) 1,080<br/>(719) 686</div></div> | <div><div>↶ 271 (268)<br/>↷ 1,434 (1,114)</div><div>(1,152) 948<br/>(522) 400</div></div> <div><div>↶ 886 (719)<br/>↷ 650 (500)</div></div> |



**LEGEND**

Existing Signal

Proposed Signal

Stop-Controlled Approach

**XXX'** Access Spacing

Proposed Lane Geometry

**XXX'** Proposed Storage Length

**Full** Full Lane

**LOS X(X)** Intersection AM (PM) Peak Hour Level of Service

Level of Service A-C

Level of Service D

Level of Service E

Level of Service F

Level of Service E/F

Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

**SHEET KEY**

A

B

C

D

E

0250500

Feet

**STIP U-4714**

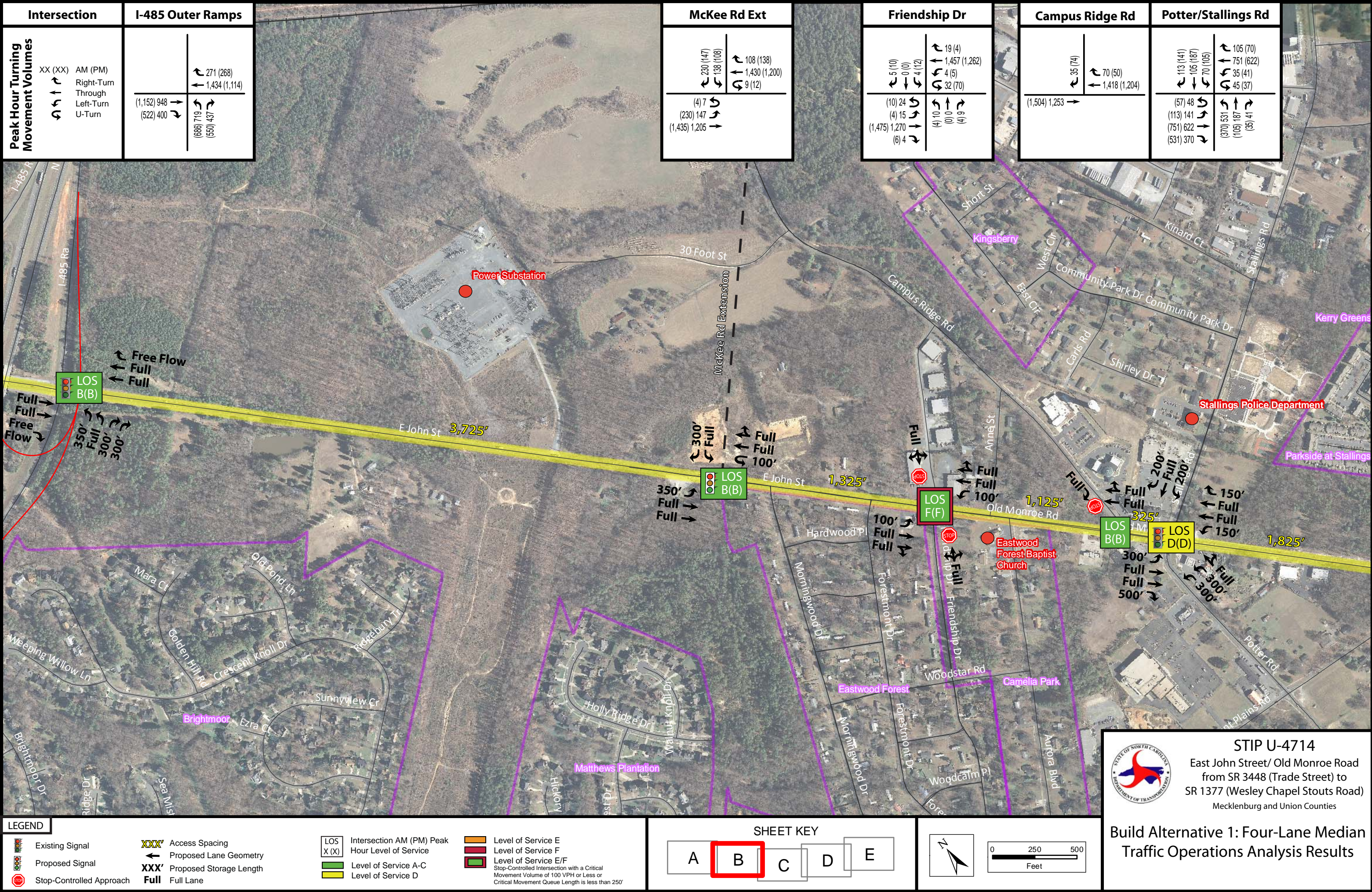
East John Street/ Old Monroe Road  
from SR 3448 (Trade Street) to  
SR 1377 (Wesley Chapel Stouts Road)  
Mecklenburg and Union Counties

**Build Alternative 1: Four-Lane Median  
Traffic Operations Analysis Results**





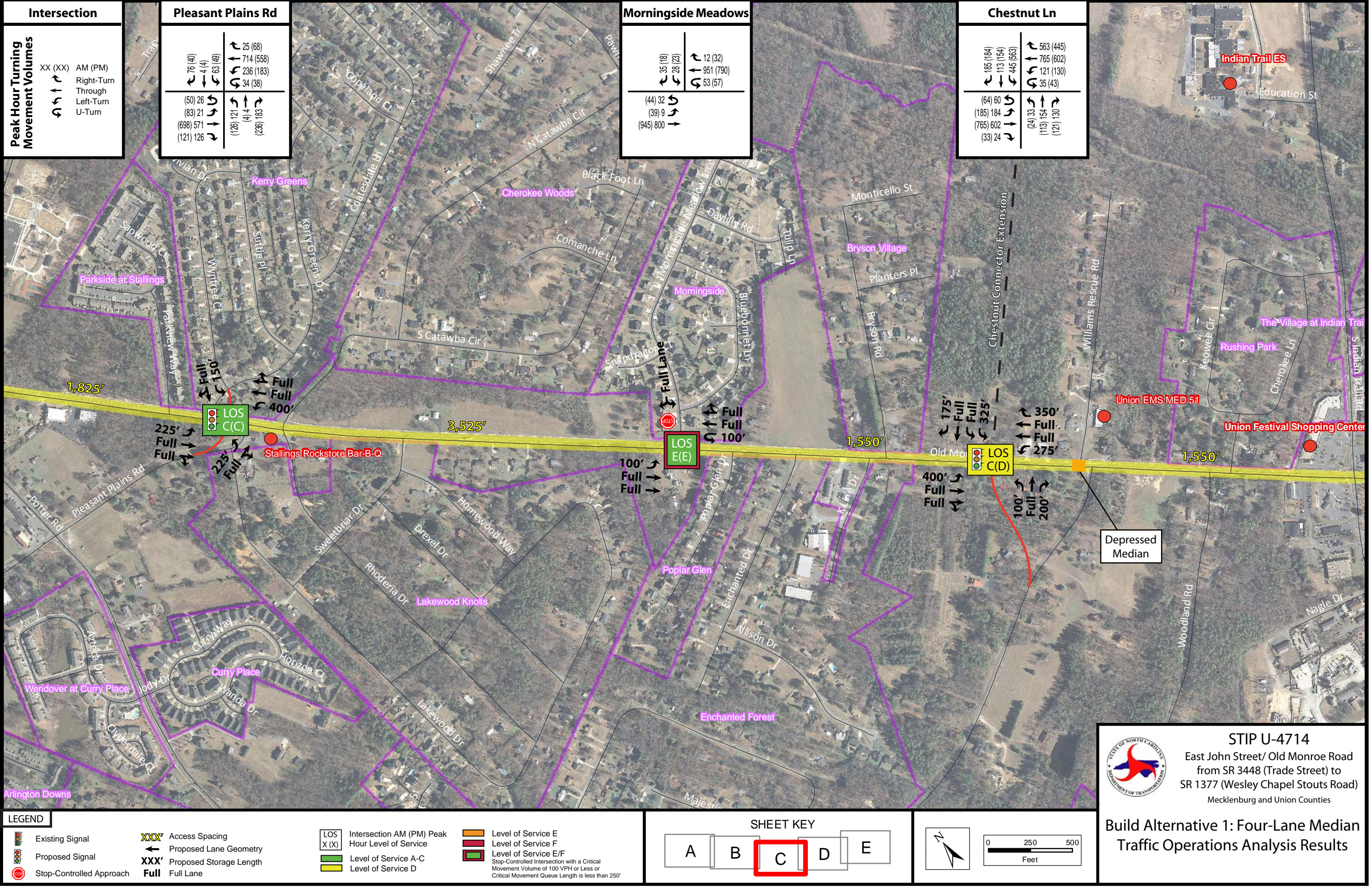










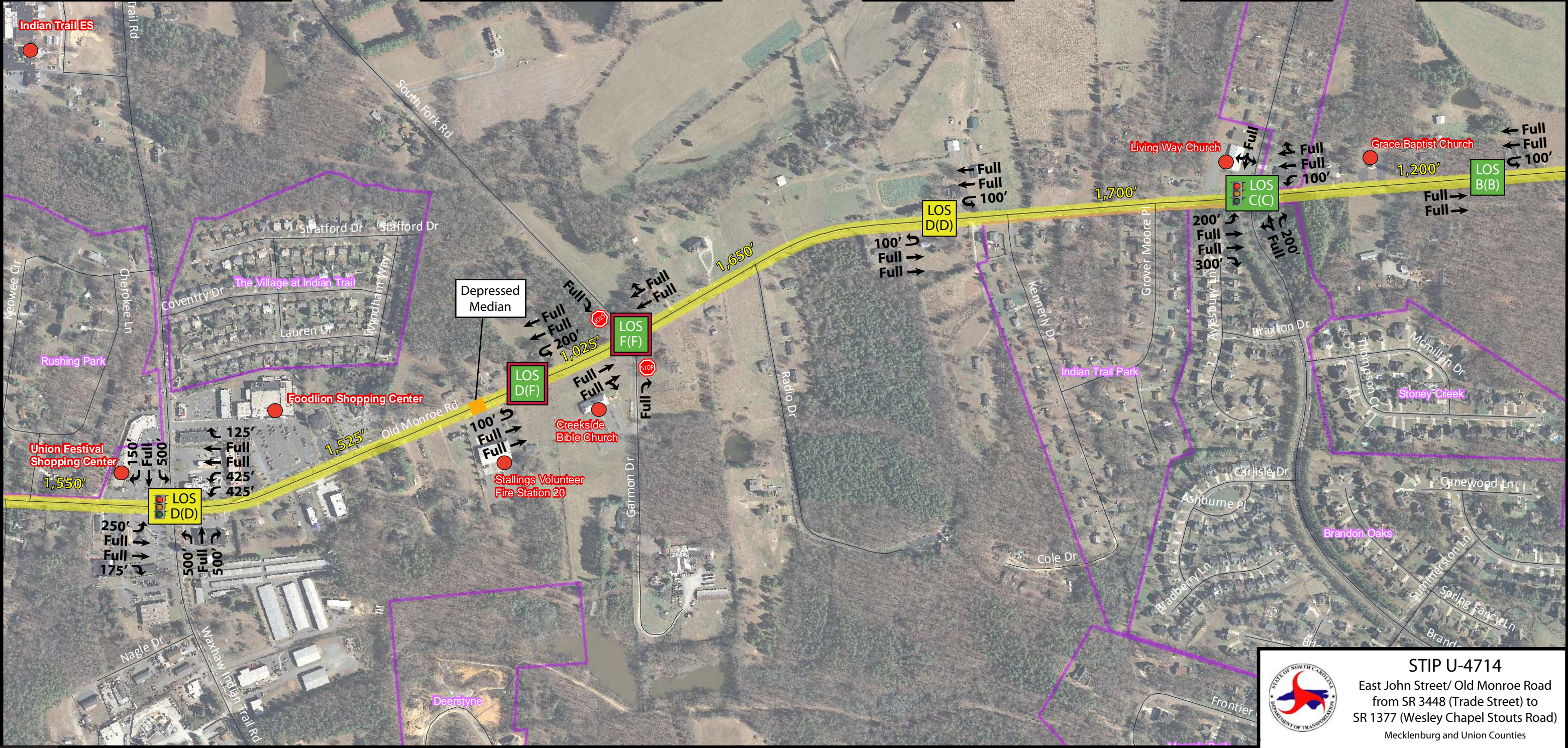








| Intersection  | Waxhaw-Indian Trail   |  | U-Turn West of Garmon   | Garmon/Southfork  |  | U-Turn West of Midway   |  | Brandon Oaks Pkwy  |  | U-Turn West of Radiator   |
|---|---|--|---|---|--|---|--|--|--|---|
| Peak Hour Turning Movement Volumes<br><br>XX (XX) AM (PM)<br>↶ ↷ Right-Turn<br>↷ Through<br>↶ ↷ Left-Turn<br>↷ U-Turn | <div><div>↶ 49 (49)<br/>↷ 96 (134)<br/>↷ 161 (206)</div><div>↶ 206 (161)<br/>↷ 1,315 (1,031)<br/>↶ 430 (468)<br/>↷ 22 (57)</div></div> <div><div>(46) 36<br/>(49) 49<br/>(1,315) 1,031<br/>(108) 78</div><div>↶ 78 (108)<br/>↷ 96 (134)<br/>↷ 430 (468)</div></div> | <div>Redskin Tr</div>  | <div>↶ 1,971 (1,642)<br/>↷ 141 (167)</div> <div><div>(46) 39<br/>(1,974) 1,642</div>↷</div> | <div>↶ 142 (173)<br/>↷ 173 (142)<br/>↷ 1,984 (1,626)</div> <div><div>(2,143) 1,751<br/>(12) 18</div>↷<br/><div>(18) 12</div>↷</div> |  | <div>↶ 2,115 (1,704)<br/>↷ 15 (26)</div> <div><div>(28) 26<br/>(2,102) 1,692</div>↷</div> |  | <div><div>↶ 19 (23)<br/>↷ 4 (4)<br/>↷ 4 (4)</div><div>↶ 4 (4)<br/>↷ 1,657 (1,379)<br/>↶ 8 (9)<br/>↷ 5 (4)</div></div> <div><div>(16) 34<br/>(19) 23<br/>(1,641) 1,362<br/>(403) 272</div><div>↶ 275 (407)<br/>↷ 4 (4)<br/>↷ 7 (10)</div></div> |  | <div>↶ 1,632 (1,372)<br/>↷ 24 (92)</div> <div><div>(1,618) 1,362</div>↷</div> |



**LEGEND**  
 Existing Signal  
 Proposed Signal  
 Stop-Controlled Approach

**Access Spacing**  
 Access Spacing  
**XXX'** Proposed Storage Length  
**Full** Full Lane

**Intersection AM (PM) Peak Hour Level of Service**  
 Level of Service A-C  
 Level of Service D

Level of Service E  
 Level of Service F  
 Level of Service E/F  
Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

**SHEET KEY**  

A B C **D** E

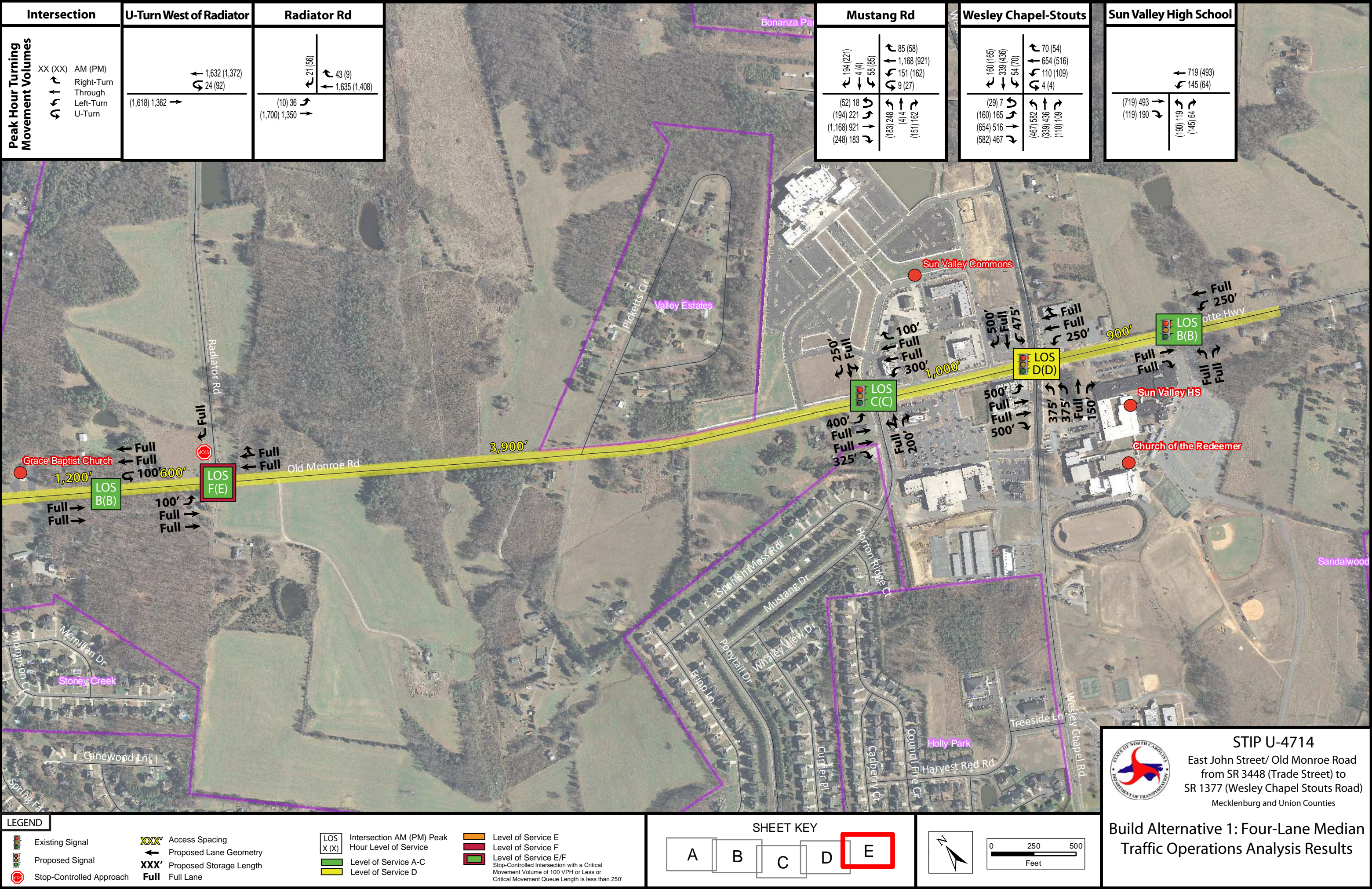
0 250 500  
Feet

**STIP U-4714**  
East John Street/ Old Monroe Road  
from SR 3448 (Trade Street) to  
SR 1377 (Wesley Chapel Stouts Road)  
Mecklenburg and Union Counties  
  
**Build Alternative 1: Four-Lane Median**  
**Traffic Operations Analysis Results**







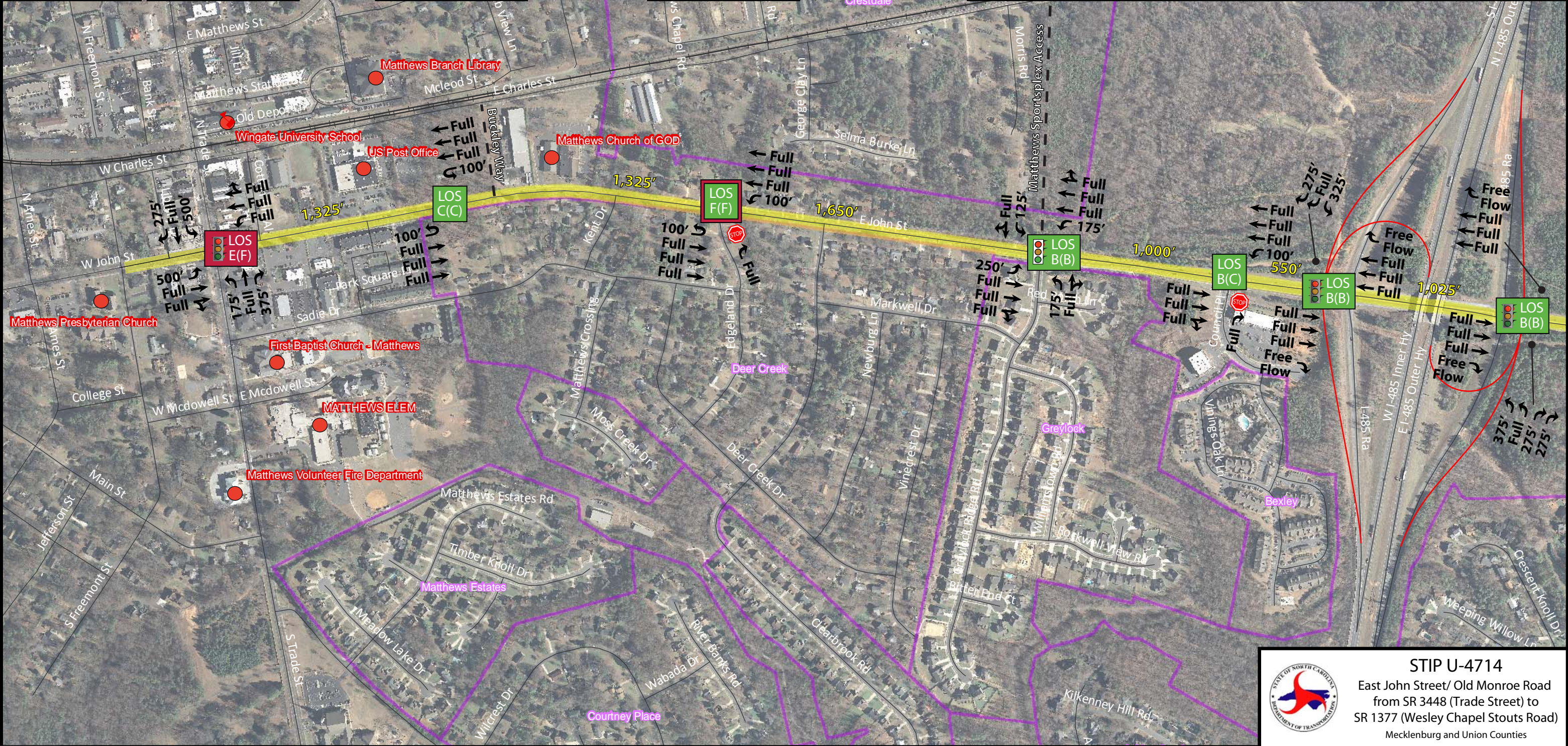








| Intersection   | N. Trade St   | U-Turn West of Edgeland   | Edgeland Dr  | Greylock/Sportsplex   | Council Place   | I-485 Inner Ramps   | I-485 Outer Ramps   |
|--|---|---|--|---|---|---|---|
| <b>Peak Hour Turning Movement Volumes</b><br><br>XX (XX) AM (PM)<br>↶ Right-Turn<br>↷ Through<br>↶ Left-Turn<br>↷ U-Turn | <div><div><div>↶ 118 (120)</div><div>↷ 44 (63)</div><div>↶ 388 (502)</div></div><div><div>↶ 502 (388)</div><div>↷ 910 (714)</div><div>↶ 280 (311)</div><div>↷ 51 (85)</div></div></div> <div><div><div>↶ (118) 120</div><div>↷ (910) 714</div><div>↶ (100) 70</div></div><div><div>↶ (70) 100</div><div>↷ (44) 63</div><div>↶ (280) 311</div></div></div> | <div><div>↶ 1,856 (1,492)</div><div>↷ 23 (43)</div></div> <div><div>↶ (84) 52</div><div>↷ (1,857) 1,493</div></div> | <div><div>↶ 2,018 (1,575)</div><div>↷ 11 (27)</div></div> <div><div>↶ (21) 46</div><div>↷ (2,026) 1,588</div><div>↶ (16) 5</div></div> <div><div>↶ (17) 29</div></div> | <div><div>↶ 5 (35)</div><div>↷ 4 (4)</div><div>↶ 4 (42)</div></div> <div><div>↶ 5 (77)</div><div>↷ 2,056 (1,578)</div><div>↶ 26 (70)</div></div> <div><div>↶ (26) 36</div><div>↷ (94) 5</div><div>↶ (2,006) 1,672</div><div>↷ (68) 17</div></div> <div><div>↶ (42) 79</div><div>↷ (4) 4</div><div>↶ (40) 51</div></div> | <div><div>↶ 2,087 (1,725)</div><div>↷ 32 (35)</div></div> <div><div>↶ (2,046) 1,700</div><div>↷ (42) 27</div></div> <div><div>↶ (73) 60</div></div> | <div><div>↶ 522 (400)</div><div>↷ 288 (271)</div></div> <div><div>↶ 550 (437)</div><div>↷ 1,603 (1,363)</div></div> <div><div>↶ (1,403) 1,080</div><div>↷ (719) 686</div></div> | <div><div>↶ 271 (268)</div><div>↷ 1,434 (1,114)</div></div> <div><div>↶ (1,152) 948</div><div>↷ (522) 400</div></div> <div><div>↶ (886) 719</div><div>↷ (550) 437</div></div> |



**LEGEND**

Existing Signal

Proposed Signal

Stop-Controlled Approach

**XXX'** Access Spacing

Proposed Lane Geometry

**XXX'** Proposed Storage Length

**Full** Full Lane

**LOS X(X)** Intersection AM (PM) Peak Hour Level of Service

Level of Service A-C

Level of Service D

Level of Service E

Level of Service F

Level of Service E/F

Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

**SHEET KEY**

A

B

C

D

E

0250500

Feet

**STIP U-4714**

East John Street/ Old Monroe Road  
from SR 3448 (Trade Street) to  
SR 1377 (Wesley Chapel Stouts Road)  
Mecklenburg and Union Counties

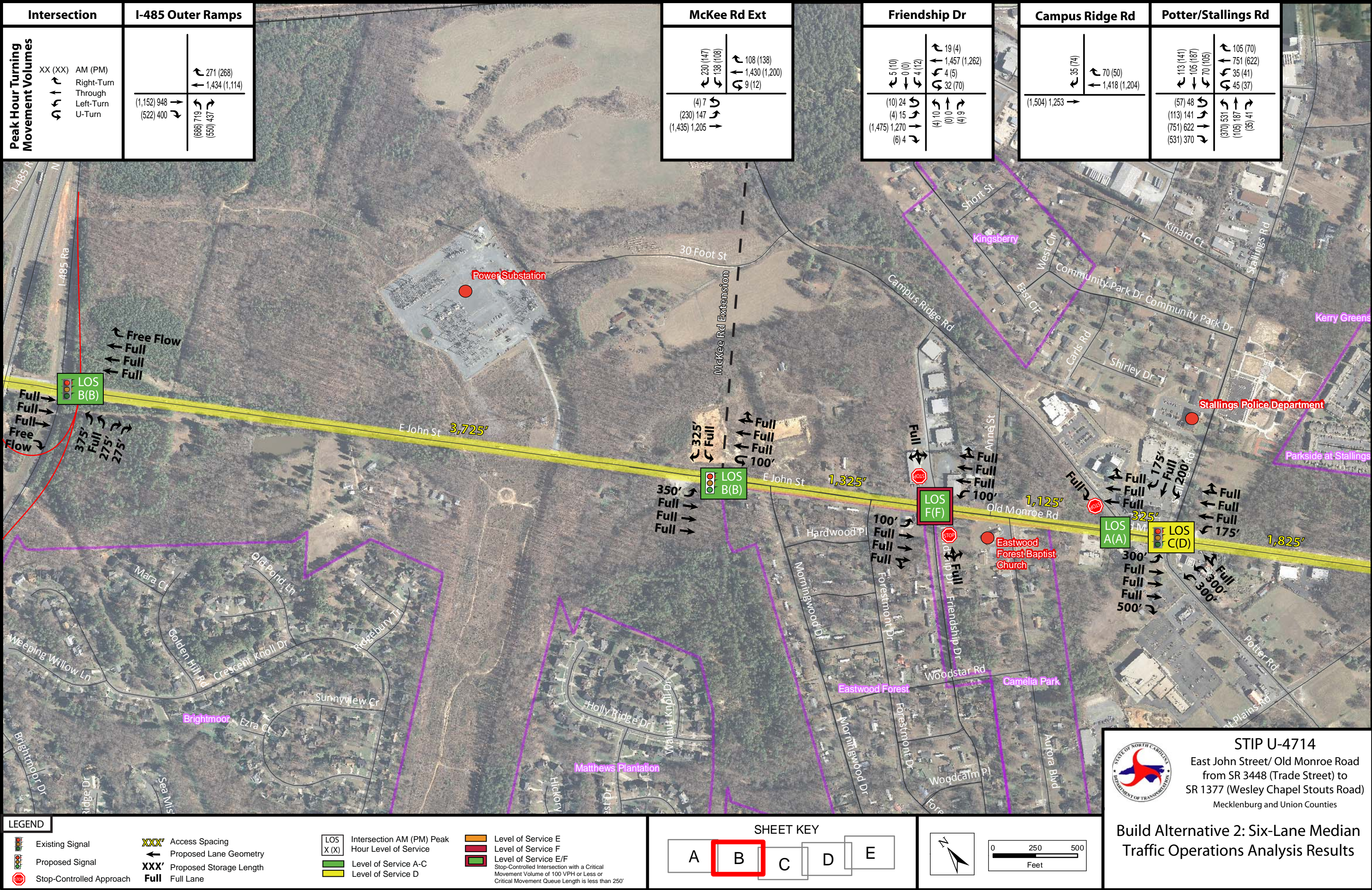
**Build Alternative 2: Six-Lane Median**

**Traffic Operations Analysis Results**





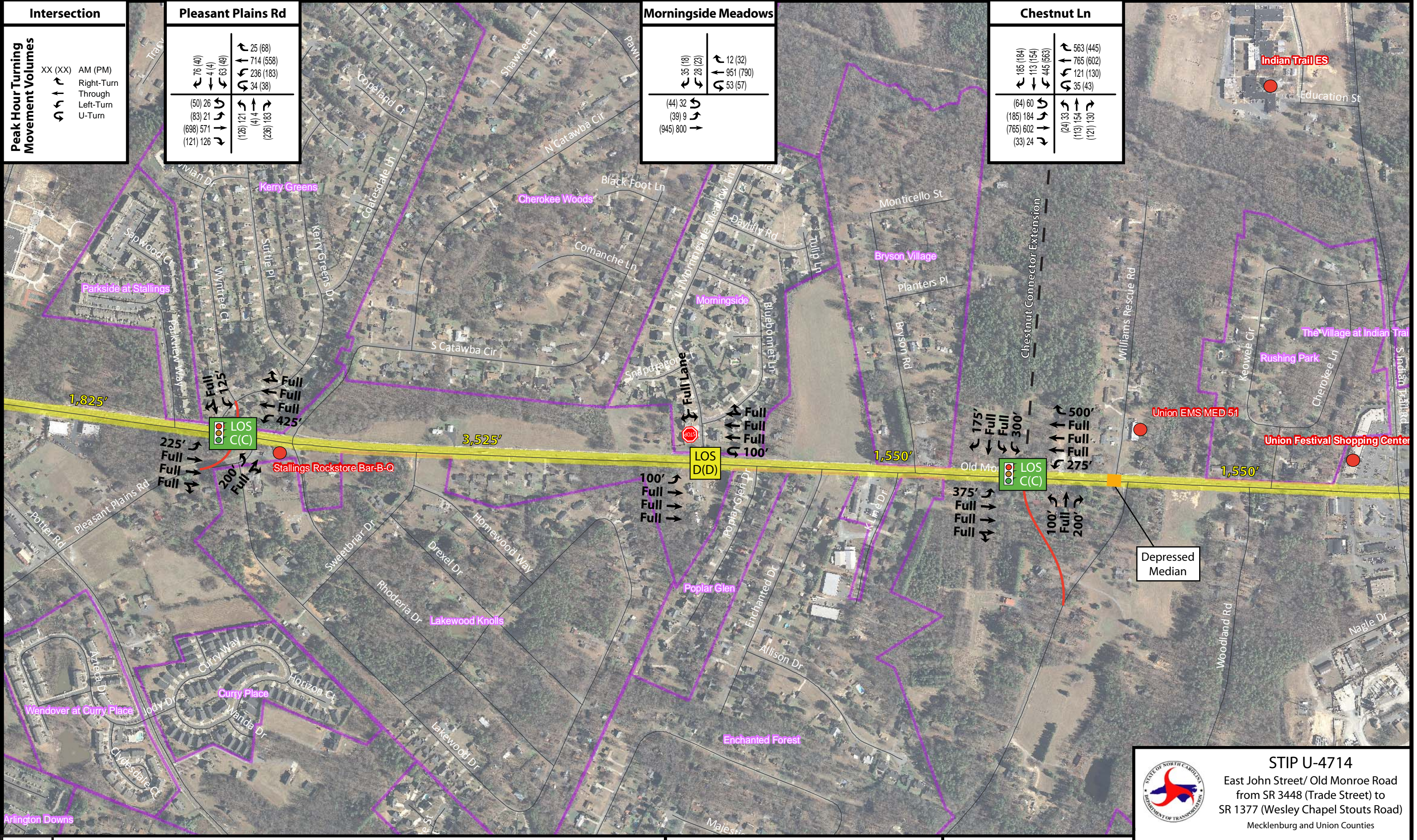












| Intersection |            |
|--------------|------------|
| XX (XX)      | AM (PM)    |
| ↶ ↷          | Right-Turn |
| ↶ ↷          | Through    |
| ↶ ↷          | Left-Turn  |
| ↶ ↷          | U-Turn     |

| Pleasant Plains Rd                           |  |
|--|--|
| ↶ 76 (40)<br>↷ 4 (4)<br>↶ 63 (49)            | ↶ 25 (68)<br>↷ 714 (558)<br>↶ 236 (183)<br>↷ 34 (38) |
| (50) 26<br>(83) 21<br>(698) 571<br>(121) 126 | (126) 121<br>(4) 4<br>(236) 183                      |

| Morningside Meadows            |                                       |
|--------------------------------|---------------------------------------|
| ↶ 35 (18)<br>↷ 28 (23)         | ↶ 12 (32)<br>↷ 951 (790)<br>↶ 53 (57) |
| (44) 32<br>(39) 9<br>(945) 800 |                                       |

| Chestnut Ln                                  |  |
|--|--|
| ↶ 185 (184)<br>↷ 113 (154)<br>↶ 445 (563)    | ↶ 563 (445)<br>↷ 765 (602)<br>↶ 121 (130)<br>↷ 35 (43) |
| (64) 60<br>(185) 184<br>(765) 602<br>(33) 24 | (24) 33<br>(113) 154<br>(121) 130                      |

LEGEND

Existing Signal

Proposed Signal

Stop-Controlled Approach

XXX' Access Spacing

Proposed Lane Geometry

Proposed Storage Length

Full Full Lane

LOS X (X) Intersection AM (PM) Peak Hour Level of Service

Level of Service A-C

Level of Service D

Level of Service E

Level of Service F

Level of Service E/F

Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

SHEET KEY

A B C D E

North Arrow

0 250 500 Feet

STIP U-4714

East John Street/ Old Monroe Road from SR 3448 (Trade Street) to SR 1377 (Wesley Chapel Stouts Road)

Mecklenburg and Union Counties

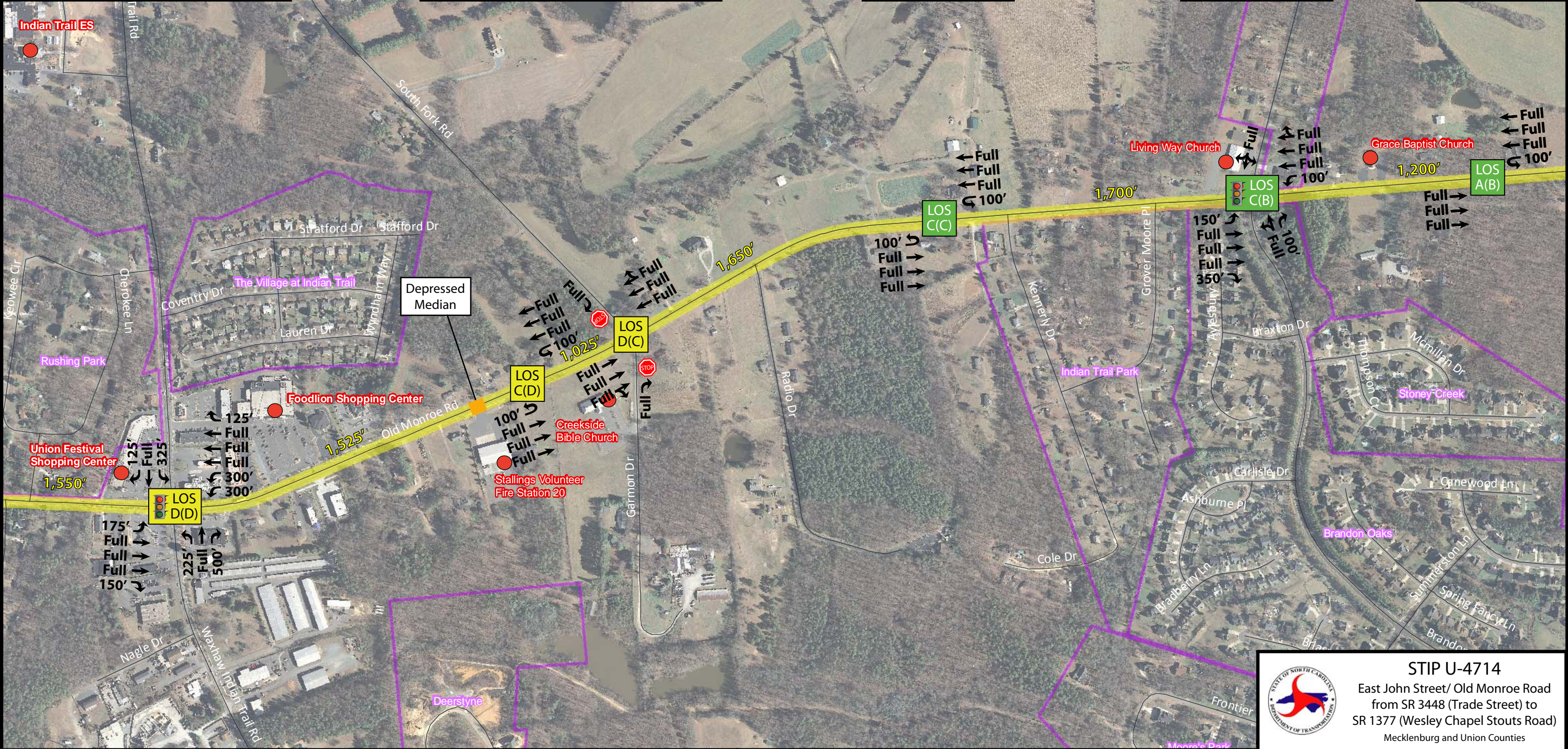
Build Alternative 2: Six-Lane Median Traffic Operations Analysis Results







| Intersection  | Waxhaw-Indian Trail   |  | U-Turn West of Garmon                                      | Garmon/Southfork                                |                                   | U-Turn West of Midway  |   | Brandon Oaks Pkwy              |                          | U-Turn West of Radiator   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
|---|---|--|--|---|-----------------------------------|--|---|--------------------------------|--------------------------|---|---|-------------------------------------|--|---|------------------------------|--------------------------|--|--|---------------------------------|--|--|----------------------------------|--|---|------------------------------|---------------|
| Peak Hour Turning Movement Volumes<br><br>XX (XX) AM (PM)<br>↶ Right-Turn<br>↷ Through<br>↶ Left-Turn<br>↷ U-Turn | <table><tr><td>↶ 49 (49)<br/>↷ 96 (134)<br/>↷ 161 (206)</td><td>↶ 206 (161)<br/>↷ 1,315 (1,031)<br/>↶ 430 (468)<br/>↷ 22 (57)</td></tr><tr><td>(46) 36<br/>(49) 49<br/>(1,315) 1,031<br/>(108) 78</td><td>↶ 78 108<br/>↷ 96 134<br/>↶ 430 468</td></tr></table> | ↶ 49 (49)<br>↷ 96 (134)<br>↷ 161 (206)                     | ↶ 206 (161)<br>↷ 1,315 (1,031)<br>↶ 430 (468)<br>↷ 22 (57) | (46) 36<br>(49) 49<br>(1,315) 1,031<br>(108) 78 | ↶ 78 108<br>↷ 96 134<br>↶ 430 468 |  | <table><tr><td>↶ 1,971 (1,642)<br/>↷ 141 (167)</td></tr><tr><td>(46) 39<br/>(1,974) 1,642</td></tr></table> | ↶ 1,971 (1,642)<br>↷ 141 (167) | (46) 39<br>(1,974) 1,642 | <table><tr><td>↶ 142 (173)<br/>↷ 173 (142)<br/>↶ 1,984 (1,626)</td></tr><tr><td>(2,143) 1,751<br/>(12) 18<br/>(18) 12</td></tr></table> | ↶ 142 (173)<br>↷ 173 (142)<br>↶ 1,984 (1,626) | (2,143) 1,751<br>(12) 18<br>(18) 12 |  | <table><tr><td>↶ 2,115 (1,704)<br/>↷ 15 (26)</td></tr><tr><td>(28) 26<br/>(2,102) 1,692</td></tr></table> | ↶ 2,115 (1,704)<br>↷ 15 (26) | (28) 26<br>(2,102) 1,692 |  | <table><tr><td>↶ 19 (23)<br/>↷ 4 (4)<br/>↶ 4 (4)</td><td>↶ 4 (4)<br/>↷ 1,657 (1,379)<br/>↶ 8 (9)<br/>↷ 5 (4)</td></tr><tr><td>(16) 34<br/>(19) 23<br/>(1,641) 1,362<br/>(403) 272</td><td>↶ 275 407<br/>↷ 4 (4)<br/>↶ 7 (10)</td></tr></table> | ↶ 19 (23)<br>↷ 4 (4)<br>↶ 4 (4) | ↶ 4 (4)<br>↷ 1,657 (1,379)<br>↶ 8 (9)<br>↷ 5 (4) | (16) 34<br>(19) 23<br>(1,641) 1,362<br>(403) 272 | ↶ 275 407<br>↷ 4 (4)<br>↶ 7 (10) |  | <table><tr><td>↶ 1,632 (1,372)<br/>↷ 24 (92)</td></tr><tr><td>(1,618) 1,362</td></tr></table> | ↶ 1,632 (1,372)<br>↷ 24 (92) | (1,618) 1,362 |
|   | ↶ 49 (49)<br>↷ 96 (134)<br>↷ 161 (206)  | ↶ 206 (161)<br>↷ 1,315 (1,031)<br>↶ 430 (468)<br>↷ 22 (57) |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| (46) 36<br>(49) 49<br>(1,315) 1,031<br>(108) 78   | ↶ 78 108<br>↷ 96 134<br>↶ 430 468   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| ↶ 1,971 (1,642)<br>↷ 141 (167)  |   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| (46) 39<br>(1,974) 1,642  |   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| ↶ 142 (173)<br>↷ 173 (142)<br>↶ 1,984 (1,626)   |   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| (2,143) 1,751<br>(12) 18<br>(18) 12   |   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| ↶ 2,115 (1,704)<br>↷ 15 (26)  |   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| (28) 26<br>(2,102) 1,692  |   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| ↶ 19 (23)<br>↷ 4 (4)<br>↶ 4 (4)   | ↶ 4 (4)<br>↷ 1,657 (1,379)<br>↶ 8 (9)<br>↷ 5 (4)  |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| (16) 34<br>(19) 23<br>(1,641) 1,362<br>(403) 272  | ↶ 275 407<br>↷ 4 (4)<br>↶ 7 (10)  |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| ↶ 1,632 (1,372)<br>↷ 24 (92)  |   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |
| (1,618) 1,362   |   |  |  |   |                                   |  |   |                                |                          |   |   |                                     |  |   |                              |                          |  |  |                                 |  |  |                                  |  |   |                              |               |



**LEGEND**  
 Existing Signal  
 Proposed Signal  
 Stop-Controlled Approach

**Access Spacing**  
 Proposed Lane Geometry  
**XXX'** Proposed Storage Length  
**Full** Full Lane

**LOS**  
 Intersection AM (PM) Peak Hour Level of Service  
 Level of Service E  
 Level of Service A-C  
 Level of Service D

Level of Service E/F  
Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

**SHEET KEY**  

|   |   |   |          |   |
|---|---|---|----------|---|
| A | B | C | <b>D</b> | E |
|---|---|---|----------|---|

0 250 500 Feet

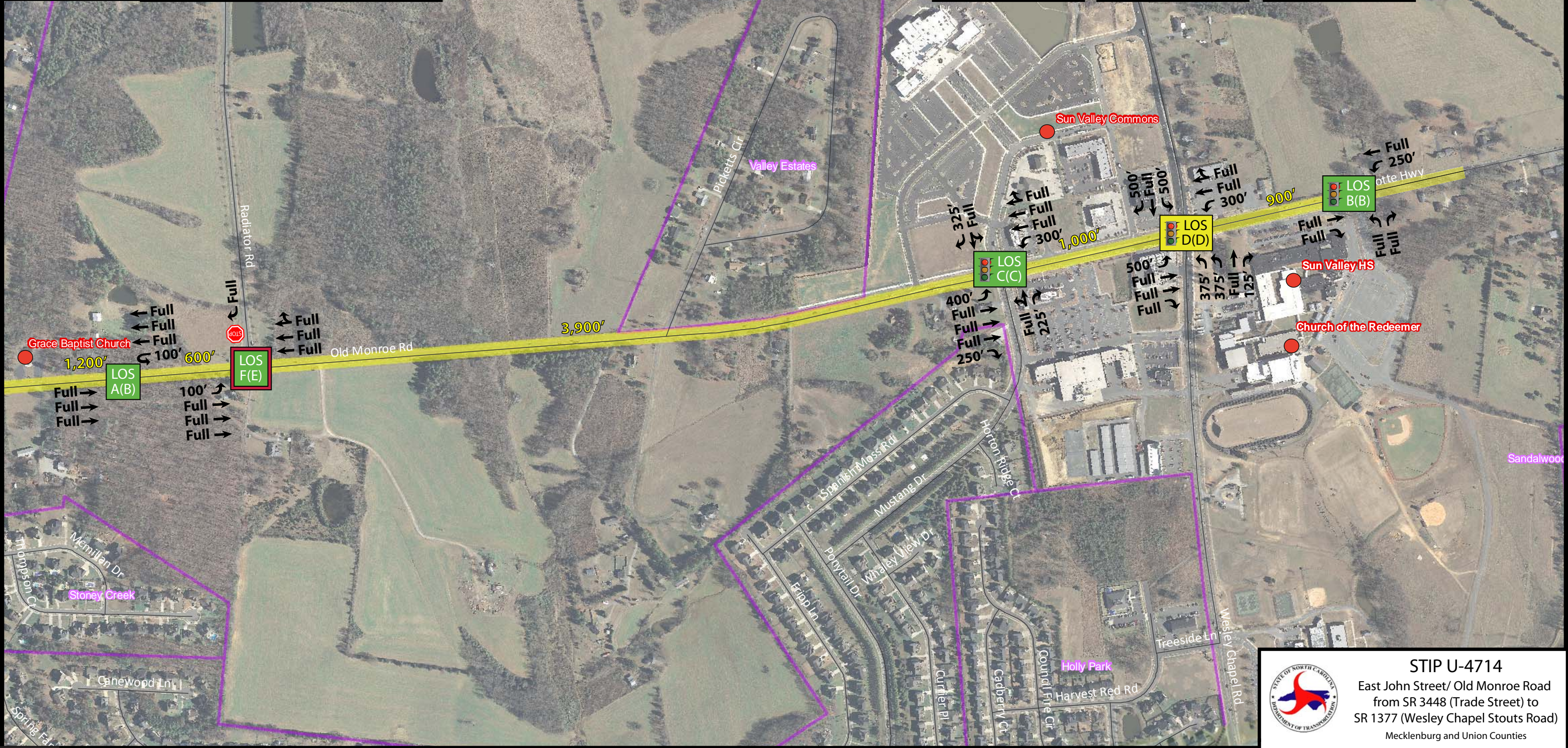
**STIP U-4714**  
East John Street/ Old Monroe Road  
from SR 3448 (Trade Street) to  
SR 1377 (Wesley Chapel Stouts Road)  
Mecklenburg and Union Counties  
  
**Build Alternative 2: Six-Lane Median**  
**Traffic Operations Analysis Results**







| Intersection   | U-Turn West of Radiator                         | Radiator Rd  | Mustang Rd  | Wesley Chapel-Stouts  | Sun Valley High School   |
|--|---|--|---|---|--|
| <b>Peak Hour Turning Movement Volumes</b><br>XX (XX) AM (PM)<br>↗ Right-Turn<br>↕ Through<br>↖ Left-Turn<br>↺ U-Turn | ← 1,632 (1,372)<br>↺ 24 (92)<br>(1,618) 1,362 → | ↺ 21 (56)<br>↗ 43 (9)<br>↖ 1,635 (1,408)<br>(10) 36<br>(1,700) 1,350 → | ↺ 194 (221)<br>↗ 4 (4)<br>↖ 58 (85)<br>(52) 18<br>(194) 221<br>(1,168) 921<br>(248) 183<br>↗ 85 (58)<br>↕ 1,168 (921)<br>↖ 151 (162)<br>↺ 9 (27)<br>(183) 248<br>(4) 4<br>(151) 162 | ↺ 160 (165)<br>↗ 339 (436)<br>↖ 54 (70)<br>(29) 7<br>(160) 165<br>(654) 516<br>(582) 467<br>↗ 70 (54)<br>↕ 654 (516)<br>↖ 110 (109)<br>↺ 4 (4)<br>(467) 582<br>(339) 436<br>(110) 109 | ↺ 719 (493)<br>↖ 145 (64)<br>(719) 493<br>(119) 190<br>(190) 119<br>(145) 64 |



**LEGEND**  
 Existing Signal  
 Proposed Signal  
 Stop-Controlled Approach

**Access Spacing**  
 Proposed Lane Geometry  
**Proposed Storage Length**  
 Full Lane

**Intersection AM (PM) Peak Hour Level of Service**  
 Level of Service A-C  
 Level of Service D  
 Level of Service E  
 Level of Service F  
 Level of Service E/F  
Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

**SHEET KEY**  

A

B

C

D

E

0 250 500 Feet

**STIP U-4714**  
 East John Street/ Old Monroe Road  
 from SR 3448 (Trade Street) to  
 SR 1377 (Wesley Chapel Stouts Road)  
 Mecklenburg and Union Counties

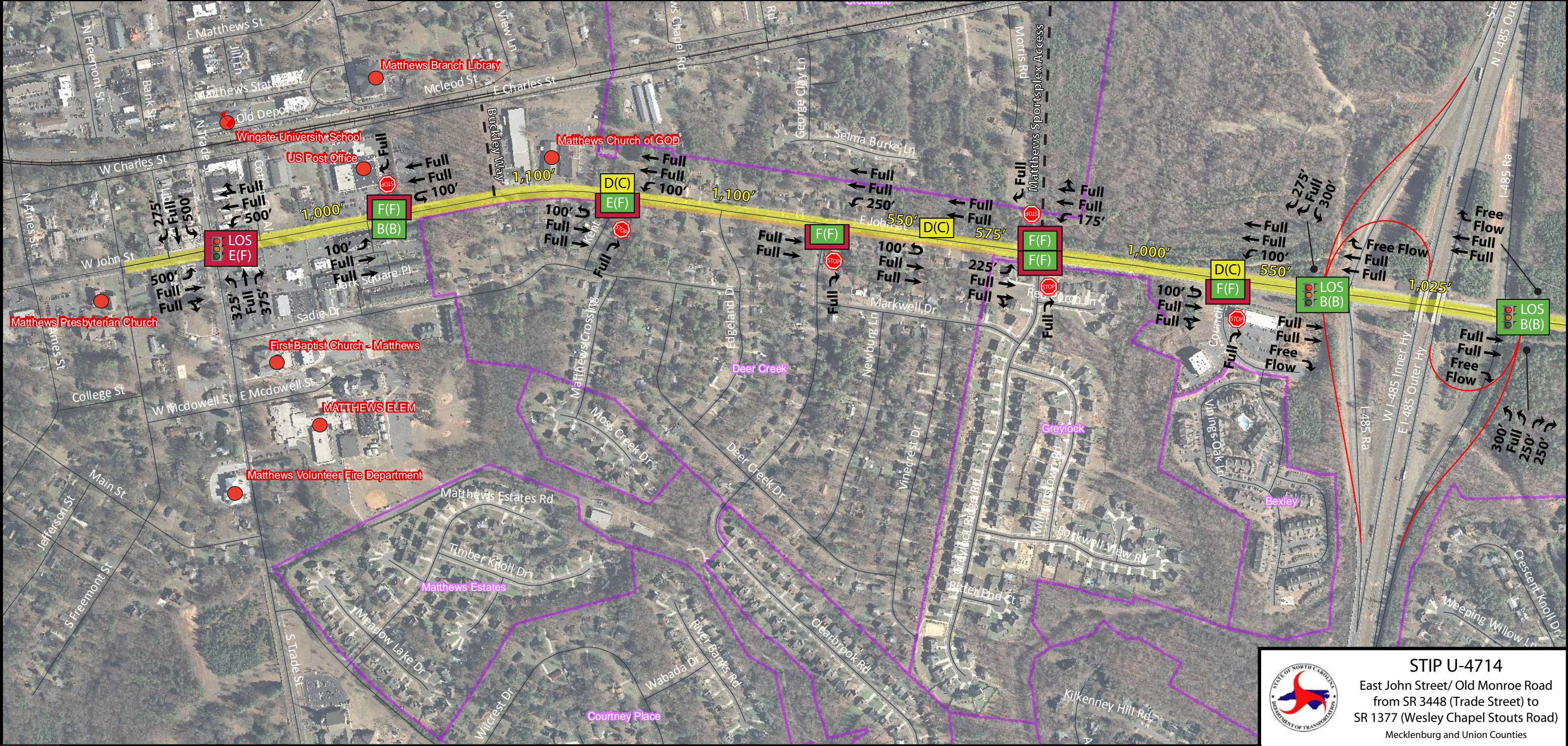
**Build Alternative 2: Six-Lane Median**  
**Traffic Operations Analysis Results**







| Intersection   | N. Trade St  | U-Turn / Post Office  | U-Turn / Keith Dr   | Clearbrook Rd  | U-turn East of Clearbrook   | Greylock/Sportsplex   | U-Turn / Council Place  | I-485 Inner Ramps   | I-485 Outer Ramps   |
|--|--|---|---|--|---|---|---|---|---|
| <b>Peak Hour Turning Movement Volumes</b><br><br>XX (XX) AM (PM)<br>↶ Right-Turn<br>↷ Through<br>↶ Left-Turn<br>↷ U-Turn | <div><div>↶ 118 (20)<br/>↷ 44 (63)<br/>↶ 388 (502)</div><div>↶ 502 (388)<br/>↷ 910 (714)<br/>↶ 280 (311)<br/>↷ 50 (81)</div></div> <div><div>↶ (118) 120<br/>↷ (910) 714<br/>↶ (100) 70</div><div>↶ 70 100<br/>↷ (44) 63<br/>↶ (280) 311</div></div> | <div><div>↶ 33 (46)</div><div>↶ 19 (21)<br/>↷ 1,790 (1,489)<br/>↶ 18 (33)</div></div> <div><div>(26) 16<br/>(1,828) 1,479</div><div>↶</div></div> | <div><div>↶ 1,878 (1,502)<br/>↷ 6 (14)</div></div> <div><div>(66) 52<br/>(1,862) 1,486<br/>(17) 5</div><div>↶ (18) 29</div></div> | <div><div>↶ 1,954 (1,557)<br/>↷ 11 (30)<br/>↶ 10 (51)</div></div> <div><div>(1,919) 1,571<br/>(36) 9</div><div>↶ (39) 60</div></div> | <div><div>↶ 1,975 (1,630)</div></div> <div><div>(46) 74<br/>(2,047) 1,614</div><div>↶</div></div> | <div><div>↶ 9 (77)<br/>↷ 5 (77)<br/>↶ 2,044 (1,589)<br/>↷ 21 (55)</div></div> <div><div>(94) 4<br/>(1,970) 1,639<br/>(67) 17</div><div>↶ (71) 113</div></div> | <div><div>↶ 2,044 (1,705)<br/>↷ 31 (35)</div></div> <div><div>(34) 65<br/>(2,008) 1,682<br/>(42) 26</div><div>↶ (71) 58</div></div> | <div><div>↶ 522 (400)<br/>↷ 288 (271)</div></div> <div><div>(1,400) 1,074<br/>(719) 686</div><div>↶</div></div> | <div><div>↶ 271 (268)<br/>↷ 1,428 (1,111)</div></div> <div><div>(1,149) 942<br/>(522) 400</div><div>↶ (686) 719<br/>↷ (550) 437</div></div> |



**LEGEND**  

Existing Signal

Proposed Signal

Stop-Controlled Approach

XXX'

Access Spacing

↶

Proposed Lane Geometry

XXX'

Proposed Storage Length

Full

Full Lane

LOS X (X)

Intersection AM (PM) Peak Hour Level of Service

Level of Service A-C

Level of Service D

Level of Service E

Level of Service F

Level of Service E/F

Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

**SHEET KEY**  

A

B

C

D

E

0250500

Feet

STIP U-4714

East John Street/ Old Monroe Road  
from SR 3448 (Trade Street) to  
SR 1377 (Wesley Chapel Stouts Road)  
Mecklenburg and Union Counties

Build Alternative 3: Superstreet

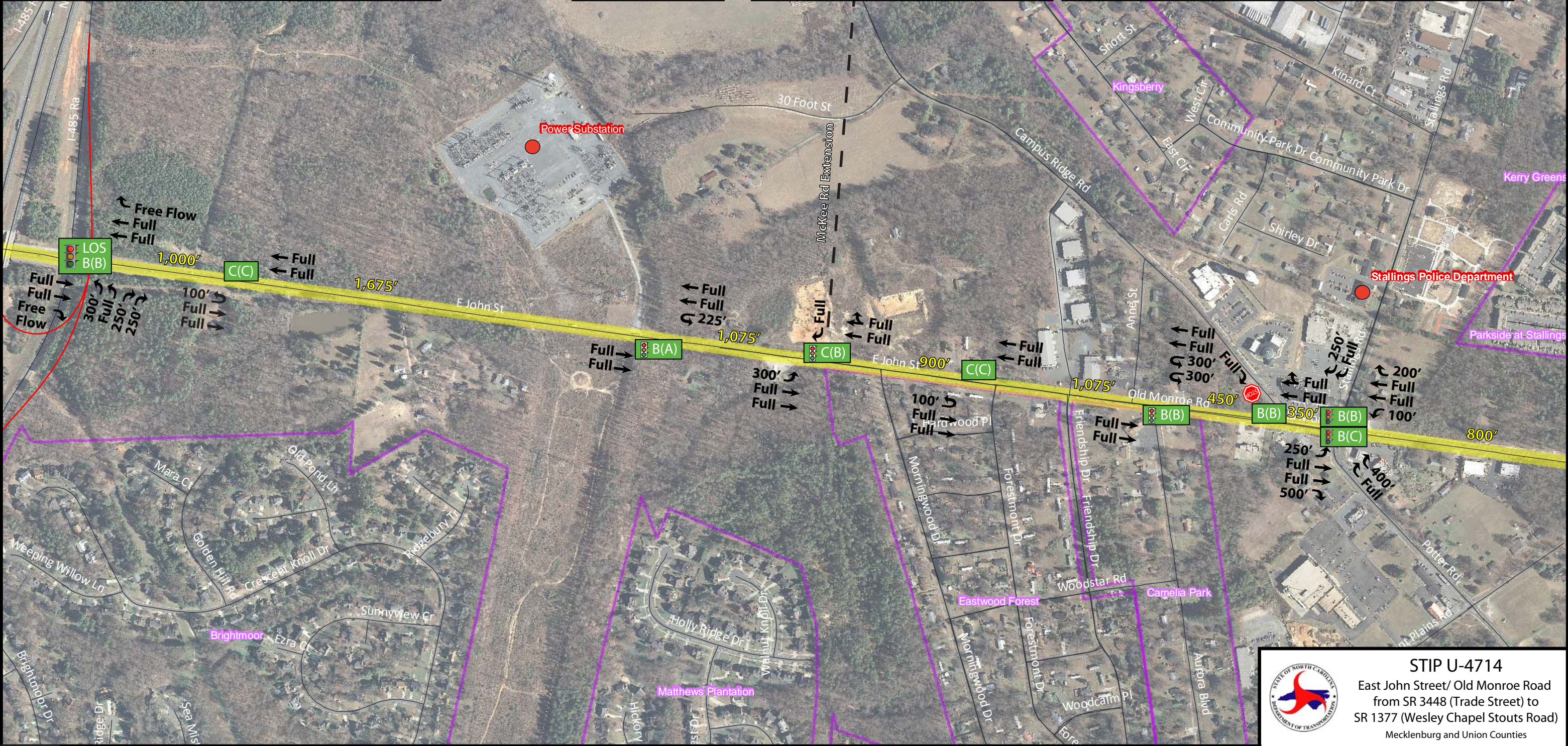
Traffic Operations Analysis Results







| Intersection   | I-485 Outer Ramps   | U-Turn East of I-485   | U-Turn West of McKee   | McKee Rd Ext  | U-Turn East of McKee   | U-Turn West of Stallings   | Campus Ridge Rd  | Potter / Stallings Rd  |
|--|---|--|--|---|--|--|--|--|
| <div>Peak Hour Turning Movement Volumes</div> <div>XX (XX) AM (PM)<br/>Right-Turn<br/>Through<br/>Left-Turn<br/>U-Turn</div> | <div><div>↶ 271 (268)<br/>↷ 1,428 (1,111)</div><div>(1,149) 942<br/>(522) 400</div><div>↶ (666) 719<br/>↷ (550) 437</div></div> | <div>↶ 1,667 (1,347)</div> <div>(32) 32<br/>(1,667) 1,347</div> <div>↶</div> | <div>↶ 1,667 (1,347)<br/>↷ 169 (148)</div> <div>(1,666) 1,352</div> <div>→</div> | <div>↶ 345 (240)<br/>↷ 97 (124)<br/>↶ 1,486 (1,255)</div> <div>(230) 147<br/>(1,583) 1,376</div> <div>→</div> | <div>↶ 1,532 (1,362)</div> <div>(18) 48<br/>(1,555) 1,363</div> <div>→</div> | <div>↶ 1,405 (1,154)<br/>↷ 215 (368)</div> <div>(1,357) 1,150</div> <div>→</div> | <div>↶ 23 (15)<br/>↷ 11 (14)<br/>↶ 1,616 (1,449)</div> <div>(1,725) 1,365</div> <div>→</div> | <div>↶ 288 (433)<br/>↷ 292 (175)<br/>↶ 1,339 (1,030)<br/>↷ 35 (41)</div> <div>(113) 141<br/>(894) 749<br/>(718) 475</div> <div>↶ (510) 759<br/>↷</div> |



LEGEND

Existing Signal

Proposed Signal

Stop-Controlled Approach

Access Spacing

Proposed Lane Geometry

Proposed Storage Length

Full Lane

Intersection AM (PM) Peak Hour Level of Service

Level of Service A-C

Level of Service D

Level of Service E

Level of Service F

Level of Service E/F

Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

SHEET KEY

A

B

C

D

E

STIP U-4714

East John Street/ Old Monroe Road  
from SR 3448 (Trade Street) to  
SR 1377 (Wesley Chapel Stouts Road)  
Mecklenburg and Union Counties

Build Alternative 3: Superstreet

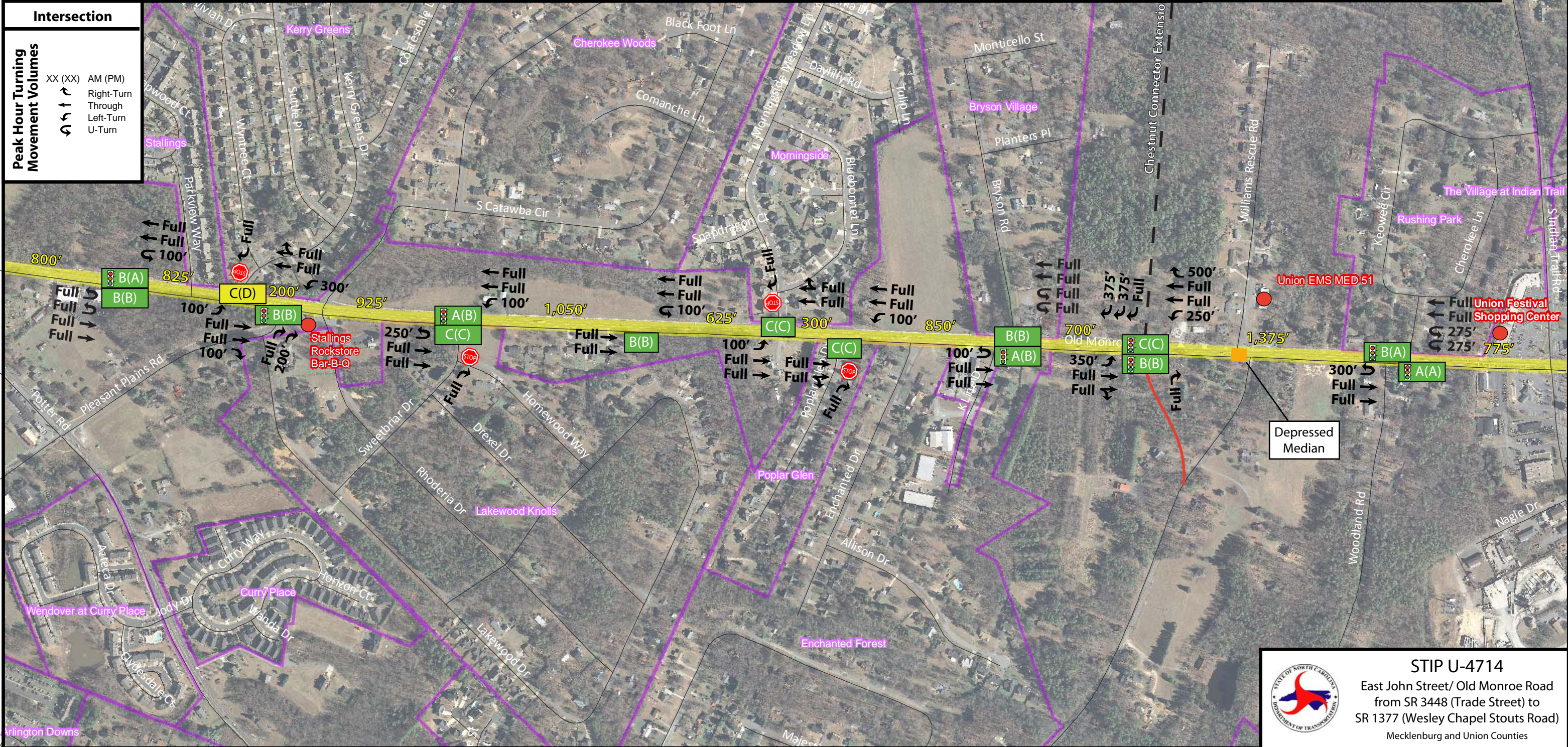
Traffic Operations Analysis Results







| U-Turn East of Stallings   | Kerry Greens Dr  | Pleasant Plains Rd  | U-Turn / Sweetbriar Dr  | U-Turn West of Morning  | Morningside Meadows  | Poplar Glen Dr  | U-Turn West of Chestnut  | Chestnut Ln  | U-Turn West of WIT Rd  |
|--|--|---|---|---|--|---|--|--|--|
| <div> <div> <div>← 886 (734)</div> <div>↻ 121 (105)</div> </div> <div> <div>(514) 774 ↻</div> <div>(889) 738 →</div> </div> </div> | <div> <div> <div>← 139 (89)</div> <div>↻ 25 (68)</div> <div>← 860 (758)</div> </div> <div> <div>(83) 21 ↻</div> <div>(929) 812 →</div> </div> </div> | <div> <div> <div>← 885 (826)</div> <div>↻ 236 (183)</div> </div> <div> <div>(808) 686 →</div> <div>(121) 126 ↻</div> <div>(362) 304 ↻</div> </div> </div> | <div> <div> <div>← 969 (821)</div> <div>↻ 4 (6)</div> </div> <div> <div>(199) 147 ↻</div> <div>(972) 825 ↻</div> <div>(8) 4 ↻</div> <div>(8) 15 ↻</div> </div> </div> | <div> <div> <div>← 1,000 (813)</div> <div>↻ 34 (35)</div> </div> <div> <div>(994) 822 →</div> </div> </div> | <div> <div> <div>← 62 (41)</div> <div>↻ 12 (32)</div> <div>← 1,000 (793)</div> </div> <div> <div>(38) 9 ↻</div> <div>(1,008) 822 ↻</div> </div> </div> | <div> <div> <div>← 1,012 (825)</div> <div>↻ 4 (10)</div> </div> <div> <div>(995) 818 →</div> <div>(13) 4 ↻</div> <div>(13) 23 ↻</div> </div> </div> | <div> <div> <div>← 1,004 (801)</div> <div>↻ 611 (754)</div> </div> <div> <div>(20) 42 ↻</div> <div>(995) 792 →</div> </div> </div> | <div> <div> <div>← 743 (801)</div> <div>↻ 717 (558)</div> <div>← 861 (665)</div> <div>↻ 121 (130)</div> </div> <div> <div>(185) 184 ↻</div> <div>(1,394) 1,071 ↻</div> <div>(187) 137 ↻</div> <div>(258) 317 ↻</div> </div> </div> | <div> <div> <div>← 1,457 (1,167)</div> <div>↻ 299 (430)</div> </div> <div> <div>(191) 228 ↻</div> <div>(1,460) 1,170 →</div> </div> </div> |



LEGEND

Existing Signal

Proposed Signal

Stop-Controlled Approach

XXX'

Access Spacing

↻

Proposed Lane Geometry

XXX'

Proposed Storage Length

Full

Full Lane

LOS

X (X)

Intersection AM (PM) Peak Hour Level of Service

Level of Service A-C

Level of Service D

Level of Service E

Level of Service F

Level of Service E/F

Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

SHEET KEY

A

B

C

D

E

North Arrow

0

250

500

Feet

STIP U-4714

East John Street/ Old Monroe Road from SR 3448 (Trade Street) to SR 1377 (Wesley Chapel Stouts Road)

Mecklenburg and Union Counties

Build Alternative 3: Superstreet

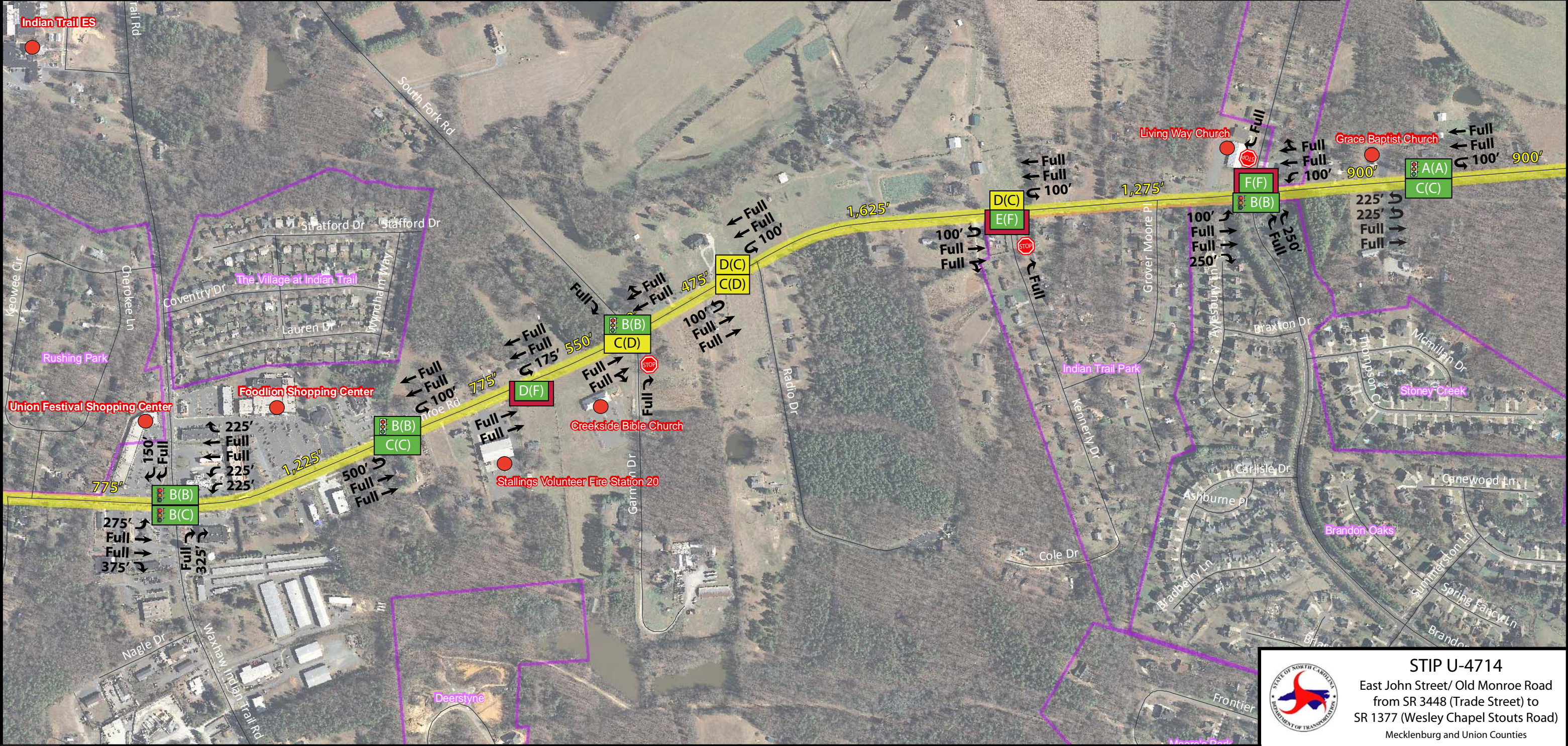
Traffic Operations Analysis Results







| Intersection  | Waxhaw-Indian Trail   | U-Turn East of WIT Rd   | U-Turn West of Garmon   | Garmon Dr/Southfork  | U-Turn East of Garmon   |  | U-Turn / Kennerly Dr | Brandon Oaks Pkwy |  | U-Turn East of Brandon |
|---|---|---|---|--|---|--|----------------------|-------------------|--|------------------------|
| Peak Hour Turning Movement Volumes<br>XX (XX) AM (PM)<br>Right-Turn<br>Through<br>Left-Turn<br>U-Turn | <div><div><div>↶ 306 (389)</div><div>↷ 340 (257)</div><div>↶ 1,446 (1,211)</div><div>↷ 430 (468)</div></div><div><div>↶ (49) 49</div><div>↷ (1,598) 1,244</div><div>↶ (242) 174</div><div>↷ (604) 710</div></div></div> <div><div>↶ 1,951 (1,662)</div><div>↷ 7 (4)</div></div> <div><div>↶ (254) 295</div><div>↷ (1,948) 1,661</div></div> | <div><div>↶ 1,979 (1,645)</div><div>↷ 137 (165)</div></div> <div><div>↶ (1,978) 1,647</div><div>→</div></div> | <div><div>↶ 142 (173)</div><div>↷ 173 (142)</div><div>↶ 1,987 (1,627)</div><div>↷ (18) 12</div></div> <div><div>↶ 2,123 (1,703)</div><div>↷ 7 (6)</div></div> <div><div>↶ (31) 27</div><div>↷ (2,105) 1,686</div></div> | <div><div>↶ 2,103 (1,666)</div><div>↷ 5 (12)</div><div>↶ 14 (18)</div><div>↷ (5) 15</div><div>↷ (2,061) 1,635</div><div>↷ (14) 4</div></div> <div><div>↶ 21 (26)</div><div>↷ 4 (4)</div><div>↶ 2,098 (1,670)</div><div>↷ 8 (9)</div></div> <div><div>↶ (19) 23</div><div>↷ (1,662) 1,399</div><div>↷ (403) 272</div><div>↷ (282) 417</div></div> | <div><div>↶ 1,664 (1,391)</div><div>↷ 21 (39)</div></div> <div><div>↶ (293) 441</div><div>↷ (1,650) 1,377</div></div> |  |                      |                   |  |                        |



**LEGEND**

Existing Signal

Proposed Signal

Stop-Controlled Approach

Access Spacing

Proposed Lane Geometry

Proposed Storage Length

Full Lane

LOS X (X)

Intersection AM (PM) Peak Hour Level of Service

Level of Service A-C

Level of Service D

Level of Service E

Level of Service F

Level of Service E/F

Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

**SHEET KEY**

A

B

C

**D**

E

0250500

Feet

STIP U-4714

East John Street/ Old Monroe Road  
from SR 3448 (Trade Street) to  
SR 1377 (Wesley Chapel Stouts Road)

Mecklenburg and Union Counties

Build Alternative 3: Superstreet

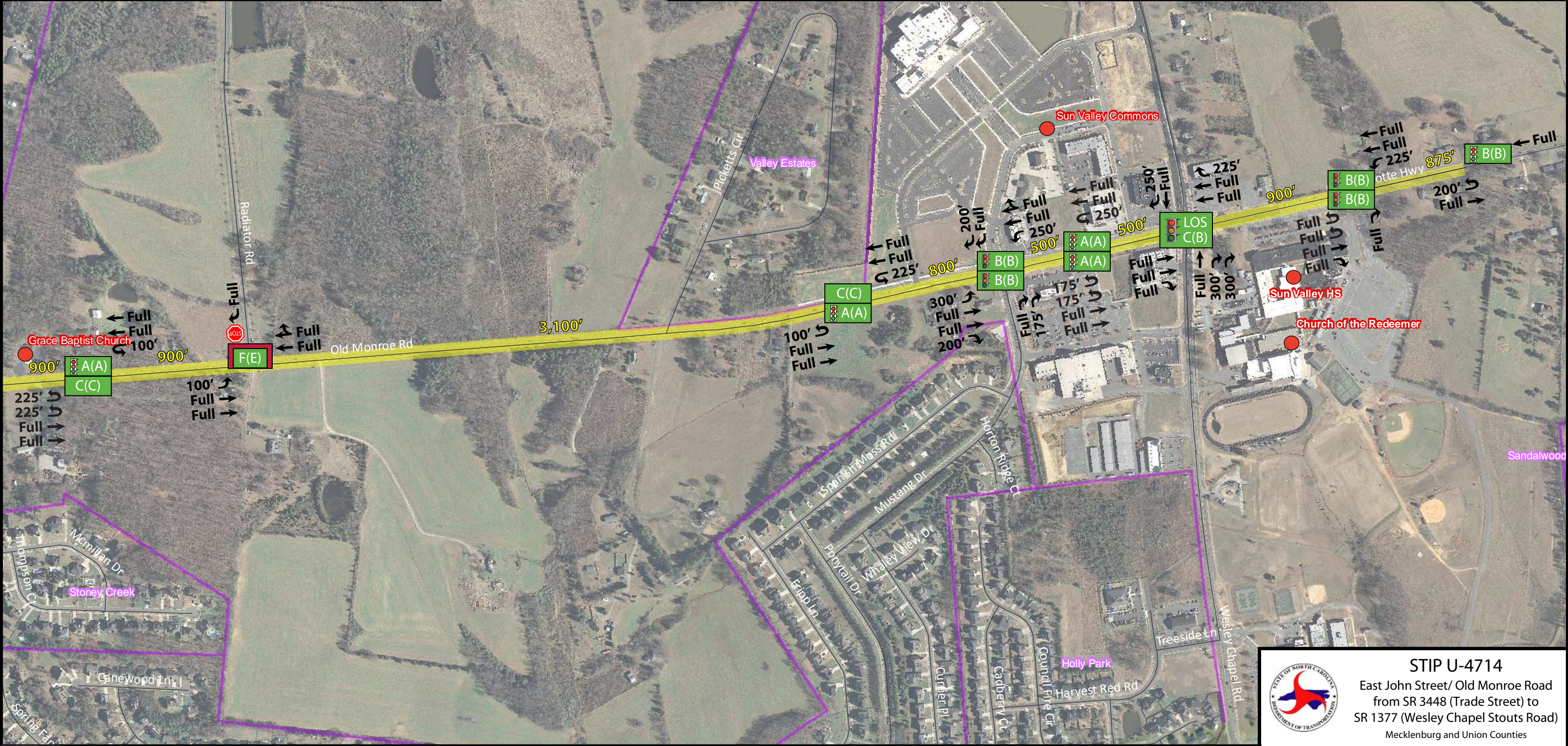
Traffic Operations Analysis Results







| Intersection   | U-Turn East of Brandon  | Radiator Rd  | U-Turn West of Mustang   | Mustang / Sun Valley   | U-Turn West of WCS Rd   | Wesley Chapel-Stouts   | Sun Valley High School  | U-Turn East of Sun Valley                                 |
|--|---|--|--|--|---|--|---|---|
| <div>Peak Hour Turning Movement Volumes</div> <div>XX (XX) AM (PM)<br/>Right-Turn<br/>Through<br/>Left-Turn<br/>U-Turn</div> | <div>← 1,664 (1,391)<br/>↻ 21 (39)</div> <div>(293) 441<br/>(1,650) 1,377</div> | <div>↻ 21 (65)<br/>← 43 (9)<br/>← 1,636 (1,362)</div> <div>(10) 36<br/>(1,653) 1,352</div> | <div>← 1,601 (1,343)<br/>↻ 64 (147)</div> <div>(12) 11<br/>(1,587) 1,332</div> | <div>↻ 252 (306)<br/>← 85 (58)<br/>← 1,413 (1,157)<br/>← 151 (162)</div> <div>(194) 221<br/>(1,291) 994<br/>(248) 183</div> <div>(304) 410</div> | <div>← 1,395 (1,149)<br/>↻ 171 (185)</div> <div>(229) 256<br/>(1,396) 1,148</div> | <div>↻ 214 (235)<br/>↻ 339 (436)<br/>← 235 (214)<br/>← 1,352 (1,099)</div> <div>(890) 742<br/>(691) 577</div> <div>(339) 436<br/>(577) 891</div> | <div>← 839 (682)<br/>↻ 145 (64)</div> <div>(631) 748<br/>(717) 495<br/>(119) 190</div> <div>(335) 183</div> | <div>← 854 (555)</div> <div>(192) 125<br/>(859) 558</div> |



LEGEND

Existing Signal

Proposed Signal

Stop-Controlled Approach

XXX' Access Spacing

Proposed Lane Geometry

Proposed Storage Length

Full Lane

LOS X (X) Intersection AM (PM) Peak Hour Level of Service

Level of Service A-C

Level of Service D

Level of Service E

Level of Service F

Level of Service E/F

Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

SHEET KEY

A

B

C

D

E

North Arrow

0 250 500 Feet

STIP U-4714

East John Street/ Old Monroe Road from SR 3448 (Trade Street) to SR 1377 (Wesley Chapel Stouts Road)

Mecklenburg and Union Counties

Build Alternative 3: Superstreet

Traffic Operations Analysis Results





# Memo

East John Street/Old Monroe Road Improvements – STIP U-4714  
Matthews, Stallings, Indian Trail - Mecklenburg and Union Counties

**Subject:** I-485 Interchange Concepts Analysis

**Date:** May 7, 2014

**To:**

Elmo Vance, NCDOT PDE  
Jim Dunlop, NCDOT Congestion Management  
Elise Groundwater, NCDOT Congestion Management  
Greg Brew, NCDOT Roadway

**CC:**

Carl Gibilaro, Atkins  
Kim Bereis, Atkins  
John Underwood, NCDOT Division 10  
Scott Cole, NCDOT Division 10

**From:**

Tom Kelly, Atkins

## PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT) proposes to widen the existing two-lane East John Street/Old Monroe Road (SR 1009) to a multi-lane facility from Trade Street (SR 3448-SR 3474) in the Town of Matthews to Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail. The project is approximately 6.5 miles long.

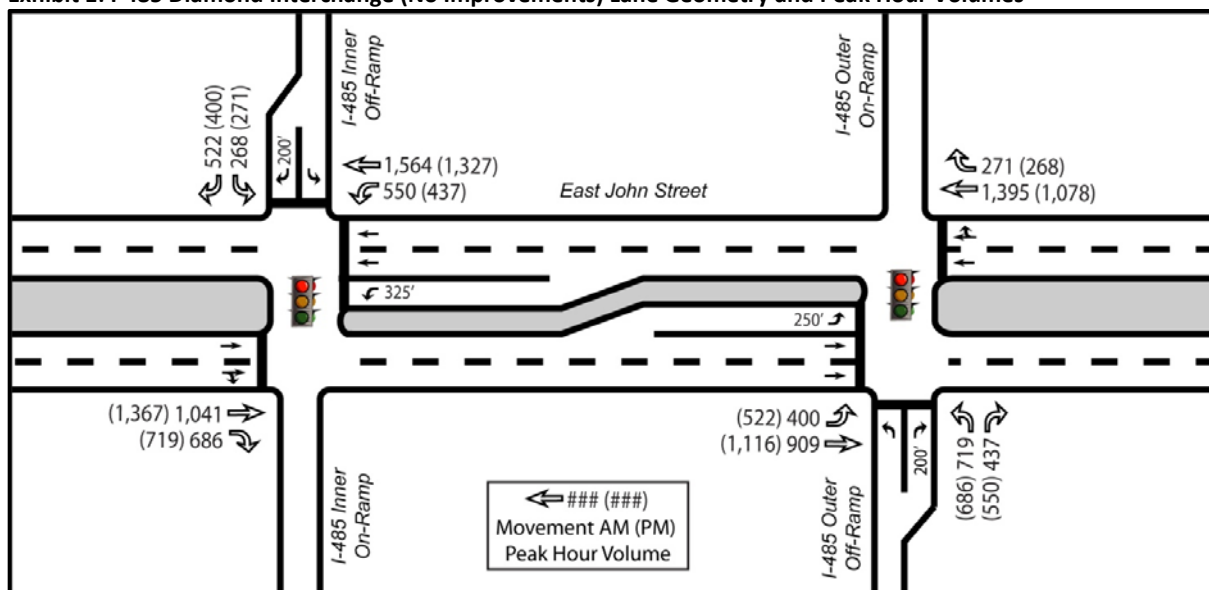
The project is included in the NCDOT *Current State Transportation Improvement Program (STIP) 2012-2020* (September 2013) as STIP No. U-4714, and is divided into three sections:

- U-4714A – Trade Street to I-485
- U-4714B – I-485 to Waxhaw-Indian Trail Road (SR 1008)
- U-4714C – Waxhaw-Indian Trail Road to Wesley Chapel-Stouts Road (SR 1377)

## ANALYSIS PURPOSE

There is a Diamond interchange at East John Street and I-485. Currently John Street has two through-lanes in each direction within the interchange that taper down to one lane in each direction outside of the interchange. The year 2035 peak hour volumes and existing lane geometry is shown in **Exhibit 1**. Preliminary traffic operations analysis results revealed that the ramp terminal intersections of the interchange will operate at unacceptable levels-of-service (LOS) and have queuing issues in the design year (2035) if the interchange would remain as it currently exists with the proposed project improvements. The traffic operations analysis results are presented in **Table 1**.

**Exhibit 1: I-485 Diamond Interchange (No Improvements) Lane Geometry and Peak Hour Volumes**



**Table 1: Existing I-485 Diamond Interchange Ramp Terminal Intersections Analysis Results**

| Intersection                         | MOE   | Overall       | Eastbound     |             |               | Westbound     |             |               | Northbound    |   |              | Southbound  |   |               |
|--------------------------------------|-------|---------------|---------------|-------------|---------------|---------------|-------------|---------------|---------------|---|--------------|-------------|---|---------------|
|                                      |       |               | L             | T           | R             | L             | T           | R             | L             | T | R            | L           | T | R             |
| East John Street at I-485 Inner Ramp | LOS   | F (F)         | -             |             | F (F)         | F (F)         | A (A)       | -             | -             | - | -            | D (E)       | - | F (F)         |
|                                      | Delay | 170.0 (171.3) | -             |             | 266.6 (260.2) | 272.0 (226.1) | 1.8 (1.7)   | -             | -             | - | -            | 44.3 (70.4) | - | 311.1 (278.2) |
|                                      | v/c   | 1.60 (1.52)   | -             |             | 1.53 (1.52)   | 1.55 (1.46)   | 0.75 (0.60) | -             | -             | - | -            | 0.74 (0.92) | - | 1.60 (1.52)   |
| East John Street at I-485 Outer Ramp | LOS   | F (F)         | F (F)         | A (A)       | -             | -             |             | F (F)         | F (F)         | - | F (F)        | -           | - | -             |
|                                      | Delay | 179.9 (165.1) | 258.5 (246.5) | 3.7 (2.2)   | -             | -             |             | 225.5 (198.3) | 302.2 (270.5) | - | 99.3 (205.4) | -           | - | -             |
|                                      | v/c   | 1.59 (1.52)   | 1.52 (1.49)   | 0.48 (0.59) | -             | -             |             | 1.43 (1.36)   | 1.59 (1.52)   | - | 1.08 (1.36)  | -           | - | -             |

The purpose of the analysis is to determine an interchange concept that will provide an acceptable LOS and operations in the design year. This Memo documents the evaluation and comparison of alternative interchange forms.

The interchange forms evaluated include:

- Diamond interchange (improve existing)
- Diverging diamond interchange (DDI)
- Partial cloverleaf (ParClo) A
- ParClo B

#### **METHODOLOGY**

Peak hour volumes were developed from the year 2035 Build forecast (NCDOT, July 2013) using Congestion Management's Intersection Analysis Utility (IAU) tool for two-way volumes. Peak hour volumes were then redistributed to the Diamond, DDI, ParClo A and ParClo B interchange forms. Peak hour volumes the four interchange forms can be found in **Exhibits 2 through 5**.

For the purposes of the analysis, it was assumed that East John Street/ Old Monroe Road would be a four-lane median divided facility. Synchro Version 7 was used to determine the LOS, corresponding delay, and capacity at the intersections, which were reported from the Synchro Lanes, Volumes, Timings Report. For this analysis, LOS D or better is considered acceptable. The reported queue lengths represent the higher of the Synchro 95<sup>th</sup> percentile queue length and SimTraffic maximum queue length. The exhibits contained in this Memo represent the recommended storage lengths, with 100 feet being the minimum recommended length, and 500 feet the maximum.

Capacity analysis was also performed for the freeway elements of the interchange concepts using Highway Capacity Software (HCS) 2010.

#### **Diamond Interchange**

The first option evaluated was an improved Diamond interchange. The peak hour volumes and the lane geometry are shown in **Exhibit 2**. As depicted in **Exhibit 2**, at both ramp terminal intersections, dual left-turn lanes and an exclusive right-turn lane serve the traffic entering I-485.

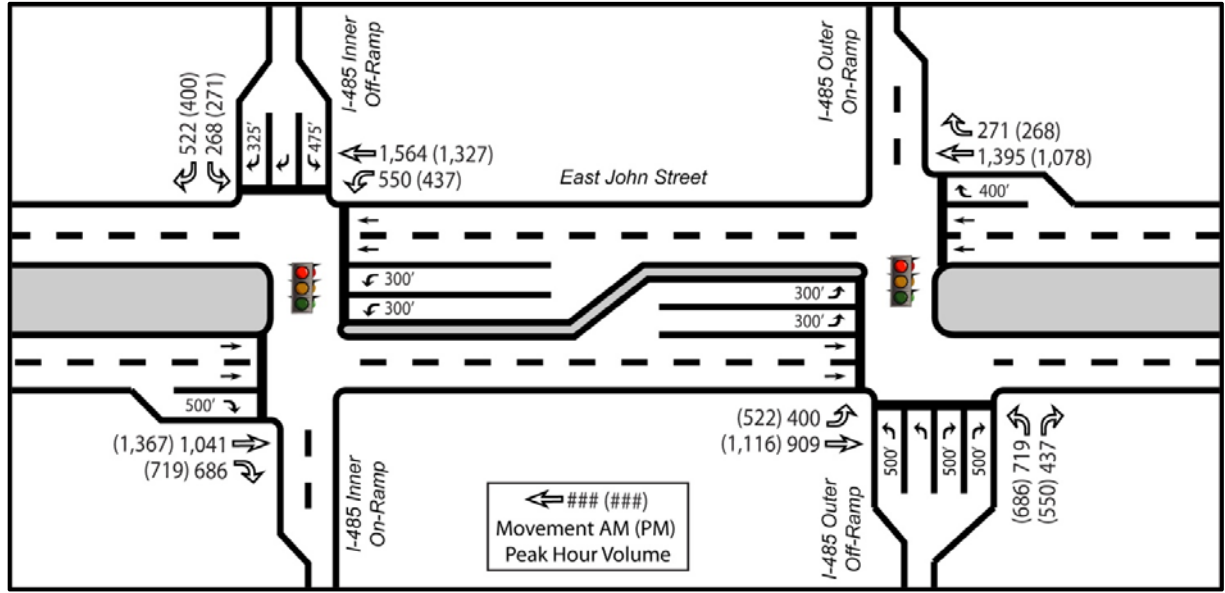
The I-485 Inner off-ramp approach has two right-turn lanes and a left-turn lane while the I-485 Outer off-ramp approach has two right-turn lanes and two left-turn lanes. Due to the dual left-turn lanes aligned back-to-back on East John Street and the need to accommodate pedestrians and bicyclists, this option would require replacement of the I-485 bridges.

The Diamond interchange traffic operations analysis results are presented in **Table 2**. Both ramp terminal intersections of the Diamond interchange are projected to operate at an acceptable LOS C, in both the AM and PM peak hours. Additionally, all movements would operate at an acceptable LOS in the AM and PM peak hours, with the exception of the I-485 Inner off-ramp left-turn, which would operate at LOS E in the PM, and the I-485 Outer off-ramp



left-turn movement, which would operate at LOS E in the AM. However, both the left-turn movements from East John Street to I-485 would experience queuing issues that impede the traffic flow on East John Street.

**Exhibit 2: I-485 Diamond Interchange Lane Geometry and Peak Hour Volumes**



**Table 2: I-485 Diamond Interchange Ramp Terminal Intersections Analysis Results**

| Intersection                         | MOE   | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound  |   |             | Southbound  |   |             |
|--------------------------------------|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---|-------------|-------------|---|-------------|
|                                      |       |             | L           | T           | R           | L           | T           | R           | L           | T | R           | L           | T | R           |
| East John Street at I-485 Inner Ramp | LOS   | C (C)       | -           | D (C)       | B (B)       | C (C)       | A (A)       | -           | -           | - | -           | D (E)       | - | D (D)       |
|                                      | Delay | 21.6 (22.9) | -           | 36.3 (30.3) | 13.6 (10.3) | 22.9 (30.6) | 4.2 (4.4)   | -           | -           | - | -           | 39.1 (60.8) | - | 44.2 (47.7) |
|                                      | v/c   | 0.88 (0.91) | -           | 0.88 (0.90) | 0.71 (0.69) | 0.85 (0.91) | 0.77 (0.60) | -           | -           | - | -           | 0.68 (0.87) | - | 0.84 (0.81) |
| East John Street at I-485 Outer Ramp | LOS   | C (C)       | D (D)       | A (A)       | -           | -           | D (D)       | A (A)       | E (D)       | - | D (D)       | -           | - | -           |
|                                      | Delay | 34.6 (28.1) | 50.5 (36.8) | 4.0 (2.8)   | -           | -           | 41.5 (35.0) | 3.9 (5.8)   | 60.0 (45.3) | - | 38.6 (46.8) | -           | - | -           |
|                                      | v/c   | 0.98 (0.90) | 0.98 (0.90) | 0.45 (0.56) | -           | -           | 0.97 (0.88) | 0.25 (0.27) | 0.97 (0.88) | - | 0.73 (0.87) | -           | - | -           |

By the year 2035, without any improvements, the I-485 mainline is projected to be over capacity. Because the mainline is over capacity, most of the Diamond interchange freeway elements operate at LOS F. Due to the auxiliary lane and being the off-peak direction, the only freeway element projected to operate with an acceptable LOS is the I-485 Outer weave East John Street and US 74 in the AM peak hour. The Diamond interchange freeway elements traffic operations analysis results are presented in **Table 3**.

**Table 3: I-485 Diamond Interchange Freeway Elements Analysis Results**

| Direction   | Location                              | Segment Type | AM Peak Hour |         | PM Peak Hour |         |
|-------------|---------------------------------------|--------------|--------------|---------|--------------|---------|
|             |                                       |              | LOS          | Density | LOS          | Density |
| I-485 Inner | US 74 to East John Street             | Weave        | F            | -       | E            | 38.9    |
|             | Within East John Street Interchange   | Freeway      | F            | 88.7    | E            | 44.4    |
|             | East John Street On-Ramp              | Merge        | F            | 55.6    | F            | 45.8    |
|             | South of East John Street Interchange | Freeway      | F            | -       | F            | 99.6    |
| I-485 Outer | South of East John Street Interchange | Freeway      | F            | 99.6    | F            | -       |
|             | East John Street Off-Ramp             | Diverge      | F            | 54.6    | F            | 65.4    |
|             | Within East John Street Interchange   | Freeway      | E            | 44.4    | F            | 88.5    |
|             | East John Street to US 74             | Weave        | D            | 30.9    | F            | -       |

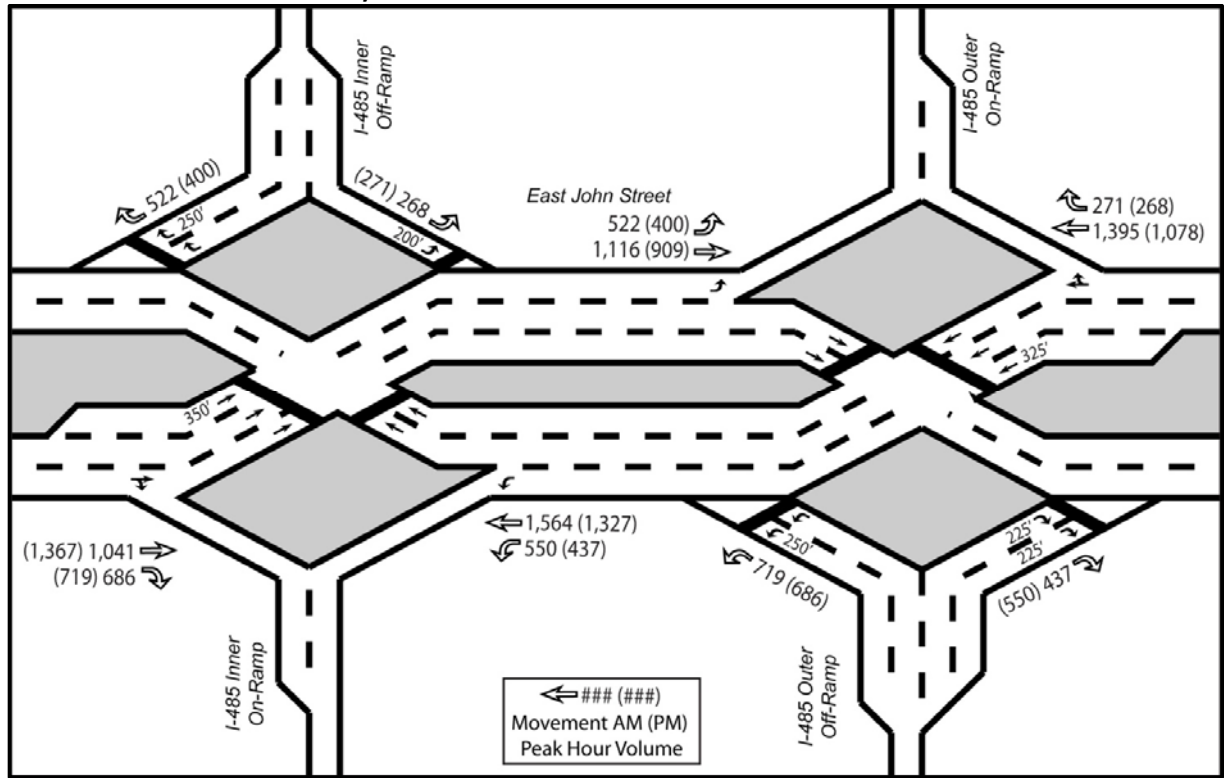
**Diverging Diamond Interchange (DDI)**

The next option evaluated was the DDI. The peak hour volumes and the lane geometry are shown in **Exhibit 3**. As depicted in **Exhibit 3**, the DDI concept has traffic on East John Street cross to the opposite side of the road within the ramp terminal intersections. This allows for two-phase signal operations at the ramp terminal intersections and eliminates the need for left-turn movements having to cross opposing traffic.

The I-485 Inner off-ramp includes two right-turn lanes and a left-turn lane while the I-485 Outer off-ramp includes two right-turn lanes and two left-turn lanes. In both the eastbound and westbound direction, a lane is developed before the crossover intersection and then dropped at the left-turn movement to I-485.

The DDI traffic operations analysis results are presented in **Table 4**. Both ramp terminal intersections of the DDI are projected to operate at an acceptable LOS, B or C, in both the AM and PM peak hours. Additionally, all movements of the intersections would operate at an acceptable LOS in both the AM and PM peak hours. There are no major queuing issues projected in either the AM or PM peak hours.

**Exhibit 3: I-485 DDI Lane Geometry and Peak Hour Volumes**



**Table 4: I-485 DDI Traffic Analysis Results**

| Intersection                         | MOE   | Overall     | Eastbound |             |   | Westbound |             |   | Northbound  |   |             | Southbound  |   |             |
|--------------------------------------|-------|-------------|-----------|-------------|---|-----------|-------------|---|-------------|---|-------------|-------------|---|-------------|
|                                      |       |             | L         | T           | R | L         | T           | R | L           | T | R           | L           | T | R           |
| East John Street at I-485 Inner Ramp | LOS   | B (C)       | -         | D (C)       | - | -         | B (C)       | - | -           | - | -           | B (B)       | - | C (C)       |
|                                      | Delay | 25.9 (26.2) | -         | 36.9 (32.5) | - | -         | 18.8 (23.3) | - | -           | - | -           | 10.1 (14.4) | - | 33.6 (22.4) |
|                                      | v/c   | 0.83 (0.81) | -         | 0.76 (0.79) | - | -         | 0.83 (0.81) | - | -           | - | -           | 0.29 (0.34) | - | 0.71 (0.43) |
| East John Street at I-485 Outer Ramp | LOS   | C (C)       | -         | B (B)       | - | -         | C (C)       | - | B (B)       | - | B (C)       | -           | - | -           |
|                                      | Delay | 20.0 (20.2) | -         | 13.9 (11.3) | - | -         | 24.6 (29.7) | - | 19.9 (13.6) | - | 18.1 (27.6) | -           | - | -           |
|                                      | v/c   | 0.69 (0.67) | -         | 0.65 (0.66) | - | -         | 0.69 (0.67) | - | 0.53 (0.42) | - | 0.40 (0.63) | -           | - | -           |

By the year 2035, without any improvements, the I-485 mainline is projected to be over capacity. The freeway elements of the DDI operate the same as the Diamond interchange. Because the mainline is over capacity, most of the DDI freeway elements operate at LOS F. Due to the auxiliary lane and being the off-peak direction, the only freeway element projected to operate with an acceptable LOS is the I-485 Outer weave East John Street and US 74 in the AM peak hour. The DDI freeway elements traffic operations analysis results are presented in **Table 5**.



**Table 5: I-485 DDI Freeway Elements Analysis Results**

| Direction   | Location                              | Segment Type | AM Peak Hour |         | PM Peak Hour |         |
|-------------|---------------------------------------|--------------|--------------|---------|--------------|---------|
|             |                                       |              | LOS          | Density | LOS          | Density |
| I-485 Inner | US 74 to East John Street             | Weave        | F            | -       | E            | 38.9    |
|             | Within East John Street Interchange   | Freeway      | F            | 88.7    | E            | 44.4    |
|             | East John Street On-Ramp              | Merge        | F            | 55.6    | F            | 45.8    |
|             | South of East John Street Interchange | Freeway      | F            | -       | F            | 99.6    |
| I-485 Outer | South of East John Street Interchange | Freeway      | F            | 99.6    | F            | -       |
|             | East John Street Off-Ramp             | Diverge      | F            | 54.6    | F            | 65.4    |
|             | Within East John Street Interchange   | Freeway      | E            | 44.4    | F            | 88.5    |
|             | East John Street to US 74             | Weave        | D            | 30.9    | F            | -       |

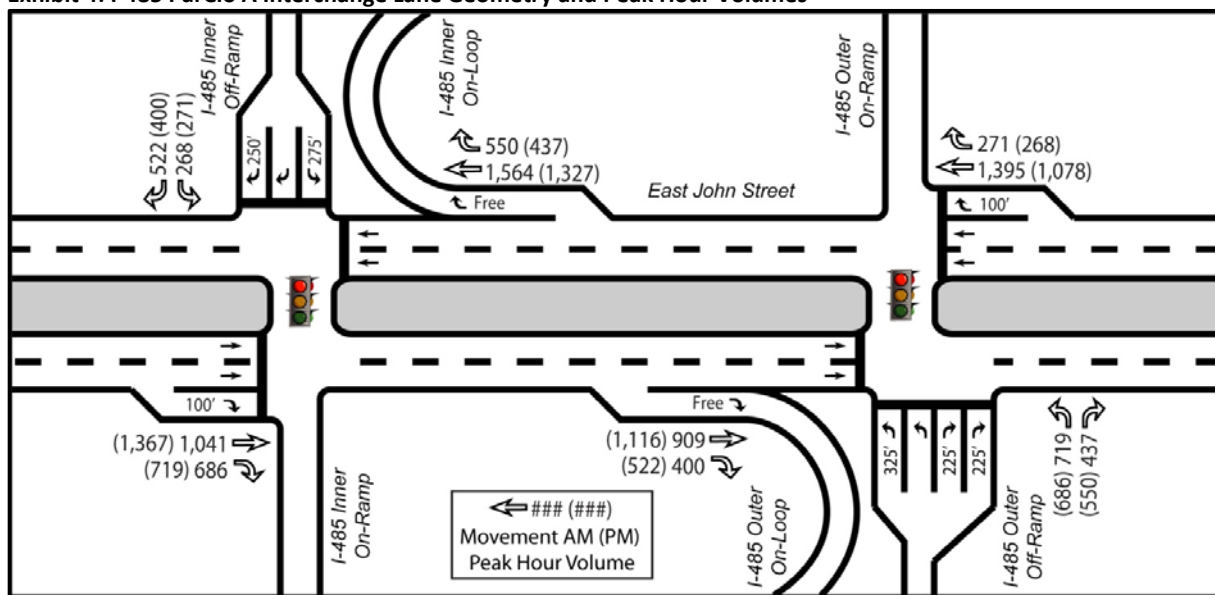
#### ParClo A Interchange

The first partial cloverleaf interchange option, ParClo A, includes the addition of loop ramps in the northwest and southeast quadrants. The peak hour volumes and the lane geometry are shown in **Exhibit 4**. The loop ramps would serve traffic from eastbound East John Street to I-485 Outer, and from westbound East John Street to I-485 Inner.

Both ramp terminal intersections would operate as two-phase signals due to the elimination of the left-turn movements from East John Street to the I-485 entrance ramps. Exclusive right-turn lanes are provided for the right-turn onto the directional on-ramps. These movements were also given green time during both phases of the signal since through movements from the ramp are rare. The I-485 Inner off-ramp includes two right-turn lanes and one left-turn lane. The I-485 Outer off-ramp approach has two right-turn lanes and two left-turn lanes.

The ParClo A traffic operations analysis results are presented in **Table 6**. Both ramp terminal intersections of the ParClo A interchange are projected to operate at an acceptable LOS, LOS B, in both the AM and PM peak hours. Additionally, all movements of the intersections would operate at an acceptable LOS in both the AM and PM peak hours. There are no queuing issues projected in either the AM or PM peak hours.

**Exhibit 4: I-485 ParClo A Interchange Lane Geometry and Peak Hour Volumes**



**Table 6: I-485 ParClo A Interchange Traffic Analysis Results**

| Intersection                         | MOE   | Overall     | Eastbound |             |             | Westbound |             |             | Northbound  |   |             | Southbound  |   |             |
|--------------------------------------|-------|-------------|-----------|-------------|-------------|-----------|-------------|-------------|-------------|---|-------------|-------------|---|-------------|
|                                      |       |             | L         | T           | R           | L         | T           | R           | L           | T | R           | L           | T | R           |
| East John Street at I-485 Inner Ramp | LOS   | B (B)       | -         | B (B)       | A (A)       | -         | B (B)       | A (A)       | -           | - | -           | C (D)       | - | D (C)       |
|                                      | Delay | 13.8 (12.8) | -         | 11.5 (13.9) | 1.1 (1.2)   | -         | 14.4 (11.3) | 0.4 (0.4)   | -           | - | -           | 34.3 (36.1) | - | 37.0 (32.4) |
|                                      | v/c   | 0.81 (0.69) | -         | 0.54 (0.69) | 0.48 (0.50) | -         | 0.81 (0.67) | 0.39 (0.31) | -           | - | -           | 0.62 (0.65) | - | 0.76 (0.61) |
| East John Street at I-485 Outer Ramp | LOS   | B (B)       | -         | A (B)       | A (A)       | -         | B (B)       | A (A)       | C (C)       | - | C (C)       | -           | - | -           |
|                                      | Delay | 17.1 (15.9) | -         | 9.5 (11.5)  | 0.4 (0.5)   | -         | 17.6 (15.3) | 0.3 (0.3)   | 33.9 (29.9) | - | 29.1 (30.5) | -           | - | -           |
|                                      | v/c   | 0.77 (0.70) | -         | 0.50 (0.63) | 0.28 (0.37) | -         | 0.76 (0.61) | 0.19 (0.19) | 0.77 (0.70) | - | 0.58 (0.69) | -           | - | -           |

As analyzed, I-485 Inner and Outer have an additional merge point due to the addition of loop on-ramps. By the year 2035, without any improvements, the I-485 mainline is projected to be over capacity. Because the mainline is over capacity, most of the ParClo A interchange freeway elements would operate at LOS F. Due to the auxiliary lane and being the off-peak direction, the only freeway element projected to operate with an acceptable LOS is the I-485 Outer weave East John Street and US 74 in the AM peak hour. The ParClo A freeway elements traffic operations analysis results are presented in **Table 7**.

**Table 7: I-485 ParClo A Freeway Elements Analysis Results**

| Direction   | Location                              | Segment Type | AM Peak Hour |         | PM Peak Hour |         |
|-------------|---------------------------------------|--------------|--------------|---------|--------------|---------|
|             |                                       |              | LOS          | Density | LOS          | Density |
| I-485 Inner | US 74 to East John Street             | Weave        | F            | -       | E            | 38.9    |
|             | Within East John Street Interchange   | Freeway      | F            | 88.7    | E            | 44.4    |
|             | East John Street Loop On-Ramp         | Merge        | F            | 46.8    | F            | 36.7    |
|             | East John Street On-Ramp              | Merge        | F            | 55.9    | F            | 46.1    |
|             | South of East John Street Interchange | Freeway      | F            | -       | F            | 99.6    |
| I-485 Outer | South of East John Street Interchange | Freeway      | F            | 99.6    | F            | -       |
|             | East John Street Off-Ramp             | Diverge      | F            | 54.6    | F            | 65.4    |
|             | Within East John Street Interchange   | Freeway      | E            | 44.4    | F            | 88.5    |
|             | East John Street Loop On-Ramp         | Merge        | F            | 36.4    | F            | 46.5    |
|             | East John Street to US 74             | Weave        | D            | 30.2    | F            | -       |

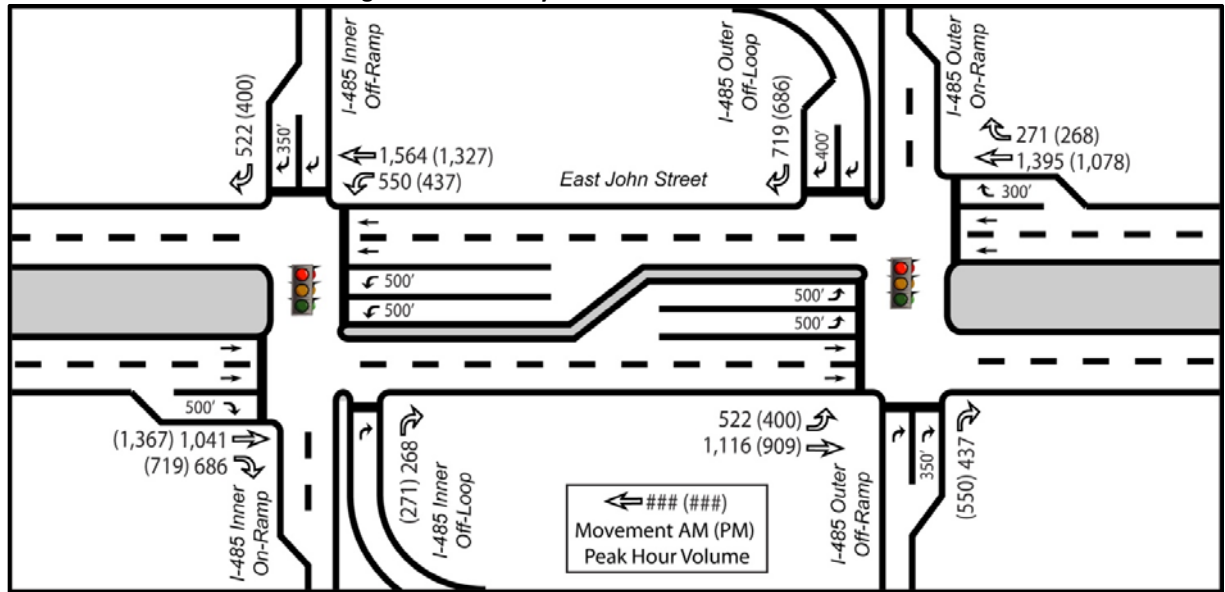
### **ParClo B Interchange**

The ParClo B option includes the addition of loop ramps in the northeast and southwest quadrants. The peak hour volumes and the lane geometry are shown in **Exhibit 5**. The loop ramps would serve traffic from I-485 Inner to eastbound East John Street, and from I-485 Outer to westbound East John Street.

At both ramp terminal intersections, dual left-turn lanes and an exclusive right-turn lane would serve the traffic entering I-485. The I-485 Inner off-ramp approach has two right-turn lanes, and the off-loop would have a single right-turn lane. The I-485 Outer off-ramp approach would have two right-turn lanes, as does the off-loop.

The ParClo B interchange traffic operations analysis results are presented in **Table 8**. Both ramp terminal intersections of the ParClo B interchange are projected to operate at an acceptable LOS C in both the AM and PM peak hours. Additionally, all movements would operate at an acceptable LOS in the AM and PM peak hours, with the exception of the I-485 Outer off-loop right-turn, which would operate at LOS E in the PM peak hour. However, both the left-turn movements from East John Street to I-485 would experience queuing issues that impede the traffic flow on East John Street.

**Exhibit 5: I-485 ParClo B Interchange Lane Geometry and Peak Hour Volumes**



**Table 8: I-485 ParClo B Interchange Traffic Analysis Results**

| Intersection                         | MOE   | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound |   |             | Southbound |   |             |
|--------------------------------------|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|---|-------------|------------|---|-------------|
|                                      |       |             | L           | T           | R           | L           | T           | R           | L          | T | R           | L          | T | R           |
| East John Street at I-485 Inner Ramp | LOS   | C (C)       | -           | D (C)       | B (B)       | C (C)       | B (A)       | -           | -          | - | B (C)       | -          | - | D (D)       |
|                                      | Delay | 22.4 (21.2) | -           | 36.3 (30.3) | 13.6 (11.2) | 25.5 (25.7) | 10.0 (5.9)  | -           | -          | - | 14.4 (22.2) | -          | - | 44.2 (53.4) |
|                                      | v/c   | 0.88 (0.90) | -           | 0.88 (0.90) | 0.71 (0.70) | 0.85 (0.85) | 0.77 (0.70) | -           | -          | - | 0.36 (0.46) | -          | - | 0.84 (0.86) |
| East John Street at I-485 Outer Ramp | LOS   | C (C)       | D (D)       | A (A)       | -           | -           | C (D)       | A (A)       | -          | - | E (D)       | -          | - | C (B)       |
|                                      | Delay | 26.4 (24.6) | 41.5 (42.7) | 2.2 (3.9)   | -           | -           | 33.1 (35.0) | 4.6 (5.8)   | -          | - | 55.3 (47.2) | -          | - | 26.4 (17.5) |
|                                      | v/c   | 0.93 (0.90) | 0.84 (0.90) | 0.42 (0.56) | -           | -           | 0.93 (0.88) | 0.26 (0.27) | -          | - | 0.89 (0.87) | -          | - | 0.71 (0.56) |

As analyzed, I-485 Inner and Outer have an additional diverge point due to the addition of loop off-ramps. By the year 2035, without any improvements, the I-485 mainline is projected to be over capacity. Because the mainline is over capacity, most of the ParClo B interchange freeway elements would operate at LOS F. Due to the auxiliary lane and being the off-peak direction, the only freeway element projected to operate with an acceptable LOS is the I-485 Outer weave East John Street and US 74 in the AM peak hour. The ParClo B freeway elements traffic operations analysis results are presented in **Table 9**.



**Table 9: I-485 ParClo B Freeway Elements Analysis Results**

| Direction   | Location                              | Segment Type | AM Peak Hour |         | PM Peak Hour |         |
|-------------|---------------------------------------|--------------|--------------|---------|--------------|---------|
|             |                                       |              | LOS          | Density | LOS          | Density |
| I-485 Inner | US 74 to East John Street             | Weave        | F            | -       | E            | 38.9    |
|             | East John Street Loop Off-Ramp        | Diverge      | F            | 50.1    | F            | 40.1    |
|             | Within East John Street Interchange   | Freeway      | F            | 88.7    | E            | 44.4    |
|             | East John Street On-Ramp              | Merge        | F            | 55.6    | F            | 45.8    |
|             | South of East John Street Interchange | Freeway      | F            | -       | F            | 99.6    |
| I-485 Outer | South of East John Street Interchange | Freeway      | F            | 99.6    | F            | -       |
|             | East John Street Off-Ramp             | Diverge      | F            | 54.6    | F            | 65.4    |
|             | East John Street Loop Off-Ramp        | Diverge      | F            | 44.4    | F            | 54.2    |
|             | Within East John Street Interchange   | Freeway      | E            | 44.4    | F            | 88.5    |
|             | East John Street to US 74             | Weave        | D            | 30.9    | F            | -       |

**Conclusion**

The ParClo B interchange would provide the best traffic operations along East John Street, followed by the DDI. The Diamond and ParClo B interchanges would provide acceptable overall intersection LOS, but would have queuing issues due to the high left-turn volume from East John Street to I-485 and the 3-phase signals.

Most of the freeway elements of the East John Street/I-485 interchange for all forms will operate at LOS F due to the I-485 mainline being over capacity. As analyzed, the ParClo A and ParClo B interchanges have an additional access point due to the loop ramps. If desired, the loop ramp and directional ramp could be combined into one access point with the I-485 mainline.

In addition to traffic operations analysis, other factors will be considered in the selection of an interchange form, including construction costs, right-of-way impacts (R/W), and environmental impacts. The ParClo options would require more R/W in the quadrants where loop ramps are added. The Diamond, DDI and ParClo B are expected to require a new I-485 bridge in order to fit underneath with bicycle and pedestrian provisions. The ParClo A may fit underneath, but would need to widen the existing bridge or build a parallel bridge to accommodate the additional lane on I-485 from the loop ramp.

# Memo

East John Street/Old Monroe Road Improvements – STIP U-4714  
Matthews, Stallings, Indian Trail - Mecklenburg and Union Counties

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**Subject:** Trade Street/Waxhaw-Indian Trail Road/Wesley Chapel-Stouts Road Alternative Intersection Analysis

**Date:** August 21, 2014

Reviewed with no comments by NCDOT Congestion Management on September 4, 2014

**To:**

Jim Dunlop, NCDOT Congestion Management  
Elise Groundwater, NCDOT Congestion Management

**CC:**

Elmo Vance, NCDOT PDEA  
Carl Gibilaro, Atkins  
Kim Bereis, Atkins

**From:**

Tom Kelly, Atkins

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## **PROJECT DESCRIPTION**

The North Carolina Department of Transportation (NCDOT) proposes to widen the existing two-lane East John Street/Old Monroe Road (SR 1009) to a multi-lane facility from Trade Street (SR 3448-SR 3474) in the Town of Matthews to Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail. The project is approximately 6.5 miles long.

The project is included in the NCDOT *Current State Transportation Improvement Program (STIP)* (July 2014) as STIP No. U-4714, and is divided into three sections:

- U-4714A – Trade Street to I-485
- U-4714B – I-485 to Waxhaw-Indian Trail Road (SR 1008)
- U-4714C – Waxhaw-Indian Trail Road to Wesley Chapel-Stouts Road (SR 1377)

## **PRELIMINARY BUILD ALTERNATIVES**

Three preliminary build alternatives were considered for the corridor:

- Alternative 1: Four-Lane Median Divided
- Alternative 2: Four-Lane Superstreet
- Alternative 3: Six-Lane Median Divided

Preliminary traffic operations were completed for the above concepts. The results of the analysis were presented and discussed at a meeting with NCDOT PDEA, Congestion Management, and Roadway staff on March 25, 2014. Due to greater direct impacts associated with the larger roadway footprint and marginal operational benefits over the 4-Lane concepts, the decision was made to eliminate Alternative 3 (Six-Lane Median Divided) for consideration as a detailed study alternative. If necessary, a six-lane cross-section would be considered at spot locations along Old Monroe Road.

Furthermore, NCDOT Congestion Management requested additional traffic operations analyses for the I-485 Interchange at East John Street (see separate memorandum dated May 7, 2013) and three intersections within the project study area.

## **ANALYSIS PURPOSE**

The purpose of the additional traffic operations analysis is to evaluate alternative intersection types for the intersection of Trade Street and East John Street, Waxhaw-Indian Trail Road and Old Monroe Road, and Wesley Chapel-Stouts Road and Old Monroe Road.

- A. Trade Street and East John Street - Eight intersection options were analyzed for the Trade Street and East John Street intersection:

- OPTION A1: Full Movement – No Trade Street Improvements – Add EB Thru Only
- OPTION A2: Full Movement – No Trade Street Improvements – Right Turns Lanes

- OPTION A3: Full Movement – Southbound Dual Left
- OPTION A4: Full Movement – Westbound Dual Left
- OPTION A5: Hybrid – No Trade Street Improvements
- OPTION A6: Hybrid – Southbound Dual Left
- OPTION A7: Roundabout – Concept provided by Town of Matthews
- OPTION A8: Roundabout – Right Turn Lanes

B. Waxhaw-Indian Trail Road and Old Monroe Road - Five intersection options were evaluated for the Waxhaw-Indian Trail Road and Old Monroe Road intersection:

- OPTION B1: Full Movement – Turn Lanes
- OPTION B2: Full Movement – Westbound Dual Left
- OPTION B3: Full Movement – Six Lanes
- OPTION B4: Superstreet – Turn Lanes
- OPTION B5: Superstreet – Westbound Dual Left

C. Wesley Chapel-Stouts Road and Old Monroe Road - Four intersection types were evaluated for the Wesley Chapel-Stouts Road and Old Monroe Road intersection:

- OPTION C1: Full Movement – Turn Lanes
- OPTION C2: Full Movement – Widen WCSR
- OPTION C3: Superstreet Option
- OPTION C4: Michigan Left

This Memo documents the evaluation and results of these intersection options.

## **METHODOLOGY**

For the purposes of the analysis, it was assumed that East John Street/ Old Monroe Road would be a four-lane facility. Peak hour volumes were developed from the year 2035 Build forecast (NCDOT, July 2013) using NCDOT Congestion Management’s Intersection Analysis utility (IAU) tool for two-way volumes. Peak hour volumes were then redistributed based on the intersection configuration for each option. The traffic forecast and peak hour breakout sheets are included in **Appendix A**.

Level of service (LOS) is a qualitative measure describing the flow of traffic. The LOS is defined with letter designations A to F, with LOS A representing the best operating conditions and LOS F the worst. Signalized intersection and roundabout LOS threshold values are defined in **Table 1**. For this analysis, LOS D or better is considered acceptable. Signalized intersection LOS is based on delay, which is the amount of time a vehicle has to wait at an intersection. LOS, corresponding delay, and capacity at the signalized intersections were reported from the Lanes, Volumes, Timings Report of Synchro 7. In addition to Synchro, SimTraffic was used to evaluate queuing at signalized intersections. Roundabouts were analyzed using Sidra Intersection 5.1. The roundabout LOS reported is based on the Sidra methodology, which is based on the degree of saturation or volume to capacity (v/c) ratio. The analysis worksheets are included in **Appendix B**.

**Table 1: Intersection Level of Service Threshold Values**

| LOS | Threshold Values                 |                           |
|-----|----------------------------------|---------------------------|
|     | Signalized<br>(Delay in sec/veh) | Roundabout<br>(v/c ratio) |
| A   | ≤10                              | ≤0.60                     |
| B   | >10-20                           | >0.60-0.70                |
| C   | >20-35                           | >0.70-0.85                |
| D   | >35-55                           | >0.85-0.95                |
| E   | >55-80                           | >0.95-1.00                |
| F   | >80 or<br>v/c > 1                | >1.00                     |



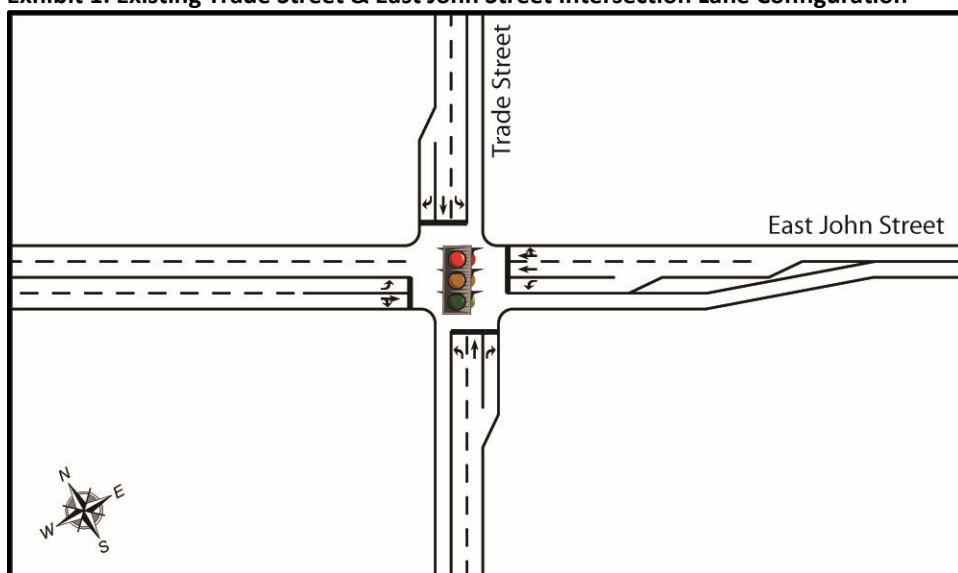
For intersections with an overall intersection LOS E or F in the year 2035, a year of failure analysis was performed to determine the year the intersection first operates at unacceptable LOS. The year of failure analysis was performed from the year 2025 to the year 2035. The year of failure analysis was not performed for years prior to 2025 because the earliest the project would be open to traffic is 2018. Any option with a year of failure prior to 2025 would not be desirable due to limited time that it would provide acceptable operations. Year 2025 peak hour volumes were developed from the traffic forecast noted above. Intermediate year peak hour volumes were determined using straight line interpolation of the year 2025 and 2035 peak hour volumes.

## **INTERSECTION ANALYSES**

### **A. TRADE STREET & EAST JOHN STREET INTERSECTION**

Currently the intersection of Trade Street and East John Street, shown in **Exhibit 1**, is a full movement, signalized intersection. Trade Street runs through the Town of Matthews central business district, which includes a national historic district. On-street parking is located along Trade Street. In this Memo, East John Street is described as the east-west roadway and Trade Street is north-south. Improvement options and preliminary results are described below.

**Exhibit 1: Existing Trade Street & East John Street Intersection Lane Configuration**

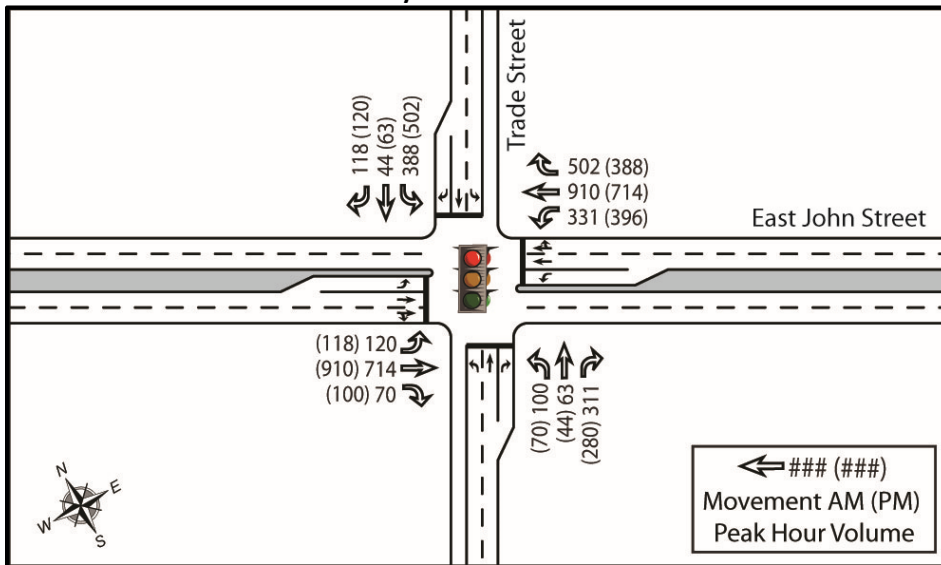


#### **OPTION A1: Full Movement – No Trade Street Improvements – Add EB Thru Only Option**

The lane geometry and peak hour volumes for OPTION A1 are shown in **Exhibit 2**. This option includes a left-turn lane, one through lane, and a shared through and right-turn lane on both East John Street approaches. The existing lane configuration for both Trade Street approaches would remain and includes a right-turn lane, a through lane, and a left-turn lane.

Intersection traffic operations analysis results for OPTION A1 are presented in **Table 2**. The year 2035 traffic operations analysis results indicate that the intersection would operate at an unacceptable overall intersection LOS in both the AM and PM peak hours. Of the 20 AM and PM peak hour lane groups, 11 would operate at an unacceptable LOS. SimTraffic simulations of the intersection indicated that in the AM peak hour the westbound left, northbound right, and southbound left movements would experience queuing that impedes the through travel lanes due to insufficient queue storage. In the PM peak hour the eastbound left, westbound left, northbound right, and southbound left movements would experience queuing issues, with the southbound left experiencing queues in excess of 1,000 feet. The year of failure analysis projected the overall intersection would operate at unacceptable LOS by the year 2025.

**Exhibit 2: OPTION A1 Lane Geometry and Peak Hour Volumes**



**Table 2: OPTION A1 Intersection Analysis Results**

| Intersection                                | MOE            | Overall        | Eastbound      |                 |   | Westbound       |                |   | Northbound     |                |                | Southbound       |                |                |
|---|----------------|----------------|----------------|-----------------|---|-----------------|----------------|---|----------------|----------------|----------------|------------------|----------------|----------------|
|   |                |                | L              | T               | R | L               | T              | R | L              | T              | R              | L                | T              | R              |
| East John St<br>at Trade St<br>(Signalized) | LOS            | E<br>(F)       | F<br>(F)       | D<br>(F)        |   | E<br>(F)        | E<br>(D)       |   | D<br>(E)       | E<br>(E)       | D<br>(D)       | F<br>(F)         | D<br>(D)       | D<br>(C)       |
|   | Delay<br>(sec) | 61.2<br>(83.3) | 98.3<br>(95.7) | 44.8<br>(109.1) |   | 72.4<br>(109.9) | 60.7<br>(37.4) |   | 54.8<br>(63.5) | 66.2<br>(60.1) | 42.1<br>(40.0) | 101.1<br>(156.6) | 42.5<br>(37.0) | 35.3<br>(27.3) |
|   | v/c            | 1.04<br>(1.22) | 0.86<br>(0.85) | 0.80<br>(1.13)  |   | 0.91<br>(1.07)  | 1.02<br>(0.84) |   | 0.44<br>(0.50) | 0.50<br>(0.35) | 0.68<br>(0.61) | 1.04<br>(1.22)   | 0.16<br>(0.15) | 0.30<br>(0.22) |

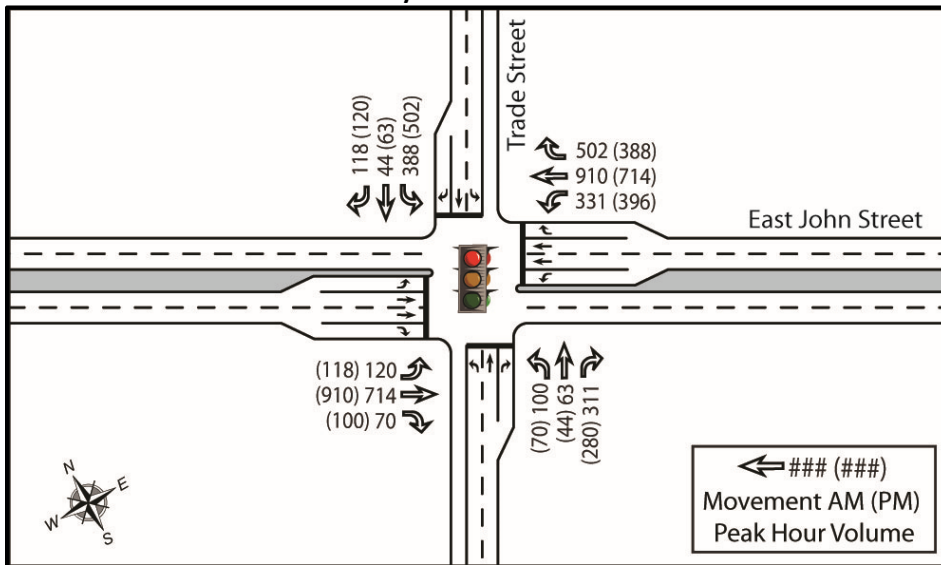
Note: AM Peak Hour  
(PM Peak Hour)

#### **OPTION A2: Full Movement – No Trade Street Improvements – Right Turn Lanes Option**

The lane geometry and peak hour volumes for OPTION A2 are shown in **Exhibit 3**. This option includes a left-turn lane, two through lanes, and a right-turn lane for both John Street approaches. The existing lane configuration for both Trade Street approaches would remain and includes a right-turn lane, through lane, and a left-turn lane.

Intersection traffic operations analysis results for OPTION A2 are presented in **Table 3**. The year 2035 traffic operations analysis results indicate that the intersection would operate at an unacceptable overall intersection LOS in both the AM and PM peak hours. In addition, ten of the 24 AM and PM peak hour lane groups at this intersection would operate at an unacceptable LOS. SimTraffic simulations of the intersection indicated that the westbound East John Street and southbound Trade Street left-turn movements would experience queuing that impedes the through travel lanes due to insufficient queue storage. Additionally, in the PM peak hour, the eastbound East John Street through movement would experience queuing well in excess of 1,000 feet, which would result in cycle failures. The year of failure analysis projected the overall intersection would operate at unacceptable LOS in the year 2030.

**Exhibit 3: OPTION A2 Lane Geometry and Peak Hour Volumes**



**Table 3: OPTION A2 Intersection Analysis Results**

| Intersection                                | MOE            | Overall        | Eastbound      |                |                | Westbound       |                |                | Northbound     |                |                | Southbound      |                |                |
|---|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|
|   |                |                | L              | T              | R              | L               | T              | R              | L              | T              | R              | L               | T              | R              |
| East John St<br>at Trade St<br>(Signalized) | LOS            | D<br>(E)       | F<br>(E)       | D<br>(F)       | C<br>(C)       | E<br>(F)        | C<br>(C)       | A<br>(A)       | D<br>(E)       | E<br>(E)       | D<br>(D)       | E<br>(F)        | D<br>(D)       | C<br>(C)       |
|   | Delay<br>(sec) | 43.1<br>(66.7) | 80.8<br>(62.8) | 47.0<br>(88.0) | 21.1<br>(22.7) | 72.4<br>(109.9) | 32.2<br>(32.6) | 9.5<br>(9.5)   | 54.5<br>(55.8) | 66.2<br>(60.1) | 42.1<br>(40.0) | 71.1<br>(127.3) | 38.8<br>(36.2) | 30.4<br>(24.9) |
|   | v/c            | 0.93<br>(1.15) | 0.77<br>(0.62) | 0.79<br>(1.06) | 0.11<br>(0.16) | 0.91<br>(1.07)  | 0.68<br>(0.58) | 0.49<br>(0.39) | 0.43<br>(0.34) | 0.50<br>(0.35) | 0.68<br>(0.61) | 0.93<br>(1.15)  | 0.14<br>(0.17) | 0.27<br>(0.23) |

Note: AM Peak Hour  
(PM Peak Hour)

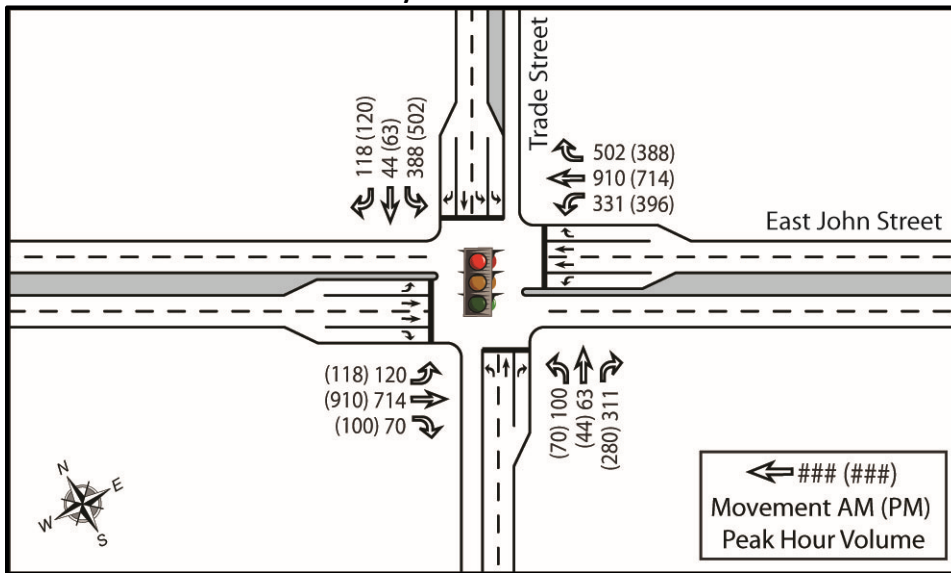
#### **OPTION A3: Full Movement – Southbound Dual Left Option**

The lane geometry and peak hour volumes for OPTION A3 are shown in **Exhibit 4**. This option includes a left-turn lane, two through lanes, and a right-turn lane on both John Street approaches. The northbound Trade Street approach is to remain with a left-turn lane, a through lane, and a right-turn lane. The southbound approach would be modified to include two left-turn lanes, a through lane, and a right-turn lane.

Intersection traffic operations analysis results for OPTION A3 are presented in **Table 4**. The year 2035 traffic operations analysis results indicate that the intersection would operate at an acceptable overall intersection LOS in both peak hours. However, ten of the 24 AM and PM peak hour lane groups operate at an unacceptable LOS. SimTraffic simulations of the intersection indicated that the southbound left-turn and westbound left-turn movements would experience queuing that impedes the through travel lanes due to insufficient queue storage.



**Exhibit 4: OPTION A3 Lane Geometry and Peak Hour Volumes**



**Table 4: OPTION A3 Intersection Analysis Results**

| Intersection                          | MOE         | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound  |             |             | Southbound  |             |             |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                                       |             |             | L           | T           | R           | L           | T           | R           | L           | T           | R           | L           | T           | R           |
| East John St at Trade St (Signalized) | LOS         | D (D)       | E (E)       | D (D)       | B (B)       | E (E)       | C (C)       | B (A)       | E (E)       | E (E)       | D (C)       | E (E)       | D (D)       | D (C)       |
|                                       | Delay (sec) | 36.0 (42.8) | 63.4 (62.8) | 36.7 (46.5) | 17.3 (19.5) | 57.0 (72.9) | 24.6 (22.9) | 11.4 (9.5)  | 57.9 (57.9) | 65.1 (60.1) | 36.8 (34.3) | 57.3 (69.1) | 50.3 (47.5) | 36.5 (33.3) |
|                                       | v/c         | 0.82 (0.94) | 0.63 (0.62) | 0.64 (0.86) | 0.10 (0.15) | 0.82 (0.94) | 0.58 (0.47) | 0.50 (0.39) | 0.50 (0.40) | 0.49 (0.35) | 0.62 (0.55) | 0.76 (0.91) | 0.22 (0.27) | 0.32 (0.30) |

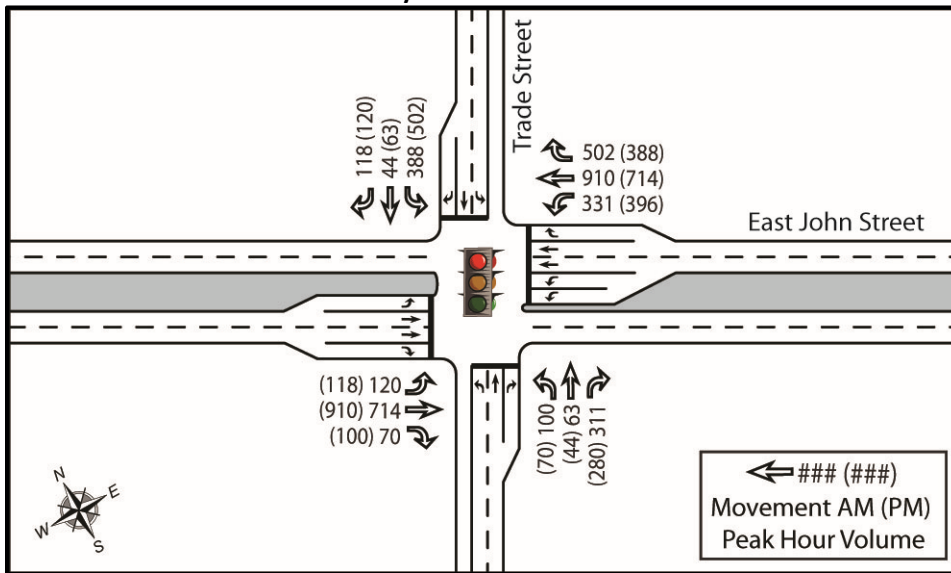
Note: AM Peak Hour  
(PM Peak Hour)

#### **OPTION A4: Full Movement – Westbound Dual Left Option**

The lane geometry and peak hour volumes for OPTION A4 are shown in **Exhibit 5**. This option includes a left turn lane, two through lanes, and a right-turn lane on the eastbound John Street approach. The westbound John Street approach would have two left-turn lanes, two through lanes, and a right-turn lane. The existing lane configuration for both Trade Street approaches would remain and includes a right-turn lane, through lane, and a left-turn lane.

Intersection traffic operations analysis results for OPTION A4 are presented in **Table 5**. The year 2035 traffic operations analysis results indicate that the intersection would operate at an acceptable overall intersection LOS in both peak hours. However, of the 24 AM and PM peak hour lane groups, ten would operate at an unacceptable LOS. SimTraffic simulations of the intersection indicated that the southbound Trade Street left-turn and northbound right-turn movements would experience queuing that impedes the through travel lanes due to insufficient queue storage.

**Exhibit 5: OPTION A4 Lane Geometry and Peak Hour Volumes**



**Table 5: OPTION A4 Intersection Analysis Results**

| Intersection                          | MOE         | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound  |             |             | Southbound  |             |             |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                                       |             |             | L           | T           | R           | L           | T           | R           | L           | T           | R           | L           | T           | R           |
| East John St at Trade St (Signalized) | LOS         | D (D)       | E (E)       | D (D)       | B (B)       | D (E)       | D (D)       | A (A)       | D (E)       | E (E)       | E (E)       | E (E)       | D (C)       | C (C)       |
|                                       | Delay (sec) | 40.7 (49.6) | 75.9 (62.8) | 40.7 (51.8) | 18.6 (19.9) | 51.7 (72.6) | 36.1 (37.8) | 9.9 (9.5)   | 54.9 (55.1) | 65.1 (60.1) | 57.3 (62.6) | 58.8 (78.1) | 35.6 (32.3) | 27.4 (21.9) |
|                                       | v/c         | 0.86 (0.99) | 0.73 (0.62) | 0.70 (0.91) | 0.10 (0.14) | 0.62 (0.89) | 0.73 (0.65) | 0.49 (0.39) | 0.44 (0.32) | 0.49 (0.35) | 0.82 (0.83) | 0.86 (0.99) | 0.12 (0.15) | 0.24 (0.21) |

Note: AM Peak Hour  
(PM Peak Hour)

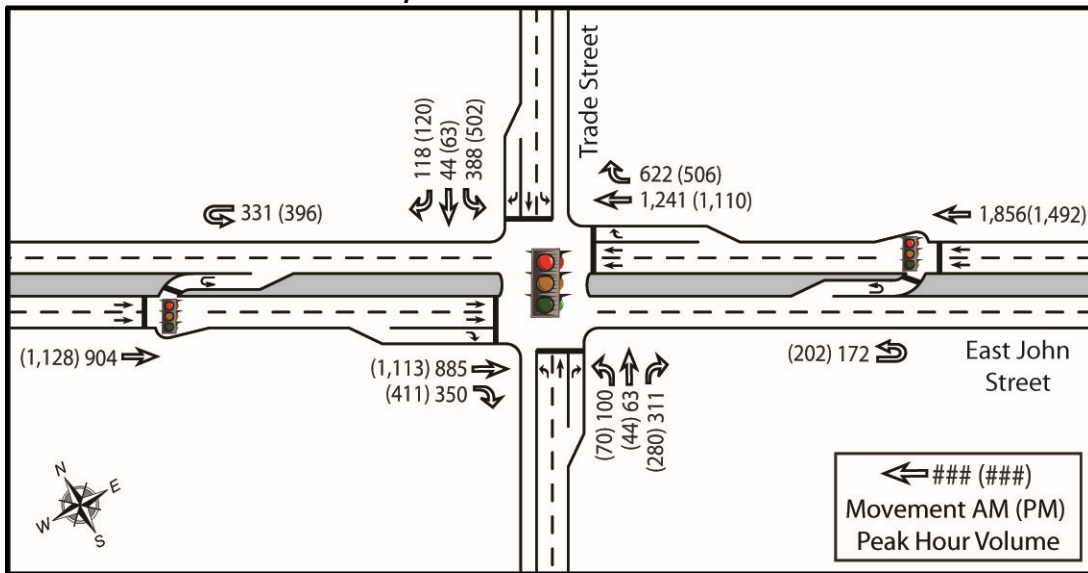
#### **OPTION A5: Hybrid – No Trade Streets Improvements Option**

The lane geometry and peak hour volumes for OPTION A5 are shown in **Exhibit 6**. The main difference with this option compared to the full movement options (OPTIONS A1 through A4) is the redirection of left-turn movements from East John Street to Trade Street at the intersection. Traffic desiring to turn left at the intersection is rerouted to a downstream signalized u-turn location on East John Street, and would then make a right-turn onto Trade Street. Redirecting the left-turn movement and removal of the left-turn lane from the intersection reduces the number of signal phases, allowing for more green time to be given to the other movements and reducing the required amount of right-of-way compared to the full movement intersection.

For this option, the eastbound and westbound East John Street approaches would consist of two through lanes and a right-turn lane. The existing lane configuration for both Trade Street approaches, which includes a right-turn lane, through lane, and a left-turn lane, would remain with this option.

Intersection traffic operations analysis results for OPTION A5 are presented in **Table 6**. The year 2035 traffic operations analysis results indicate that the overall intersection LOS for the Trade Street and East John Street intersection, as well as the two u-turn locations, would operate at an acceptable LOS in both peak hours. However, at the Trade Street and John Street intersection, four of the 20 AM and PM peak hour lane groups would operate at an unacceptable LOS. None of the lane groups at the signalized u-turn locations would operate at unacceptable LOS. SimTraffic simulations of the intersection indicated that the southbound Trade Street left-turn and northbound right-turn movements would experience queuing that impedes the through travel lanes due to insufficient queue storage. Neither of the u-turn locations would experience queuing issues.

**Exhibit 6: OPTION A5 Lane Geometry and Peak Hour Volumes**



**Table 6: OPTION A5 Intersection Analysis Results**

| Intersection                          | MOE         | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound  |             |              | Southbound  |             |             |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
|                                       |             |             | U           | T           | R           | U           | T           | R           | L           | T           | R            | L           | T           | R           |
| East John St at Trade St (Signalized) | LOS         | D (D)       | -           | C (D)       | A (B)       | -           | D (D)       | A (A)       | D (D)       | C (C)       | F (F)        | F (F)       | C (C)       | C (C)       |
|                                       | Delay (sec) | 38.4 (47.2) | -           | 25.0 (51.3) | 7.5 (11.3)  | -           | 43.6 (44.0) | 6.5 (5.8)   | 37.0 (38.9) | 30.6 (32.7) | 95.9 (122.3) | 91.8 (85.8) | 23.2 (21.7) | 27.2 (23.3) |
|                                       | v/c         | 1.04 (1.11) | -           | 0.73 (1.00) | 0.38 (0.54) | -           | 1.00 (0.98) | 0.64 (0.50) | 0.30 (0.34) | 0.18 (0.15) | 1.04 (1.11)  | 1.04 (1.05) | 0.10 (0.11) | 0.31 (0.24) |
| U-turn west of Trade St (Signalized)  | LOS         | B (B)       | -           | B (B)       | -           | C (C)       | -           | -           | -           | -           | -            | -           | -           | -           |
|                                       | Delay (sec) | 15.4 (17.4) | -           | 12.2 (16.1) | -           | 24.3 (20.9) | -           | -           | -           | -           | -            | -           | -           | -           |
|                                       | v/c         | 0.72 (0.77) | -           | 0.48 (0.64) | -           | 0.72 (0.77) | -           | -           | -           | -           | -            | -           | -           | -           |
| U-turn east of Trade St (Signalized)  | LOS         | B (B)       | D (D)       | -           | -           | -           | B (B)       | -           | -           | -           | -            | -           | -           | -           |
|                                       | Delay (sec) | 14.7 (14.3) | 46.9 (40.9) | -           | -           | -           | 11.7 (10.7) | -           | -           | -           | -            | -           | -           | -           |
|                                       | v/c         | 0.80 (0.68) | 0.66 (0.63) | -           | -           | -           | 0.80 (0.68) | -           | -           | -           | -            | -           | -           | -           |

Note: AM Peak Hour  
(PM Peak Hour)

#### **OPTION A6: Hybrid – Southbound Dual Left**

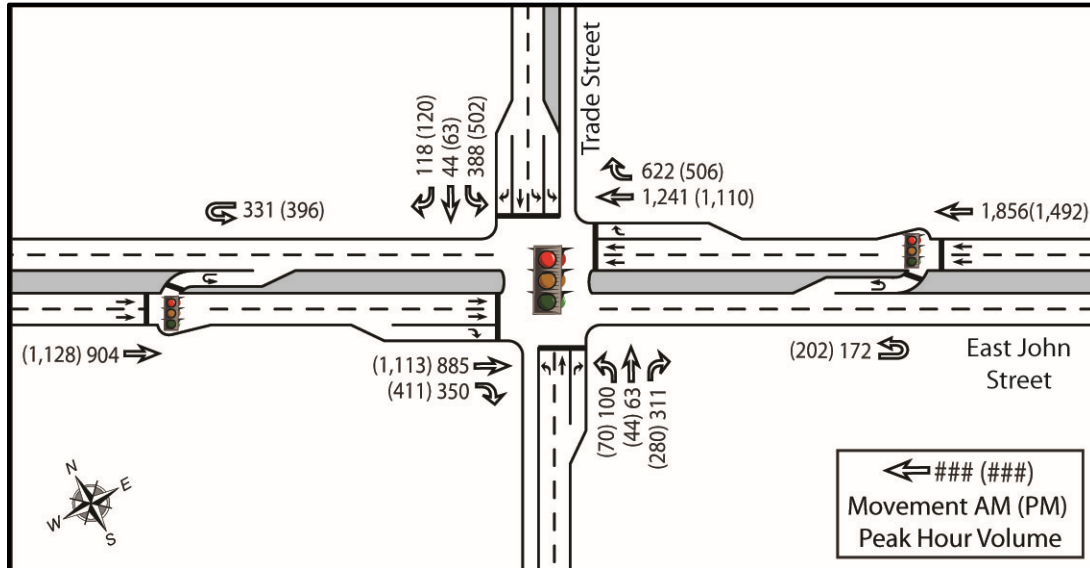
The lane geometry and peak hour volumes for OPTION A6 are shown in **Exhibit 7**. For this option, the East John Street left-turn movements are redirected to u-turn locations in the same way as the OPTION A5. This option also shares the same lane geometry on the eastbound, westbound and northbound approaches as OPTION A5. The difference between this option and OPTION A5 is OPTION A6 would have an additional southbound left-turn lane, which makes for two left-turn lanes, one through lane, and one right-turn lane on the southbound Trade Street approach.

Intersection traffic operations analysis results for OPTION A6 are presented in **Table 7**. The year 2035 traffic operations analysis results indicate that the overall intersection LOS for the Trade Street and East John Street intersection, as well as the two U-turn locations, would operate with an acceptable LOS in both peak hours. At the Trade Street and John



Street intersection, one of the 20 AM and PM peak hour lane groups operate with an unacceptable LOS. None of the lane groups at the signalized u-turn locations would operate at unacceptable LOS. SimTraffic simulations of the intersection indicated that the southbound Trade Street left-turn movement would experience queuing that impedes the through travel lane due to insufficient queue storage. Neither of the u-turn locations would experience queuing issues.

**Exhibit 7: OPTION A6 Lane Geometry and Peak Hour Volumes**



**Table 7: OPTION A6 Intersection Analysis Results**

| Intersection                          | MOE         | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound  |             |             | Southbound  |             |             |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                                       |             |             | U           | T           | R           | U           | T           | R           | L           | T           | R           | L           | T           | R           |
| East John St at Trade St (Signalized) | LOS         | C (C)       | -           | C (C)       | A (A)       | -           | C (C)       | A (A)       | D (D)       | C (C)       | D (E)       | D (D)       | C (C)       | C (C)       |
|                                       | Delay (sec) | 26.5 (27.7) | -           | 22.0 (29.2) | 7.7 (8.7)   | -           | 28.7 (26.5) | 8.8 (7.7)   | 41.0 (39.2) | 26.2 (28.1) | 52.7 (57.8) | 49.9 (45.2) | 25.7 (24.6) | 28.7 (26.8) |
|                                       | v/c         | 0.92 (0.88) | -           | 0.67 (0.88) | 0.41 (0.50) | -           | 0.92 (0.86) | 0.69 (0.54) | 0.45 (0.34) | 0.15 (0.12) | 0.85 (0.86) | 0.81 (0.81) | 0.10 (0.13) | 0.30 (0.28) |
| U-turn west of Trade St (Signalized)  | LOS         | B (B)       | -           | B (B)       | -           | C (C)       | -           | -           | -           | -           | -           | -           | -           | -           |
|                                       | Delay (sec) | 15.0 (17.3) | -           | 12.2 (16.1) | -           | 22.9 (20.6) | -           | -           | -           | -           | -           | -           | -           | -           |
|                                       | v/c         | 0.72 (0.77) | -           | 0.48 (0.64) | -           | 0.72 (0.77) | -           | -           | -           | -           | -           | -           | -           | -           |
| U-turn east of Trade St (Signalized)  | LOS         | B (B)       | D (D)       | -           | -           | -           | B (B)       | -           | -           | -           | -           | -           | -           | -           |
|                                       | Delay (sec) | 14.7 (14.3) | 47.1 (41.3) | -           | -           | -           | 11.7 (10.7) | -           | -           | -           | -           | -           | -           | -           |
|                                       | v/c         | 0.80 (0.68) | 0.66 (0.63) | -           | -           | -           | 0.80 (0.68) | -           | -           | -           | -           | -           | -           | -           |

Note: AM Peak Hour  
(PM Peak Hour)

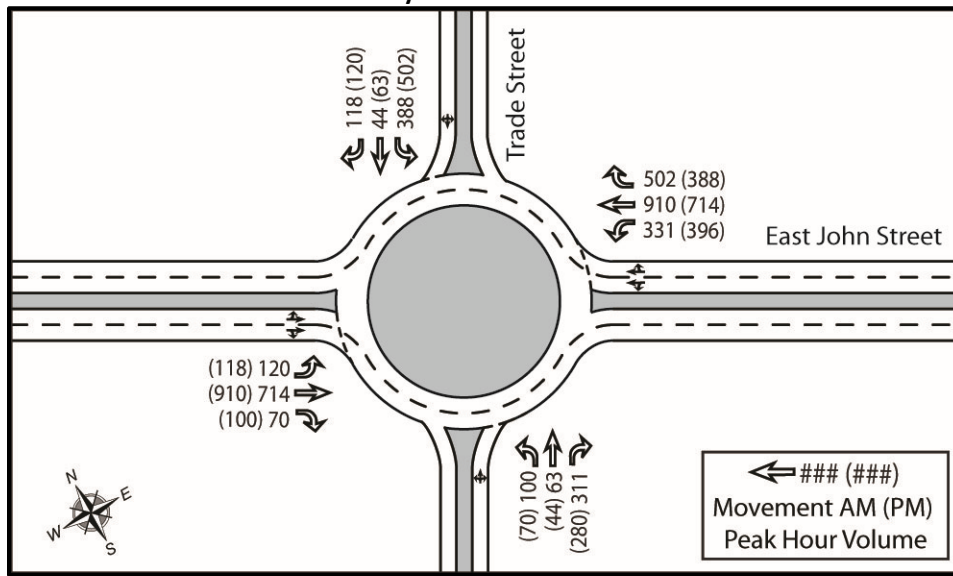
#### **OPTION A7: Roundabout – Matthews Option**

The lane geometry and peak hour volumes for OPTION A7 are shown in **Exhibit 8**. This option was provided to the project team by the Town of Matthews as a possible option to minimize physical impacts associated with improving this intersection. This option replaces the existing signalized intersection with a roundabout. Both East John Street

approaches would consist of a shared through and left-turn lane and a shared through and right-turn lane. Both Trade Street approaches would consist of a shared left-turn, through, and right-turn lane.

Intersection traffic operations analysis results for OPTION A7 are presented in **Table 8**. The traffic operations analysis results indicate that the overall intersection would operate at an unacceptable LOS in both the AM and PM peak hours. Of the eight AM and PM lane groups, four would operate at an unacceptable LOS. The Trade Street approaches would experience queuing in excess of 1,000 feet in both the AM and PM peak hours. The year of failure analysis projected the overall intersection would operate at unacceptable LOS by the year 2025.

**Exhibit 8: OPTION A7 Lane Geometry and Peak Hour Volumes**



**Table 8: OPTION A7 Intersection Analysis Results**

| Intersection                          | MOE         | Overall       | Eastbound   |   |   | Westbound  |   |   | Northbound    |   |   | Southbound    |   |   |
|---------------------------------------|-------------|---------------|-------------|---|---|------------|---|---|---------------|---|---|---------------|---|---|
|                                       |             |               | L           | T | R | L          | T | R | L             | T | R | L             | T | R |
| East John St at Trade St (Roundabout) | LOS         | F (F)         | B (D)       |   |   | D (C)      |   |   | F (F)         |   |   | F (F)         |   |   |
|                                       | Delay (sec) | 113.2 (127.4) | 9.7 (31.6)  |   |   | 10.5 (6.1) |   |   | 166.7 (255.4) |   |   | 562.5 (476.5) |   |   |
|                                       | v/c         | 2.20 (2.02)   | 0.65 (0.93) |   |   | 0.86 (.71) |   |   | 1.33 (1.51)   |   |   | 2.20 (2.02)   |   |   |

Notes: AM Peak Hour  
(PM Peak Hour)  
LOS determined using Sidra methodology, which is based on v/c ratio not delay.

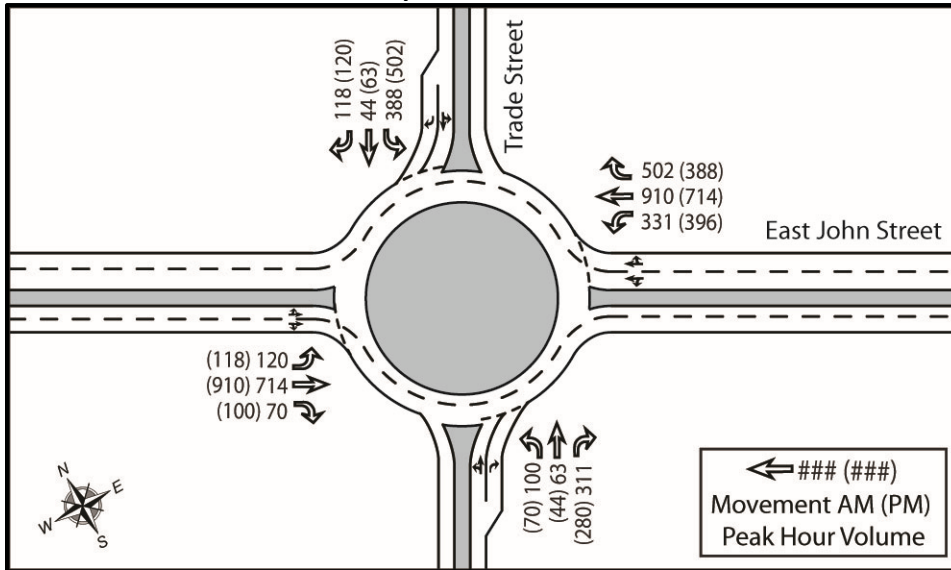
#### **OPTION A8: Roundabout – Right Turn Lanes Option**

The lane geometry and peak hour volumes for OPITON A8 are shown in **Exhibit 9**. Similar to OPTION A7, this option replaces the existing signalized intersection with a roundabout. However, this option includes exclusive right-turn lanes on both Trade Street approaches. Both East John Street approaches would consist of a shared through and left-turn lane and a shared through and right-turn lane. Both Trade Street approaches would consist of a shared through and left-turn lane and a right-turn lane.

Intersection traffic operations analysis results for OPTION A8 are presented in **Table 9**. The traffic operations analysis results indicate that the overall intersection would operate at an unacceptable LOS in both the AM and PM peak hours. Of the 12 AM and PM lane groups, three would operate at an unacceptable LOS. The southbound approach would experience queues in excess of 1,000 feet in the AM and PM peak hours. Additionally, the eastbound approach would

experience queues in excess of 1,000 feet in the PM peak hour. The overall intersection would operate at unacceptable LOS by the year 2025.

**Exhibit 9: OPTION A8 Lane Geometry and Peak Hour Volumes**



**Table 9: OPTION A8 Intersection Analysis Results**

| Intersection                          | MOE         | Overall     | Eastbound    |   |   | Westbound   |   |   | Northbound  |   |   | Southbound    |   |   |
|---------------------------------------|-------------|-------------|--------------|---|---|-------------|---|---|-------------|---|---|---------------|---|---|
|                                       |             |             | L            | T | R | L           | T | R | L           | T | R | L             | T | R |
| East John St at Trade St (Roundabout) | LOS         | F (F)       | C (F)        |   |   | D (C)       |   |   | A (A)       |   |   | F (F)         |   |   |
|                                       | Delay (sec) | 35.6 (64.1) | 14.9 (110.5) |   |   | 13.9 (6.8)  |   |   | 15.5 (19.7) |   |   | 193.1 (165.9) |   |   |
|                                       | v/c         | 1.37 (1.32) | 0.73 (1.17)  |   |   | 0.90 (0.72) |   |   | 0.60 (0.60) |   |   | 1.37 (1.32)   |   |   |

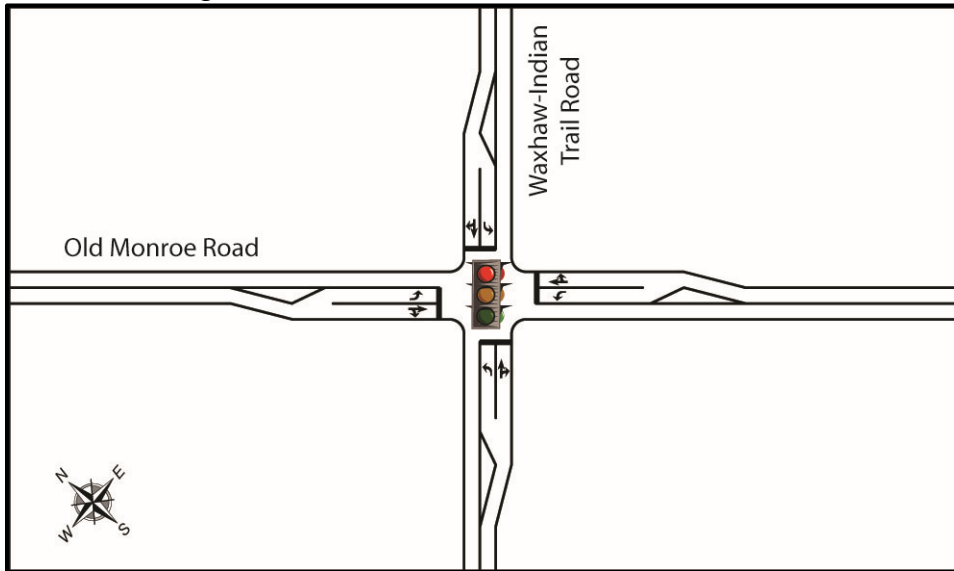
Notes: AM Peak Hour  
(PM Peak Hour)  
LOS determined using Sidra methodology, which is based on v/c ratio not delay.

### **WAXHAW-INDIAN TRAIL ROAD INTERSECTION**

Currently the intersection of Waxhaw-Indian Trail Road and Old Monroe Road, shown in **Exhibit 10**, is a full movement, signalized intersection. In this Memo, Old Monroe Road is described as the east-west roadway and Waxhaw-Indian Trail Road is north-south. The year 2035 high volume movements include the Old Monroe Road and Waxhaw-Indian Trail Road through movements, the westbound Old Monroe Road left-turn movement, and the northbound Waxhaw-Indian Trail Road right-turn movement. Improvement options and preliminary results are described below.



**Exhibit 10: Existing Waxhaw-Indian Trail Road & Old Monroe Road Intersection Lane Configuration**

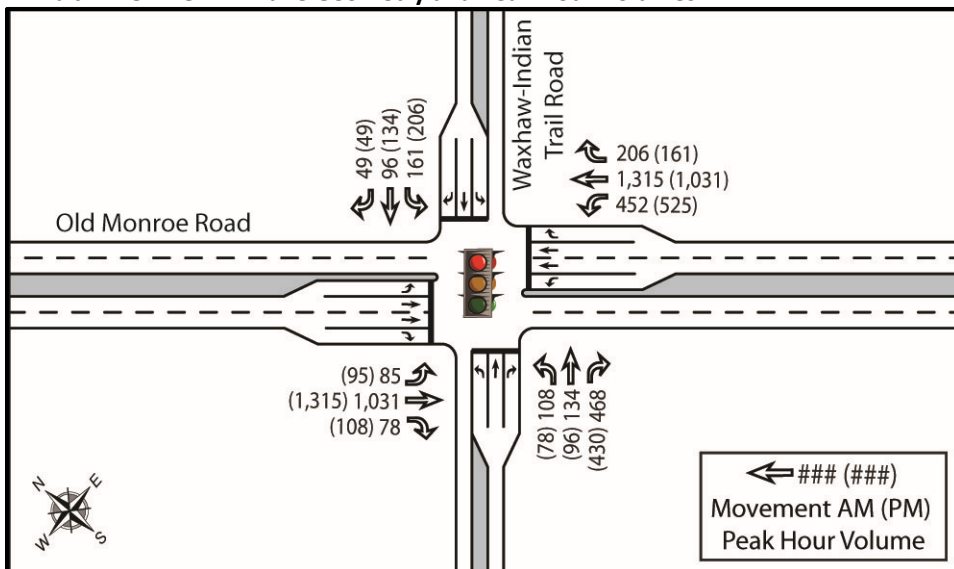


**OPTION B1: Full Movement – Turn Lanes Option**

The lane geometry and peak hour volumes for OPTION B1 are shown in **Exhibit 11**. This option assumes a left-turn lane, two through lanes, and a right-turn lane in each direction along Old Monroe Road. It is also assumed that Waxhaw-Indian Trail Road will include a left-turn lane, a through lane, and a right-turn lane on each approach.

Intersection traffic operations analysis results for OPTION B1 are presented in **Table 10**. The traffic operations analysis results indicate that the overall intersection would operate at an acceptable LOS in the AM peak hour and an unacceptable LOS in the PM peak hour. Of the 24 AM and PM lane groups, 14 would operate at an unacceptable LOS. SimTraffic simulations indicate that the eastbound left-turn, westbound left-turn, and northbound right-turn movements would experience queuing that impedes the through travel lanes due to insufficient queue storage. The year of failure analysis projected the overall intersection would operate at unacceptable LOS by the year 2025.

**Exhibit 11: OPTION B1 Lane Geometry and Peak Hour Volumes**



**Table 10: OPTION B1 Intersection Analysis Results**

| Intersection   | MOE         | Overall     | Eastbound   |              |             | Westbound    |             |             | Northbound  |              |             | Southbound    |             |             |
|--|-------------|-------------|-------------|--------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|---------------|-------------|-------------|
|  |             |             | L           | T            | R           | L            | T           | R           | L           | T            | R           | L             | T           | R           |
| Old Monroe Road at Waxhaw-Indian Trail Road (Signalized) | LOS         | D (E)       | E (E)       | E (F)        | B (B)       | E (F)        | C (C)       | A (A)       | E (E)       | F (F)        | D (D)       | F (F)         | E (E)       | D (C)       |
|  | Delay (sec) | 48.3 (77.6) | 63.4 (61.3) | 55.2 (105.6) | 17.6 (17.5) | 78.4 (150.8) | 25.3 (21.0) | 7.4 (7.3)   | 79.9 (77.1) | 117.9 (87.1) | 40.6 (41.7) | 102.9 (172.4) | 64.5 (73.8) | 36.4 (34.1) |
|  | v/c         | 0.98 (1.21) | 0.55 (0.55) | 0.95 (1.13)  | 0.12 (0.16) | 0.98 (1.21)  | 0.77 (0.61) | 0.21 (0.17) | 0.74 (0.65) | 0.96 (0.76)  | 0.79 (0.77) | 0.93 (1.19)   | 0.58 (0.74) | 0.14 (0.13) |

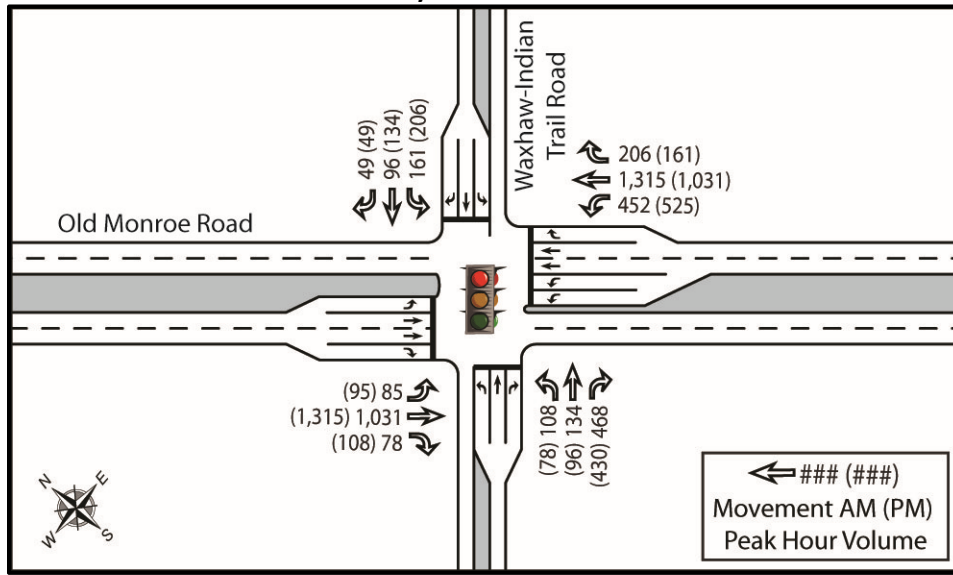
Note: AM Peak Hour  
(PM Peak Hour)

**OPTION B2: Full Movement – Westbound Dual Left Option**

The lane geometry and peak hour volumes for OPTION B2 are shown in **Exhibit 12**. The eastbound Old Monroe Road approach would consist of one left-turn lane, two through lanes, and a right-turn lane. The westbound Old Monroe Road approach would include two left-turn lanes, two through lanes, and a right-turn lane. Both Waxhaw-Indian Trail Road approaches would include a left-turn lane, a through lane, and a right-turn lane.

Intersection traffic operations analysis results for OPTION B2 are presented in **Table 11**. The traffic operations analysis results indicate that the overall intersection would operate at an acceptable LOS in both peak hours. However, 12 of the 24 AM and PM lane groups would operate at an unacceptable LOS. SimTraffic simulations indicate that the northbound right-turn would experience queuing that impedes the through travel lane due to insufficient queue storage.

**Exhibit 12: OPTION B2 Lane Geometry and Peak Hour Volumes**



**Table 11: OPTION B2 Intersection Analysis Results**

| Intersection   | MOE         | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound  |             |             | Southbound   |             |             |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|
|  |             |             | L           | T           | R           | L           | T           | R           | L           | T           | R           | L            | T           | R           |
| Old Monroe Road at Waxhaw-Indian Trail Road (Signalized) | LOS         | D (D)       | F (E)       | D (D)       | B (B)       | D (F)       | C (C)       | A (A)       | E (E)       | F (F)       | D (F)       | E (F)        | E (E)       | D (C)       |
|  | Delay (sec) | 41.6 (52.1) | 83.3 (61.3) | 43.0 (45.2) | 15.3 (12.8) | 46.7 (81.8) | 26.2 (23.5) | 6.9 (7.3)   | 73.6 (76.8) | 81.9 (87.1) | 54.9 (93.2) | 79.6 (103.0) | 55.5 (60.0) | 37.0 (31.7) |
|  | v/c         | 0.89 (1.03) | 0.72 (0.55) | 0.87 (0.95) | 0.11 (0.14) | 0.66 (0.98) | 0.78 (0.64) | 0.21 (0.17) | 0.69 (0.65) | 0.80 (0.76) | 0.89 (1.03) | 0.82 (0.97)  | 0.45 (0.60) | 0.14 (0.12) |

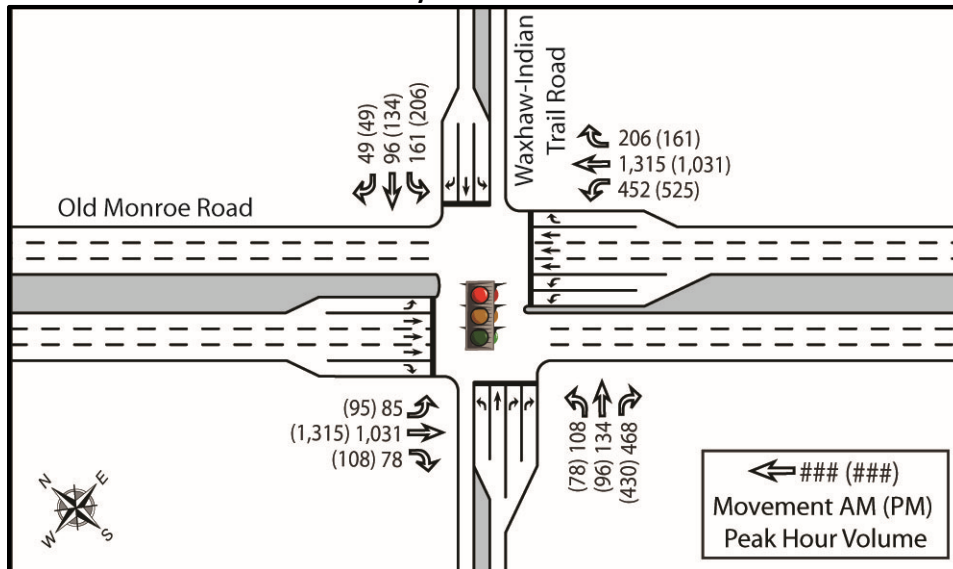
Note: AM Peak Hour  
(PM Peak Hour)

#### OPTION B3: Full Movement – Six Lanes Option

The lane geometry and peak hour volumes for OPTION B3 are shown in **Exhibit 13**. Both Old Monroe Road approaches would include three through lanes and one right-turn lane. The eastbound approach would have only one left-turn lane, while the westbound approach would have two left-turn lanes. The two Waxhaw-Indian Trail Road approaches would include one through lane and one left-turn lane. The northbound approach would have two right-turn lanes, while the southbound approach would have one right-turn lane.

Intersection traffic operations analysis results for OPTION B3 are presented in **Table 12**. The traffic operations analysis results indicate that the overall intersection would operate at an acceptable LOS in the AM and PM peak hours. Of the 24 AM and PM lane groups, eight would operate at an unacceptable LOS. SimTraffic simulations indicate that none of the movements would experience substantial queuing issues.

**Exhibit 13: OPTION B3 Lane Geometry and Peak Hour Volumes**





**Table 12: OPTION B3 Intersection Analysis Results**

| Intersection   | MOE         | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound  |             |             | Southbound  |             |             |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|  |             |             | L           | T           | R           | L           | T           | R           | L           | T           | R           | L           | T           | R           |
| Old Monroe Road at Waxhaw-Indian Trail Road (Signalized) | LOS         | D (D)       | E (E)       | D (D)       | B (B)       | D (D)       | C (C)       | B (A)       | E (E)       | E (E)       | C (C)       | E (E)       | D (D)       | C (C)       |
|  | Delay (sec) | 36.0 (38.2) | 62.8 (61.3) | 35.4 (39.1) | 16.8 (17.3) | 52.7 (54.9) | 27.6 (23.6) | 10.0 (8.1)  | 62.5 (63.3) | 61.3 (69.6) | 31.0 (33.1) | 61.6 (67.0) | 47.4 (51.7) | 29.0 (28.7) |
|  | v/c         | 0.75 (0.81) | 0.54 (0.55) | 0.65 (0.81) | 0.11 (0.16) | 0.75 (0.81) | 0.64 (0.49) | 0.23 (0.17) | 0.59 (0.52) | 0.62 (0.63) | 0.51 (0.50) | 0.68 (0.78) | 0.35 (0.49) | 0.11 (0.11) |

Note: AM Peak Hour  
(PM Peak Hour)

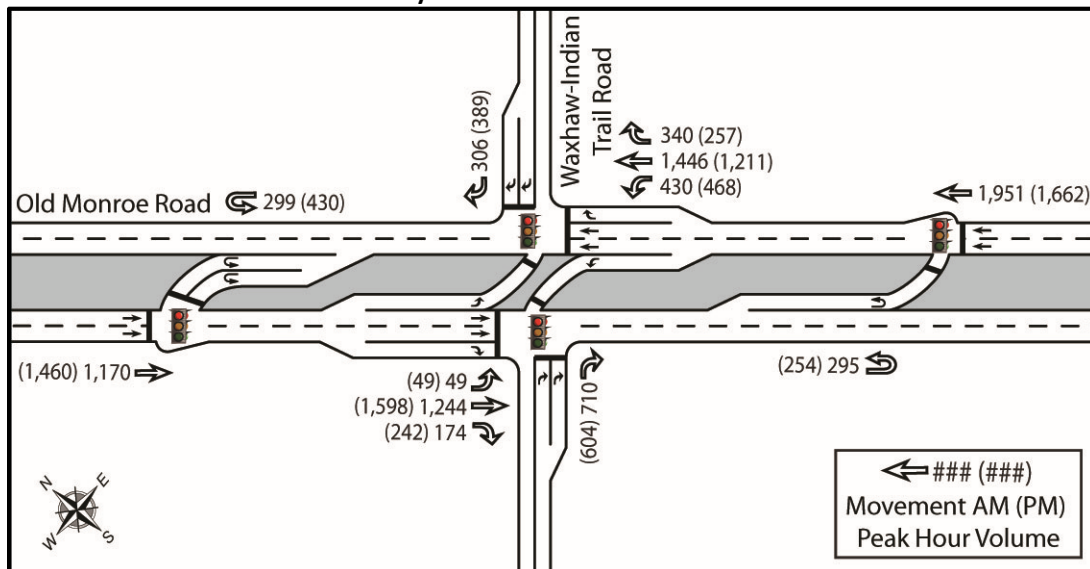
#### OPTION B4: Superstreet – Turn Lanes Option

The lane geometry and peak hour volumes for OPTION B4 are shown in **Exhibit 14**. The superstreet intersection would redistribute the through and left-turn movements from Waxhaw-Indian Trail Road to u-turn locations on Old Monroe Road. This configuration allows for two-phase signals that operate independently in the eastbound and westbound directions.

Both Waxhaw-Indian Trail Road approaches would have two right-turn lanes while the eastbound and westbound Old Monroe Road approaches would both have a left-turn lane, two through lanes, and a right-turn lane. The two u-turn locations would both be signalized. The u-turn location west of the intersection would include dual u-turn lanes while the u-turn location to the east would have a single u-turn lane.

Intersection traffic operations analysis results for OPTION B4 are presented in **Table 13**. The traffic operations analysis results indicate that the overall intersection for the Waxhaw-Indian Trail Road intersection, as well as the two u-turn locations, would operate at an acceptable LOS in both the AM and PM peak hours. At all three locations, all lane groups would operate at acceptable LOS in both peak hours. SimTraffic simulations indicate that the westbound left-turn movement would experience queuing that impedes the through travel lanes due to insufficient queue storage.

**Exhibit 14: OPTION B4 Lane Geometry and Peak Hour Volumes**



**Table 13: OPTION B4 Intersection Analysis Results**

| Intersection   | MOE         | Overall     | Eastbound   |             |             |             | Westbound   |             |             |             | NB          | SB          |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|  |             |             | U           | L           | T           | R           | U           | L           | T           | R           | R           | R           |
| Eastbound Old Monroe Road                                |             |             |             |             |             |             |             |             |             |             |             |             |
| Old Monroe Road at Waxhaw-Indian Trail Road (Signalized) | LOS         | C (C)       | -           | -           | B (C)       | B (B)       | -           | B (C)       | -           | -           | C (C)       | -           |
|  | Delay (sec) | 22.6 (27.7) | -           | -           | 19.5 (25.4) | 13.9 (11.5) | -           | 15.8 (35.0) | -           | -           | 34.2 (34.5) | -           |
|  | v/c         | 0.82 (0.90) | -           | -           | 0.74 (0.90) | 0.23 (0.30) | -           | 0.75 (0.90) | -           | -           | 0.82 (0.77) | -           |
| U-turn west of Waxhaw-Indian Trail Road (Signalized)     | LOS         | B (B)       | -           | -           | A (B)       | -           | C (C)       | -           | -           | -           | -           | -           |
|  | Delay (sec) | 10.9 (14.5) | -           | -           | 7.3 (11.2)  | -           | 25.1 (25.5) | -           | -           | -           | -           | -           |
|  | v/c         | 0.55 (0.70) | -           | -           | 0.53 (0.70) | -           | 0.55 (0.66) | -           | -           | -           | -           | -           |
| Westbound Old Monroe Road                                |             |             |             |             |             |             |             |             |             |             |             |             |
| Old Monroe Road at Waxhaw-Indian Trail Road (Signalized) | LOS         | A (B)       | -           | C (B)       | -           | -           | -           | -           | A (A)       | A (A)       | -           | D (D)       |
|  | Delay (sec) | 9.8 (13.8)  | -           | 24.4 (15.9) | -           | -           | -           | -           | 4.8 (8.2)   | 3.6 (5.7)   | -           | 38.4 (36.6) |
|  | v/c         | 0.66 (0.67) | -           | 0.15 (0.13) | -           | -           | -           | -           | 0.66 (0.58) | 0.35 (0.28) | -           | 0.63 (0.67) |
| U-turn east of Waxhaw-Indian Trail Road (Signalized)     | LOS         | C (B)       | D (C)       | -           | -           | -           | -           | -           | C (B)       | -           | -           | -           |
|  | Delay (sec) | 23.3 (15.9) | 37.2 (28.0) | -           | -           | -           | -           | -           | 21.2 (14.1) | -           | -           | -           |
|  | v/c         | 0.92 (0.79) | 0.85 (0.73) | -           | -           | -           | -           | -           | 0.92 (0.79) | -           | -           | -           |

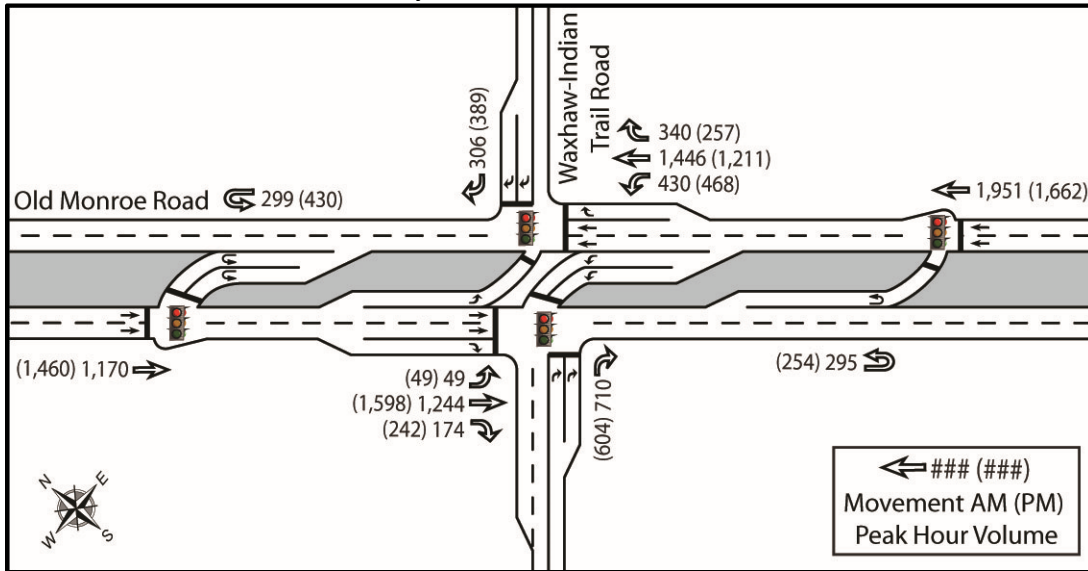
Note: AM Peak Hour  
(PM Peak Hour)

#### **OPTION B5: Superstreet – Westbound Dual Left Option**

The lane geometry and peak hour volumes for OPTION B5 are shown in **Exhibit 15**. This option is the same as OPTION B4 except the westbound Old Monroe Road approach would have two left-turn lanes instead of one left-turn lane.

Intersection traffic operations analysis results for OPTION B5 are presented in **Table 14**. The traffic operations analysis results indicate that the overall Waxhaw-Indian Trail Road intersection, as well as the two U-turn locations, would operate at an acceptable LOS in both the AM and PM peak hours. At all three locations, all lane groups would operate at an acceptable LOS in both peak hours. SimTraffic simulations indicate that none of the movements would experience substantial queuing issues.

**Exhibit 15: OPTION B5 Lane Geometry and Peak Hour Volumes**



**Table 14: OPTION B5 Intersection Analysis Results**

| Intersection   | MOE         | Overall     | Eastbound   |             |             |             | Westbound   |             |             |             | NB          | SB          |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|  |             |             | U           | L           | T           | R           | U           | L           | T           | R           | R           | R           |
| Eastbound Old Monroe Road                                |             |             |             |             |             |             |             |             |             |             |             |             |
| Old Monroe Road at Waxhaw-Indian Trail Road (Signalized) | LOS         | C (C)       | -           | -           | B (C)       | B (A)       | -           | B (B)       | -           | -           | C (D)       | -           |
|  | Delay (sec) | 21.6 (24.0) | -           | -           | 19.5 (20.8) | 13.9 (9.6)  | -           | 10.2 (18.5) | -           | -           | 34.2 (42.8) | -           |
|  | v/c         | 0.82 (0.86) | -           | -           | 0.74 (0.85) | 0.23 (0.29) | -           | 0.39 (0.53) | -           | -           | 0.82 (0.86) | -           |
| U-turn west of Waxhaw-Indian Trail Road (Signalized)     | LOS         | B (B)       | -           | -           | A (B)       | -           | C (C)       | -           | -           | -           | -           | -           |
|  | Delay (sec) | 10.9 (14.6) | -           | -           | 7.3 (11.2)  | -           | 25.1 (26.1) | -           | -           | -           | -           | -           |
|  | v/c         | 0.55 (0.70) | -           | -           | 0.53 (0.70) | -           | 0.55 (0.66) | -           | -           | -           | -           | -           |
| Westbound Old Monroe Road                                |             |             |             |             |             |             |             |             |             |             |             |             |
| Old Monroe Road at Waxhaw-Indian Trail Road (Signalized) | LOS         | A (B)       | -           | C (B)       | -           | -           | -           | -           | A (A)       | A (A)       | -           | D (D)       |
|  | Delay (sec) | 9.8 (13.8)  | -           | 24.4 (16.1) | -           | -           | -           | -           | 4.8 (8.2)   | 3.6 (5.7)   | -           | 38.4 (36.6) |
|  | v/c         | 0.66 (0.67) | -           | 0.15 (0.13) | -           | -           | -           | -           | 0.66 (0.58) | 0.35 (0.28) | -           | 0.63 (0.67) |
| U-turn east of Waxhaw-Indian Trail Road (Signalized)     | LOS         | C (B)       | D (C)       | -           | -           | -           | -           | -           | C (B)       | -           | -           | -           |
|  | Delay (sec) | 23.3 (15.7) | 37.2 (26.1) | -           | -           | -           | -           | -           | 21.2 (14.1) | -           | -           | -           |
|  | v/c         | 0.92 (0.79) | 0.85 (0.73) | -           | -           | -           | -           | -           | 0.92 (0.79) | -           | -           | -           |

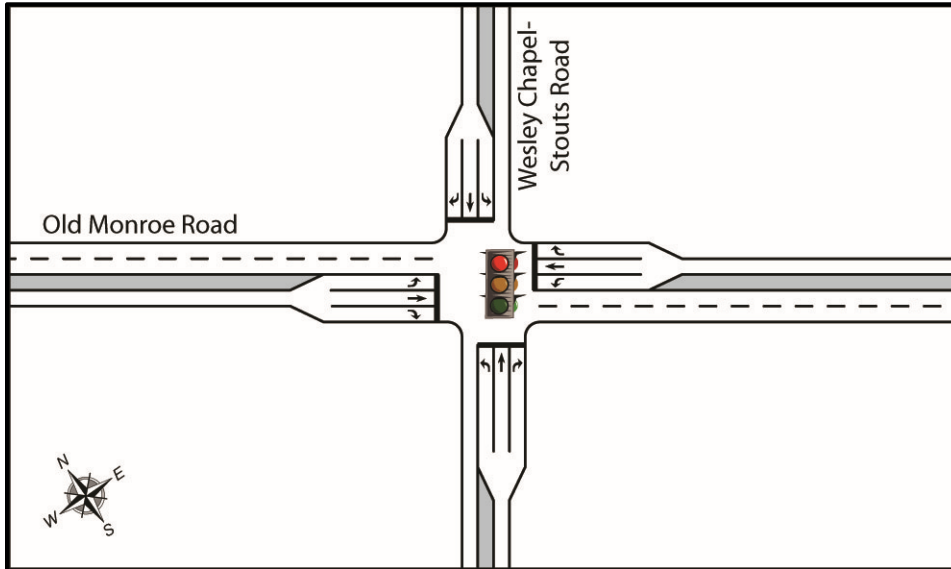
Note: AM Peak Hour  
(PM Peak Hour)



### **WESLEY CHAPEL-STOUTS ROAD & OLD MONROE ROAD INTERSECTION**

Currently the intersection of Wesley Chapel-Stouts Road and Old Monroe Road, as shown in **Exhibit 16**, is a full movement, signalized intersection. In this Memo, Old Monroe Road is described as the east-west roadway and Wesley Chapel-Stouts Road is north-south. The year 2035 high volume movements include the Old Monroe Road and Wesley Chapel-Stouts Road through movements, as well as the eastbound Old Monroe Road right-turn and northbound Wesley Chapel-Stouts Road left-turn movements. Closely spaced signalized intersections located within 1,000' to the west (Mustang Drive/ Sun Valley Commons Shopping Center Driveway) and to the east (Sun Valley High School Driveway) of the Wesley Chapel-Stouts Road intersection were included in the Synchro model. Improvement options and preliminary results are described below.

**Exhibit 16: Existing Wesley Chapel-Stouts Road & Old Monroe Road Intersection Lane Configuration**

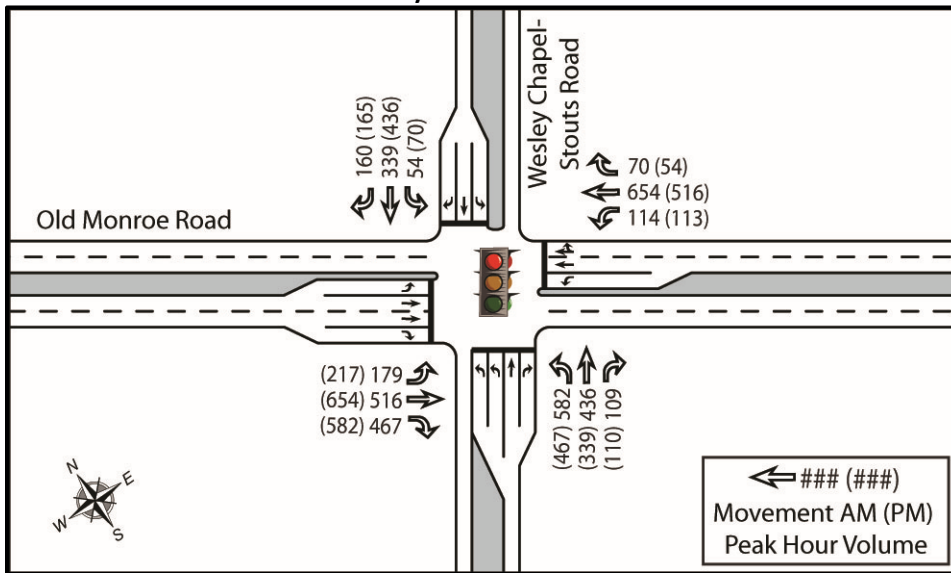


#### **OPTION C1: Full Movement – Turn Lanes Option**

The lane geometry and peak hour volumes for OPTION C1 are shown in **Exhibit 17**. The eastbound Old Monroe Road approach includes a left-turn lane, two through lanes and a right-turn lane. The westbound approach includes a left-turn lane, a through lane, and a shared through-right lane. The northbound Wesley Chapel-Stouts Road includes dual left-turn lanes, a through lane, and a right-turn lane. The southbound approach includes a left-turn lane, a through lane, and a right-turn lane.

Intersection traffic operations analysis results for OPTION C1 are presented in **Table 15**. The traffic operations analysis results indicate that the overall intersection would operate at an acceptable LOS in both peak hours. However, 11 of the 22 AM and PM peak hour lane groups at this intersection would operate at an unacceptable LOS. SimTraffic simulations of the intersection indicate that the eastbound Old Monroe Road right-turn movement would experience queuing that impedes the through travel lanes due to insufficient queue storage. Unlike the Superstreet and Michigan Left options where this movement is a channelized free-flow right-turn, for this option, it is a permitted and overlap phase. Additionally, in the PM peak hour, the southbound Wesley-Chapel Stouts Road through movement would experience queuing that would approach 1,000 feet resulting in cycle failures.

**Exhibit 17: OPTION C1 Lane Geometry and Peak Hour Volumes**



**Table 15: OPTION C1 Intersection Analysis Results**

| Intersection  | MOE         | Overall     | Eastbound   |             |             | Westbound   |   |             | Northbound  |             |             | Southbound  |             |             |
|---|-------------|-------------|-------------|-------------|-------------|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|   |             |             | L           | T           | R           | L           | T | R           | L           | T           | R           | L           | T           | R           |
| Old Monroe Road at Wesley Chapel-Stouts Road (Signalized) | LOS         | D (D)       | E (F)       | E (D)       | C (C)       | E (E)       |   | D (D)       | E (E)       | D (C)       | B (B)       | E (E)       | E (E)       | C (B)       |
|   | Delay (sec) | 50.9 (47.4) | 79.2 (94.7) | 58.5 (38.9) | 22.4 (20.7) | 62.0 (74.9) |   | 47.4 (50.8) | 67.3 (64.1) | 39.4 (33.0) | 15.1 (16.4) | 64.7 (61.5) | 74.4 (69.5) | 26.7 (19.9) |
|   | v/c         | 0.93 (0.94) | 0.88 (0.90) | 0.57 (0.74) | 0.62 (0.83) | 0.61 (0.74) |   | 0.86 (0.83) | 0.93 (0.87) | 0.70 (0.53) | 0.14 (0.15) | 0.45 (0.48) | 0.92 (0.94) | 0.29 (0.25) |

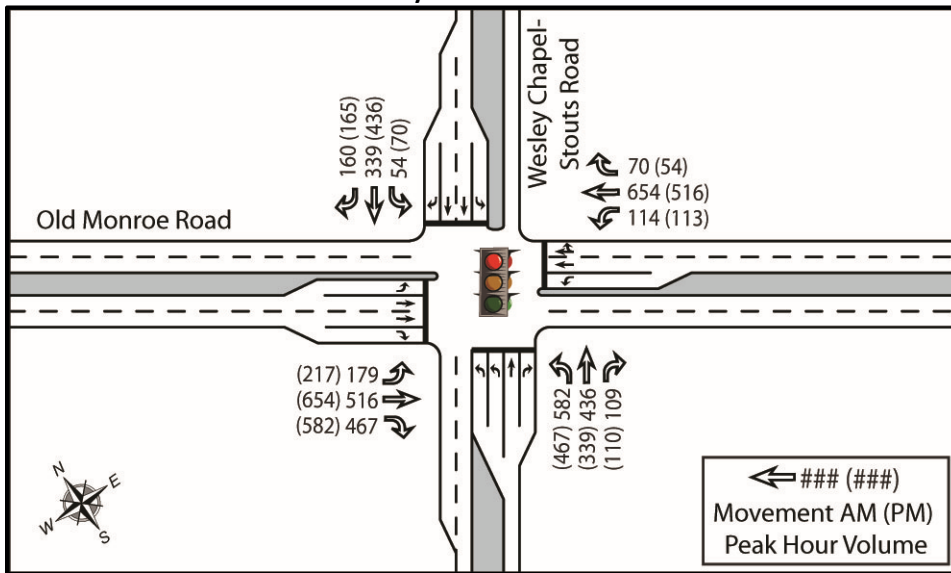
Note: AM Peak Hour  
(PM Peak Hour)

#### **OPTION C2: Full Movement – Widen WCSR Option**

The lane geometry and peak hour volumes for OPTION C2 are shown in **Exhibit 18**. The eastbound, westbound, and northbound approaches remain the same as the previous option. The southbound approach would have one left-turn lane, one right-turn lane, and two through lanes, which would require Wesley Chapel-Stouts Road to be widened south of Old Monroe Road.

Intersection traffic operations analysis results for OPTION C2 are presented in **Table 16**. The traffic operations analysis results indicate that the overall intersection would operate at an acceptable LOS in both peak hours. However, eight of the 22 AM and PM lane groups would operate at an unacceptable LOS. SimTraffic simulations indicate that none of the movements would experience substantial queuing issues.

**Exhibit 18: OPTION C2 Lane Geometry and Peak Hour Volumes**



**Table 16: OPTION C2 Intersection Analysis Results**

| Intersection  | MOE         | Overall     | Eastbound   |             |             | Westbound   |   |             | Northbound  |             |             | Southbound  |             |             |
|---|-------------|-------------|-------------|-------------|-------------|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|   |             |             | L           | T           | R           | L           | T | R           | L           | T           | R           | L           | T           | R           |
| Old Monroe Road at Wesley Chapel-Stouts Road (Signalized) | LOS         | D (D)       | F (F)       | C (C)       | A (A)       | E (E)       |   | D (D)       | E (D)       | D (D)       | B (B)       | E (E)       | D (E)       | C (C)       |
|   | Delay (sec) | 40.9 (39.2) | 92.2 (84.0) | 21.9 (27.9) | 6.8 (9.1)   | 62.1 (62.7) |   | 40.0 (39.2) | 58.2 (51.3) | 48.7 (42.5) | 17.7 (19.3) | 64.2 (63.2) | 53.3 (58.7) | 30.6 (26.7) |
|   | v/c         | 0.86 (0.80) | 0.80 (0.80) | 0.49 (0.61) | 0.56 (0.70) | 0.61 (0.63) |   | 0.77 (0.67) | 0.86 (0.74) | 0.80 (0.65) | 0.16 (0.17) | 0.45 (0.50) | 0.67 (0.80) | 0.33 (0.30) |

Note: AM Peak Hour  
(PM Peak Hour)

### OPTION C3: Superstreet Option

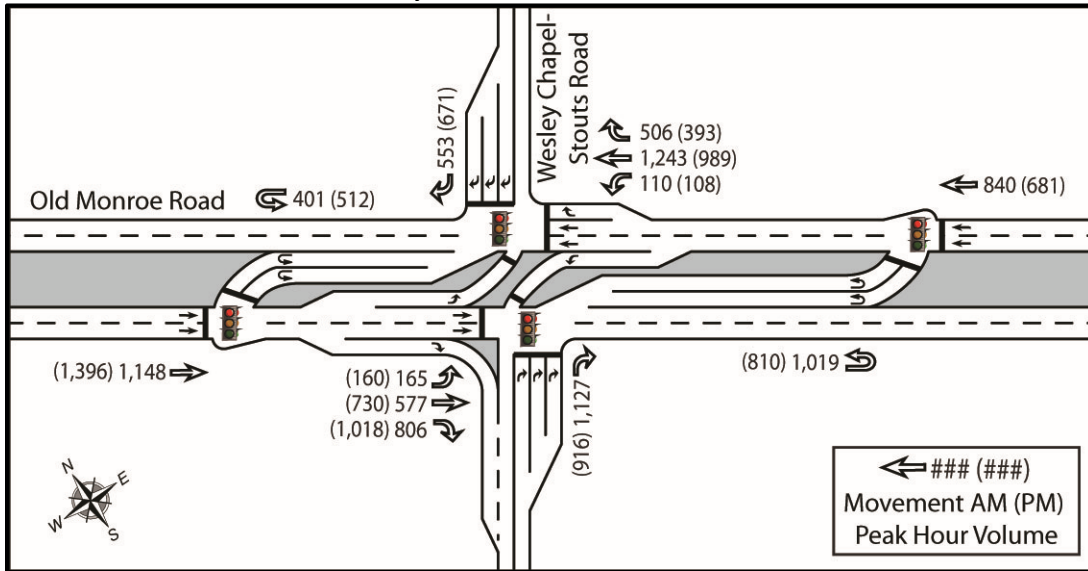
The lane geometry and peak hour volumes for OPTION C3 are shown in **Exhibit 19**. This option redistributes the through and left-turn movements from Wesley Chapel-Stouts Road intersection to u-turn locations on Old Monroe Road. This configuration allows for two-phase signals that operate independently in the eastbound and westbound directions.

Both Wesley Chapel-Stouts Road approaches would have three right-turn lanes while the eastbound and westbound Old Monroe Road approaches would both have an exclusive left-turn lane, two through lanes, and a right-turn lane. The eastbound right-turn lane would be a channelized free-flow movement with an add lane on Wesley Chapel-Stouts Road. The two u-turn locations, the westbound U-turn to the west of Wesley Chapel-Stouts Road and the eastbound u-turn to the east, would both be signalized dual u-turn lanes.

Intersection traffic operations analysis results for OPTION C3 are presented in **Table 17**. The traffic operations analysis results indicate that the overall intersection, as well as the two u-turn locations, would operate at acceptable LOS in both peak hours. Additionally, at these three locations, all lane groups would operate at acceptable LOS in both the AM and PM peak hours. SimTraffic simulations indicate that none of the movements would experience substantial queuing issues.



**Exhibit 19: OPTION C3 Lane Geometry and Peak Hour Volumes**



**Table 17: OPTION C3 Intersection Analysis Results**

| Intersection  | MOE         | Overall     | Eastbound   |             |             |             | Westbound   |             |             |             | NB          | SB          |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|   |             |             | U           | L           | T           | R           | U           | L           | T           | R           | R           | R           |
| Eastbound Old Monroe Road                                 |             |             |             |             |             |             |             |             |             |             |             |             |
| Old Monroe Road at Wesley Chapel-Stouts Road (Signalized) | LOS         | B (B)       | -           | -           | B (B)       | A (A)       | -           | A (B)       | -           | -           | C (C)       | -           |
|   | Delay (sec) | 14.5 (15.0) | -           | -           | 17.1 (16.7) | 1.9 (3.4)   | -           | 7.5 (11.4)  | -           | -           | 22.8 (27.1) | -           |
|   | v/c         | 0.76 (0.74) | -           | -           | 0.43 (0.46) | 0.57 (0.72) | -           | 0.15 (0.17) | -           | -           | 0.76 (0.74) | -           |
| U-turn west of Wesley Chapel-Stouts Road (Signalized)     | LOS         | A (B)       | -           | -           | A (A)       | -           | A (B)       | -           | -           | -           | -           | -           |
|   | Delay (sec) | 5.1 (12.1)  | -           | -           | 4.2 (9.5)   | -           | 7.6 (19.3)  | -           | -           | -           | -           | -           |
|   | v/c         | 0.62 (0.70) | -           | -           | 0.54 (0.68) | -           | 0.62 (0.70) | -           | -           | -           | -           | -           |
| Westbound Old Monroe Road                                 |             |             |             |             |             |             |             |             |             |             |             |             |
| Old Monroe Road at Wesley Chapel-Stouts Road (Signalized) | LOS         | B (B)       | -           | C (B)       | -           | -           | -           | -           | A (A)       | A (A)       | -           | D (C)       |
|   | Delay (sec) | 16.3 (15.4) | -           | 31.6 (12.6) | -           | -           | -           | -           | 8.6 (7.4)   | 9.4 (8.2)   | -           | 35.5 (32.1) |
|   | v/c         | 0.70 (0.71) | -           | 0.41 (0.33) | -           | -           | -           | -           | 0.62 (0.54) | 0.57 (0.48) | -           | 0.70 (0.71) |
| U-turn east of Wesley Chapel-Stouts Road (Signalized)     | LOS         | B (A)       | A (A)       | -           | -           | -           | -           | -           | B (B)       | -           | -           | -           |
|   | Delay (sec) | 11.1 (8.0)  | 5.9 (4.9)   | -           | -           | -           | -           | -           | 17.3 (11.6) | -           | -           | -           |
|   | v/c         | 0.78 (0.73) | 0.78 (0.73) | -           | -           | -           | -           | -           | 0.59 (0.42) | -           | -           | -           |

Note: AM Peak Hour  
(PM Peak Hour)

#### OPTION C4: Quadrant Roadway Option

OPTION C4 utilizes one of the roadways in the Sun Valley Commons Shopping Center, as shown in **Exhibit 20**, which is in the northwest quadrant of the intersection. Left-turn movements from the intersection are redirected through the quadrant roadway. The benefit provided is the signal at the Old Monroe Road and Wesley Chapel-Stouts Road becomes a two-phase signal. However, after further examining this option it was eliminated due to disruption to the shopping center and movie theatre traffic operations and pedestrian crossings. As such, a detailed traffic operations analysis was not performed for this option.

**Exhibit 20: OPTION C4 Concept**



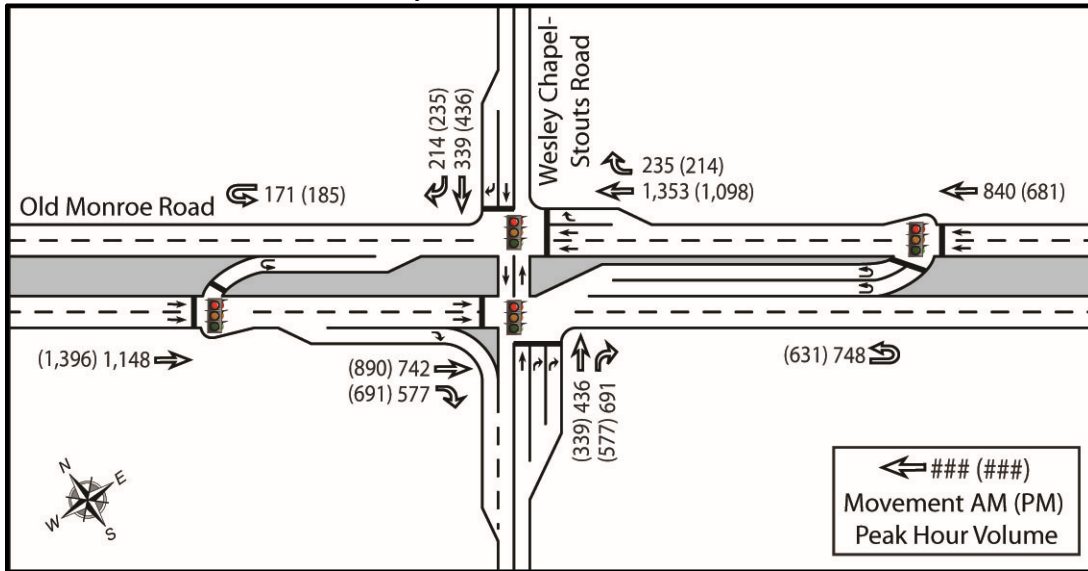
#### OPTION C5: Michigan Left Option

The lane geometry and peak hour volumes for OPTION C5 are shown in **Exhibit 21**. This option would redistribute the left-turn movements at the Waxhaw-Indian Trail Road intersection to u-turn locations. Traffic wanting to turn left from Old Monroe Road would be rerouted to a downstream signalized u-turn location to make a u-turn, followed by a right-turn onto Wesley Chapel-Stouts Road. Traffic wishing to turn left from Wesley Chapel-Stouts Road instead would make a right-turn onto Old Monroe Road and proceeds to the downstream u-turn location. This design allows for a two-phase signal operation at the Old Monroe Road and Wesley Chapel-Stouts Road intersection.

Both Old Monroe Road approaches would have two through lanes and a dedicated right turn lane. The eastbound right-turn lane would be a channelized free-flow movement that adds a lane on Wesley Chapel-Stouts Road. The northbound Wesley Chapel-Stouts Road approach would consist of one through lane and two right-turn lanes while the southbound approach would have one through lane and a right-turn lane. The two u-turn locations, the westbound u-turn to the west of Wesley Chapel-Stouts Road and the eastbound u-turn to the east, would both be signalized. The westbound u-turn would have one u-turn lane while the eastbound u-turn would have two u-turn lanes.

Intersection traffic operations analysis results for OPTION C5 are presented in **Table 18**. The traffic operations analysis results indicate that the overall intersection, as well as the two u-turn locations, would operate at acceptable LOS in both peak hours. Additionally, at these three locations, all lane groups would operate at acceptable LOS in both the AM and PM peak hours. SimTraffic simulations indicate that none of the movements would experience substantial queuing issues.

**Exhibit 21: OPTION C5 Lane Geometry and Peak Hour Volumes**



**Table 18: OPTION C5 Intersection Analysis Results**

| Intersection  | MOE         | Overall     | Eastbound   |   |             |             | Westbound   |   |             |             | Northbound  |             | Southbound  |             |
|---|-------------|-------------|-------------|---|-------------|-------------|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|
|   |             |             | U           | L | T           | R           | U           | L | T           | R           | T           | R           | T           | R           |
| Eastbound Old Monroe Road                                 |             |             |             |   |             |             |             |   |             |             |             |             |             |             |
| Old Monroe Road at Wesley Chapel-Stouts Road (Signalized) | LOS         | B (B)       | -           | - | A (B)       | A (A)       | -           | - | -           | -           | C (C)       | C (C)       | A (A)       | -           |
|   | Delay (sec) | 16.5 (13.4) | -           | - | 8.1 (11.8)  | 0.7 (0.9)   | -           | - | -           | -           | 33.9 (26.8) | 33.7 (27.7) | 4.6 (6.8)   | -           |
|   | v/c         | 0.81 (0.74) | -           | - | 0.44 (0.53) | 0.41 (0.49) | -           | - | -           | -           | 0.74 (0.57) | 0.80 (0.66) | 0.58 (0.74) | -           |
| U-turn west of Wesley Chapel-Stouts Road (Signalized)     | LOS         | A (A)       | -           | - | A (A)       | -           | D (D)       | - | -           | -           | -           | -           | -           | -           |
|   | Delay (sec) | 8.1 (7.5)   | -           | - | 4.0 (3.0)   | -           | 35.3 (41.0) | - | -           | -           | -           | -           | -           | -           |
|   | v/c         | 0.57 (0.63) | -           | - | 0.52 (0.63) | -           | 0.57 (0.62) | - | -           | -           | -           | -           | -           | -           |
| Westbound Old Monroe Road                                 |             |             |             |   |             |             |             |   |             |             |             |             |             |             |
| Old Monroe Road at Wesley Chapel-Stouts Road (Signalized) | LOS         | B (B)       | -           | - | -           | -           | -           | - | B (B)       | A (A)       | A (A)       | -           | C (C)       | C (C)       |
|   | Delay (sec) | 17.2 (15.8) | -           | - | -           | -           | -           | - | 17.8 (12.3) | 9.1 (8.1)   | 7.4 (4.5)   | -           | 28.0 (32.4) | 25.3 (25.0) |
|   | v/c         | 0.81 (0.74) | -           | - | -           | -           | -           | - | 0.81 (0.66) | 0.81 (0.29) | 0.74 (0.57) | -           | 0.58 (0.74) | 0.43 (0.47) |
| U-turn east of Wesley Chapel-Stouts Road (Signalized)     | LOS         | B (B)       | B (C)       | - | -           | -           | -           | - | B (A)       | -           | -           | -           | -           | -           |
|   | Delay (sec) | 13.0 (14.9) | 15.0 (21.8) | - | -           | -           | -           | - | 11.1 (8.6)  | -           | -           | -           | -           | -           |
|   | v/c         | 0.73 (0.70) | 0.73 (0.70) | - | -           | -           | -           | - | 0.49 (0.37) | -           | -           | -           | -           | -           |

Note: AM Peak Hour  
(PM Peak Hour)

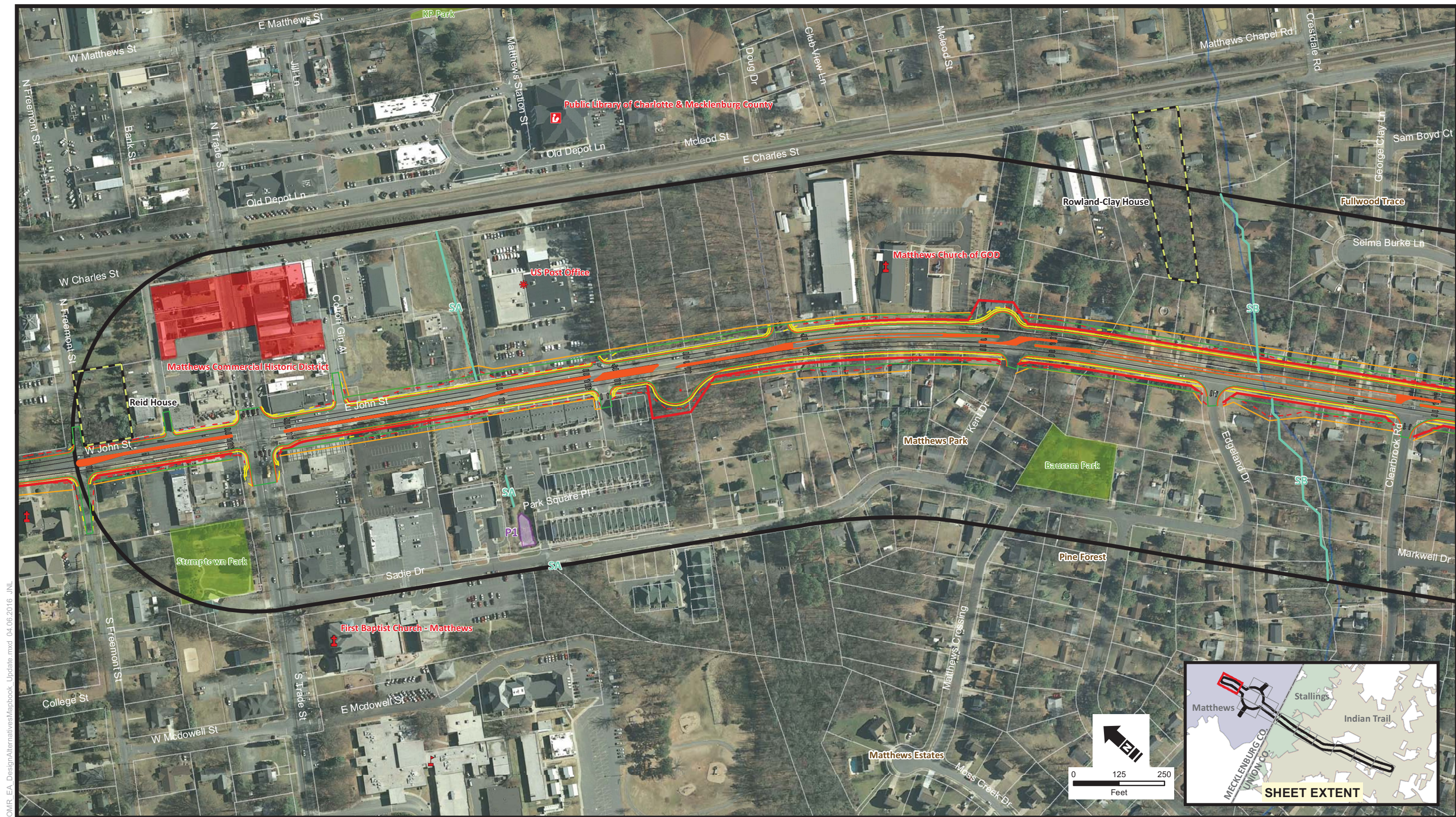


## **Appendix C**

### **Preferred Alternative Preliminary Design**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

|               |                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| <b>Legend</b> | Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
|               | Historic District         | Surveyed Wetlands | Permanent Utility Easement | Slopestake Transition Line | Edge of Travel          | Notable Feature   | Church         | Parks               | Concrete Islands |
|               | Eligible for NRHP Listing | Open Water        | Proposed Right of Way      | County Line                | Lane Lines              | School            | Fire Station   | Floodway            |                  |
|               | Requires Additional Study | Stream            | Slopestake Cut Line        | Concrete Curb              | Proposed Roadway        | Library           | Police Station | 100 Year Floodplain |                  |

**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

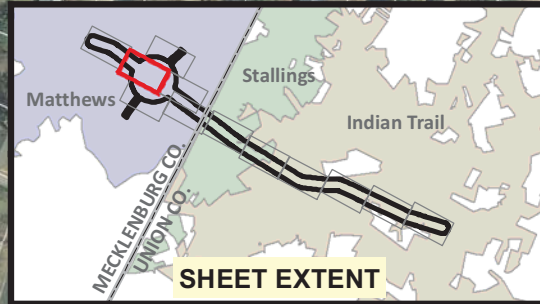
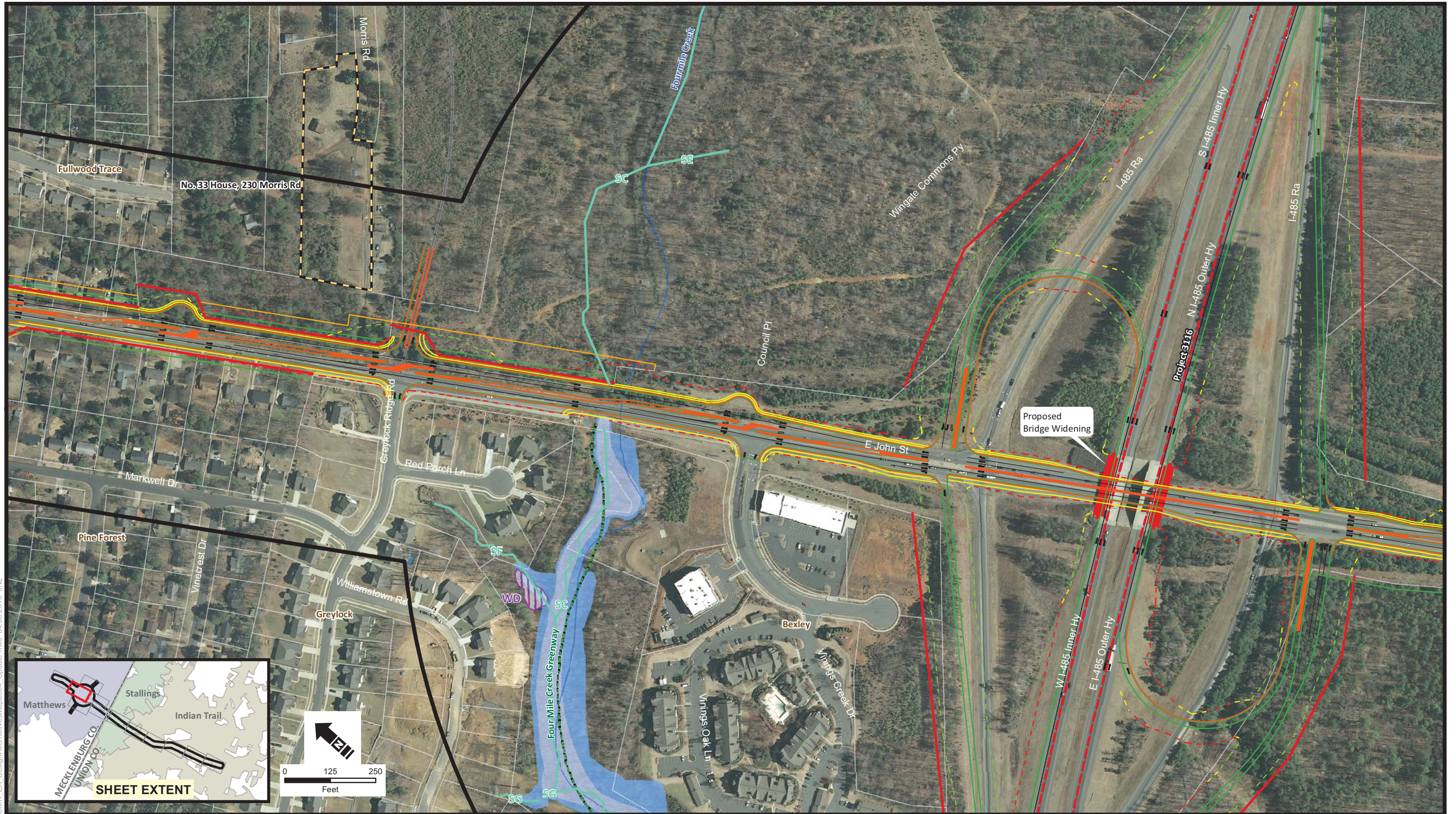
**SHEET 01**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

Legend

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
| Historic District         | Surveyed Wetlands | Permanent Utility Easement | Slopestake Transition Line | Edge of Travel          | Notable Feature   | Church         | Parks               | Concrete Islands |
| Eligible for NRHP Listing | Open Water        | Proposed Right of Way      | County Line                | Lane Lines              | School            | Fire Station   | Floodway            |                  |
| Requires Additional Study | Stream            | Slopestake Cut Line        | Concrete Curb              | Proposed Roadway        | Library           | Police Station | 100 Year Floodplain |                  |

**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

**SHEET 02**









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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

|               |                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| <b>Legend</b> | Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
|               | Historic District         | Surveyed Wetlands | Permanent Utility Easement | Slopestake Transition Line | Edge of Travel          | Notable Feature   | Church         | Parks               | Concrete Islands |
|               | Eligible for NRHP Listing | Open Water        | Proposed Right of Way      | County Line                | Lane Lines              | School            | Fire Station   | Floodway            |                  |
|               | Requires Additional Study | Stream            | Slopestake Cut Line        | Concrete Curb              | Proposed Roadway        | Library           | Police Station | 100 Year Floodplain |                  |

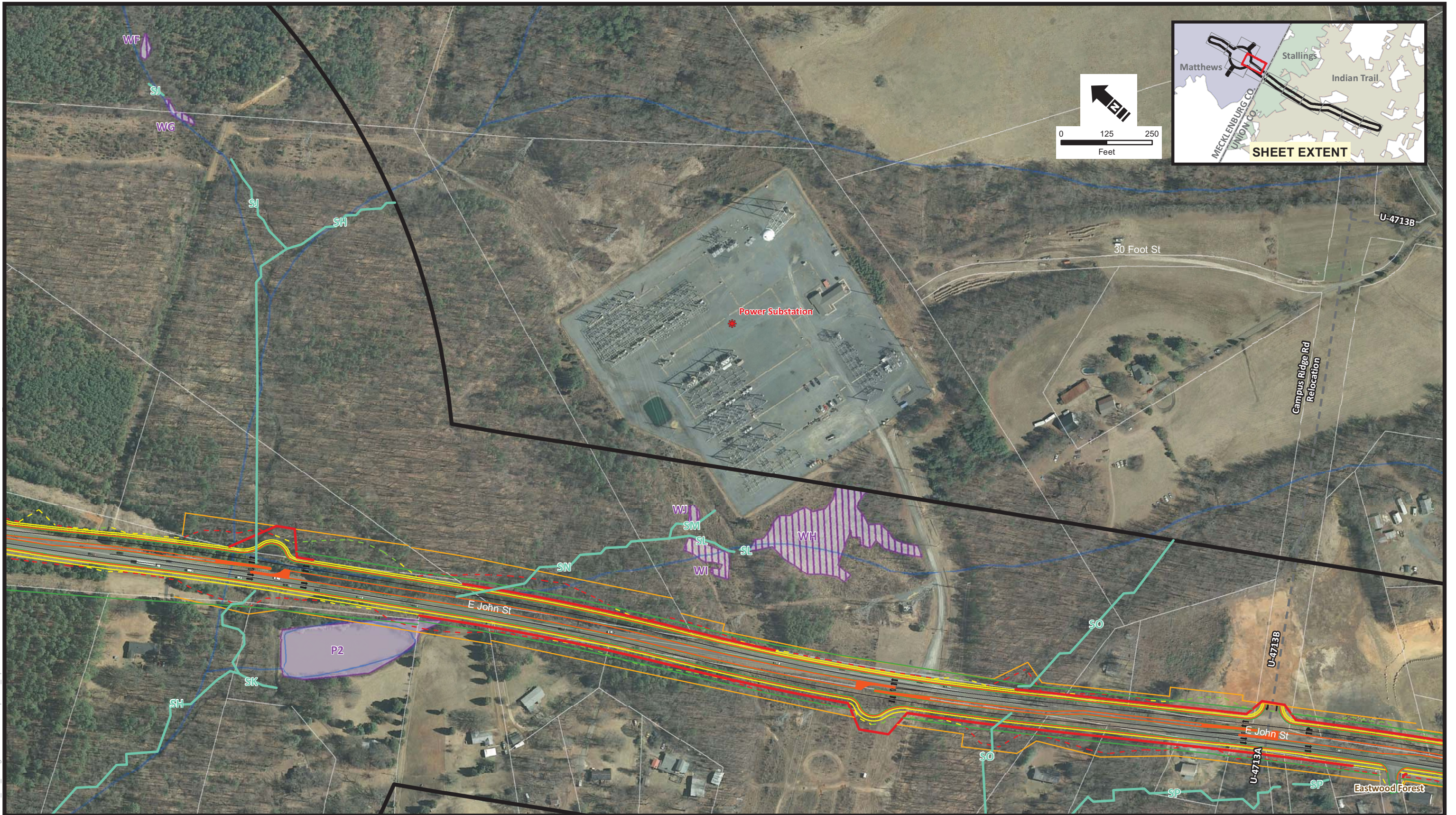
**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

Legend

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
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| Requires Additional Study | Stream            | Slopestake Cut Line        | Concrete Curb              | Proposed Roadway        | Library           | Police Station | 100 Year Floodplain |                  |

**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

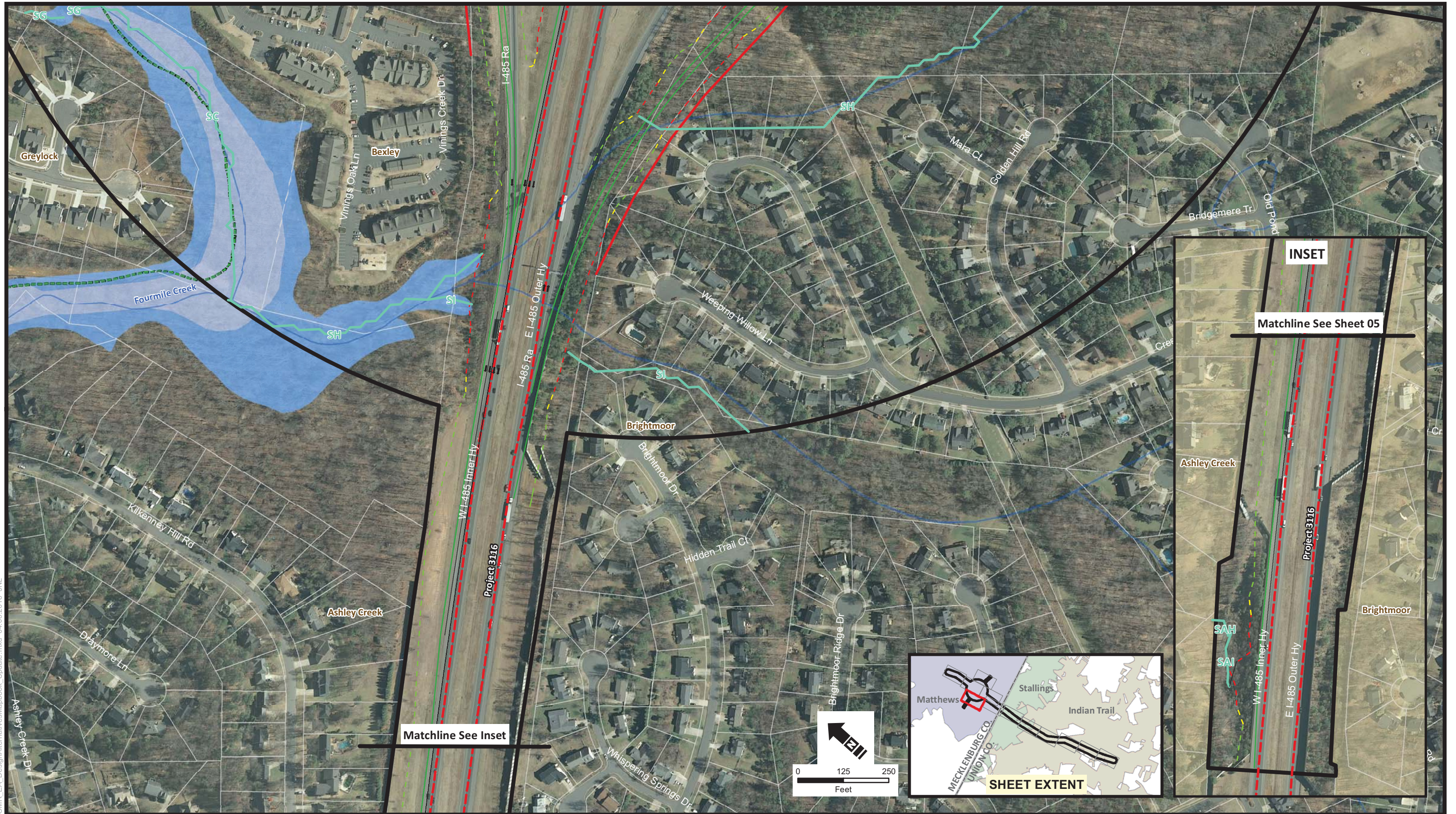
**SHEET 04**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

**Legend**

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
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**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

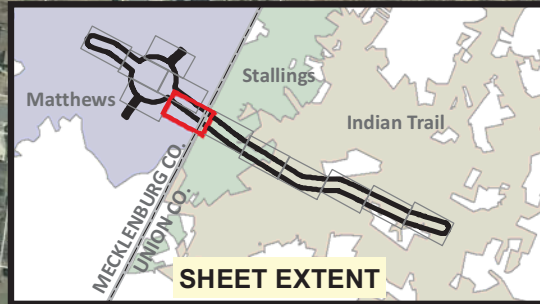
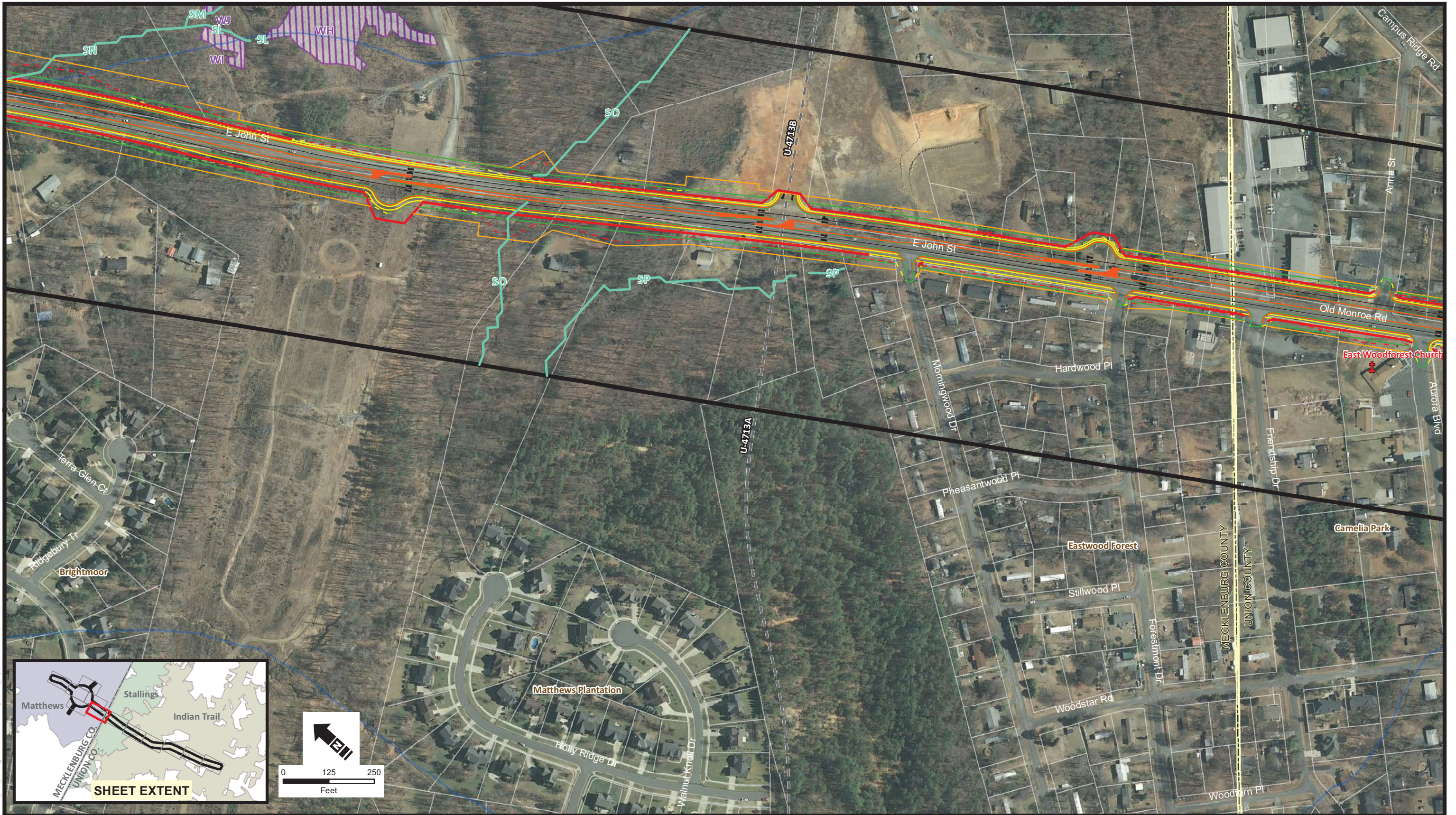
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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

Legend

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
| Historic District         | Surveyed Wetlands | Permanent Utility Easement | Slopestake Transition Line | Edge of Travel          | Notable Feature   | Church         | Parks               | Concrete Islands |
| Eligible for NRHP Listing | Open Water        | Proposed Right of Way      | County Line                | Lane Lines              | School            | Fire Station   | Floodway            |                  |
| Requires Additional Study | Stream            | Slopestake Cut Line        | Concrete Curb              | Proposed Roadway        | Library           | Police Station | 100 Year Floodplain |                  |

**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

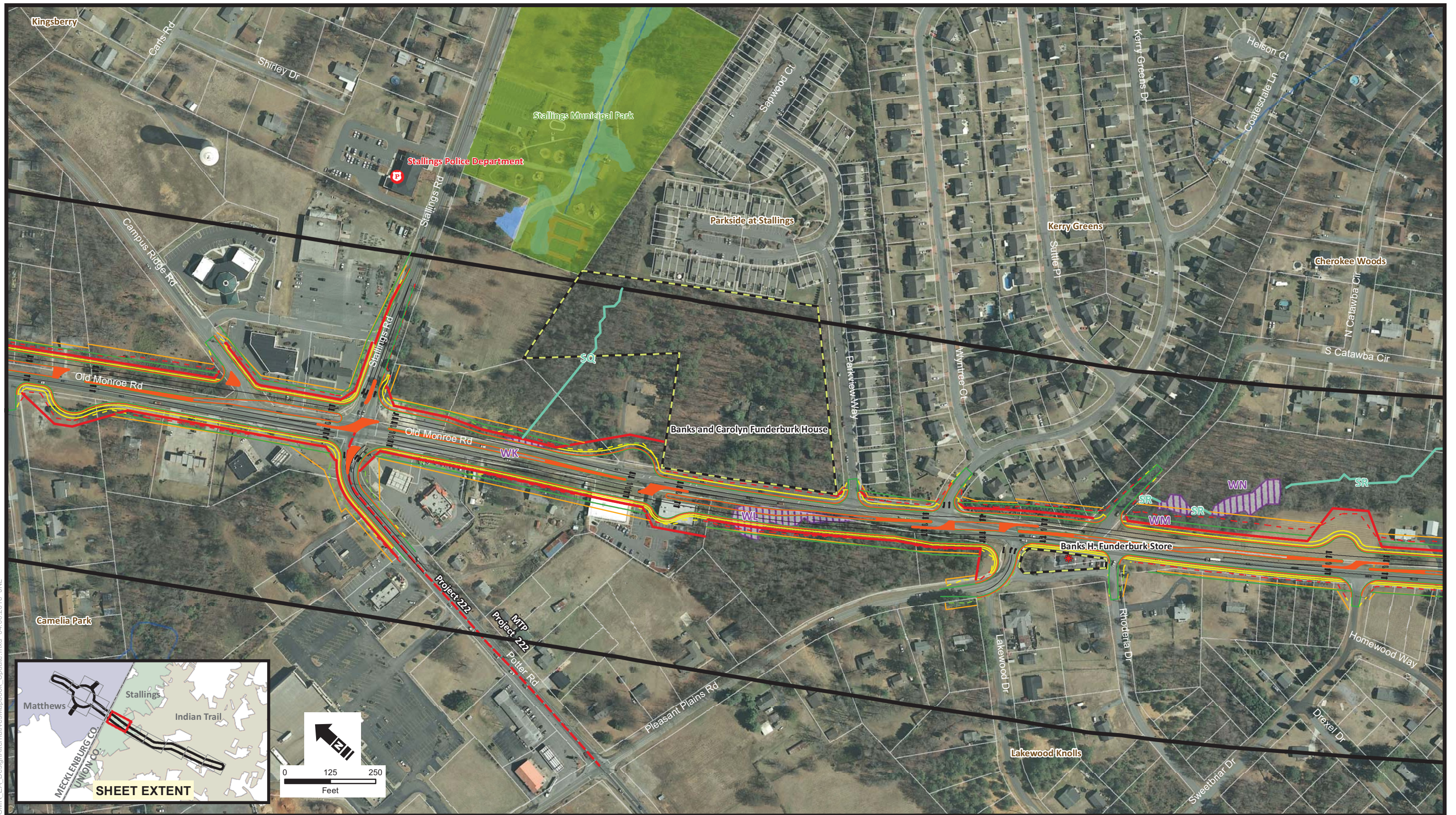
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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

Legend

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
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| Eligible for NRHP Listing | Open Water        | Proposed Right of Way      | County Line                | Lane Lines              | School            | Fire Station   | Floodway            |                  |
| Requires Additional Study | Stream            | Slopestake Cut Line        | Concrete Curb              | Proposed Roadway        | Library           | Police Station | 100 Year Floodplain |                  |

**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

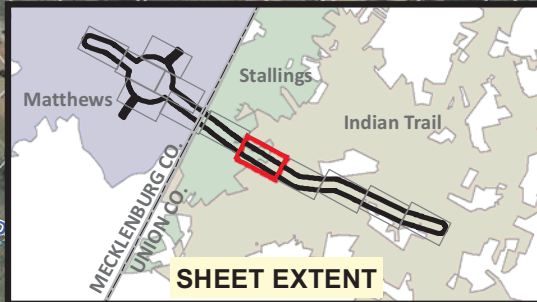
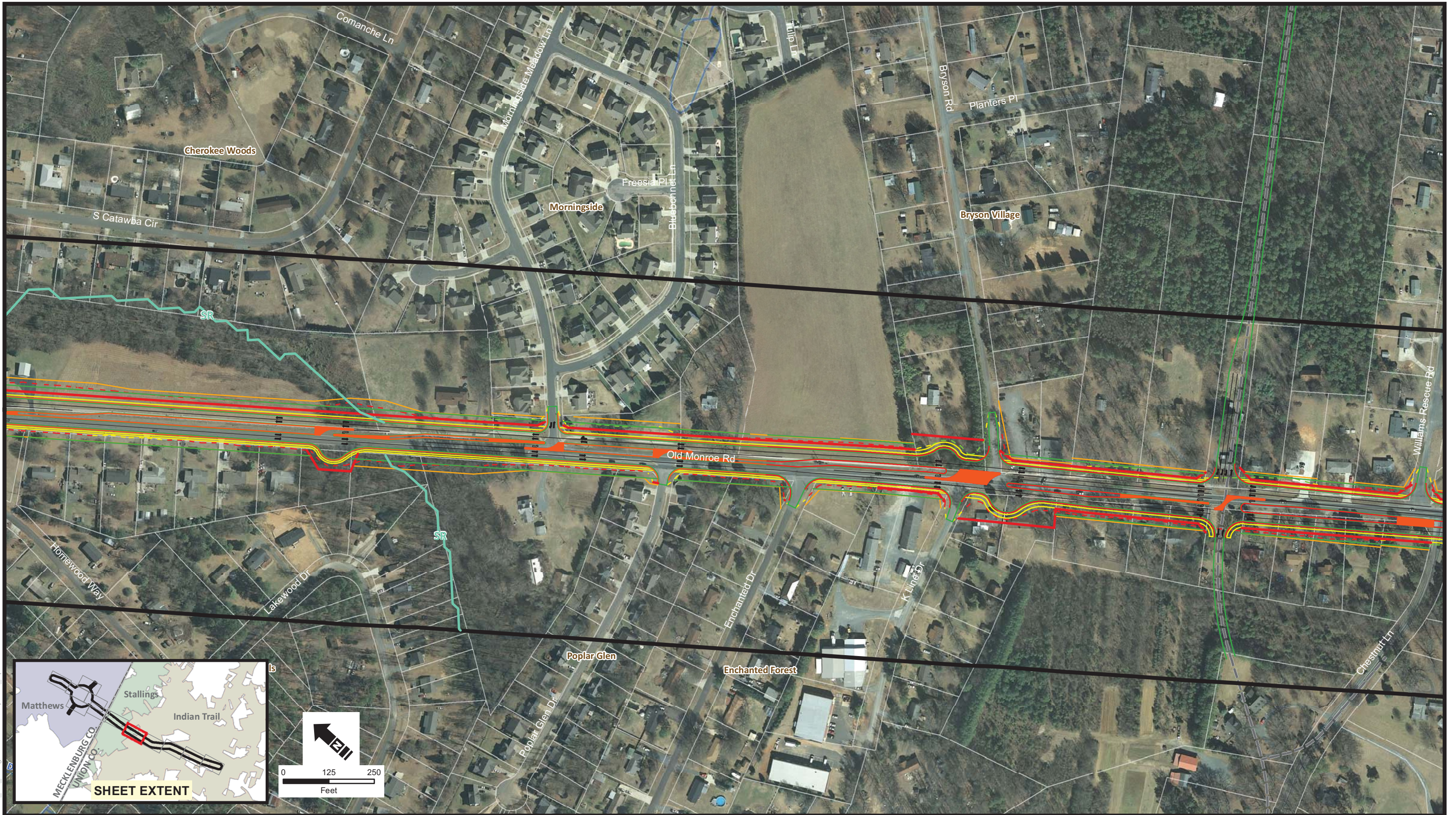
**SHEET 07**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

Legend

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
| Historic District         | Surveyed Wetlands | Permanent Utility Easement | Slopestake Transition Line | Edge of Travel          | Notable Feature   | Church         | Parks               | Concrete Islands |
| Eligible for NRHP Listing | Open Water        | Proposed Right of Way      | County Line                | Lane Lines              | School            | Fire Station   | Floodway            |                  |
| Requires Additional Study | Stream            | Slopestake Cut Line        | Concrete Curb              | Proposed Roadway        | Library           | Police Station | 100 Year Floodplain |                  |

**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

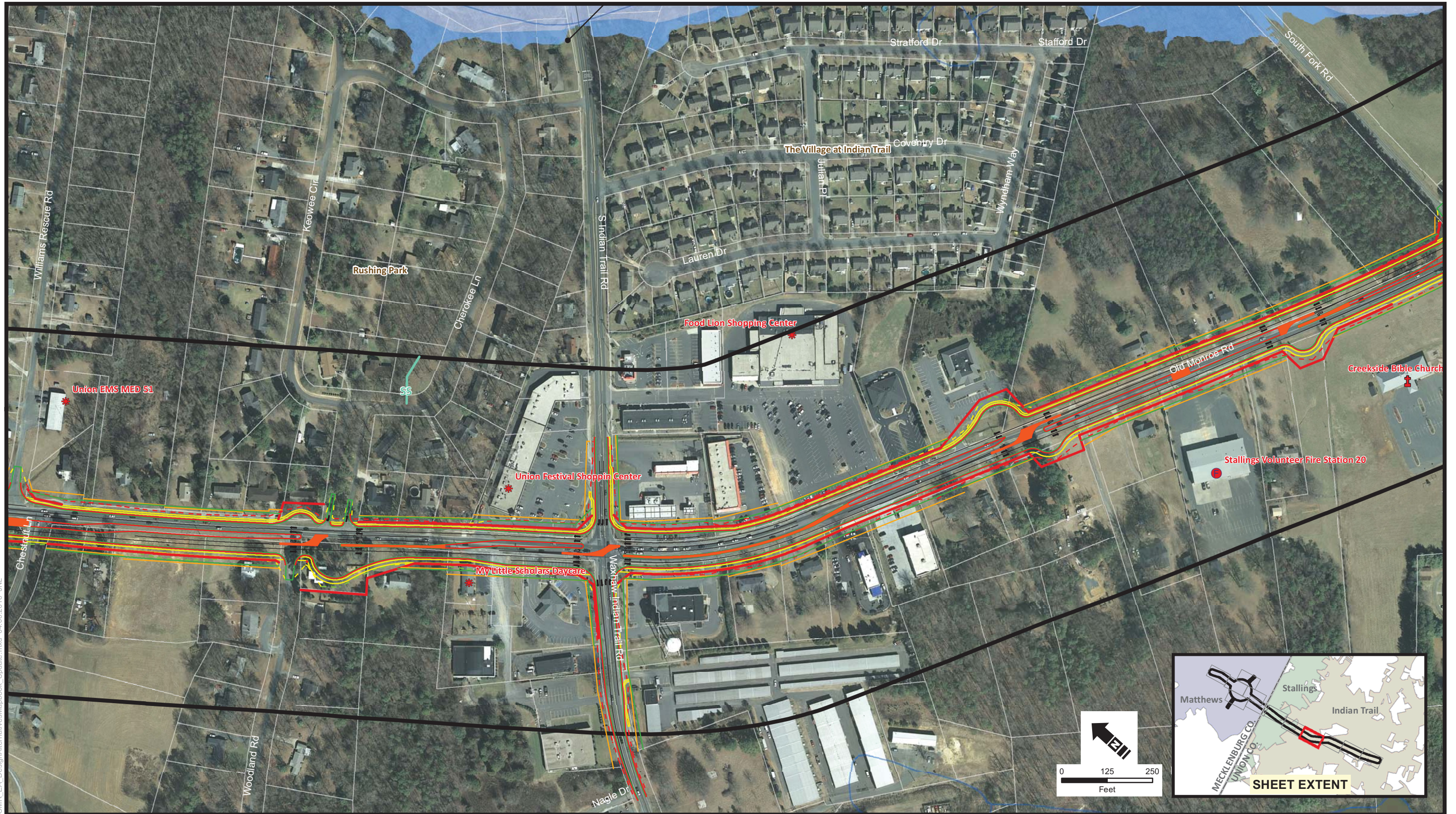
**SHEET 08**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

Legend

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
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| Requires Additional Study | Stream            | Slopestake Cut Line        | Concrete Curb              | Proposed Roadway        | Library           | Police Station | 100 Year Floodplain |                  |

**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

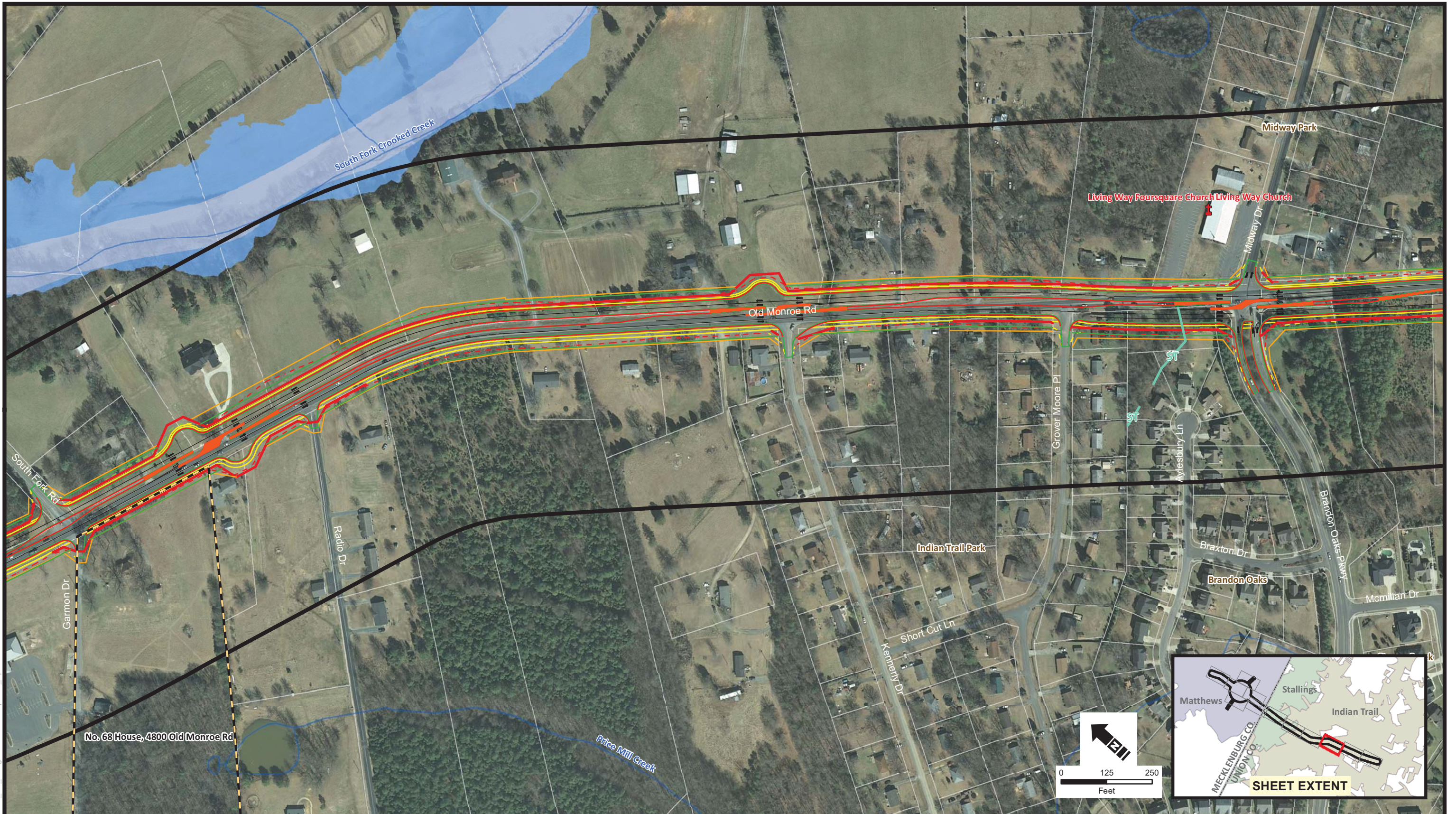
**SHEET 09**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

Legend

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
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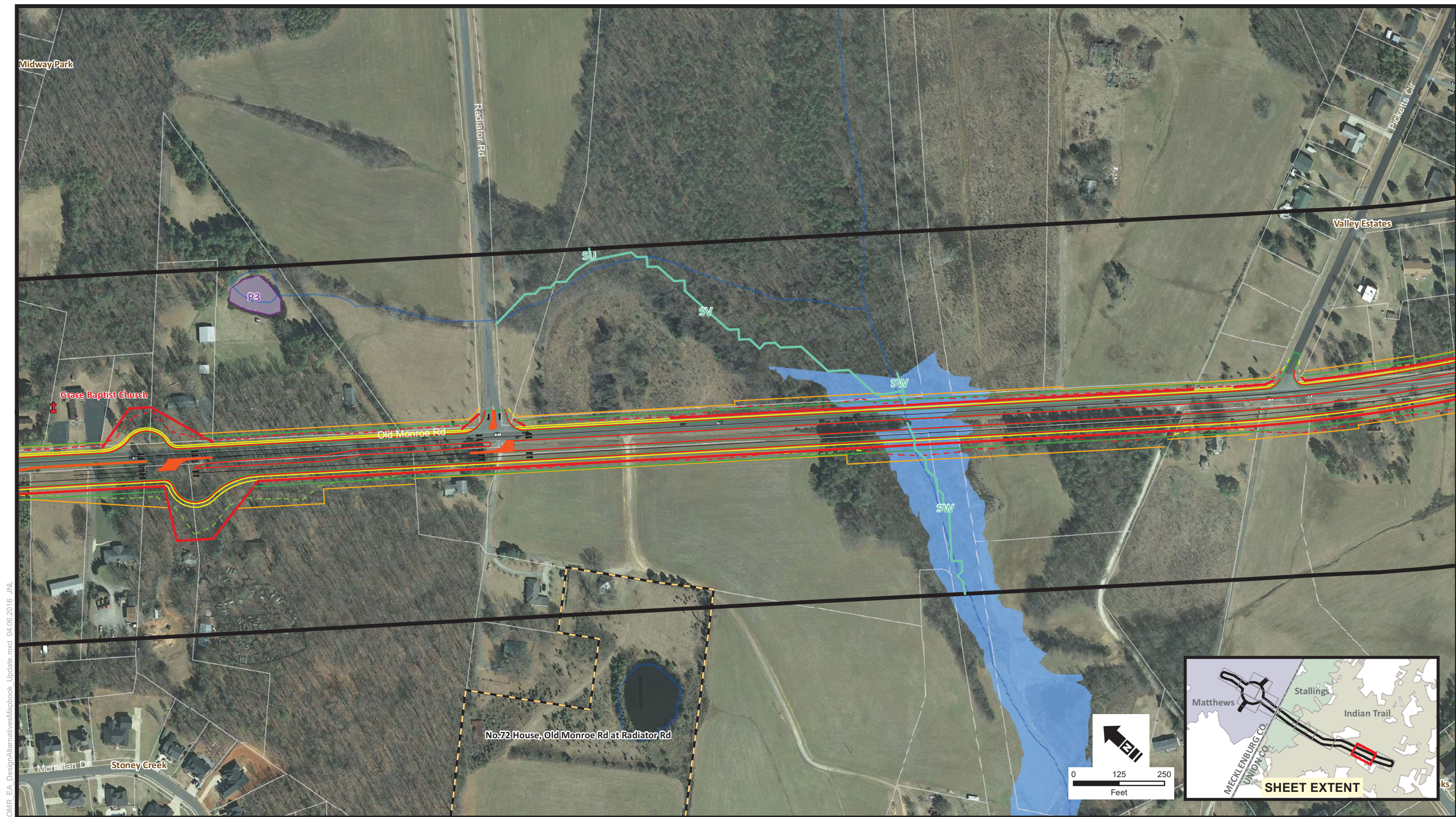
**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

**SHEET 10**









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**E. JOHN STREET/  
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Mecklenburg and Union Counties,  
North Carolina

|               |                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| <b>Legend</b> | Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
|               | Historic District         | Surveyed Wetlands | Permanent Utility Easement | Slopestake Transition Line | Edge of Travel          | Notable Feature   | Church         | Parks               | Concrete Islands |
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**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

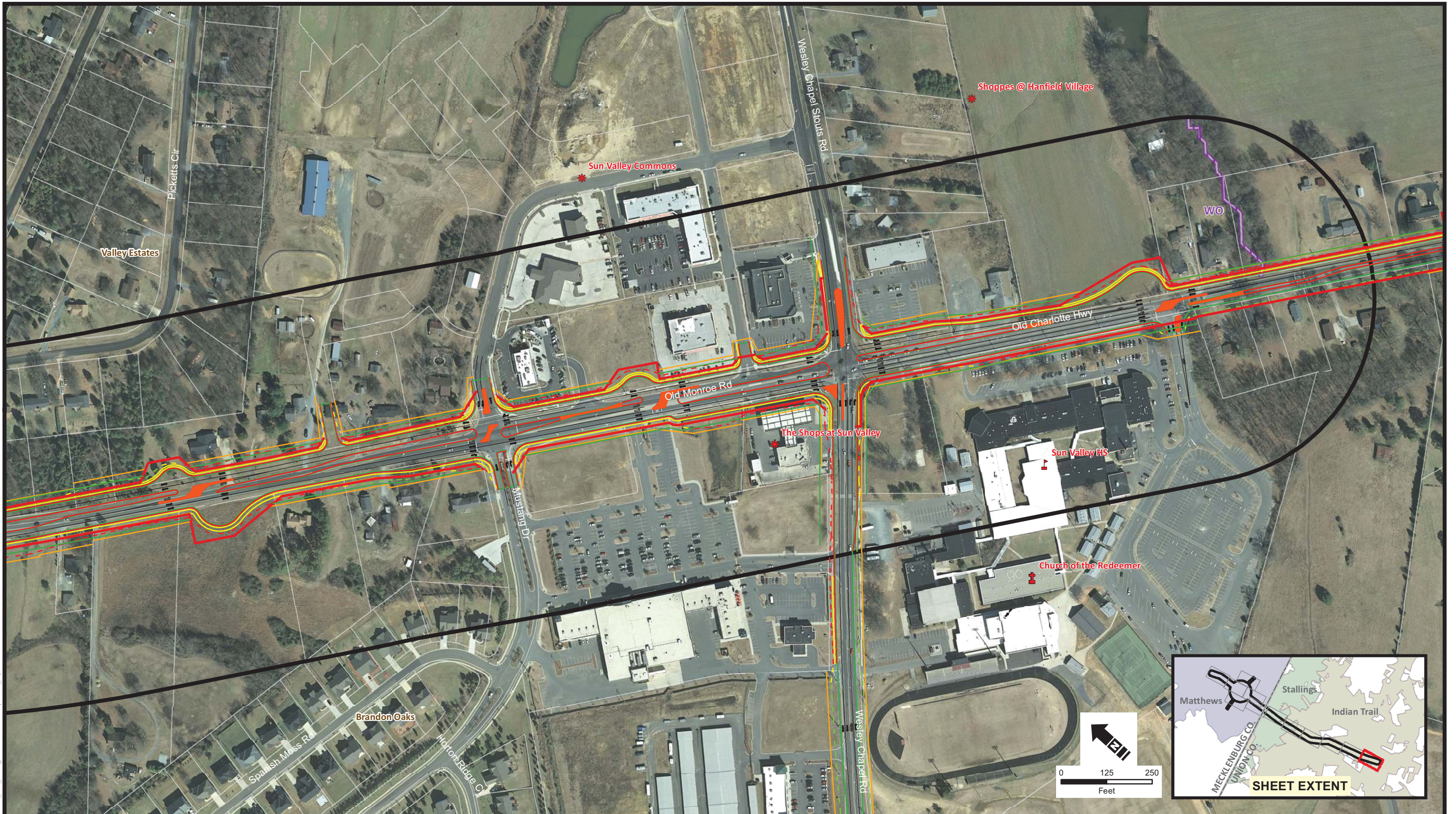
**SHEET 11**







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**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

Legend

|                           |                   |                            |                            |                         |                   |                |                     |                  |
|---------------------------|-------------------|----------------------------|----------------------------|-------------------------|-------------------|----------------|---------------------|------------------|
| Project Study Area        | Surveyed Streams  | Construction Easement      | Slopestake Fill Line       | Sidewalk/Multi-use Path | Widening Projects | Cemetery       | Parcels             | Greenway         |
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| Eligible for NRHP Listing | Open Water        | Proposed Right of Way      | County Line                | Lane Lines              | School            | Fire Station   | Floodway            |                  |
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**PREFERRED ALTERNATIVE  
PRELIMINARY DESIGNS**

**SHEET 12**





# **Appendix D**

## **Relocation Report**





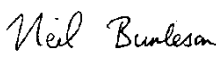
# EIS RELOCATION REPORT

## North Carolina Department of Transportation RELOCATION ASSISTANCE PROGRAM

☒ E.I.S. ☐ CORRIDOR ☐ DESIGN

|                         |   |        |            |                  |           |
|-------------------------|---|--------|------------|------------------|-----------|
| WBS ELEMENT:            | 39078.1.1   | COUNTY | Meck/Union | Alternate 1 of 1 | Alternate |
| T.I.P. No.:             | U-4714  |        |            |                  |           |
| DESCRIPTION OF PROJECT: | E. John Street-Old Monroe Rd. Widening from SR 3448 (Trade St.) in the Town of Matthews (Meck. Co.) to SR 1377 (Wesley Chapel-Stouts Rd.) in the Town of Indian Trail (Union Co.) |        |            |                  |           |

| ESTIMATED DISPLACED  |        |  |       |            | INCOME LEVEL      |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|--|--------|--|-------|------------|-------------------|--------|----------------------------|--------|------------------------|---|----------|----|--|---|--|---|---|--|--|--|---|--|--|---|---|---|--|--|--|---|--|--|---|---|--|---|--|---|--|----------------------------------|---|--|---|--|---|--|---|--|--|--|--|---|--|--|-----------|---|--|--|--|--|--|--|--|
| Type of Displacees   | Owners | Tenants  | Total | Minorities | 0-15M             | 15-25M | 25-35M                     | 35-50M | 50 UP                  |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| Residential  | 20     | 25   | 45    | 25         | 0                 | 0      | 10                         | 20     | 15                     |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| Businesses   | 1      | 12   | 13    | 6          | VALUE OF DWELLING |        |                            |        | DSS DWELLING AVAILABLE |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| Farms  | 0      | 0  | 0     | 0          | Owners            |        | Tenants                    |        | For Sale               |   | For Rent |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| Non-Profit   | 0      | 0  | 0     | 0          | 0-20M             | 0      | \$ 0-150                   | 0      | 0-20M                  | 0   | \$ 0-150 | 0  |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| ANSWER ALL QUESTIONS   |        |  |       |            | 20-40M            | 2      | 150-250                    | 0      | 20-40M                 | 5   | 150-250  | 0  |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  |        |  |       |            | 40-70M            | 14     | 250-400                    | 0      | 40-70M                 | 15  | 250-400  | 0  |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  |        |  |       |            | 70-100M           | 3      | 400-600                    | 5      | 70-100M                | 25  | 400-600  | 10 |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  |        |  |       |            | 100 UP            | 1      | 600 UP                     | 20     | 100 UP                 | 30  | 600 UP   | 30 |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  |        |  |       |            | TOTAL             | 20     |                            | 25     |                        | 75  |          | 40 |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| <table border="1"> <tr> <td>Yes</td> <td>No</td> <td>Explain all "YES" answers.</td> </tr> <tr> <td></td> <td>X</td> <td>1. Will special relocation services be necessary?</td> </tr> <tr> <td></td> <td>X</td> <td>2. Will schools or churches be affected by displacement?</td> </tr> <tr> <td>X</td> <td></td> <td>3. Will business services still be available after project?</td> </tr> <tr> <td>X</td> <td></td> <td>4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.</td> </tr> <tr> <td></td> <td>X</td> <td>5. Will relocation cause a housing shortage?</td> </tr> <tr> <td></td> <td>X</td> <td>6. Source for available housing (list).</td> </tr> <tr> <td>X</td> <td></td> <td>7. Will additional housing programs be needed?</td> </tr> <tr> <td></td> <td>X</td> <td>8. Should Last Resort Housing be considered?</td> </tr> <tr> <td></td> <td>X</td> <td>9. Are there large, disabled, elderly, etc. families?</td> </tr> <tr> <td></td> <td>X</td> <td>10. Will public housing be needed for project?</td> </tr> <tr> <td>X</td> <td></td> <td>11. Is public housing available?</td> </tr> <tr> <td>X</td> <td></td> <td>12. Is it felt there will be adequate DSS housing available during relocation period?</td> </tr> <tr> <td></td> <td>X</td> <td>13. Will there be a problem of housing within financial means?</td> </tr> <tr> <td>X</td> <td></td> <td>14. Are suitable business sites available (list source).</td> </tr> <tr> <td></td> <td></td> <td>15. Number months estimated to complete RELOCATION?</td> </tr> <tr> <td></td> <td></td> <td>24 months</td> </tr> </table> |        |  |       |            | Yes               | No     | Explain all "YES" answers. |        | X                      | 1. Will special relocation services be necessary? |          | X  | 2. Will schools or churches be affected by displacement? | X |  | 3. Will business services still be available after project? | X |  | 4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc. |  | X | 5. Will relocation cause a housing shortage? |  | X | 6. Source for available housing (list). | X |  | 7. Will additional housing programs be needed? |  | X | 8. Should Last Resort Housing be considered? |  | X | 9. Are there large, disabled, elderly, etc. families? |  | X | 10. Will public housing be needed for project? | X |  | 11. Is public housing available? | X |  | 12. Is it felt there will be adequate DSS housing available during relocation period? |  | X | 13. Will there be a problem of housing within financial means? | X |  | 14. Are suitable business sites available (list source). |  |  | 15. Number months estimated to complete RELOCATION? |  |  | 24 months | REMARKS (Respond by number)<br><br>4. See attached Sheet listing all affected business relocations<br><br>6. MLS, Newspaper, Realtor, Real Estate publications, Internet<br><br>8. As required by law.<br><br>12. Based on current market, housing & storefront business Locations should be available.<br><br>14. MLS, Newspaper, Realtor, Real Estate publications, Internet<br><br><b>**NOTE**</b><br><ul style="list-style-type: none"> <li>17 Parcels shown on the Project Alignment Alternate will necessitate the acquisition of parking spaces from the parcels which may or may not result in additional business relocation claims depending upon the opinion of the appraiser for the use of the remaining parking spaces. (See Attached Sheet for Said Parcel Information)</li> </ul> |  |  |  |  |  |  |  |
| Yes  | No     | Explain all "YES" answers.   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  | X      | 1. Will special relocation services be necessary?  |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  | X      | 2. Will schools or churches be affected by displacement?   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| X  |        | 3. Will business services still be available after project?  |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| X  |        | 4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc. |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  | X      | 5. Will relocation cause a housing shortage?   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  | X      | 6. Source for available housing (list).  |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| X  |        | 7. Will additional housing programs be needed?   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  | X      | 8. Should Last Resort Housing be considered?   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  | X      | 9. Are there large, disabled, elderly, etc. families?  |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  | X      | 10. Will public housing be needed for project?   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| X  |        | 11. Is public housing available?   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| X  |        | 12. Is it felt there will be adequate DSS housing available during relocation period?                          |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  | X      | 13. Will there be a problem of housing within financial means?   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
| X  |        | 14. Are suitable business sites available (list source).   |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  |        | 15. Number months estimated to complete RELOCATION?  |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |
|  |        | 24 months  |       |            |                   |        |                            |        |                        |   |          |    |  |   |  |   |   |  |  |  |   |  |  |   |   |   |  |  |  |   |  |  |   |   |  |   |  |   |  |                                  |   |  |   |  |   |  |   |  |  |  |  |   |  |  |           |   |  |  |  |  |  |  |  |

|   |  |          |                        |      |
|---|--|----------|------------------------|------|
|  |  | 12-15-15 |                        |      |
| Right of Way Agent  |  | Date     | Relocation Coordinator | Date |



**U-4714 Displaced Business List: Name, Type, Tax ID#, Ownership, Size, Employee Number**

- 1) Plantation Animal Clinic (Veterinarian) Tax ID #22702423  
Tenant Operated  
Size: 5,574 Sq. Ft.  
10 employees (2 Minorities)
- 2) Stronghaven Warehouse (Mfg. of Fiber Boxes and Supplies) Tax ID #22701315  
Tenant Operated  
Size: 45,838 Sq. Ft.  
50 employees (15 Minorities)
- 3) S&L Construction (Construction Contractor) Tax ID #07126001A  
Owner Operated  
Size: 9,600 Sq. Ft.  
10 employees (5 Minorities)

**NOTE:** Eight (8) Business's Located in Two (2) Commercial Buildings. Tax ID #07129292  
Size Bldg. 1: 6,192 Sq. Ft. Four (4) Businesses'  
Size Bldg. 2: 5,780 Sq. Ft. Four (4) Businesses'

Bldg. 1 Tenant Business's:

- 4) Balanced Health Chiropractic (Chiropractor)  
Tenant Operated  
Size: 1,550 Sq. Ft.  
5 employees (1 Minority)
- 5) Southern Dynamic Engineering & Design (Engineering Firm)  
Tenant Operated  
Size: 1,500 Sq. Ft.  
5 employees (2 Minorities)
- 6) StoryTellers Dance Academy (Dance Studio)  
Tenant Operated  
Size: 1,600 Sq. Ft.  
3 employees (1 Minority)
- 7) International Grocery (Herb/Medicine Shop)  
Tenant Operated  
Size: 1,542 Sq. Ft.  
3 employees (3 Minorities)

Bldg. 2 Tenant Business's:

- 8) Encompass Bldg. Group (Real Estate Developer)  
Tenant Operated  
Size: 1,400 Sq. Ft.  
2 employees (0 Minorities)
- 9) Homeschool Room (School Supplies Retailer)  
Tenant Operated  
Size: 1,450 Sq. Ft.  
3 employees (1 Minority)
- 10) Athens Pizza (Restaurant)  
Tenant Operated  
Size: 1,500 Sq. Ft.  
7 employees (3 Minorities)
- 11) Restaurant (Food Eatery)  
Tenant Operated  
Size: 1,430 Sq. Ft.  
7 employees (3 Minorities)
- 12) Omega Coney Island (Restaurant) Tax ID #07129396  
Tenant Operated  
Size: 1,632 Sq. Ft.  
20 employees (5 Minorities)
- 13) Books & Quills (School Consignment Supplies) Tax ID #07114038  
Tenant Operated  
Size: 2,400 Sq. Ft.  
20 employees (8 Minorities)

**NOTES:**

Business Displacees # 7, 9, 10, 11, 12, 13 are all minority owned businesses.

Tax ID #07072004 has a Vacant building (former restaurant) in the proposed project alternate Right of Way that was not counted as a business displacee due to the current vacancy.



There are 17 tax parcels where parking spaces are to be acquired due to the proposed project alternate alignment. These properties were not counted as business displacees but are shown for information to use in this EIS report accordingly by NCDOT.

### **PARKING PARCELS LIST**

#### **Tax Parcel ID #, Parking Spaces Acquired During Acquisition, Damage % Applied:**

- 1) Tax Parcel ID #22701324, 15 of 68 parking spaces acquired, 15% damages applied
- 2) Tax Parcel ID #22701323, 18 of 54 parking spaces acquired, 30% damages applied
- 3) Tax Parcel ID #21501424, 8 of 41 parking spaces acquired, 20% damages applied
- 4) Tax Parcel ID #07114038F, 19 of 50 parking spaces acquired, 40% damages applied
- 5) Tax Parcel ID #07114020, 19 of 56 parking spaces acquired, 35% damages applied
- 6) Tax Parcel ID #07114073, 18 of 26 parking spaces acquired, 70% damages applied
- 7) Tax Parcel ID #07114081, 7 of 43 parking spaces acquired, 15% damages applied
- 8) Tax Parcel ID #07114072D, 21 of 204 parking spaces acquired, 10% damages applied
- 9) Tax Parcel ID #07114072C, 13 of 34 parking spaces acquired, 40% damages applied
- 10) Tax Parcel ID #07114017, 9 of 34 parking spaces acquired, 25% damages applied
- 11) Tax Parcel ID #07114072J, 29 of 62 parking spaces acquired, 50% damages applied
- 12) Tax Parcel ID #07090006U, 15 of 44 parking spaces acquired, 35% damages applied
- 13) Tax Parcel ID #07090006B, 26 of 70 parking spaces acquired, 40% damages applied
- 14) Tax Parcel ID #07090006T, 23 of 62 parking spaces acquired, 40% damages applied
- 15) Tax Parcel ID #07072001, 12 of 29 parking spaces acquired, 40% damages applied
- 16) Tax Parcel ID #07090006M, 25 of 69 parking spaces acquired, 35% damages applied
- 17) Tax Parcel ID #07072004A, 14 of 83 parking spaces acquired, 10% damages applied

## **Appendix E**

### **Agency Correspondence**

- NCDENR – Correspondence re LWCF (6f) dated August 3, 2012
- NCDOT – Letter re Mussel Survey Conclusion dated July 30, 2014
- SHPO – Eligibility Letter dated July 17, 2014/Corrected dated July 18, 2014
- NCDOT – No Survey Required for Archaeology dated August 5, 2014
- SHPO – Section 106/Signed Concurrence Form dated October 20, 2015
- NCDOT – Streamline Section 7 Consultation for the Northern Long-Eared Bat dated June 15, 2016





## Bereis, Kimberly D

---

**From:** Even, Darren L  
**Sent:** Thursday, September 17, 2015 10:02 AM  
**To:** Bereis, Kimberly D  
**Subject:** FW: LWCF Question - Meck. County  
**Attachments:** LWCF4milegreenway.pdf

FYI

**Darren Even, AICP**  
Senior Planner I, NEPA

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**From:** Bereis, Kimberly D  
**Sent:** Friday, May 17, 2013 2:50 PM  
**To:** Even, Darren L; Gibilaro, Carl; Gurak, Jill S  
**Subject:** FW: LWCF Question - Meck. County

Got it!

**Kim Bereis, AICP**  
Senior Planner, Transportation Planning

**ATKINS**  
75 years of design, engineering and project management excellence

5200 Seventy Seven Center Drive, #500, Charlotte, NC, 28217 | Tel: +1 (704) 522 7275 Ext. 4294404 | Fax: +1 (704) 525 2838 | Direct: +1 (704) 665 4404 | Cell: +1 (704) 604 5883  
Email: [kimberly.bereis@atkinsglobal.com](mailto:kimberly.bereis@atkinsglobal.com) | Web: [www.atkinsglobal.com/northamerica](http://www.atkinsglobal.com/northamerica) [www.atkinsglobal.com](http://www.atkinsglobal.com)  
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LinkedIn: [www.linkedin.com/company/atkins](http://www.linkedin.com/company/atkins) | YouTube: [www.youtube.com/wsatinksplc](http://www.youtube.com/wsatinksplc)

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**From:** Poole, John [<mailto:john.poole@ncdenr.gov>]  
**Sent:** Friday, August 03, 2012 3:14 PM  
**To:** Bereis, Kimberly D  
**Cc:** Alcorn, Bayard; Bryan, Luann  
**Subject:** RE: LWCF Question - Meck. County

August 3, 2012

Kimberly:

Based on the information you provided and in NCDENR's project file for Mecklenburg County's Four Mile Creek Greenway, LWCF # 37-01021, it does appear that the greenway section in the town of Matthews has ever received any federal Land and Water Conservation Fund (LWCF) assistance.

To assist in your review, please find attached an LWCF project location map and a copy of two (2) different LWCF Section 6(f)(3) boundary maps for the project. Any proposed work on Four Mile Creek Greenway outside of these Section 6(f)(3) boundaries is not restricted for LWCF restrictive covenants.

If you have any further questions, please let us know.



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**From:** Bereis, Kimberly D [<mailto:Kimberly.Bereis@atkinsglobal.com>]

**Sent:** Friday, August 03, 2012 1:13 PM

**To:** Poole, John

**Subject:** LWCF Question - Meck. County

Good afternoon, John. Per my voicemail from earlier today. I was hoping to get more information on a grant listing for the Four Mile Creek Greenway (seen below in the first attached file). How can I find out exactly where this site is since there are different access areas for the Four Mile Creek Greenway in the Charlotte metro area? I've attached a photo and map of one in the Town of Matthews that I'm inquiring about...just wanted to confirm that this site has/hasn't or if it will receive LWCF funds in the near future.

Please advise. Thank you for your assistance! -kim



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY  
GOVERNOR

ANTHONY J. TATA  
SECRETARY

July 30, 2014

Memorandum to: Michael Turchy, Environmental Program Consultant  
Natural Environment Section (NES), Project Management  
Group

From: Matt Haney, Environmental Specialist  
NES, Biological Surveys Group

Subject: Freshwater Mussel Survey Report for Proposed Widening  
of SR 1009/1010 (Old Monroe Rd in Union County/John St  
in Mecklenberg County) from SR 3448-SR 3474 (Trade St)  
to SR 1377 (Wesley Chapel-Stouts Rd) in the towns of  
Matthews and Stallings, Mecklenberg and Union Counties.  
TIP No. U-4714. WBS # 39078.1.1

The North Carolina Department of Transportation proposes to widen SR 1009/1010 (Old Monroe Rd in Union County/John St in Mecklenberg County) from SR 3448-SR 3474 (Trade St) to SR 1377 (Wesley Chapel-Stouts Rd) in the towns of Matthews and Stallings in Mecklenberg and Union Counties. This project crosses Fourmile Creek and unnamed tributaries to Fourmile Creek, South Fork Crooked Creek, Davis Mine Creek and Price Mill Creek. All of these water bodies are in the Yadkin-Pee Dee River basin. The federally endangered Carolina heelsplitter (*Lasmigona decorata*) is listed by the U.S. Fish and Wildlife Service (USFWS) as potentially occurring in Mecklenberg and Union County.

The Carolina heelsplitter is known to occur in the Catawba and Yadkin-Pee Dee River basins. This mussel requires cool, clean, well-oxygenated water. Stable, silt-free stream bottoms appear to be critical to the species. Typically, stable areas occur where the stream banks are well-vegetated with trees and shrubs.

Prior to conducting in-stream surveys, a review of the NC Natural Heritage Program database was conducted (March 7, 2014) to determine if there were any records of rare mussels within the proposed project study area or receiving waters. **This review indicated that there is no known occurrence of the federally endangered Carolina heelsplitter in Fourmile Creek or any of the unnamed tributaries. The closest occurrence of this species is in the Sixmile Creek, approximately 8 miles from this project.**

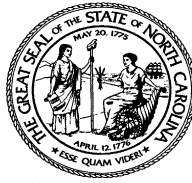


A habitat assessment was conducted on March 10, 2014 by NCDOT biologists Neil Medlin (Permit No. 14-ES00030), Jared Gray (Permit No. 14-ES00314), Matt Haney and Jason Elliott. Fourmile Creek is the largest stream crossed by the project. The unnamed tributaries are all small headwater streams. Therefore, Fourmile Creek was the only waterbody that was assessed. The stream was between 5 and 8 ft wide. The water depth varied from 6 in to 2 ft. The unstable substrate of Fourmile Creek consisted of primarily cobble and silt. A sewer easement is located adjacent to the stream. Land use in the project vicinity consists of urban, commercial, residential, industrial, and agricultural development. No mussel shells were observed along the streambanks.

A mussel survey was conducted on March 10, 2014 by the aforementioned biologists at the Fourmile Creek crossing of Trade Street (SR 3448) for TIP Project I-5507. This site is approximately one mile downstream from the Fourmile Creek crossing of John Street (this project). No mussels or mussel shells were found during 3 person-hours of search time.

Due to the lack of appropriate substrate for Carolina heelsplitter, and the fact that no Carolina heelsplitters were found during surveys, this project will have no effect on this species.

**Biological Conclusions: No Effect for Carolina heelsplitter for U-4714**



## North Carolina Department of Cultural Resources

### State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory  
Secretary Susan Kluttz

Office of Archives and History  
Deputy Secretary Kevin Cherry

July 17, 2014

#### MEMORANDUM

TO: Shelby Reap  
Office of Human Environment  
NCDOT Division of Highways

FROM: Ramona M. Bartos *Reap for Ramona M. Bartos*

SUBJECT: Historic Structures Survey Report, Widening of John Street/Old Monroe Road (SR 1009)  
From Trade Street to Wesley Chapel/Stout Road, U-4714, Mecklenburg & Union Counties,  
ER 13-0879

Thank you for your June 10, 2014, letter transmitting the above-referenced report. We have reviewed the report and offer the following comments.

For the reasons outlined below, we believe the proposed **Matthews Commercial Historic District boundary expansion (MK3357 and MK3358) is not eligible for listing** in the National Register of Historic Places.

- To qualify as a boundary expansion, the area must have made a significant contribution to the history of Matthews' central business district and have historic integrity.
- The addition of the fence, stairs, and modern gazebo at the sidewalk edge has significantly altered the appearance of the property to the southeast.
- It is not clear if other gin-related buildings used to stand on the property in the now vacant area.
- No information is offered about what the auxiliary buildings were used for, and no case has been made for their importance.
- A case has not been made for the individual contribution of the 1957 store building to Matthews' downtown area and expanding the historic district's period of significance to include it would require such a claim. There has to be important history and/or architecture to add a very small number of buildings to a district.
- No context is offered in the report about why/how the post-1946 period in Matthews has historic significance.

We concur that the **Reid House (MK1191) is eligible for listing** in the National Register under Criterion C as a very good local representative example of the Queen Anne style. If the storage building/servants' quarters date from within 15-20 years of the house, then the building is a contributing resource to the historic setting for the house. If the building was built after 1910, we agree it is a noncontributing resource on the property.



We concur that the **Rowland - Clay House (MK2301) is eligible for listing** in the National Register under Criterion A for its association with the African American community in Matthews and represents the economic success of Charlie and Vivian Rowland to be able to purchase land and construct a house for themselves. The workshop to the rear of the house very likely contributes to the continuing history of the African American-owned parcel by the Clay family. The house may also qualify under Criterion C; however, more information about the interior integrity would be needed to make that judgment.

We concur that the **Banks H. Funderburk Store (UN0125) (Rock Store, local landmark) is eligible for listing** in the National Register under Criterion C for its intact picturesque architectural design using very distinctive ashlar rubble stone with raised joints. We are not certain that the stone is actually flint.

We agree that the **Sun Valley High School (UN1182) does not meet National Register criteria** due to changes to the setting and design of the historic school campus. The detached 1960 auditorium now has two large additions on either side. The rear modern additions to the main building do somewhat detract from the school's integrity. Other pre-1963 buildings to the southwest historically stood separately and they have been added on to the rear also. In addition to the post-1965 buildings, the original school building has been altered on the exterior. The alterations to the historic buildings and the new additions have lessened the integrity of the historic school sufficiently enough to result in the property not qualifying for the National Register.

The **Heywood - Killough House (UN0178) does not meet National Register criteria**. The application of synthetic siding, a modern rear addition, new windows, the replacement of the original porch with a Craftsman style porch, and extensive interior remodeling has significantly altered the appearance of this Queen Anne style house.

We believe that contrary to the finding of the report, the **Banks and Carolyn Funderburk House (UN1200) is eligible for listing** in the National Register under Criterion C for architecture as a good representative local example of a Split Level house. The sets of modern columns at the entrance to the living room do detract from the interior integrity of the house, but the excellent integrity of the rest of the main house block is more than enough for the house to have the distinctive characteristics of this house type.

Having reviewed the inventory of properties that were judged as not warranting further investigation, we would recommend additional study to more fully evaluate the following for National Register eligibility.

- No. 33 -- This hip-roofed concrete block house has a very distinctive exterior brick treatment, and the original metal windows are intact.
- No. 68 -- This house is also constructed of the stone found at the Funderburk Store, and it appears to have good integrity.
- No. 72 -- Other pyramidal cottages in the Mecklenburg/Union area have been listed in the Register or are designated as local landmarks, and I would like to know more about this house which appears to have relatively good integrity.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or [renee.gledhill-earley@ncdcr.gov](mailto:renee.gledhill-earley@ncdcr.gov). In all future communication concerning this project, please cite the above referenced tracking number.

cc: Mary Pope Furr, NCDOT

[mpfurr@ncdot.gov](mailto:mpfurr@ncdot.gov)



North Carolina Department of Cultural Resources  
State Historic Preservation Office

Ramona M. Bartos, Administrator

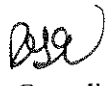
Pat McCrory, Governor  
Susan Kluttz, Secretary  
Kevin Cherry, Deputy Secretary

Office of Archives and History  
Division of Historical Resources

July 18, 2014

MEMORANDUM

To: Shelby Reap, Architectural Historian [slreap@ncdot.gov](mailto:slreap@ncdot.gov)  
NCDOT/PDEA/HES

From: Renee Gledhill-Earley   
Environmental Review Coordinator

Re: Historic Structures Survey Report, Widening of John Street/Old Monroe Road (SR 1009)  
From Trade Street to Wesley Chapel/Stout Road, U-4714, Mecklenburg & Union Counties,  
ER 13-0879

This memorandum is to correct a misstatement in our July 17, 2014, review of the above-referenced report and offer clarification on our recommendation for additional evaluation of three properties.

We concur that the **Banks and Carolyn Funderburk House (UN1200)** is eligible for listing in the National Register under Criterion C for architecture as a good representative local example of a Split Level house. The sets of modern columns at the entrance to the living room detract somewhat from the interior integrity of the house, but the rest of the main house block retains the distinctive characteristics of this house type.

Having reviewed the inventory of properties that were judged as not warranting further investigation, we would recommend additional study to more fully evaluate the following for National Register eligibility, if it appears the project may adversely affect them.

- No. 33 -- This hip-roofed concrete block house has a very distinctive exterior brick treatment, and the original metal windows are intact.
- No. 68 -- This house is also constructed of the stone found at the Funderburk Store, and it appears to have good integrity.
- No. 72 -- Other pyramidal cottages in the Mecklenburg/Union area have been listed in the Register or are designated as local landmarks, and I would like to know more about this house which appears to have relatively good integrity.

cc: Mary Pope Furr, NCDOT [mpfurr@ncdot.gov](mailto:mpfurr@ncdot.gov)





STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY  
GOVERNOR

ANTHONY J. TATA  
SECRETARY

August 5, 2014

Ramona Bartos, Administrator  
State Historic Preservation Office  
Deputy State Historic Preservation Officer  
4617 Mail Service Center  
Raleigh, NC 27699-4617

RE: John Street/Old Monroe Road Widening, Mecklenburg and Union Counties, TIP# U-4714, ER 13-0879

Ms. Bartos,

Thank you for your correspondence of May 17, 2013 regarding the above-mentioned project. In response to comments provided by the Office of State Archaeology (OSA), consultation was held on Tuesday, August 5, 2014, between Paul J. Mohler (NCDOT Archaeologist) and John Mintz (OSA) to review and discuss preliminary design plans for the widening of SR 1009 (John Street/Old Monroe Road) from its intersection with Freemont Street in the Town of Matthews, Mecklenburg County, to its intersection with SR 1377 (Wesley Chapel/Stouts Road) in Union County.

Based on the mapping provided at this meeting as well as a thorough review of soil/landscape conditions, current commercial and residential development, previous archaeological survey results, and the nature and extent of the proposed project, it was determined that the project corridor, as depicted, is unlikely to contain intact and significant archaeological resources. Therefore, OSA does not recommend an archaeological survey be conducted for this project. However, if design plans change, then additional consultation regarding archaeology will be required.

Thank you for your assistance in this matter. If you have any questions concerning this project, please contact me at (919) 707-6089 or Mr. Paul J. Mohler, NCDOT Archaeologist, at (919) 707-6080.

Sincerely,

Matt Wilkerson  
Archaeology Supervisor  
Human Environment Section

MTW/pjm

cc: Elmo Vance, PDEA  
Paul J. Mohler, Archaeology

# Meeting Summary

## East John Street/Old Monroe Road Improvement Project

### Historic Effects Meeting

NCDOT PDEA CCB – Large Conference Room

October 20, 2015, 9:30 am

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**Purpose:** *To review the Preferred Alternative preliminary engineering design in relation to properties determined eligible for the National Register of Historic Places (NRHP) and to concur on the project effects to these properties.*

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### Attendees

Elmo Vance – NCDOT PDEA

Shelby Reap – NCDOT HES

Beverly Robinson – NCDOT PDEA

Theresa Ellerby – NCDOT PDEA

Kim Bereis – Atkins

Mary Pope Furr – NCDOT HES

Jill Gurak – Atkins

Renee Gledhill-Early – SHPO

Gina Schaar – Atkins

Donnie Brew – FHWA

### Material(s)

- Agenda
- Mapping with location of historic district/resources and their boundaries and cross sections

### Meeting Summary

1. **Brief Project Overview** – Kim provided a brief overview of the project, including the location and scope. The project is in a rapidly growing area approximately 12 miles southeast of Uptown Charlotte. The project consists of widening about 6.5 miles of East John Street-Old Monroe Road (SR 1009) from Trade Street (SR 3448-SR 3474) in the Town of Matthews to Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail. The road is known as East John Street through the Town of Matthews in Mecklenburg County and as Old Monroe Road through Stallings and Indian Trail in Union County. An EA is being prepared for the project, with FHWA approval scheduled for end of 2015/early 2016.

The area has experienced notable population growth over the past decade due to proximity to Charlotte, with all three towns in the project area becoming suburban bedroom communities. Existing East John Street-Old Monroe Road is a two-lane facility with no control of access that runs east-southeast from downtown Matthews to the Town of Indian Trail, generally parallel to US 74. The road is a commuter route heavily congested during peak periods. The purpose of the project is to improve existing and projected traffic flow and operations on this section of E. John Street-Old Monroe Road. The project will also enhance mobility for pedestrians and bicyclists along the corridor. Another desirable outcome is to enhance overall travel safety in the project study area.

The proposed widening consists of a 4-lane median-divided “hybrid” design. The design generally has the same cross section throughout the corridor (4-lane median divided with multi-use path on one side and sidewalk on the other), with differences at major intersections where strategic directional crossovers and non-traditional intersection designs were needed to achieve acceptable operations. Improvements at intersections would include full movement, Superstreet, and Michigan Left designs. All three Towns desire a complete street facility, but understand the importance of function for commuters and access to corridor destinations. There has been extensive coordination with the municipalities throughout the project.



# Meeting Summary

2. **Recap of (Internal) Preliminary Effects Review Meeting (September 2014)** – Kim provided a recap of the internal review meeting that was held in September 2014 to obtain a preliminary effects review on historic properties potentially impacted by the proposed roadway improvement. The main focus of that meeting was the “pinch point” in Stallings created by two eligible properties: Banks and Carolyn Funderburk House and the Banks H. Funderburk Store (locally known as the Rock Store Bar-B-Q), which are on opposite sides of the road and fairly close to each other. Since that meeting, the preliminary designs have been revised. Avoiding both of these resources resulted in impacts to the Stallings Plaza.

Also at that meeting, NCDOT HES requested that for the formal effects meeting with SHPO, the mapping include NRHP boundaries (for listed district and eligible properties), boundaries of the resources that were flagged for further investigation should the project result in impacts to those properties, and cross sections in the area of each resource. It was also noted that in addition to direct property impacts, factors such as access, visual, and noise impacts as well as drainage and utility design requirements are considered in the effects determinations.

Kim noted that since the project is still in preliminary design, an exact assessment of both the drainage and utility requirements are not possible at this time. Atkins has had discussions with hydraulic staff to assess what can be done to avoid impacts due to drainage requirements. None of the resources are located at potential outfall locations where stormwater measures would be located, so it appears that drainage designs will not be an issue with encroachment. Greg Brew (NCDOT Roadway) initiated coordination with the NCDOT Utilities Section, and they are aware of the historic resources. Greg noted that the expectation is that they will design the utilities/PUEs in a manner that does not affect these resources.

Mary Pope asked what the speed limit is along the corridor. Currently, it is 45 mph with the exception of the area through Stallings (Town speed limit of 35) and a small section in Matthews that is posted 25 mph. The design speed is 50 mph. Kim noted that in previous municipal coordination meetings Town staff have requested specific posted speeds. At the meetings where this was discussed, NCDOT Division noted that the decision on speed limit will come later on and will be coordinated with the Towns.

3. **Discussion/Effects Determinations for Area Historic Resources** – Kim noted that access would change for all of the historic resources to right-in/right-out (due to change from two lanes with no control of access to a four-lane median divided roadway). No noise impacts were identified for the eligible resources in the Draft Traffic Noise Analysis and visual impacts are not anticipated. A summary of the effects determinations for the historic architectural resources intensively surveyed are on the following page. *(Note: Signed Effects form received following the meeting is included with this meeting summary).*

Kim noted that regarding the resources that were flagged for further investigation if impacted, the following will not be in the construction limits of the project: No. 33 House at 230 Morris Road and No. 72 House at Old Monroe Road at Radiator Road. However, No. 68 House at 4800 Old Monroe Road could have minor right of way impacts and was identified as an impacted “receptor” in the Draft Traffic Noise Analysis. As such, Shelby noted that an eligibility study/report will be completed for No. 68 house.

# Meeting Summary

| Property No. | Property Name   | Site No.  | Listed or Eligible Under Criterion | Effects Finding/ Conditions  | Additional Notes  |
|--------------|---|---|------------------------------------|--|---|
| 1            | Matthews National Register Commercial Historic District | MK1417  | Listed                             | No Effect  | Begin project area in downtown Matthews. Boundary comprised of Trade Street just north of begin project, south of the RR tracks, and a section of East Charles Street. Outside of project area and no changes to Trade Street.  |
| 3            | Reid House  | MK1191<br>(Study List 1987/Local Landmark 1987) | C                                  | No Adverse Effect with Conditions<br>(No construction in ROW; no drainage easements; no PUEs; only replace C&G; keep existing sidewalk; no tree removal) | Preliminary designs were completed with limited survey data. In some places like near the Reid House, only LIDAR was available. When project moves forward into final design and final design survey is available, it likely can be designed so that the Reid House property can still be avoided. The widening is occurring to the other side of the road, no multi-use path is proposed in this section, and there was minimal concern of impacts to property/house by drainage features.                       |
| 31           | Rowland-Clay House                                      | MK2301<br>(Study List 2002/Local Landmark 2005) | A/<br>Possibly C                   | No Effect  | Eligible but outside corridor on East Charles Street. Not near construction limits so no concern.   |
| 55           | Banks H. Funderburk Store (a.k.a. Rock Store Bar-B-Q)   | UN0125 (Local Landmark)                         | C                                  | No Adverse Effect with Conditions<br>(no ROW; no permanent drainage easements)   | Located in Stallings. Local Landmark. There is no construction within the boundary based on available survey. Access would change to right-in/right-out. Given the proximity of the resource to the road, there may need to be some design tweaks to make the drainage fit in without impacts such as by lowering the grade.  |
| 95           | Banks and Carolyn Funderburk House                      | UN1200  | C                                  | No Adverse Effect with Conditions<br>(No ROW; no easements; minimize tree removal; no PUEs; no PDEs).  | Located west of the Rock Store on the opposite side of the road. Property has a lot of trees and is set well back so is buffered. Small concern of minor impacts to property by drainage and erosion control features, but adjustments can be made to the typical section (e.g. remove planting strip from design) to accommodate a swale and can adjust grade. Donnie noted that if property within the boundary is needed, it would likely <i>de minimis</i> and that an additional meeting would be necessary. |
| 33           | House – 230 Morris Road                                 | N/A   | N/A                                | N/A  | Additional study to more fully evaluate the following for NRHP eligibility if it appears the project may adversely affect them.<br>No. 68 House will need an eligibility report due to potential property impacts and noise impact.   |
| 68           | House – 4800 Old Monroe Road                            | N/A   | N/A                                | N/A  |   |
| 72           | House – Old Monroe Road/Radiator Road                   | N/A   | N/A                                | N/A  |   |



Federal Aid #: STPDA-1009(16) TIP#: U-4714 County: Mecklenburg & Union

**CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS**

**Project Description: Improve SR 1009 (John St/Old Monroe Rd) from SR 3448/SR 3474 (Trade St) to SR 1377 (Wesley Chapel/Stout Rd) in Matthews, Stallings, and Indian Trail.**

On October 20, 2015, representatives of the

- ☒ North Carolina Department of Transportation (NCDOT)
- ☒ Federal Highway Administration (FHWA)
- ☒ North Carolina State Historic Preservation Office (HPO)
- ☐ Other United States Army Corps of Engineers (USACE)

Reviewed the subject project and agreed on the effects findings listed within the table on the reverse of this signature page.

Signed:

Shelby Reap  
Representative, NCDOT

Oct 20, 2015  
Date

John P. [Signature]

FHWA, for the Division Administrator, or other Federal Agency

10-20-15  
Date

Renee Hedrick-Easley  
Representative, HPO

10.20.15  
Date

\_\_\_\_\_  
State Historic Preservation Officer

\_\_\_\_\_  
Date

Federal Aid #: STPDA-1009(16)

TIP#: U-4714

County: Mecklenburg &amp; Union

| Property and Status  | Alternative | Effect Finding                          | Reasons  |
|--|-------------|---|--|
| Matthews National Register<br>Commercial Historic<br>District<br>(MK1417) NR |             | no effect                               | no changes to Tradee St.<br>boundary outside APE   |
| Reid House (MK1191) DE   |             | no adverse<br>effect                    | no construction in ROW, no easements<br>no PVEs; only replace curb & gutter; keep existing<br>sidewalk. No tree removal.                       |
| Rowland-Clay House<br>(MK2301) DE  |             | no effect                               | out side construction area   |
| Banks H. Funderburk Store<br>(UN0125) DE, LL                                 |             | no adverse<br>effect with<br>conditions | right in, right out; no construction in boundary<br>may <del>remove</del> remove planting strip from plans,<br>no permanent drainage easements |
| Banks and Carolyn<br>Funderburk House<br>(UN1200) DE                         |             | no adverse<br>effect<br>w/conditions    | no ROW; no easements, minimize tree removal<br>No PVEs, No PDEs.   |
|  |             |   |  |

Initialed:

NCDOT

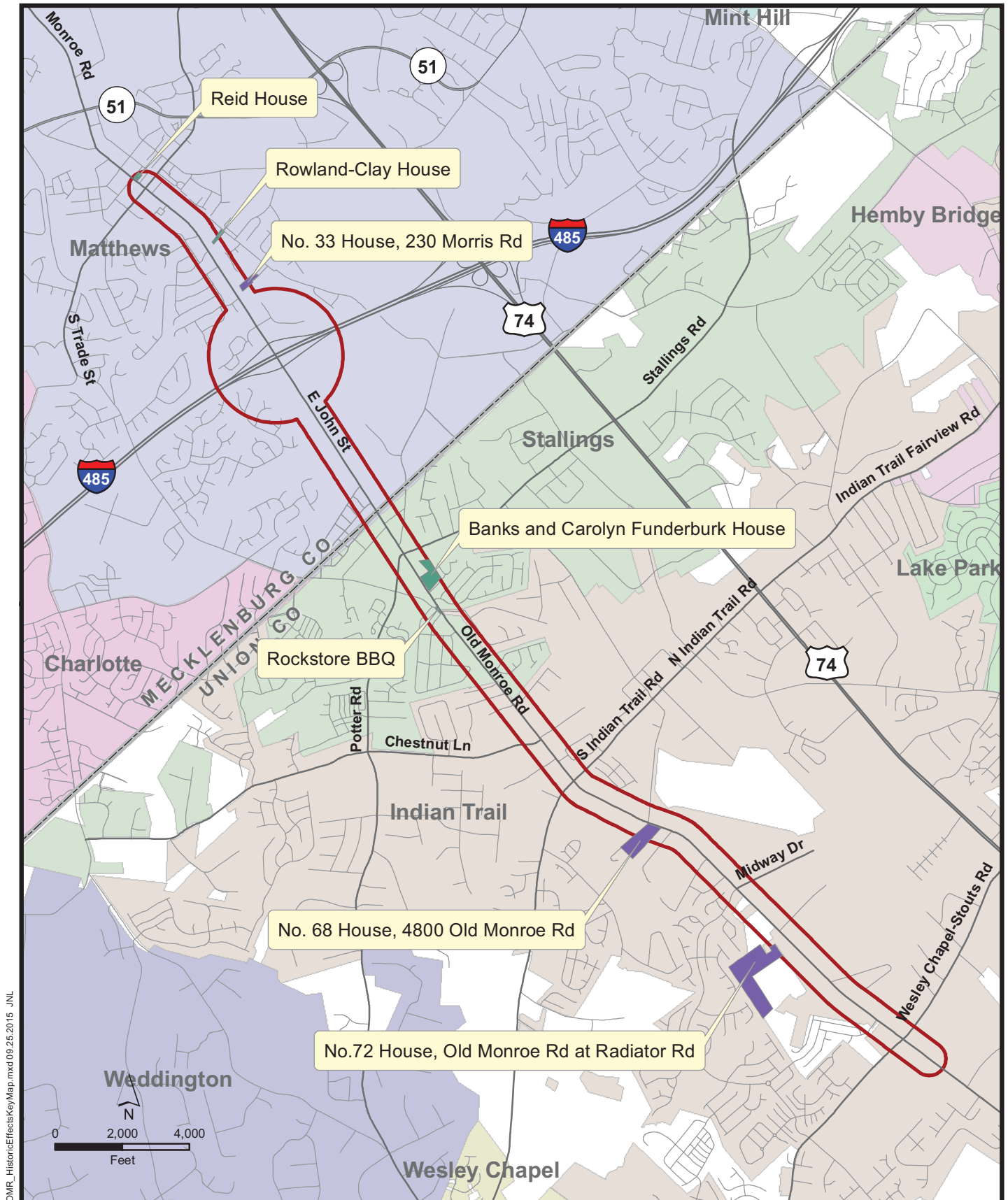
SJRFHWA  
USACEDJB

HPO \_\_\_\_\_

FHWA intends to use SHPO's concurrence as a basis of a "de minimis" finding for the following properties, pursuant to Section 4(f):







OMR\_HistoricEffectsKeyMap.mxd 09.25.2015 JNL



**E. JOHN STREET/  
OLD MONROE ROAD  
WIDENING PROJECT**  
STIP PROJECT NO. U-4714  
Mecklenburg and Union Counties,  
North Carolina

#### Legend

- Requires Additional Study
- Eligible for NRHP Listing
- Project Study Area

Source: Union County, NCDOT, Mecklenburg County

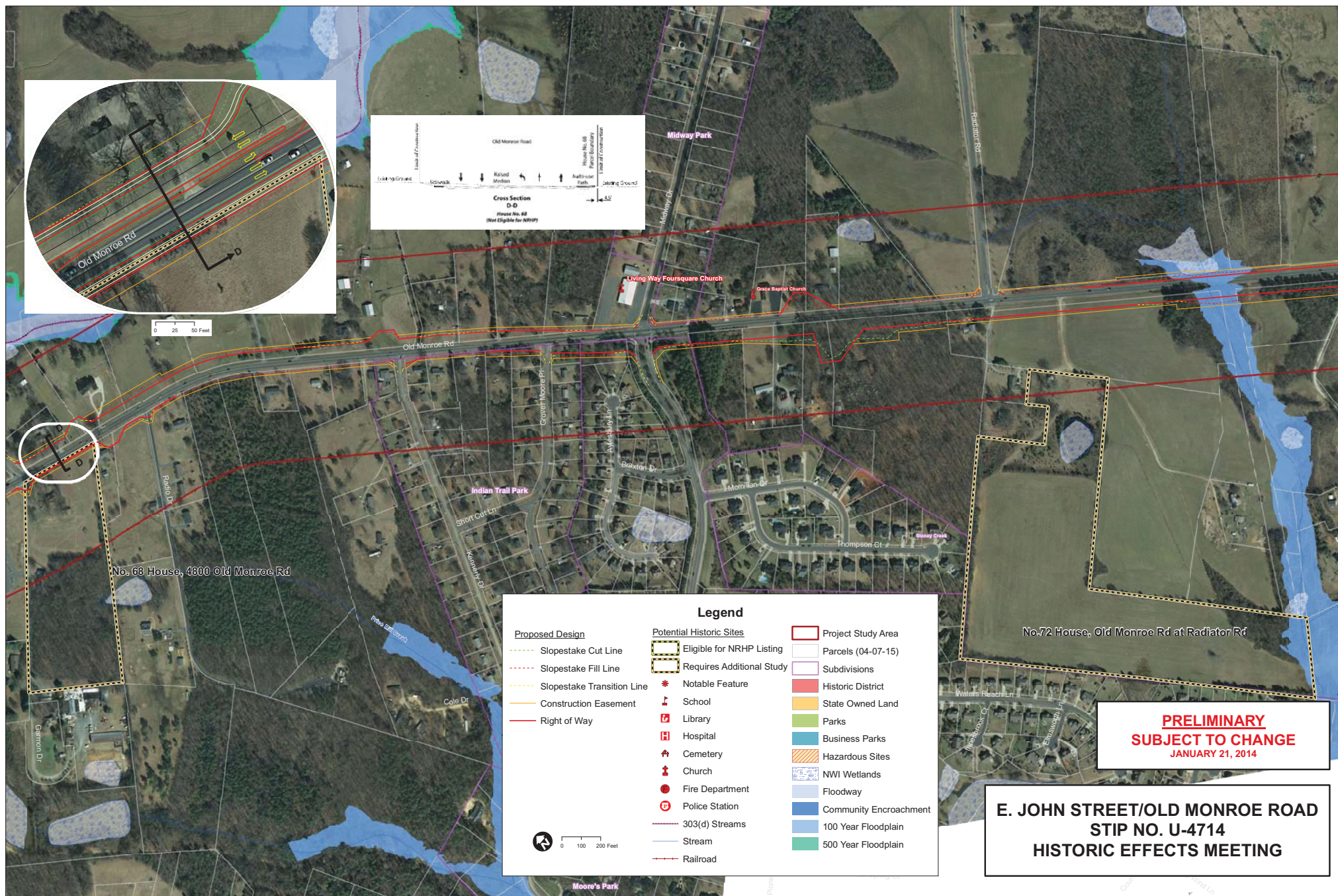


#### HISTORIC SITES

**FIGURE H-1**
























June 15, 2016

TO: Erin Cheely, Environmental Senior Specialist  
Environmental Coordination & Permitting Group Western, NES - PDEA

CC: Elmo Vance, Project Development Engineer  
Project Development Group - Western Region, PDEA

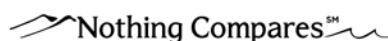
FROM: Cheryl Gregory, Environmental Program Consultant   
Biological Surveys Group, NES - PDEA

SUBJECT: *Streamline Section 7 Consultation for the Northern Long-Eared Bat* associated with the widening of SR 1009 (Old Monroe Road, Union County/East John Street, Mecklenburg County) from SR 3448-SR 3474 (Trade Street) to SR 1377 (Wesley Chapel-Stouts Road) in Mecklenburg and Union Counties, **TIP No. U-4714.**

The North Carolina Department of Transportation (NCDOT, Division 10) proposes to widen the existing two-lane East John Street-Old Monroe Road (SR 1009) to a multi-lane facility from Trade Street (SR 3448-SR 3474) in the Town of Matthews in Mecklenburg County to Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail in Union County, TIP No. U-4714. The length of the project is approximately 6.5 miles long.

The project to widen SR 1009 has been reviewed for effects on the northern long-eared bat (NLEB). As of May 4, 2015, NLEB is listed by the U.S. Fish and Wildlife Service (USFWS) as "Threatened" under the Endangered Species Act of 1973. As of April 6, 2016, NLEB is listed by USFWS ([http://www.fws.gov/raleigh/species/cntylist/nc\\_counties.html](http://www.fws.gov/raleigh/species/cntylist/nc_counties.html)) as "probable/potential" in Mecklenburg County. As of April 6, 2016, NLEB is not listed by USFWS for Union County. USFWS also established a final rule under the authority of section 4(d) of the Endangered Species Act that provides measures for the conservation of NLEB. The USFWS has tailored the final 4(d) rule to prohibit the take of NLEB from certain activities within areas where they are in decline. This incidental take protection applies only to known NLEB occupied maternity roost trees and known NLEB hibernacula. Effective February 16, 2016, incidental take resulting from tree removal is prohibited if it 1) occurs within a ¼ mile radius of known NLEB hibernacula; or 2) cuts or destroys known occupied maternity roost trees, or any other trees within a 150-foot radius from the known maternity tree during the pup season (June 1-July 31).

According to the North Carolina Natural Heritage Program (NHP) Biotics Database, most recently updated October 2015, **the nearest NLEB hibernacula record is 86 miles west (EO ID 32166) and no known NLEB roost trees occur within 150 feet of the project area.** EO 32166 represents Breakdown Cave site with multiple observations from 2001 to 2010.





NCDOT has also reviewed the USFWS Asheville Field office website ([http://www.fws.gov/asheville/htmls/project\\_review/NLEB\\_in\\_WNC.html](http://www.fws.gov/asheville/htmls/project_review/NLEB_in_WNC.html)) for consistency with NHP records. This project is located entirely outside of the red highlighted areas (12 digit HUC) that the USFWS Asheville Field Office has determined to be representative of an area that may require consultation.

For the proposed action, NCDOT has committed to the conservation measures listed below:

- 1) No alterations of a known hibernaculum's entrance or interior environment if it impairs an essential behavioral pattern, including sheltering northern long-eared bats (January 1 through December 31);
- 2) No tree removal within a 0.25 mile radius of a known hibernacula (January 1 through December 31); and
- 3) No cutting or destroying a known, occupied maternity roost tree, or any other trees within a 150-foot radius from the known, occupied maternity tree during the period from June 1 through and including July 31.

**NCDOT has determined that the proposed action does not require separate consultation on the grounds that the proposed action is consistent with the final Section 4(d) rule**, codified at 50 C.F.R. § 17.40(o) and effective February 16, 2016. NCDOT may presume its determination is informed by best available information and consider Section 7 responsibilities fulfilled for NLEB.

If you need any additional information, please contact Cheryl Gregory at 919-707-6142.

## **Appendix F**

### **Scoping and Agency Coordination**

- Scoping Summary and Comments Received
- NEPA/Section 404 Merger Screening Meeting Summary





# East John Street/Old Monroe Road Improvement Project

**Date:** July 3, 2013

**To:** Elmo Vance, Project Manager, NCDOT PDEA

**From:** ATKINS

**Re:** STIP No. U-4714 Scoping Summary

A formal Scoping Packet, as required by NEPA, was sent by NCDOT to local, state, and federal agencies on April 26, 2013. The packet is included in **Appendix A**. The purpose of distributing the packet was to solicit comments and collect pertinent project information early in the project development process. The coordination (NEPA scoping) between the NCDOT, FHWA, and various agencies will assist with the development of the purpose and need statement, identifying the range of alternatives, and defining the scope of the environmental analyses.

In addition to agencies' standard/generalized comments submitted for all projects, several responses included comments related directly to STIP No. U-4714. **Table 1** lists the agencies that provided comments in response to the scoping letter, along with a brief summary of the comments. Comments are listed in order of the date they were provided, from earliest to latest. **Appendix B** contains all project scoping response letters in their entirety.

As a result of these scoping comments, NCDOT will initiate a screening meeting with the four primary resource agencies to the Merger MOA to determine the project's merger status. In addition, other requests and comments below are related to environmental analyses that will be addressed in the EA and supporting technical studies.

**TABLE 1: Scoping Comments**

| Agency                                   | Date   | Comments   |
|--|--------|--|
| Mecklenburg County Fire Marshal's Office | 5/2/13 | <ul style="list-style-type: none"> <li>Blasting permits (if applicable)</li> <li>Proper storage of Aboveground Tanks (if applicable)</li> </ul>  |
| US EPA Region 4                          | 5/7/13 | <ul style="list-style-type: none"> <li>EPA defers to the four primary agencies to the Merger MOA to evaluate placement of the proposed project in the nationally-recognized NC NEPA/Section 404 Merger Team Process.</li> <li>A portion of the proposed 6.5-mile widening project is located within the project study area for the Monroe Bypass/Connector Toll project. The EA should address the relationship between these two projects, as this project closely parallels existing US 74. The east-west traffic flow and anticipated traffic volumes along SR 1009 and US 74 should be considered as part of the NCDOT's overall traffic analysis.</li> <li>Current 2013 AADT ranges from 15,200 to 27,000 vpd. The 2035 design year traffic range is 16,300 to 29,500 vpd. Over 20 years, this projected increase does not appear to be substantial. Because the main purpose of this project is to relieve existing congestion, it would be helpful to know what the existing LOS is at the major intersections, including Wesley Chapel-Stouts Road, Indian Trail Road, Potter Road, I-485, and Trade Street.</li> <li>Figure 2 of the scoping packet provides the 2013 AADT along different segments of the corridor. Again, it is unclear to non-traffic engineers what these numbers mean in relation to congestion and a LOS measure would be helpful in understanding the potential traffic issues at the intersections.</li> <li>It is noted that there are only TIP cost estimates for Section B.</li> <li>The project is located in a non-attainment/maintenance area for the 2008 8-hour Ozone NAAQS. The existing posted speed limit is 25-45 mph. With a new multi-lane facility, driving speeds would be expected to increase. Increased driving speeds can result in increased emissions of VOCs and other pollutants that help to form ground level ozone.</li> </ul> |



# East John Street/Old Monroe Road Improvement Project

**TABLE 1: Scoping Comments**

| Agency  | Date    | Comments  |
|---|---------|---|
|   |         | <ul style="list-style-type: none"> <li>The proposed project may impact 2 named streams (Four Mile Creek and Price Mill Creek) and 3 unnamed streams. NCDOT should consult with NCDWQ to determine if these streams are on the current list of 303(d) listed impaired waters.</li> <li>EPA requests a copy of the EA when it becomes available.</li> </ul>   |
| NCDOT Transportation Planning Branch  | 5/8/13  | <ul style="list-style-type: none"> <li>Noted projects in the vicinity that are in the adopted 2035 LRTP and Draft 2012-2018 STIP:                             <ul style="list-style-type: none"> <li>U-4713 – McKee Road Extension (new two-lane road from Pleasant Plains Road to Campus Ridge Road)</li> <li>I-5507 – I-485 from I-77 to US 74 (widen to six lanes and add one managed lane in each direction)</li> </ul> </li> <li>Planning, design, and construction of U-4714 should be coordinated with NCDOT Division 10, District Engineer, Jeff Littlefield, PE, to ensure there are no potential conflicts with any other NCDOT projects in the general area of the subject project.</li> </ul>   |
| NC DENR Division of Water Resources Public Water Supply Section                                 | 5/9/12  | <ul style="list-style-type: none"> <li>For the Mecklenburg County portion of the project - consult with Charlotte Mecklenburg Utilities Department (CMUD) concerning any water main relocations. CMUD has been delegated local plan approval authority by the DWR. Any water main relocation projects would require approval by CMUD.</li> <li>For the Union County portion of the project - if existing water lines will be relocated during the construction, plans for the water line relocation must be submitted to the DWR/PWSS Technical Services Branch, 1634 Mail Service Center, Raleigh, NC 27699-1634, 919-707-9100, as Union County does not have delegated authority to approve water main project relocations.</li> </ul>  |
| NC Department of Public Safety Emergency Management Geospatial and Technology Management Office | 5/9/13  | <ul style="list-style-type: none"> <li>Coordination with NCDOT Hydraulics (David Chang) to determine if this project is eligible to fall within the Mapping Program MOA between the NCDOT Hydraulics Section and the NC Floodplain Mapping Program to ensure compliance with the FHWA floodplain management requirements of EO 11988.</li> </ul>  |
| NC DENR Division of Waste Management (DWM)  | 5/10/13 | <ul style="list-style-type: none"> <li>Search of Petroleum Underground Storage Tank (UST) and Non-UST databases for documented releases of petroleum and regulated substances for the proposed project along Old Monroe Road, and no open documented release was found along the proposed route.</li> <li>The Mooresville Regional Office (MRO) UST Section recommends removal of any abandoned or out-of-use petroleum USTs or petroleum above ground storage tanks (ASTs) within the project area. Contact the UST Section regarding use of any proposed or on-site petroleum USTs or ASTs. Can be reached at 704-663-1699.</li> <li>Any petroleum spills must be contained and the area of impact must be properly restored. Petroleum spills of significant quantity must be reported to the NCDENR DWM at the Section/phone number above.</li> <li>Any soils excavated during demolition or construction that show evidence of petroleum contamination, such as stained soil, odors, or free product must be reported immediately to the local Fire Marshall to determine whether explosion or inhalation hazards exist, and also notify the UST Section. Petroleum contaminated soils must be handled in accordance with all applicable regulations. Any questions should be directed to 704-235-2167.</li> </ul> |

# East John Street/Old Monroe Road Improvement Project

**TABLE 1: Scoping Comments**

| Agency  | Date    | Comments   |
|---|---------|--|
| NC Department of Cultural Resources<br>State Historic Preservation Office | 5/17/13 | <ul style="list-style-type: none"> <li>Six structures of historical or architectural importance within the general area of the project and their Status are as follows: <ul style="list-style-type: none"> <li><u>Matthews Commercial Historic District (MK 1417)</u> – listed in the National Register (NR)</li> <li><u>Heywood-Killough House (UN 0178)</u> - Survey (identified in 1982 Union County Survey; no evaluation of its NR eligibility)</li> <li><u>House (UN 0301)</u> - Survey (identified in 1982 Union County Survey; no evaluation of its NR eligibility)</li> <li><u>Bain Reid House (MK 1173)</u> - Survey (identified in 1982 Union County Survey; no evaluation of its NR eligibility)</li> <li><u>Nancy Reid House (MK 1191)</u> - SL/Local (placed on the State Study List, a preliminary step in the review of a potential nomination to the National Register)</li> <li><u>Rock Store (UN 0125)</u> - Survey/Local (identified in 1982 Union County Survey; no evaluation of its NR eligibility)</li> </ul> </li> <li>The Matthews Commercial Historic District also includes four individual, locally-designated historic landmarks: 1) (former) Matthews Post Office (MK 1597); 2) Funderburk Brothers Blacksmith Shop &amp; Grist Mill (MK 1177); 3) Heath and Reid General Store (MK 1179); and 4) Renfro Hardware Store (MK 1190).</li> <li>Recommended that records be thoroughly searched and a comprehensive survey be conducted to identify and evaluate any structures over 50 years of age that could potentially be impacted by the project. The last architectural surveys in this portion of Mecklenburg County were the 1987-88 Rural Survey and the 1997 Rural Survey Update. The last architectural survey of Union County was completed in 1982.</li> </ul>  |
| NC Wildlife Resources Commission  | 5/20/13 | <ul style="list-style-type: none"> <li>The project corridor appears to be a significant part of an alternative considered for the Monroe Connector of the Monroe Bypass, but dropped fairly early in the process due to impacts. The Bypass is expected to reduce congestion on existing US 74, which may impact traffic numbers of the project roadway. The EA should analyze the effect that constructing the Monroe Bypass will have on traffic on SR 1008 to determine if this project and the Monroe Bypass project are both necessary to relieve congestion in the design year. Analysis should include the build and no-build scenarios of the Monroe Bypass.</li> <li>Most of the project runs along the dividing line between the Catawba River basin and the Yadkin River basin, draining to both. It is situated between two known populations of the Federal and State Endangered Carolina heelsplitter (<i>Lasmigona decorate</i>), one in each river basin. Streams within and in close proximity to the project study area, in both basins, support a number of State and/or Federally listed aquatic species. Several of these streams, including all those with the most critically imperiled species, are on the 303(d) list of impaired waters, making the rare and sensitive resources very vulnerable to additional pollutants that can come from both direct and indirect project impacts. The EA should provide adequate analysis of the indirect and cumulative impacts and identify techniques and commitments to minimize the negative project impacts to the natural environment.</li> <li>Encourage use of Low Impact Development (LID) techniques and other important measures to minimize negative impacts from development, and encourage local authorities and NCDOT to work together to develop strategies that prevent further degradation of area streams, improve water quality, protect sensitive species, and ensure proper management of secondary growth prior to permit application.</li> <li>The Commission requested 9 “general information needs” to help facilitate document preparation and the review process.</li> </ul> |



# East John Street/Old Monroe Road Improvement Project

**TABLE 1: Scoping Comments**

| Agency  | Date    | Comments  |
|---|---------|---|
| Town of Stallings   | 5/20/13 | <p><b><u>Cross Section/Design and Aesthetic Considerations</u></b></p> <ul style="list-style-type: none"> <li>• Requested consideration of their vision for C&amp;G and landscaped medians with a 10' multi-use path on one side of the roadway and a typical 5' sidewalk on the opposite side. The location of the multi-use path should be coordinated with Indian Trail as they are also requesting the multi-use path along Old Monroe Road.</li> <li>• Requested street trees and a planting strip of at least 6' between the C&amp;G and the sidewalk/multi-use path for which the Town will accept maintenance responsibility at the end of the project.</li> <li>• Requested street lighting and pedestrian lighting and involvement in selection of type of fixtures. Again, the Town will accept maintenance/operational costs of the lighting.</li> <li>• Requested steel poles with mast arms for all signals along their section.</li> </ul> <p><b><u>Old Monroe Road at Pleasant Plains Road</u></b></p> <ul style="list-style-type: none"> <li>• Requested realignment/signalization of the existing skewed Pleasant Plains Road/Old Monroe Road intersection to Kerry Greens Drive (access road to Kerry Greens subdivision) to create a four-legged intersection.</li> </ul> <p><b><u>Crosswalks</u></b></p> <ul style="list-style-type: none"> <li>• Requested crosswalks at the following locations: <ol style="list-style-type: none"> <li>1. Old Monroe Road at proposed McKee Road Extension</li> <li>2. Old Monroe Road at Potters Road/Stallings Road (all approaches)</li> <li>3. Old Monroe Road at Pleasant Plains Road (all approaches)</li> </ol> </li> <li>• Requested decorative crosswalks at signalized intersections (stamped asphalt or equivalent), for which the Town will assume maintenance once installed.</li> </ul> <p><b><u>Speed Limit</u></b></p> <ul style="list-style-type: none"> <li>• Requested speed limit from I-485 to McKee Road Extension to be posted at 45 mph and from McKee Road Extension to Indian Trail Town limits at 35 mph due to pedestrian activity in the area.</li> </ul> <p><b><u>Bus Turn-outs</u></b></p> <ul style="list-style-type: none"> <li>• Requested that in order to accommodate future CATS route expansion (as identified in their CTP), consider installing bus turn-outs in both directions in the following three locations: <ol style="list-style-type: none"> <li>1. Old Monroe Road near Morningwood Drive</li> <li>2. Old Monroe Road near Potters Road/Pleasant Plains Road</li> <li>3. Old Monroe Road near Morningside Meadow Lane</li> </ol> </li> </ul> <p><b><u>Access Control</u></b></p> <ul style="list-style-type: none"> <li>• Requested providing directional crossovers to facilitate U-turning movements as well as considering McKee Road Extension in the plans to provide access cuts for the roadway extension to minimize future disturbance to Old Monroe Road.</li> </ul> <p><b><u>Rock Store</u></b></p> <ul style="list-style-type: none"> <li>• As this structure is an important part of Stallings history, requested avoidance and minimization of impacts to this resource.</li> </ul> <p><b><u>Utilities</u></b></p> <ul style="list-style-type: none"> <li>• Requested utility companies consider consolidating utilities or putting utilities underground along Old Monroe Road.</li> </ul> |
| NCDENR<br>Mooresville Office<br>(Division of Water<br>Quality and Division<br>of Air Quality) | 5/22/13 | <ul style="list-style-type: none"> <li>• Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable stormwater conveyances and outlets.</li> </ul>   |

# East John Street/Old Monroe Road Improvement Project

**TABLE 1: Scoping Comments**

| Agency           | Date    | Comments   |
|------------------|---------|--|
|                  |         | <ul style="list-style-type: none"> <li>401 Water Quality Certification may be required and stream/wetland impacts should be minimized, and wetlands determination within the corridor</li> <li>Air quality modeling might be needed to determine transportation conformity.</li> <li>Notification of the proper regional office is requested if “orphan” underground storage tanks are discovered during any excavation operation.</li> </ul>  |
| Town of Matthews | 5/24/13 | <ul style="list-style-type: none"> <li>For Section A and the portion of Section B within Matthews/Meck. County portion, plan and design a complete street; 10’ multi-use path on at least the south side and 5’ sidewalk on the north side, or multi-use paths on both sides, with green space between back of curb and pathway.</li> <li>Two through-lanes in each direction with landscaped center median, which allows left turning movement at intersections and other selected controlled locations.</li> <li>Provide for consistent features along entire corridor – mast arms, sign posts, signals, etc.</li> <li>Explore interim options or incremental improvements along the Section A portion of the overall corridor should Section B construction be completed in advance of Section A; recognize the increased bottleneck pressure likely to result on Section A, downtown Matthews, and W. John Street.</li> <li>Accommodate future new road construction which will create new intersections on E. John Street, including Buckley Way, Greylock Ridge Road, and McKee Rd/Campus Ridge Rd. relocation.</li> <li>Follow the recommendations of the Matthews Land Use Plan and Downtown Matthews Master Plan.</li> <li>Protect and limit disturbance to historic properties in downtown Matthews.</li> <li>Include options on how to transition traffic patterns at Trade Street, especially for east-bound traffic ultimately going from one to two lanes.</li> <li>Determine logical separation distances for left-turn median crossover movements, especially near the I-485 interchange; included with this would be adequate bulbout space at the curblane for trucks and other large vehicles if they must U-turn.</li> <li>Determine whether the existing interchange configuration will allow additional laneage as well as separated pedestrian and bicycle pathways-will it be necessary to bring a sidewalk or multi-use path up against the vehicular use curblane, and if so, how will safety be accomplished.</li> <li>Explore what landscaping options are possible, especially to provide for some trees in the center median and/or along road edges; what species of trees, especially larger maturing varieties, can be included.</li> <li>Incorporate irrigation in center medians and along curblane green space, and/or design rain garden planting areas.</li> <li>Determine what public utilities are currently in the existing or expanded right-of-way, and accommodate the extension, installation, or removal of utilities-sewer and water mains as well as overhead or underground electronic, telephone, and cable wires, and natural gas.</li> <li>During design and construction phases, plan for relocation of overhead utilities with buried systems.</li> <li>Prior to construction determine what construction activity for public water and sewer in planned by Charlotte-Mecklenburg Utilities in their long-range needs and plans; during design phase, accommodate adequate construction space for any extensions/enlargements of public water or sanitary sewer systems as per Charlotte-Mecklenburg Utilities long-range plans, including sufficient separation spacing between them.</li> <li>Plan for extension of Four Mile Creek Greenway to north side of the roadway—interim by signalized intersection at Greylock Ridge Road, and with construction of Section A determine if greenway can be tunneled under the road.</li> </ul> |

# East John Street/Old Monroe Road Improvement Project

**TABLE 1: Scoping Comments**

| Agency   | Date    | Comments  |
|--|---------|---|
|  |         | <ul style="list-style-type: none"> <li>Study alternatives to right-of-way being evenly widened on each side of the roadway, specifically in Section A, where single-family homes front both sides; an option would be to push the widening to the north side and eliminate the existing individual small homes already close to the street, allowing future redevelopment of the residual land as an assembled site, possibly coordinated with land to its rear.</li> <li>Study the traffic patterns at I-485 interchange where an additional lane exists for a short distance; the queue-jumping movements are often dangerous and annoying to drivers, and the left-turn stacking lane for south-bound I-485 is not sufficient at certain times; this may require interim improvements when Section B is constructed ahead of Section A.</li> <li>Be sensitive to the lower income neighborhood Eastwood Forest, which straddles the Mecklenburg-Union line; streets within neighborhood are often used as a cut-through; only some are Town-maintained and were not built to Town standards.</li> <li>Include the Crestdale neighborhood as a residential area impacted by this project since they will have vehicular connection to E. John Street via planned new construction streets (Buckley Way and Greylock Ridge Road).</li> </ul>   |
| Union Emergency Medical Services                             | 5/30/13 | <ul style="list-style-type: none"> <li>Supports improvements to a multi-lane facility along the corridor.</li> <li>Concerns - impacts at intersections of Williams Rescue Road and Chestnut Lane.</li> <li>Union EMS operates two ambulances and a supervisory response unit from an EMS Base located at 100 Williams Rescue Road. Traffic congestion and the existing irregular configuration of this intersection significantly impede egress from Williams Rescue Road when responding to ambulance calls. Request that this intersection be addressed within the scope of the project to include realignment of the intersection such that Williams Rescue Road and Chestnut Lane would meet at a controlled intersection (stop lights) to relieve congestions, improve driver safety, and facilitate safe and timely egress of emergency vehicles from Williams Rescue Road. With a multilane facility at this intersection, believes intersection controls will be an absolute necessity for safety and traffic flow.</li> </ul>  |
| Mecklenburg-Union Metropolitan Planning Organization (MUMPO) | 5/31/13 | <ul style="list-style-type: none"> <li>Project should be designed with "Complete Streets" perspective to ensure that John St./Old Monroe Road becomes a viable transportation corridor for all modes.</li> <li>MUMPO attempts to assess project impacts on environmental justice (EJ) communities by using a process called Degree of Impacts (DOI). The DOI assessment of this project indicates that the Mecklenburg County portion of this project has a DOI of "slight", which means that one to two of the six demographic groups that we assess (Black, Hispanic, Asian-American/American Indian/Alaskan Native, households in poverty, carless households, limited English proficiency) are represented at levels higher than the regional average for those groups. The assessment of the Union County portion of the project indicates that none of the six communities is represented at levels that exceed regional averages. Nonetheless, NCDOT is urged to assess the project's potential impact on EJ communities. MUMPO's DOI assessment process is done at the Census tract level, which can understate the presence of EJ populations in the community.</li> <li>Analysis should take into account the proposed Chestnut Parkway. Part of this project is being built by the Town of Indian Trail, and will intersect Old Monroe Road at a location between Stallings Road and Indian Trail Road.</li> <li>In February 2010, a technical improvement analysis report was prepared to identify near term improvements to improve traffic operations along John Street/Old Monroe Road from Trade Street in Matthews to Sun Valley High School just east of Wesley Chapel-Stouts Road. The report's intent was to identify potential projects that could be implemented in advance of the widening associated with U-4714.</li> <li>MUMPO recently updated its Congestion Management Process (CMP). While one of the purposes of a CMP is to determine if less costly improvements can be</li> </ul> |



# East John Street/Old Monroe Road Improvement Project

**TABLE 1: Scoping Comments**

| Agency  | Date    | Comments  |
|---|---------|---|
|   |         | <p>constructed that will eliminate or delay the need for the type of improvements proposed by this project, some of the identified strategies may be useful and could be incorporated into the project.</p> <ul style="list-style-type: none"> <li>The 2035 Long Range Transportation Plan (LRTP) includes a section that identified potential project mitigation strategies, and should be consulted for scoping effort.</li> </ul>  |
| Town of Indian Trail                            | 5/31/13 | <ul style="list-style-type: none"> <li>Requests a 4-lane median divided street with sidewalk on both sides of the road.</li> <li>Request to include Chestnut Parkway project in analysis.</li> <li>Environmental Features Map - add Union County EMS on Williams Rescue Road; label Shopping Center in southwest quadrant of Wesley Chapel-Stouts Road/Old Monroe Road.</li> </ul>  |
| Army Corps of Engineers,<br>Wilmington District | 6/17/13 | <ul style="list-style-type: none"> <li>Project likely to impact streams and /or wetlands within the work corridor, and impacts associated with discharge of fill into jurisdictional waters of the U.S. are subject to Corp regulatory authority pursuant to Section 404 of the Clean Water Act. The Department of the Army (DA) permit authorization required will be determined by the location type, and extent of jurisdictional area impacted by the project, and the project design and construction limits.</li> <li>The project may be a candidate for the Merger Process. At this time, the proposed impacts to the aquatic environment associated with this project are unknown.</li> <li>To assist in determining permitting requirements, recommend a detailed delineation of the streams and/or wetlands present on the project site. When the information becomes available, forward to the Asheville Regulatory Field Office for review and comment, as well as a determination of DA permit eligibility.</li> </ul> |





600 East Fourth Street  
Charlotte, NC 28202  
704-336-2205  
www.mumpo.org

TO: John Conforti, REM  
NC Department of Transportation  
FROM: Robert W. Cook, AICP  
MUMPO Secretary  
DATE: May 31, 2013  
  
**SUBJECT: TIP Project U-4714, John St./Old Monroe Road  
Request for Scoping Comments**

The Mecklenburg-Union MPO (MUMPO) offers the following comments on the Subject project.

1. The project should be designed with a "Complete Streets" perspective in order to ensure that John St./Old Monroe Road becomes a viable transportation corridor for all modes.
2. MUMPO attempts to assess project impacts on environmental justice communities by using a process called Degree of Impacts (DOI). The DOI assessment of this project indicates that the Mecklenburg County portion of this project has a DOI score of "slight," which means that one to two of the six demographic groups that we assess (Black, Hispanic, Asian-American/American Indian/Alaskan Native, households in poverty, carless households, limited English proficiency) are represented at levels higher than the regional average for those groups. The assessment of the Union County portion of the project indicates that none of the six communities is represented at levels that exceed regional averages. Nonetheless, NCDOT is urged to assess the project's potential impact on environmental justice communities. MUMPO's DOI assessment process is done at the Census tract level, which can understate the presence of environmental justice populations in a community.
3. The analysis that will be conducted should take into account the proposed Chestnut Parkway. Part of this project is being built by the Town of Indian Trail, and will intersect Old Monroe Road at a location between Stallings Road and Indian Trail Road.
4. In February 2010, a technical improvement analysis report was prepared to identify near term improvements to improve traffic operations along John Street/Old Monroe Road from Trade St. in Matthews to Sun Valley High School just east of Wesley Chapel-Stouts Road. The report's intent was to identify potential projects that could be implemented in advance of the widening associated with U-4714. [Click here](#) to view a copy of the report.
5. MUMPO recently updated its Congestion Management Process (CMP). While one of the purposes of a CMP is to determine if less costly improvements can be constructed that will



eliminate or delay the need for the type of improvement proposed by this project, some of the identified strategies may be useful and could be incorporated into the project.

6. The 2035 Long Range Transportation Plan includes a section that identifies potential project mitigation strategies. The LRTP should be consulted as a part of the scoping effort.

Attached are comments prepared by the Town of Stallings, Town of Matthews and the Town of Indian Trail.

Please note that the MPO's governing body recently approved changing the organization's name to *Charlotte Regional Transportation Planning Organization*. MUMPO is still be used at this time, but will be gradually phased out during FY 2014.



# *Town of Stallings*

MAYOR  
Lynda M. Paxton

MAYOR PRO TEMPORE  
Reed Esarove

TOWN COUNCIL  
Wyatt Dunn      Paul Frost  
Shawna Steele    Harry Stokes  
Fred Weber

TOWN MANAGER  
Brian W. Matthews

TOWN CLERK  
Erinn E. Nichols

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May 20, 2013

John Conforti, REM  
NC Department of Transportation  
Project Development and Environmental Analysis  
1548 Mail Service Center  
Raleigh, NC 27699-1548

Subject:      Scoping Comments  
                John Street/Old Monroe Road Widen to Multi-Lanes  
                SR 1009 (John Street/Old Monroe Rd.) from SR 3448/SR3474 (Trade Street to SR  
                1377 (Wesley Chapel Stouts Rd.) in Mecklenburg and Union Counties. STIP  
                Project U-4714, State WBS Project No. 39078.1.1, Federal Aid No. TBD

Dear Mr. Conforti:

The Town of Stallings has reviewed your letter dated April 26, 2013 concerning the Scoping of John Street/Old Monroe Rd. from Trade St. in Matthews, NC to Wesley Chapel Stouts Rd. in Indian Trail, NC. This is an important corridor for the Town and we have the following comments regarding the project.

Cross Section of Old Monroe Rd. (U-4714B)

Our vision of Old Monroe Road from I-485 to Indian Trail Rd. is a multi-lane roadway with curb and gutter and landscaped medians where possible. The Town of Stallings adopted a Comprehensive Pedestrian Plan which calls for a 10' multi-use path to be constructed on one side of the roadway and a typical 5' width sidewalk on the opposite side of the street. The location of the multi-use path should be coordinated with the Town of Indian Trail as they are also requesting the multi-use path along Old Monroe Rd.

The Town of Stallings requests street trees to be included in the plan. We would prefer that a planting strip of at least 6 feet be provided between the curb and gutter and the sidewalk or multi-use path. The street trees may be added in the planting strip or behind the sidewalk/multi-use path. The Town of Stallings will accept maintenance responsibilities of the trees at the end of the project.

The Town of Stallings requests Street lighting and pedestrian lighting to be included as well along this section of the project. The Town of Stallings will also accept the maintenance and operational costs of the lighting. We also would like to be involved in the decision process on the type of fixtures used.

The Town of Stallings requests steel poles with mast arms to be used for all traffic signals along this portion of the project.

#### Old Monroe Rd. at Pleasant Plains Rd.

The Pleasant Plains Rd. approach to Old Monroe Rd. is currently a skewed intersection. We recommend that you consider realigning the approach of Pleasant Plains Rd. to Kerry Greens Dr. Kerry Greens is a single family residential subdivision with over 250 homes. This will create a 4-legged intersection and we feel a traffic signal would be warranted at this location.

#### Crosswalks

The Town of Stallings recommends the following locations to have crosswalks.

- a. Old Monroe Rd. at Proposed McKee Rd. Extension
- b. Old Monroe Rd. at Potters Rd./Stallings Rd. (all approaches)
- c. Old Monroe Rd. at Pleasant Plains Rd. (all approaches)

At signalized intersections, we recommend decorative crosswalks (stamped asphalt or equivalent). The Town will assume maintenance responsibilities of the crosswalks once they are installed.

#### Speed Limits along Old Monroe Rd.

The Town of Stallings recommend that the speed limit from I-485 to the McKee Rd. Extension to be posted at 45 mph. From McKee Rd. Extension to the Indian Trail Town Limits, we recommend the posted speed limit to be 35 mph due to the pedestrian activity in the area.

#### Bus Turn-outs

Although we do not currently have a CATS bus route that has a designated route on this portion of Old Monroe Rd., it has been identified in the Town of Stallings Comprehensive Transportation Plan. We recommend that you consider bus turn-outs in both directions in the following three locations:

- a. Old Monroe Rd. near Morningwood Drive
- b. Old Monroe Rd. near Potters Rd./Pleasant Plains Rd.
- c. Old Monroe Rd. near Morningside Meadow Lane



### Access Control

We understand the need to minimize driveways and median cuts along this section of Old Monroe Rd. to reduce congestion and crashes. We recommend that you provide directional crossovers along this section where necessary to facilitate U-turning movements. We also recommend that you consider McKee Rd. Extension in your plans and provide access cuts for the roadway extension to minimize future disturbance to Old Monroe Rd.

We currently have a streetscape design being completed by Kimley-Horn for Potters Rd./Stallings Rd. We have been in coordination with the NCDOT Division office concerning the design and will provide the final plans to you as well.

### Rock Store

The Rock Store is located on Old Monroe Rd. at the Pleasant Plains Rd. intersection. You have identified it as a landmark and it is an important part of the Town of Stallings history. This is evident in the Town seal which bears a sketch of the Rock Store. We recommend that you minimize the impacts that the roadway widening will have on the Rock Store.

### Utilities

During the design phase of the project, we would like for the utility companies to consider consolidating the utilities or putting the utilities underground along Old Monroe Rd.

If you have any questions about our comments or would like to discuss further, please feel free to contact me at (704) 821-8557. You may also email information to us at [BMatthews@admin.stallingsnc.org](mailto:BMatthews@admin.stallingsnc.org).

Sincerely,



Brian Matthews  
Town Manager  
Town of Stallings

CC: Elmo Vance, NCDOT  
Carl Gibilaro, Atkins



May 24, 2013

Mr John Conforti, REM  
Project Development Group Leader  
NC-DOT Project Development and Environmental Analysis Unit – Western Region  
1548 Mail Service Center  
Raleigh NC 27699 – 1548

Dear Mr Conforti,

In response to the letter requesting input on scoping for STIP Project #U-4714, Segments A, B, and C, the Town of Matthews has compiled a list of concerns we would like to see included in the study and design of the road widening project. While we anticipate a coordinated design approach through Matthews, Stallings and Indian Trail, the items listed below are of particular relevance to Segment A and the portion of Segment B within the Town of Matthews/Mecklenburg County.

- plan and design for a complete streets approach – a 10' multi-use path on at least the south side and 5' sidewalk on the north side, or multi-use paths on both sides, with green space between back of curb and pathway
- generally design for 2 through lanes in each direction with a landscaped center median, which will allow left turning movement at intersections and other selected controlled locations
- provide for consistent features along entire corridor – mast arms, sign posts, signals, etc.
- explore interim options or incremental improvements along the Segment A portion of the overall corridor should Segment B construction be completed in advance of Segment A; recognize the increased bottleneck pressure likely to result on Segment A, downtown Matthews, and W John Street
- accommodate future new road construction which will create new intersections on E John Street, including Buckley Way, Greylock Ridge Road, and McKee Rd/Campus Ridge Rd relocation
- follow the recommendations of the Matthews Land Use Plan and Downtown Matthews Master Plan
- protect and limit disturbance to historic properties in downtown Matthews
- include options on how to transition traffic patterns at Trade Street, especially for east-bound traffic ultimately going from 1 to 2 lanes
- determine logical separation distances for left-turn median crossover movements, especially near the I-485 interchange; included with this would be adequate bulbout space at the curblane for trucks and other large vehicles if they must make a U-turn
- determine whether the existing interchange configuration will allow additional laneage as well as separated pedestrian and bicycle pathways – will it be necessary to bring a sidewalk or multi-use path up against the vehicular use curblane, and if so, how will safety be accomplished
- explore what landscaping options are possible, especially to provide for some trees in the center median and/or along road edges; what species of trees, especially larger maturing varieties, can be included



- incorporate irrigation in center medians and along curblin green space, and/or design rain garden planting areas
- determine what public utilities are currently in the existing or expanded right-of-way, and accommodate the extension, installation, or removal of utilities – sewer and water mains as well as overhead or underground electric, telephone, and cable wires, and natural gas
- during design and construction phases, plan for relocation of overhead utilities with buried systems
- prior to construction determine what construction activity for public water and sewer by Charlotte-Mecklenburg Utilities are in their long-range needs and plans; during design phase, accommodate adequate construction space for any extensions/enlargements of public water or sanitary sewer systems as per Charlotte-Mecklenburg Utilities long-range plans, including sufficient separation spacing between them
- plan for the extension of Four Mile Creek Greenway to the north side of the roadway -- interim by signalized intersection at Greylock Ridge Rd, and with construction of Segment A determine if the greenway can be tunneled under the road
- study alternatives to right-of-way being evenly widened on each side of the roadway, specifically in Segment A where single-family houses front both sides; an option would be to push the widening to the north side and eliminate the existing individual small homes which are already close to the street, allowing future redevelopment of the residual land as an assembled site, possibly coordinated with land to its rear
- study the traffic patterns at I-485 interchange where an additional lane exists for a short distance; the queue-jumping movements are often dangerous and annoying to drivers, and the left-turn stacking lane for south-bound I-485 is not sufficient at certain times; this may require interim improvements when Segment B is constructed ahead of Segment A
- be sensitive to the lower income neighborhood of Eastwood Forest, which straddles the Mecklenburg-Union County line; streets within this neighborhood are often used as a cut-through; only some are Town-maintained and were not built to Town standards
- include the Crestdale neighborhood as a residential area impacted by this project (Figure 3A) since they will have vehicular connection to E John Street via planned new construction streets (Buckley Way and Greylock Ridge Rd)

We appreciate the opportunity to provide this input. Please let us know if you have any questions or need additional explanation on any of these comments.

Sincerely,

Hazen Blodgett  
Town Manager

cc via e-mail: Elmo Vance Jr ([eevance@ncdot.gov](mailto:eevance@ncdot.gov))  
Carl Gibilaro ([carl.gibilaro@atkinsglobal.com](mailto:carl.gibilaro@atkinsglobal.com))

ejohnscoping5-24-13



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY  
GOVERNOR

ANTHONY J. TATA  
SECRETARY

April 26, 2013

Mr. Robert Cook, MUMPO Secretary  
MUMPO  
600 E. 4th St., 8th Floor  
Charlotte, NC 28202

**SUBJECT: Request for Scoping Comments**  
**John Street/Old Monroe Road Widen to Multi-Lanes**  
**SR 1009 (John Street/Old Monroe Road) from SR 3448/SR 3474 (Trade**  
**Street) to SR 1377 (Wesley Chapel-Stouts Road) in Mecklenburg and Union**  
**Counties. STIP Project No. U-4714, State WBS Project No. 39078.1.1, Federal**  
**Aid No. TBD**

Dear Mr. Cook:

The Project Development and Environmental Analysis Unit - Western Region has begun studying the proposed improvements to the subject project. The project is included in the NCDOT's *Draft 2013-2023 State Transportation Improvement Plan* (STIP). A project location map is attached.

STIP Project No. U-4714 extends along E. John Street/Old Monroe Road/Old Charlotte Highway (SR 1009) from Trade Street (SR 3448/SR 3474) in Matthews, Mecklenburg County to Wesley Chapel-Stouts Road (SR 1377) in Indian Trail, Union County, a distance of approximately 6.5 miles. The project is divided into three sections: U-4714A is from Trade Street to I-485, U-4714B is from I-485 to Waxhaw-Indian Trail Road (SR 1008) and U-4714C is from Waxhaw-Indian Trail Road to Wesley Chapel-Stouts Road (SR 1377). U-4714B is currently programmed for right-of-way acquisition in 2016 and construction in 2018. U-4714A and U-4714C are both currently unfunded.

NCDOT proposes to improve John Street/Old Monroe Road to a multilane facility to relieve existing and projected congestion along the corridor. An environmental analysis consistent with the requirements on the National Environmental Policy Act (NEPA) is underway with the preparation of an Environmental Assessment. NCDOT will study all three sections (A, B, and C) together as one project during the NEPA study, and will investigate a variety of improvement options for the existing two-lane facility. NCDOT will consider the Towns' (Matthews, Stallings, and Indian Trail) visions for the corridor in the alternatives development process. A No-Build Alternative also will be considered.

**MAILING ADDRESS:**  
NC DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS  
1548 MAIL SERVICE CENTER  
RALEIGH NC 27699-1548

TELEPHONE: 919-707-6000  
FAX: 919-250-4224

[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/ENVIRON  
MENTAL/PAGES/DEFAULT.ASPX](https://connect.ncdot.gov/resources/environmental/PAGES/DEFAULT.ASPX)

**LOCATION:**  
CENTURY CENTER, BUILDING A  
1000 BIRCH RIDGE DRIVE  
RALEIGH NC 27610

The purpose of this letter is to solicit input concerning the scope of the project and identify potential impacts within the corridor. To assist in the evaluation of this project, please **respond in writing by May 26, 2013** concerning any needs and goals to be addressed, sensitive resources in the project study area, and potential beneficial or adverse impacts of the project relating to the interest of your agency or organization. If applicable, please identify any permits or approvals that may be required by your agency.

If you have any questions or comments concerning the project, please contact Elmo Vance, Jr. at (919) 707-6048 or by email at [eevance@ncdot.gov](mailto:eevance@ncdot.gov) or Carl Gibilaro, P.E. of Atkins at (704) 522-7275 or by email at [carl.gibilaro@atkinsglobal.com](mailto:carl.gibilaro@atkinsglobal.com).

Sincerely,

A handwritten signature in blue ink, appearing to read 'John', with a long horizontal stroke extending to the right.

John Conforti, REM  
Project Development Group Leader  
Project Development and Environmental Analysis Unit - Western Region

EV/cg

Attachments:

|                                    |                              |
|------------------------------------|------------------------------|
| Figure 1                           | Project Location             |
| Figure 2                           | Existing (2013) AADT Volumes |
| Figure 3A – 3D                     | Environmental Features       |
| Figure 4A – 4B                     | USGS Map                     |
| Project Scoping Information Sheets |                              |



## Project Development and Environmental Analysis Branch Scoping Information Sheets

TIP No.: U-4714 Sent Date: 04/26/13

WBS No.: 39078.1.1 Revision Date:

Federal Aid No.: TBD Meeting Date: The need for a formal scoping meeting will be evaluated after reviewing comments received.

Division: 10

County: Mecklenburg and Union

Project Description: SR 1009 (John Street/Old Monroe Road), SR 3448/SR 3474 (Trade Street) to SR 1377 (Wesley Chapel-Stouts Road). Widen to multi-lanes. See **Figure 1**.

General Project Need: The Old Monroe Road is currently a two-lane road that traverses the Towns of Matthews, Stallings, and Indian Trail. Portions of Old Monroe Road are currently over capacity and demand is projected to increase by 2035.

Metropolitan / Rural Planning Organization: Mecklenburg-Union MPO

NEPA/404 Merger Candidate?: ☐ Yes ☐ No ☒ To Be Determined

Feasibility Study Completed?: ☐ Yes ☒ No Date of Study: 

|                                  |                          |                     |
|----------------------------------|--------------------------|---------------------|
| <u>Project Schedule:</u>         | <u>Type of Document:</u> | <u>Dates:</u>       |
| Environmental Document(s):       | Draft EA                 | February 2014       |
|                                  | FONSI                    | November 2014       |
| Right of Way Authorization Date: | Production TIP           | Section B Only 2016 |
| Let Date:                        | Production TIP           | Section B Only 2018 |

|  | Construction:<br>FY 2018 | Right of Way:<br>FY 2016 | Total Cost: |
|--|--------------------------|--------------------------|-------------|
| <u>Cost Estimate: STIP 2012-2020</u>       |                          |                          |             |
| TIP Estimate (Section B Only) <sup>1</sup> | 16,900                   | 21,300                   | 38,200      |
| Current Estimate                           | TBD                      | TBD                      | TBD         |

1. Project costs in thousands of dollars.

### Design Criteria:

Length of Project: Approximately 6.5 miles

Right of Way:

|           |                                       |
|-----------|---------------------------------------|
| Existing: | Varies – 60 to 105 Feet               |
| Proposed: | TBD – ROW acquisition is anticipated. |

Type of Access Control:

|           |      |
|-----------|------|
| Existing: | None |
| Proposed: | TBD  |

Roadway Typical Section:

|           |                                   |
|-----------|-----------------------------------|
| Existing: | 2 Lanes                           |
| Proposed: | Multi-lanes (typical section TBD) |

Speed:

|                        |                       |
|------------------------|-----------------------|
| Existing Posted Speed: | Varies – 25 to 45 mph |
| Proposed Design Speed: | TBD                   |

Bridge / Culvert Inventory

|   |
|---|
| Bridges 800 and 801; I-485 over John Street/Old Monroe Road |
|---|

Functional Classification:

|                |
|----------------|
| Minor Arterial |
|----------------|

Strategic Highway Corridor Information:

|     |
|-----|
| N/A |
|-----|

CTP/Thoroughfare Plan Designation (Facility Type):

|  |
|--|
| Boulevard – Needs Improvement<br>(Union County, Draft November 2012) |
|--|

Air Quality Status: ☒ Non-attainment ☒ Maintenance ☐ Attainment

Non-attainment: Mecklenburg and Union counties: 8-Hour Ozone 2008, 8-Hr Ozone 1997

Maintenance: Mecklenburg County; CO

Horizon Completion Year (Long Range Trans. Plan):

|  |
|--|
| U-4714 B – 2025<br>U-4714 A, C – Unknown |
|--|

Typical Section in Compliance with  
Conformity Determination?

☒ Yes ☐ No

Traffic (AADT)  
See **Figure 2:**

|               | Year                | Range of Traffic | % TTST: | 1 to 3 |
|---------------|---------------------|------------------|---------|--------|
| Current Year: | 2013 <sup>2</sup>   | 15,200 – 27,000  | % Dual: | 2 to 7 |
| Design Year:  | 2035 <sup>2,3</sup> | 16,300 – 29,500  | % DHV:  | 7 to 9 |

2. Source: Traffic Forecasts (NCDOT TPB, February 19, 2013)

3. Design Year is 2035 No Build

Design Standards Applicable: ☒ AASHTO ☐ 3R

Railroad Involvement:

N/A

Utility Involvement:

TBD





Comments in red text box below  
received from Indian Trail

**Preliminary Project Study Area Resources Inventory Table**  
(Use with Figure 3A-3D)

| Resource/Affected Environment & Measure  | Applicability/ Resources in Study Area  |
|--|---|
| General Project Information  |   |
| Length of project (approximate in miles)   | Approximately 6.5 Miles   |
| Crossing or Intersecting (#) ← <b>This needs to include Chestnut and/or the future Chestnut Parkway</b><br><i>Interchanges include:</i> I-485<br><i>Intersections (major) include:</i> Trade Street, Stallings Road, Waxhaw-Indian Trail Road, Brandon Oaks Parkway-Midway Drive, Mustang Drive, and Wesley Chapel-Stouts Road | Interchanges - 1<br>Intersections - 6<br>RR Crossings - 0   |
| Cultural Resources   |   |
| NRHP (and eligible sites, districts, other properties) (#)   | 0 – Known sites<br>1 – National Register District – Matthews Commercial Historic District   |
| Human Environment  |   |
| Community Resources (#)  | Local Landmark (1) – Stallings Rockstore Bar-B-Q<br>Fire Station (1) – Volunteer Fire Station 20<br>Churches (6) – Matthews Presbyterian Church, Matthews Baptist Church, Matthews Baptist Church, Matthews Baptist Church, Matthews Baptist Church, Matthews Baptist Church<br><b>UC EMS at Williams Rescue Road</b> → |
| Public Parks/Section 4(f) Properties (#)   | Four Mile Creek Greenway  |
| Greenways, Game Lands, Land and Water Conservation Fund Properties, etc. (#)   | Four Mile Creek Greenway (access adjacent to corridor)  |
| Residential Properties (# potentially affected)  | TBD. Residences are located adjacent to existing roadway.   |
| Business Properties (# potentially affected)   | TBD. Businesses are located adjacent to existing roadway.   |
| High % Special Populations (Low-income, Minority)  | None. Review of 2010 Census data and 2011 American Community Survey data (Census Block Group level) did not identify a presence of minority, Hispanic, or low-income populations near the project corridor  |
| Natural Environment  |   |
| Streams (# of stream crossings)  | 2 – named stream crossings, Four Mile Creek, Price Mill Creek<br>3 - unnamed streams are present.   |
| Wetlands (est. acres)  | Surveys will be conducted.  |
| Critical Water Supply Watersheds   | None  |
| Riparian Buffer Rules apply  | No. Portion of project within Catawba River Basin however, riparian buffer protection program Rule 15A NCAC 02B .0243 does not apply.   |
| Identified Critical Habitat/ESA Spp. (# known)   | 0 known   |
| Physical Environment   |   |

| Resource/Affected Environment & Measure              | Applicability/ Resources in Study Area   |
|--|--|
| Hazardous Materials (# suspected/known sites)        | TBD  |
| Utilities  | YES. Location and type TBD. Power line easements are located adjacent to ROW       |
| Active agriculture (Voluntary Agricultural District) | No VADs or EVADs in study area   |
| Noise  | Impacts TBD. Noise sensitive receptors in study area (residences, churches, etc.). |
| FEMA Buyout Properties                               | 0 known  |

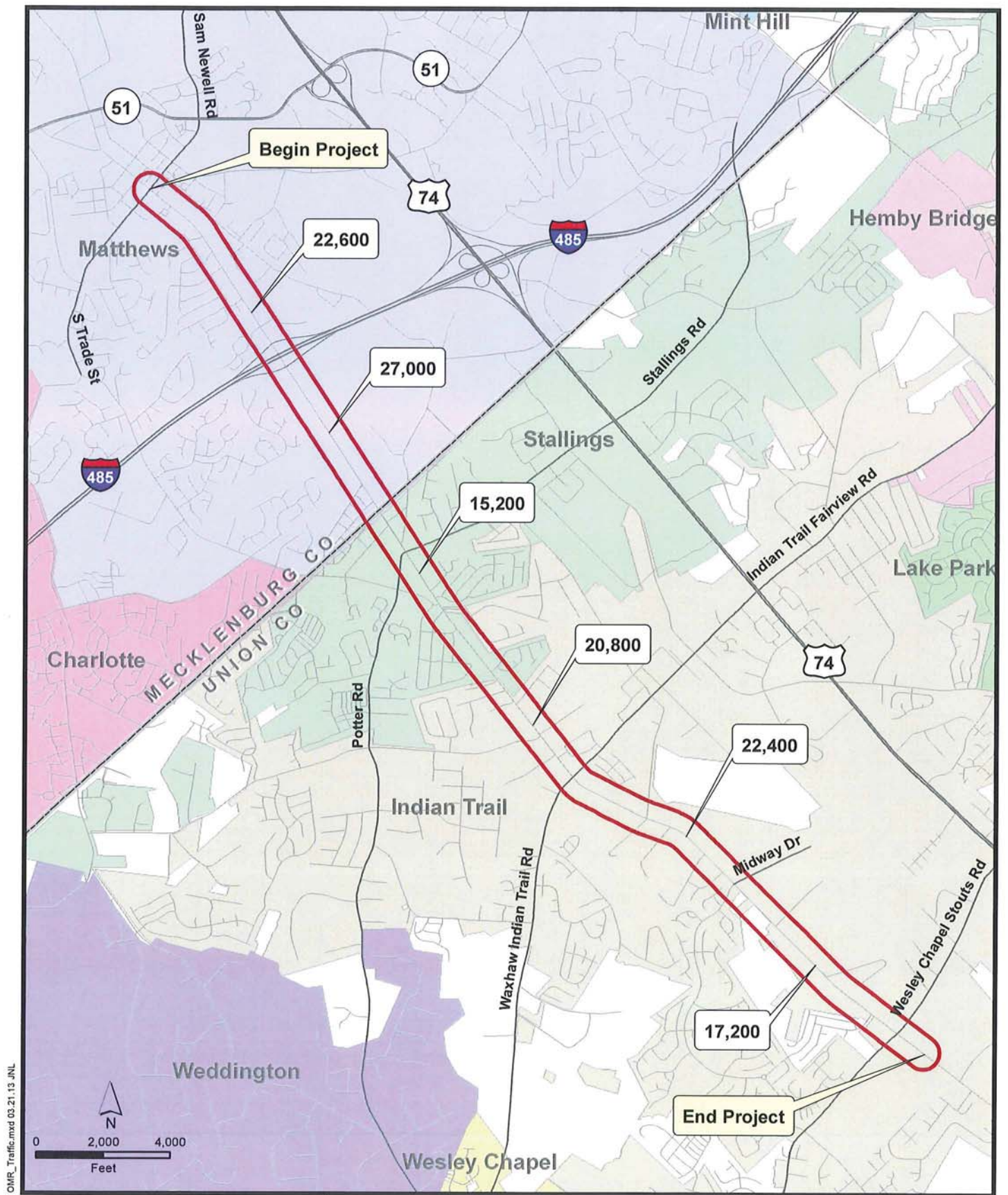
NOTES: This table is intended to be used in conjunction with the Environmental Features Map (Figure 3A-3D) and the USGS Map (Figure 4A-4B).











OMR\_Traffic.mxd 03.21.13 JNL



# **OLD MONROE ROAD WIDENING PROJECT**

STIP PROJECT NO. U-4714

Mecklenburg and Union Counties,  
North Carolina

## **Legend**

Project Study Area

XX,XXX 2013 AADT

Source: Union and Mecklenburg County GIS Departments,  
AADT from NCDOT Transportation Planning Branch Traffic Forecasts (2/9/13).

**2013 ANNUAL  
AVERAGE DAILY  
TRAFFIC (AADT)**

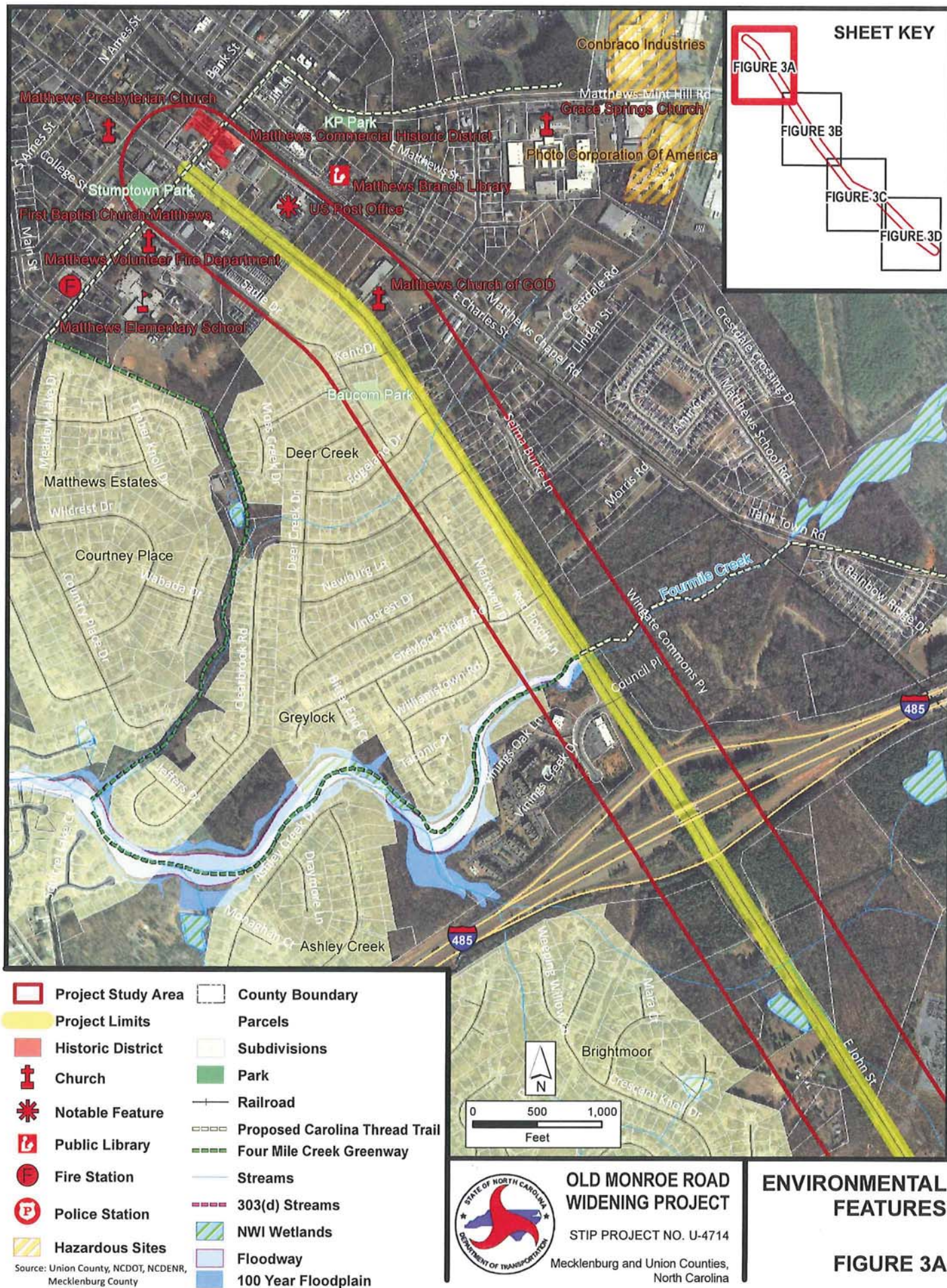
**FIGURE 2**







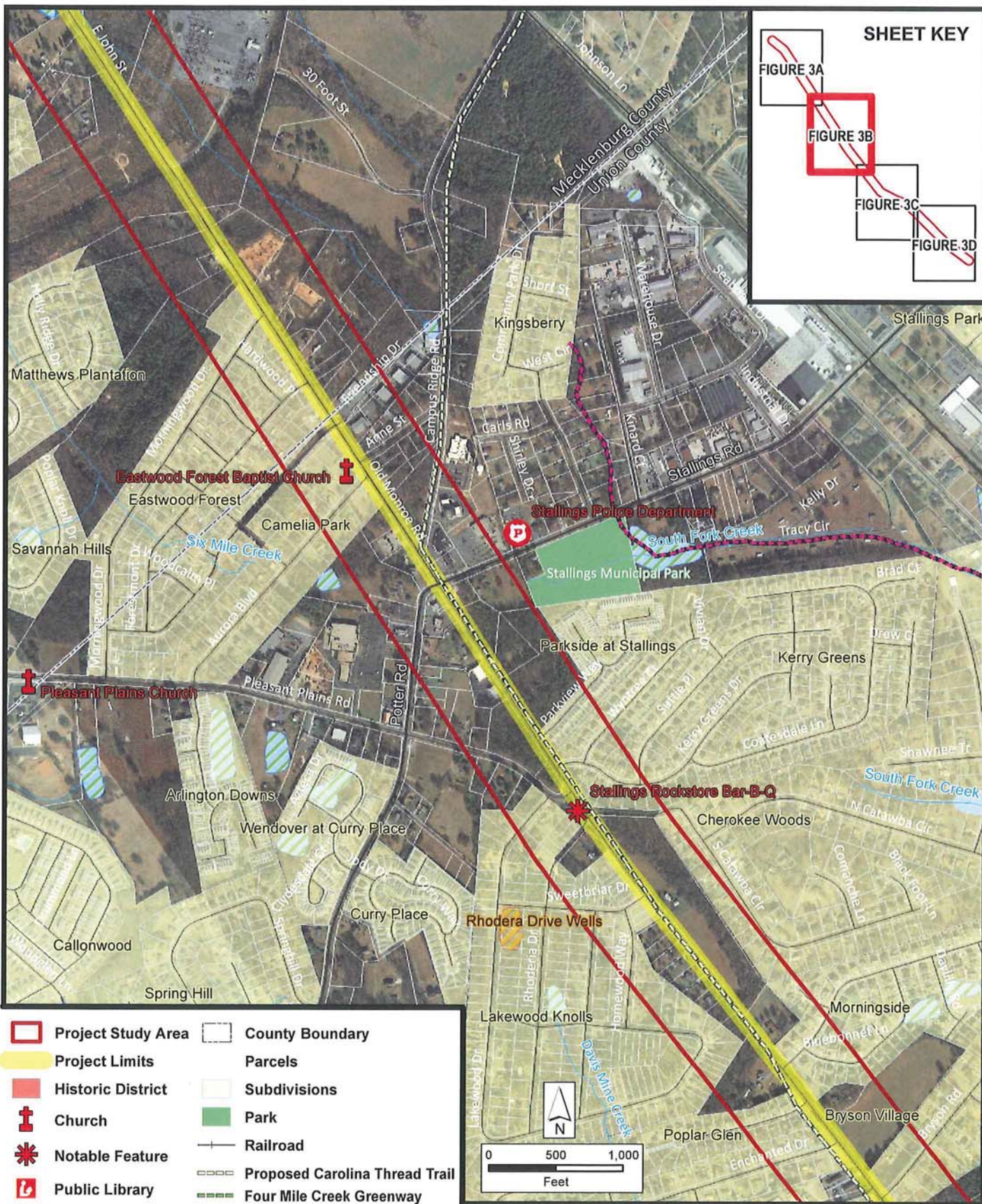
OMR\_CommunityFeatures.mxd 04.23.13 JNL











## OLD MONROE ROAD WIDENING PROJECT

STIP PROJECT NO. U-4714

Mecklenburg and Union Counties,  
North Carolina

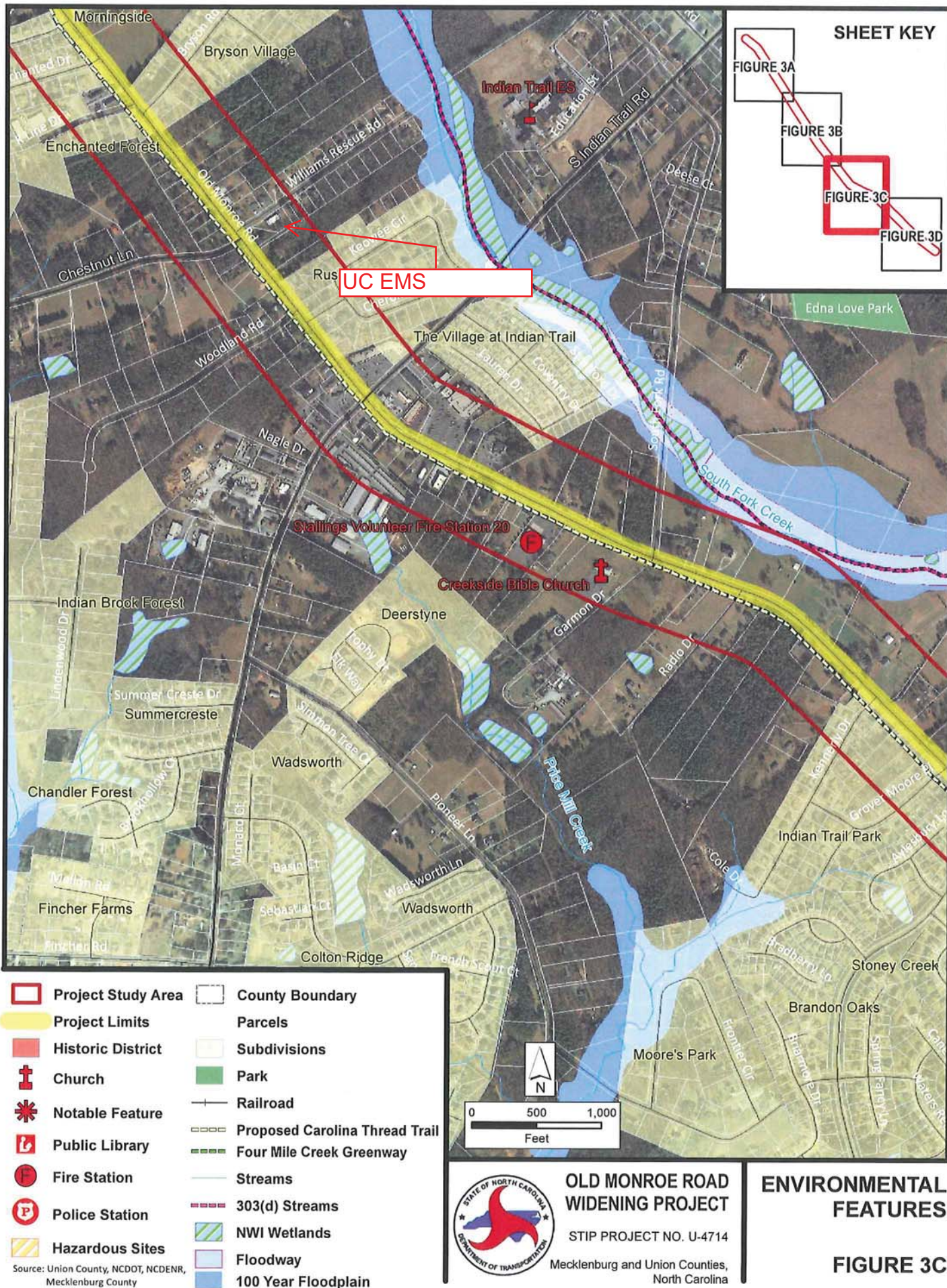
## ENVIRONMENTAL FEATURES

FIGURE 3B





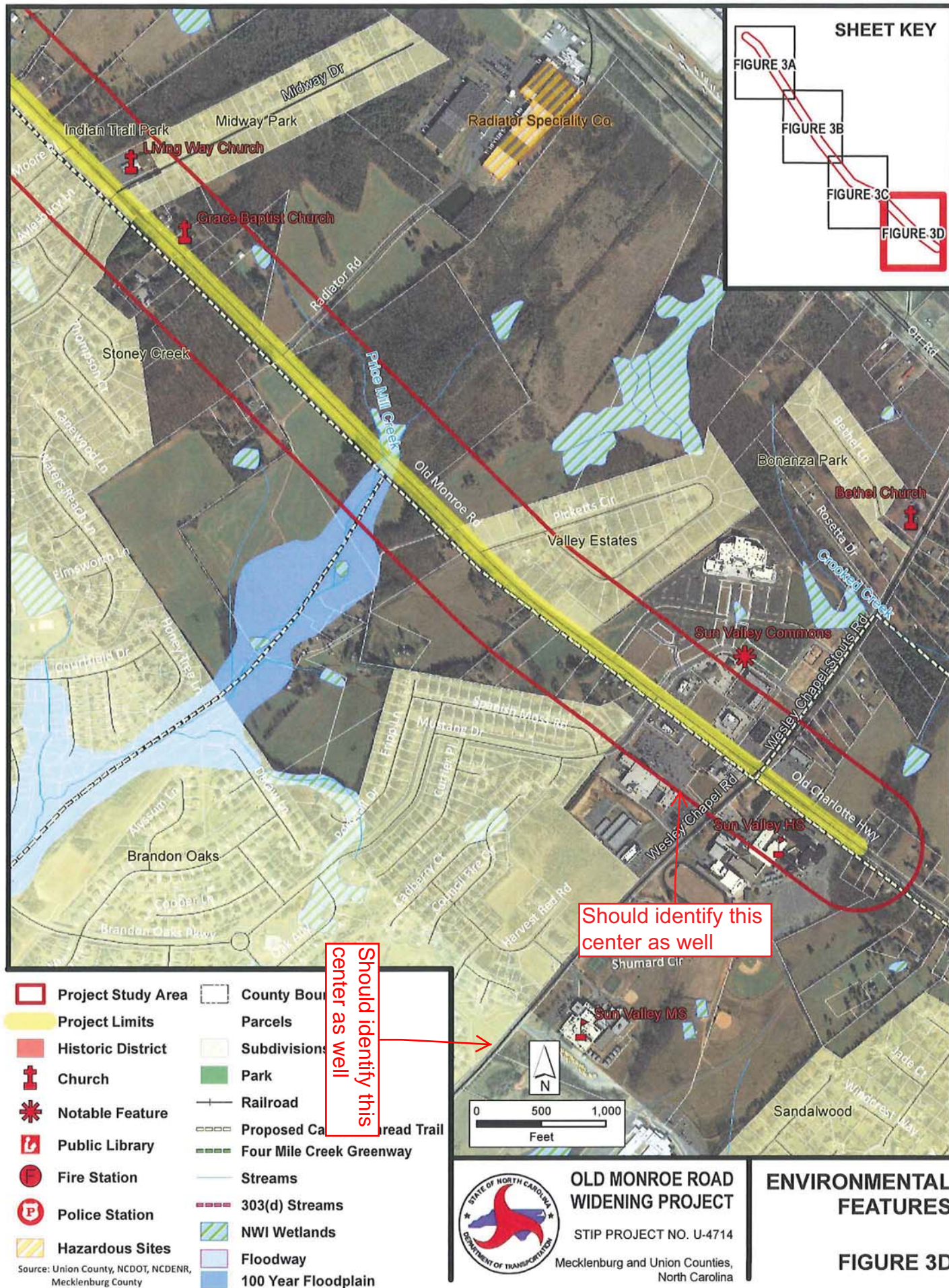
OMR\_CommunityFeatures.mxd 04.23.13 JNL



UC EMS



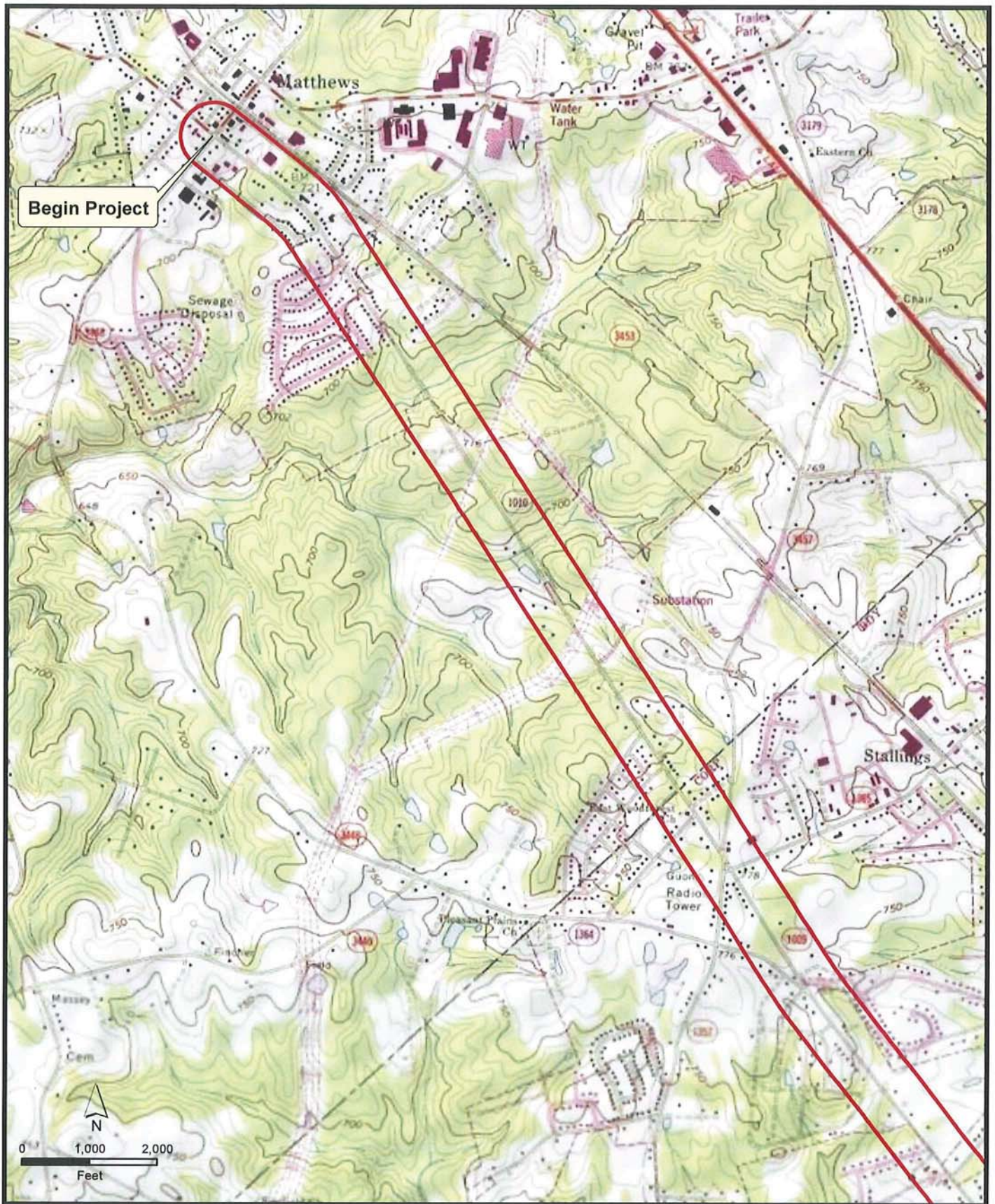








OMR\_USGS.mxd 03.19.13 JNL



## OLD MONROE ROAD WIDENING PROJECT

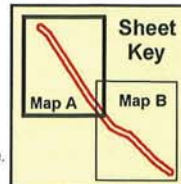
STIP PROJECT NO. U-4714

Mecklenburg and Union Counties,  
North Carolina

### Legend

 Project Study Area

Source: National Geographic Society ArcGIS Map Service.  
Matthews 1:24000 Quad.



Sheet  
Key

Map A

Map B

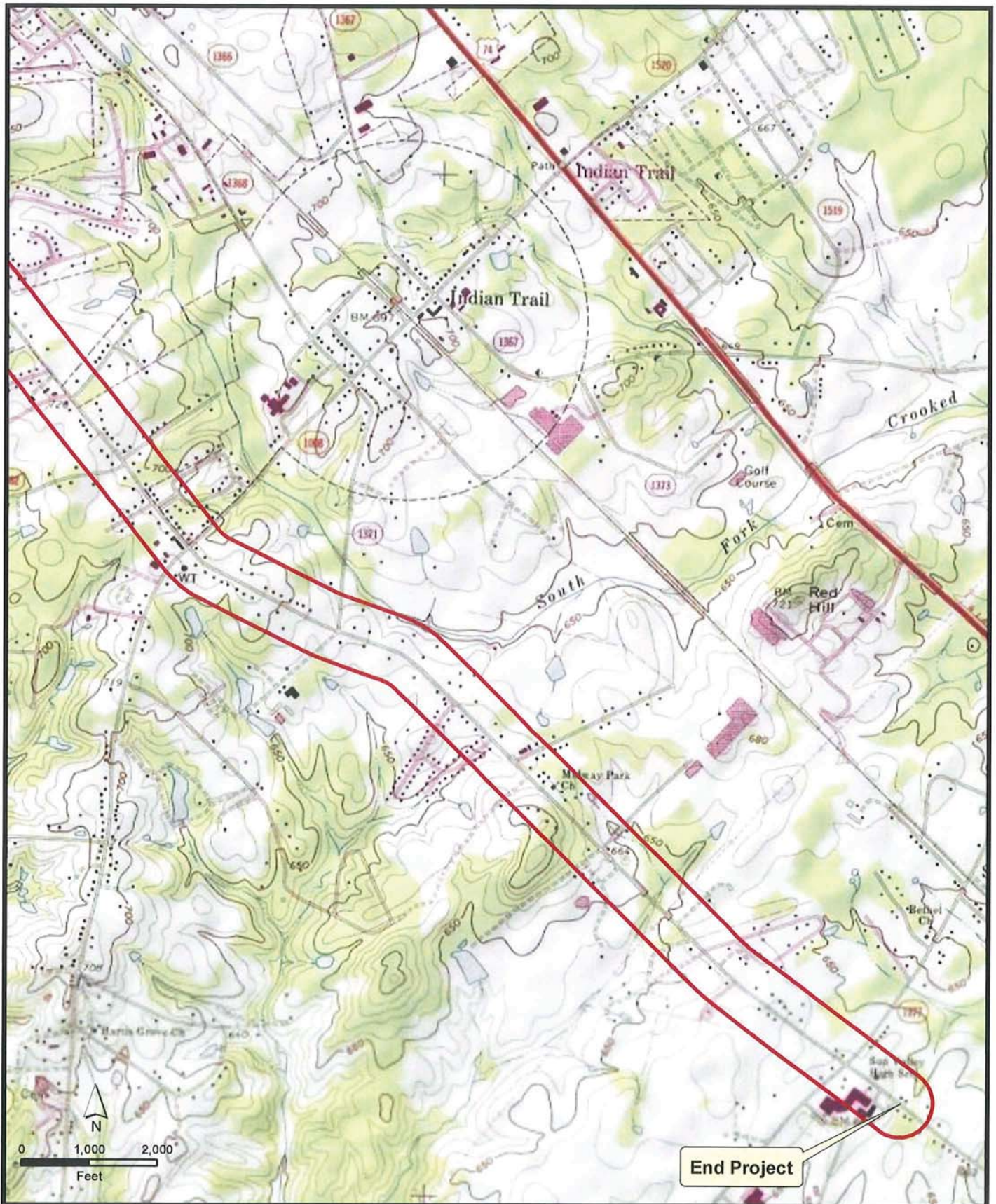
USGS MAP

FIGURE 4A





OMR\_USGS.mxd 03.19.13 JNL



# **OLD MONROE ROAD WIDENING PROJECT**

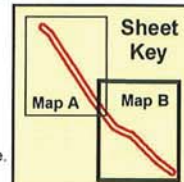
STIP PROJECT NO. U-4714

Mecklenburg and Union Counties,  
North Carolina

## **Legend**

 **Project Study Area**

Source: National Geographic Society ArcGIS Map Service,  
Matthews 1:24000 Quad.



**USGS MAP**

**FIGURE 4B**





# Meeting Minutes

East John Street/Old Monroe Road Improvements – STIP U-4714  
 Matthews, Stallings, Indian Trail  
 Mecklenburg and Union Counties

## Merger Screening Meeting

Structures Conference Room, Century Center, Raleigh, NC  
 July 24, 2013, 2:00 pm – 3:30 pm

---

*Purpose: To discuss whether the subject project should be placed in the NEPA/Section 404 Merger Process.*

---

## Attendees

|                                     |                             |
|-------------------------------------|-----------------------------|
| Amanda Jones, USACE (by phone)      | Elmo Vance, NCDOT – PDEA    |
| Alan Johnson, NCDWQ (by phone)      | Zahid Baloch, NCDOT - PDEA  |
| Scott Cole, NCDOT Div 10 (by phone) | Michael Turchy, NCDOT - NES |
| Jennifer Harris, NCDOT - PDEA       | Greg Brew, NCDOT - Roadway  |
| John Conforti, NCDOT – PDEA         | Carl Gibilaro - Atkins      |
| Carla Dagnino, NCDOT - NES          | Kim Bereis - Atkins         |

---

## Handouts and Displays

- Agenda
- Scoping Packet Data Sheet and Figures
- Map – 2013 and 2035 No-Build AADTs
- Large Scale Environmental Features Mapping (displayed on screen and table)

## Summary

Elmo Vance opened the meeting with introductions and described the project description/limits. The proposed project involves improvements to approximately 6.5 miles of John Street/Old Monroe Road (SR 1009) from Trade Street (SR 3448) in Matthews to Wesley Chapel-Stouts Road (SR 1377) in Indian Trail.

**Background Information.** Carl Gibilaro provided a project description and described the resources in the project area (displayed on screen). The project is divided into 3 Sections: Section A - Trade Street to I-485, Section B - I-485 to Waxhaw-Indian Trail Road (SR 1008), and Section C - Waxhaw-Indian Trail Road to Wesley Chapel-Stouts Road (SR 1377). Section B is currently programmed for right-of-way acquisition in 2016 and construction in 2018. Sections A and C are both currently unfunded. The NCDOT is studying all three sections (A, B, and C) together as one project during the environmental review process in which an Environmental Assessment (EA) will be completed, then an anticipated Finding of No Significant Impact (FONSI). There are ongoing discussions between NCDOT and the Town of Indian Trail regarding the Town providing \$10 million from their transportation bond program to assist in accelerating the construction of Section C to be constructed concurrent with Section B.

Most of the existing John Street and Old Monroe Road are 2-lane roadways with no shoulders and no control of access. Portions of Old Monroe Road are currently over capacity and demand is projected to increase by 2035. The NCDOT/municipalities desire to widen the roadway to four travel lanes with

# Meeting Minutes

bike/pedestrian accommodations (Carl Gibilaro referred attendees to the figure with Existing (2013) and Future (2035) No-Build traffic volumes). The typical section is not known at this time, and may vary along the corridor depending on needs and surrounding resources.

Mr. Gibilaro scanned the corridor on-screen and noted some of the resources and features along the corridor:

- In Section A, the project begins in the Matthews Historic Commercial District (on the national register).

Four Mile Creek Greenway is located just north of the John Street/I-485 interchange. There is a trail entrance at this location (see picture inserted to the right). Opposite this site is a vacant parcel, which was once slated for the Wingate University expansion development, but those plans have recently been withdrawn. The Town has suggested that while the current plans



are for some mixed use type of development, the developer (Lat Purser & Associates) will come back with a revised zoning plan for the Wingate Commons site. The future Matthews Sportsplex is adjacent to this parcel but will not be impacted by this project.

- **Question** – is there enough room under I-485 to widen? *There appears to be, but may require an Interchange Modification Report (IMR).*
- In Section B, located just east of the I-485 interchange, there is an unnamed stream parallel to the roadway to the north and a wetland located on the south side of the roadway. It will not be possible to avoid both of these resources. The best alignment option for this area will be determined following the jurisdictional determinations and during the alternatives process.
- Other features in Section B include the Rock Store BBQ, which is a local landmark. Regardless of its national significance, the locals have expressed a strong desire to not impact this site.
- There are utilities on both sides of the project throughout and a major utility easement just prior to the Stallings Town Limits.
- There are proposed Carolina Thread Trail crossings (or running parallel) throughout much of the project, so we will coordinate with the Carolina Thread Trail staff.
- There is moderate to very dense (mostly commercial/retail development) at most signalized intersections, including Trade Street, Stallings/Potter Road, Waxhaw Indian Trail Road and Wesley Chapel Stouts Road.
- There is one named stream crossing (Four Mile Creek) and 3 unnamed stream crossings (all culverts). It is probable that the existing culverts can be extended or bridged.
- There is support from all three municipalities for increasing the capacity of this facility. However, the Towns desire to see more of a complete street type of facility. As such, this project is including extensive coordination with Matthews, Stallings, and Indian Trail to incorporate a context sensitive design for the corridor. A project charrette will be held August 27<sup>th</sup> – 29<sup>th</sup> to seek input desired typical sections, aesthetic features, and access management considerations.
- Greg Brew suggested that there is no need to study a 5-lane section, as the NCDOT's trend is to avoid such option.
- It was clarified that US 74 is parallel facility, but that the two projects have entirely different purpose and needs.
- There are numerous un-signalized roadway crossings and connections along the corridor, including private driveways (both residential and commercial) that connect directly to East John Street-Old Monroe Road. The project will result in some residential and business impacts, including relocations. An estimate as to how many cannot be made until alternatives are developed.



# Meeting Minutes

- There are several community resources directly adjacent to the corridor (listed on the scoping packet data sheet) – Post Office, Stallings Fire Department, Union County EMS, Sun Valley High School, and several churches.
- **Question - Amanda asked about the breakout of impacts** - *There will be some natural resource impacts that cannot be avoided, but these impacts are expected to be minimal. For the widening equally to both sides scenario, there is approximately 200' of impact to Four Mile Creek, ~1200' impact total to the unnamed streams, and less than 1/10 acre of wetland impacts. It is expected that these impacts will be reduced through avoidance and minimization methods during alternative development.*
- Jennifer asked if there were a recommendation on whether the project should be inserted into the merger process. Siting minimal resources in the project area and the anticipation of similar impacts for all build alternatives, Carl Gibilaro recommended that it not be inserted into Merger. Alan Johnson agreed with this recommendation. Mr. Johnson stated that he does not see a resource issue that warrants inserting the project in merger.
- **Question – Amanda Jones asked when the project impacts will be known** – *The alternatives process will begin later this year and a draft of the EA is due in February 2014 (correction from the meeting). Michael Turchy indicated that there will be site visits to streams, but that field verifications may reveal that jurisdictional involvement may not apply.*
- If Ms. Jones was going to be in the project area, Mr. Gibilaro offered to meet her in the project corridor to help familiarize her with the project.
- John Conforti indicated that whether or not projects are inserted into the Merger process are more driven by competing resources rather than simply stream impact quantities. He noted STIP No. U-3301 as an example.
- In the past NCDOT Natural Environment Section (NES) has been involved with projects where they are inserted into the Merger process at concurrence point 4A/4B.
- Alan Johnson and Amanda Jones stated that they support the project not being in merger. FHWA was not present at the meeting, but they will be included on the meeting summary distribution.
- Amanda Jones noted that someone else will take over Division 10 projects while she is on leave. Ms. Jones will provide Elmo Vance the contact information for her replacement.
- ATKINS will add Greg Brew and Jim Dunlop to the list of charrette invitees.

## ACTION ITEMS

### NCDOT

- Mr. Vance will coordinate with NES to begin the natural environment field work.

### USACE

- Amanda Jones will provide contact information for her replacement while she is on leave.

### ATKINS

- Atkins will prepare meeting minutes and distribute to attendees for review.



## **Appendix G**

### **Public Involvement**

- Project Update Newsletter dated January 2015
- May 2013 Project Symposium Summary
- Stallings Letter dated July 2014
- Indian Trail Letter/Resolution dated October 14, 2014





## PROJECT CHALLENGES

The drawings on the enclosed map show the recommendations for the proposed improvements at major intersections along the corridor. In addition to the design and other challenges noted below, NCDOT considered the desires of Town staff, elected officials, and the public in the development of potential improvements.

### E. John Street/Trade Street Considerations

- Avoidance of the nationally eligible historic Reid House west of Trade Street
- Maximize access to adjacent destinations
- Maintain pedestrian access and on-street parking in the downtown area

### E. John Street/I-485 Considerations

- Accommodate bicyclist and pedestrian provisions
- Design that doesn't require total interchange reconstruction
- Minimize right of way impacts to adjacent developable land
- Maximize traffic flow during peak periods

### Old Monroe Road/Stallings Road/Potter Road Considerations

- Allow flexibility for future improvements
- Optimize traffic flow but maintain ability to implement the Stallings Downtown plan
- Provide appropriate pedestrian island for people to cross the intersection

### Old Monroe Road/Pleasant Plains Road Considerations

- Provide safe movement for Kerry Greens neighborhood

### Old Monroe Road/Waxhaw-Indian Trail Road Considerations

- Access to existing shopping centers
- Substantial volumes along Waxhaw-Indian Trail Road
- Incoming development east of intersection

### Old Monroe Road/Wesley Chapel-Stouts Road Considerations

- High volume movements for both Old Monroe Road and Wesley Chapel-Stouts Road
- Closely spaced signalized intersections to the west and to the east
- Proposed development in the northeast quadrant

## NEXT STEPS/SCHEDULE

Preliminary designs for the overall corridor will be advanced and evaluated in the Environmental Assessment (EA). The EA is expected to be approved in mid-year 2015, followed by a public hearing. A Preferred Alternative will be identified for the project and presented in a final environmental document.

## CONTACT INFORMATION

For more information, please contact:

### **Elmo Vance**

NCDOT Project Manager  
(919) 707-6048  
eevance@ncdot.gov

### **Kim Bereis**

Atkins Deputy Project Manager  
(704) 665-4404  
Kimberly.Bereis@atkinsglobal.com



STIP  
Project No.  
U-4714

# East John St./Old Monroe Road Improvements



# NEWSLETTER

January 2015

## PROJECT GOAL

Balance the access and mobility needs along the corridor, while minimizing impacts and incorporating the Towns' desires to the extent possible.  
The proposed project is unique because it traverses three municipalities, each with similar yet differing opinions of how the road should look and function.

The NCDOT proposes to widen the existing two-lane roadway from Trade Street (SR 3448-SR 3474) in the Town of Matthews to Wesley Chapel-Stouts Road (SR 1377) in the Town of Indian Trail, a distance of about 6.5 miles.

The project is divided into three sections:

- U-4714A - Trade Street to I-485
- U-4714B - I-485 to Waxhaw-Indian Trail Road (SR 1008)
- U-4714C - Waxhaw-Indian Trail Road to Wesley Chapel-Stouts Road (SR 1377)

The corridor connects to many major cross streets, including Trade Street, I-485, Stallings/Potter Road, Waxhaw-Indian Trail Road, and Wesley-Chapel Stouts Road, which also carry substantial traffic volumes. The proposed project will also include connections with the future Buckley Way, Greylock Ridge Road Extension, and McKee

Road Extension in Matthews and with the Chestnut Connector in Indian Trail. For this corridor, adding capacity (lanes) is only a part of the ultimate solution for the corridor. How the intersections are designed also plays an important role in carrying projected traffic volumes and reducing congestion along the corridor. Intersection design can substantially help or worsen conditions along a roadway. In the last several months, the NCDOT and its consultant have been investigating numerous options for both existing and future major intersections along the corridor. The NCDOT recommendations for detailed study are provided on the enclosed map.

## WHAT HAS BEEN GOING ON SINCE THE PUBLIC MEETING IN JANUARY 2014?

During this past year, the study team conducted field reviews and studies to support the required environmental review process. For natural resources, minor wetlands and streams were defined and no endangered species were found. Following in-depth investigations of historic architectural resources, the North Carolina State Historic Preservation Office recommended four resources as individually eligible for the National Register of Historic Places. Due to federal laws, the NCDOT must avoid these resources, where practicable, and has reconsidered widening options in certain areas of the project.

In addition, the NCDOT analyzed traffic operations at intersections. Developing solutions has been a complex and challenging task, and the Towns and the NCDOT have coordinated and partnered with municipalities throughout the project. Four intersection types (Full Movement, Superstreet, Roundabout, and Michigan Left) were modeled, including some variations. There have been several meetings with Matthews, Stallings, and Indian Trail staff and elected officials to identify and discuss various options.

## WHEN WILL I KNOW IF MY HOUSE OR BUSINESS WILL BE AFFECTED BY THIS PROJECT?

Some additional right of way will be required for the project. The NCDOT will have an estimate of required right of way and potential affected properties once the preliminary designs are completed. However, exact impacts won't be known until final designs are complete.

## WILL NOISE WALLS BE CONSTRUCTED?

A noise study will be conducted for the detailed study alternative and noise barriers will be evaluated for impacted areas in accordance with NCDOT's noise policy. Recommendations will be presented in the environmental document.

## HOW DO I OBTAIN CURRENT INFORMATION ON THE PROGRESS OF THE PROJECT?

The NCDOT has been coordinating with the Towns of Matthews, Stallings, and Indian Trail throughout the project. Project information is being provided to Town representatives for uploading on their municipal websites.

**Matthews:** <http://www.matthewsnc.gov/TownGovernment/OngoingProjects.aspx>

**Stallings:** <http://www.stallingsnc.org/> **Indian Trail:** <http://www.indiantrail.org/>

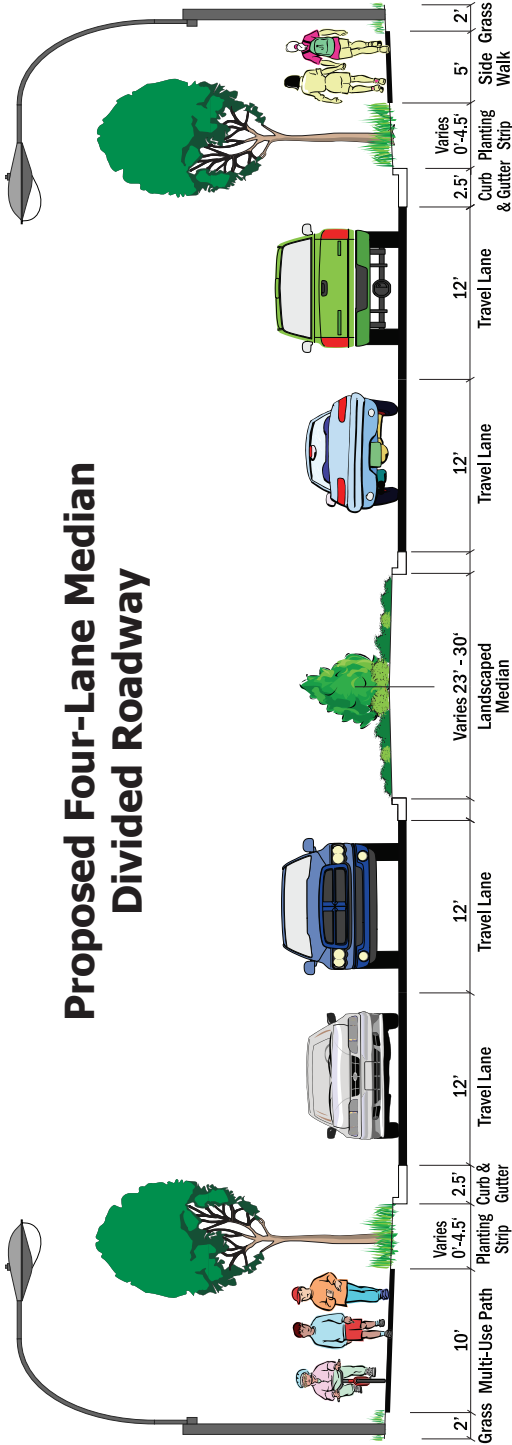
<<OwnerName1>>  
<<OwnerName2>>  
<<OwnerAddress>>  
<<OwnerCity>>, <<Owner-  
State>> <<OwnerZip>>

Important information -  
Please read!

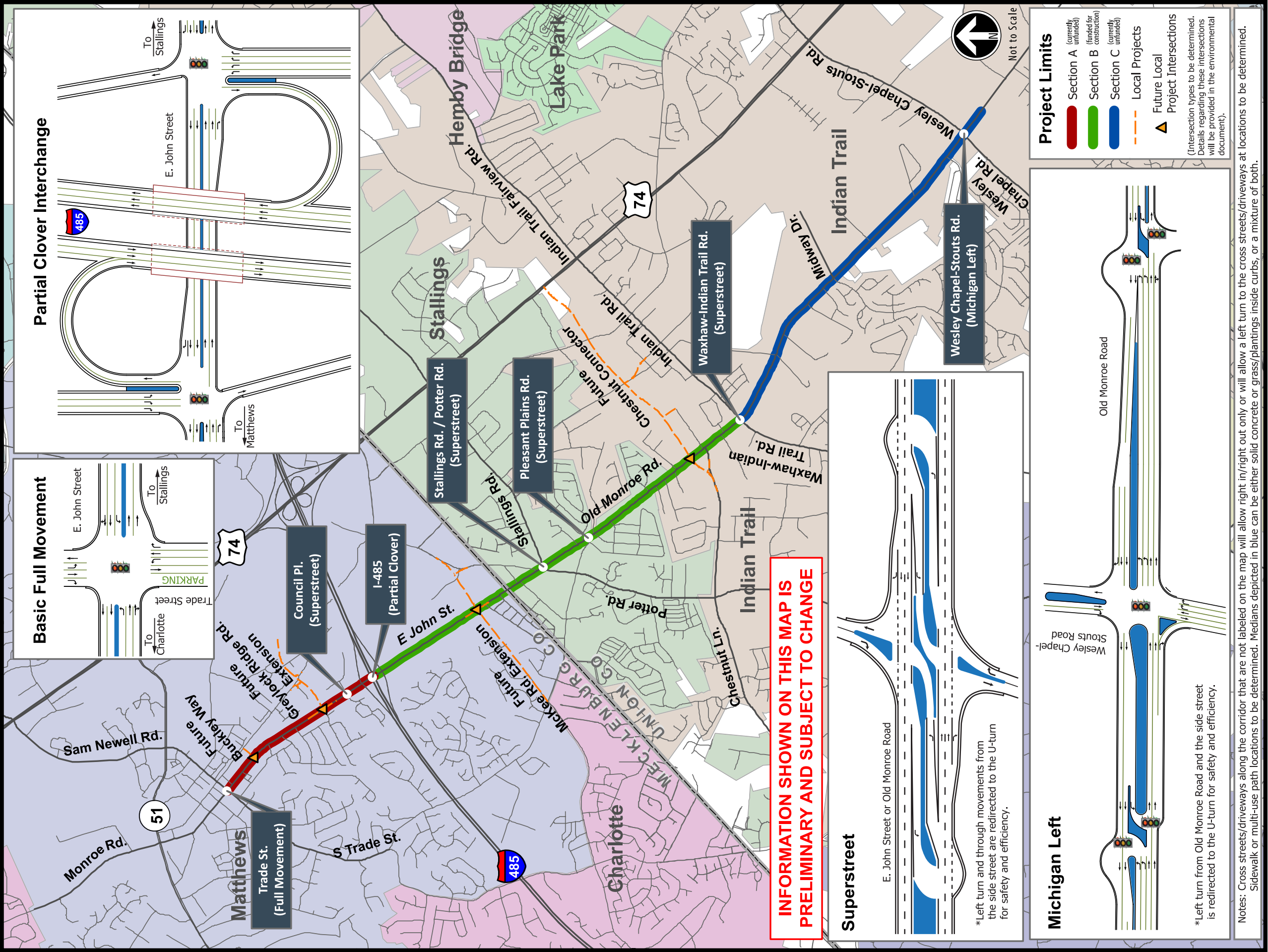
NCDOT PDEA  
c/o Atkins  
ATTN: Kim Bereis, AICP  
5200 Seventy Seven Center Dr., Suite 500  
Charlotte, NC 28217



The picture on the right shows overall what the proposed improvements would look like between the intersections. The proposed "typical section" reflects input from the design charrette and public workshop regarding accommodating bicyclists separate from travel lanes.



Proposed Four-Lane Median Divided Roadway







# U-4714 – John Street/Old Monroe Road Widening EA

Matthews, Stallings, and Indian Trail  
Mecklenburg and Union Counties

---

**Subject:** Meeting Summary - Project Symposium with Matthews, Stallings, and Indian Trail

**Date:** May 9, 2013  
9:30 am to 3:00 pm  
Carl "Tip" Stallings Civic Building

**Attendees:**

Elmo Vance, Project Manager – NCDOT PDEA  
John Underwood, Engineer – NCDOT Division 10  
Carl Gibilaro, Project Manager – Atkins  
Kim Bereis, Deputy Project Manager – Atkins  
Matt Noonkester, Public Involvement – Seven Hills Town Planning Group  
Hazen Blodgett, Town Manager – Matthews  
Ralph Messera, Public Works – Matthews

Kathi Ingrish, Planning Director – Matthews  
Brian Matthews, Town Manager – Stallings  
Lynda M. Paxton, Mayor – Stallings  
Paul Frost, Councilman-District 6 – Stallings  
Shelley DeHart, Planning Director – Indian Trail  
Joe Fivas, Town Manager – Indian Trail  
Adam McLamb, Eng./Public Works – Indian Trail

**Meeting Purpose:**

*Bring together Town officials, planning and engineering department staffs, and the NCDOT to discuss key components for a successful planning process; to fine-tune steps in subsequent phases of the project to ensure a truly collaborative, transparent planning process; and to discuss logistics for the future multi-day design charrette.*

---

## ACTION ITEMS

- NCDOT (Elmo Vance) will provide the Towns with an update on the Chestnut Connector project during the next quarterly call (June 4, 2013).
- NCDOT PDEA (Elmo Vance) will coordinate with the NCDOT STIP Development Unit (Van Argabright) to inquire 1) if local (Indian Trail) funding can be used to improve project ranking for the John Street/Old Monroe Road Widening Project and 2) determine the funding status for Section A of the Project. A report to the group will be made during the next quarterly call (June 4, 2013).
- Atkins will add Ralph Messera to the regular quarterly call participant list.
- Atkins will coordinate with NCDOT to develop a Project website. Logistics for developing the website — content, schedule, web links, etc. — will be discussed during the next quarterly call (June 4, 2013).
- Meeting participants will suggest additional participants/partners for the multi-day design charrette, including contacts for Homeowner Associations and key business owners in the study area. Information should be forwarded to Atkins by May 30, 2013 for discussion during the next quarterly call (June 4, 2013).

- **Town officials for Indian Trail will contact Sun Valley High School, retail owners in the study area (use of vacant store fronts), and the Stone Theater to examine their potential for hosting a multi-day design charrette in mid-July.**
- 

## **SYMPOSIUM SUMMARY**

Nine local government representatives (three from each town) joined NCDOT and NCDOT's consultant team to discuss key components for a successful planning process to support the John Street/Old Monroe Road Widening Environmental Assessment. Each participant was provided a three-ring project binder to organize information generated during the planning process. The following information was included in the project binder:

- Project Symposium Materials (meeting agenda, slide presentation notes, and breakout discussion questions).
- Study Area & Environmental Features Mapping
- NEPA/Project Development Glossary
- Attendee Roster

Committee members are requested to have their project binders available for all meetings or quarterly coordination calls. Atkins will provide new material for the project binders via e-mail or handouts (as appropriate) prior to each scheduled event.

Major discussion topics for the project symposium included: welcome & introductions, setting a winning strategy, current state of affairs, local visions and tools, partner identification, and next steps for moving forward. A summary of the meeting follows:

### ***Welcome & Introductions***

Mr. Vance kicked off the meeting by welcoming and thanking everyone for their attendance at the event. Mr. Vance reviewed the agenda and reiterated the purpose of the meeting, which was to educate participants on the requirements for preparing an environmental assessment, share ideas for improving the overall planning process, and refine details for conducting a multi-day charrette to study alternative design solutions. Mr. Vance also explained the project symposium and multi-day design charrette identified for the project are not typical components for an environmental assessment, but NCDOT favors this approach because of the number of jurisdictions in the corridor and the potential for competing visions. Both events will supplement, not replace, the more traditional public involvement process for preparing an environmental assessment.

Meeting attendees introduced themselves, and Mr. Vance asked Matt Noonkester to review the "Rules of the Game" for a successful project symposium.

Mr. Noonkester explained the purpose of the project symposium; highlighting the need to bring project partners together early in the planning process and define the details for a successful multi-day design charrette. He asked that attendees speak freely and share their opinions throughout the day. Mr. Noonkester also noted that the scope of services for the multi-day design charrette and associated public involvement activities was not complete at this time, specifically because of the need to allow the

affected jurisdictions to have input for defining a successful planning process. Input from the symposium will be used to write the consultant's next task order with NCDOT for the project.

Mr. Noonkester also reviewed the overall planning process and reminded participants that the project must go through the required approval channels to move forward. He asked Kim Bereis of Atkins to discuss the National Environmental Policy Act (NEPA) and its application for "Setting a Win Strategy" related to the John Street/Old Monroe Road Widening Project.

### ***Setting a Win Strategy***

Ms. Bereis presented the following information related to how we are required to complete an environmental assessment for the widening project:

Ms. Bereis reviewed the limits of STIP No. U-4714; the corridor's importance in the area and overall transportation network; land uses and existing traffic generators on the existing roadway; and how federal funding requires compliance with the NEPA. It was emphasized that multi-modal/complete street concepts were important to the project.

Ms. Bereis further explained how NEPA fits in the overall transportation project development process; overview of NEPA history/intent and evolution to incorporate context-sensitive design solutions through public involvement requirements; description of the type of NEPA document (and its components) required for this project (Environmental Assessment/Finding of No Significant Impact or EA/FONSI). EA elements include purpose and need; identifying the affected environment (human, physical, cultural, natural); and alternatives evaluation/environmental consequences. Ms. Bereis reviewed potential project challenges related to resources and conditions under each of these categories.

Ms. Bereis also discussed resource/regulatory agency coordination requirements and provided a brief overview of the Merger Process; current NEPA/planning activities; and overview of project schedule.

Several questions followed the presentation:

#### ***When do stakeholders/public get to review the documents?***

*NCDOT and FHWA will review and approve the technical supporting documents and the EA first. FHWA is the "owner" of the document. All documents are public record and can be provided to the public at their request. The signed EA will be made available prior to the public hearing.*

#### ***Are we comfortable moving forward with an Environmental Assessment (EA) and obtaining a Finding of No Significant Impact (FONSI)? What is the potential that the EA would not result in a FONSI, but rather a finding to complete a Draft Environmental Impact Statement (EIS)?***

*We are at the beginning of the process, so we cannot say with absolute certainty. However, it is highly unlikely, as there appears to be no significant impacts that cannot be avoided (such as those associated with a new-location roadway for example) to warrant a notice of intent to prepare a Draft EIS.*

### ***Current State of Affairs***

Mr. Noonkester used a handout in the project binder to facilitate a "state of affairs" discussion for the project. Key topics for discussion included: project funding, critical tasks, project schedule, project



prioritization, and what could further delay the planning process or project construction. Meeting participants were encouraged to ask anything on their mind while state and local officials were in the same room. Mr. Noonkester suggested in the absence of information people tend to make up their own. One key to a successful planning process will be up-to-date, time-sensitive information made available to local governments for communicating with elected officials, business owners, homeowners, and the general public about the project.

NCDOT representatives reviewed the status for each segment in the project, as follows:

Section A - Currently unfunded.

Section B - Section B is currently funded for right-of-way acquisition in 2016 and construction in 2018. The NCDOT STIP Development Unit (Van Argabright) stated in a recent presentation to MUMPO that construction could be pushed to 2019 to cover funding shortfalls for other projects in the MPO planning area.

Section C - Currently unfunded.

John Underwood noted NCDOT Division 10 is looking to accelerate the schedule for Section C so that construction of Sections B and C can occur simultaneously.

Several questions followed the project status summary, as follows:

***Barry Moose once told me that this project was the highest ranking mobility project. If that's the case, why has it taken so long for it to get funded? Did we misstep/wait too long?***

*Projects are divided into priority tiers: state, regional, and sub-regional tiers. Any one project may be a priority in its tier, but it does not trump other priority projects. STIP No. U-4714 is in the sub-regional tier and it does not have significance outside of the corridor. Also, it has been suggested at recent MUMPO meetings that the accelerated I-77 High-Occupancy Toll (HOT) Lanes project may affect funding or schedule for U-4714. John Underwood could not confirm, but suggested that the Chestnut Connector project could have played a role in delaying the project funding. The team will coordinate with NCDOT Division 10 (Louis Mitchell) to obtain further clarification on this question and to ask the status of additional funding request for Section C.*

***What could delay the project further?***

*Specific to the environmental assessment, there are four main causes for NEPA project delay, as suggested in a national research paper published in 2006: low project priority, lack of funding, local controversy, or project complexity. The consultant team added other causes of delay associated with projects in North Carolina: permitting agency concerns, changes to the local environment, and politics.*

***What is the appropriate timeframe for Indian Trail to develop an agreement with NCDOT to fund Section C along with Section B? If there is no agreement soon, will NCDOT be able to find funding within a couple of years?***

*All meeting participants agreed that a municipal agreement should be put in place as soon as possible to determine a plan for a funding agreement. Ralph Messera noted that projects not being let by 2015*

*could fall in being ranked with the new funding method coming out of the General Assembly this spring. There will be more competition statewide for funding, as the amount available for state road projects (in urban areas) is anticipated to decrease. NCDOT (Elmo Vance) will follow up with Van Argabright to determine the protocol/status for a formal agreement to get the project updated in the LRTP and STIP.*

*The project will need to be updated in the forthcoming MUMPO 2040 Plan. As with the old funding formula, it is anticipated that local contributions can help boost project ranking. Elmo Vance will contact Van Argabright to see if Indian Trail funding will still keep the project ranked high and where Section A stands. He will report back to the group during the next quarterly call (June 4, 2013).*

***Will right-of-way estimates be included in the environmental document?***

*NCDOT provides estimates of construction cost and right-of-way cost (if available) in the environmental document. Cost estimates typically include a contingency factor since they are done at the preliminary engineering design stage in the document year and do not include utility relocations and other costs.*

***How long is the EA good for?***

*The EA technically does not have a shelf life unlike an EIS. In the case of an EIS, if more than 3 years have passed since the approval of DEIS or FEIS, a reevaluation is required. The FONSI, which is the environmental document that comes after the completion of the EA, has a shelf life of one year. After one year of the FONSI's approval date, a consultation must be completed in accordance with 23 CFR 771.129 (c). A consultation may also be required if the time is less than one year and substantial changes to the proposed designs, evaluation impacts, or environmental commitments have occurred prior to right-of-way acquisition or construction.*

***How will the Chestnut Connector project affect this project? Will we have to redesign where the project ties in (Section 2)?***

*The project is divided into three sections: 1) Matthews Indian Trail Road to US 74 (currently under construction) 2) Old Monroe Road to Gribble Road 3) Gribble Road to Matthews Indian Trail Road (feasibility study being done to go over or under railroad). There are questions regarding phasing of that project and impacts to traffic operations on Old Monroe Road.*

*NCDOT (Elmo Vance) will coordinate internally to discuss the Chestnut Connector project and its impact in the forecasts/operations studied for Old Monroe Road.*

***What is the cut off for using the current adopted regional model and socio-economic data? Is there a date when the new data must be used?***

*No one had an answer to this question. Carl will contact Loretta Barren with FHWA and inquire about this topic.*

***Local Vision & Tools***

*Mr. Noonkester directed a small group exercise where representatives for each of the three towns developed responses to four specific questions critical to a successful planning process:*

1. Long-term, what is your vision for the corridor? What does the road look like, function like, and what type of development (i.e., use, pattern, intensity, and design features) occurs within the corridor?
2. How do we get there? What are the challenges? Who needs to be involved?
3. What can be done now with local regulatory tools to realize the state vision?
4. How do we ensure a successful project? Planning process? Deliverables?

Each local government met first as a small group and then shared their ideas with the group as a whole. Scribes recorded their responses and Mr. Noonkester noted similarities and differences among the jurisdictions along the corridor. A detailed summary of responses recorded during the small group exercise is provided at the end of this document. This information will be important as we start planning for the multi-day design charrette.

### ***Partner Identification***

Mr. Noonkester stressed that participation will be critical to a successful planning process; especially for the planned multi-day design charrette. Meeting participants were asked to brainstorm a list of key stakeholders to invite to the design charrette. A preliminary list is included at the end of this document. The list will be finalized during the next quarterly call (June 4, 2013) to start the recruitment process.

### ***Next Steps for Moving Forward***

Mr. Noonkester facilitated a discussion on “how do we continue to work together?” and logistics for the upcoming multi-day design charrette. A brief slide presentation was used to discuss the merits and activities associated with a multi-day design charrette. Key components of the event include a constrained work schedule, collaborative team atmosphere, work-in-detail focus, transparent planning process, short feedback loops, and testing design feasible solutions.

How do we continue to work together? Matt described the desired setting, format, and potential ‘themes’ for the charrette. Symposium attendees were asked to help flush out more of the details such as location, time, possible dates, appropriate themes, advertisement of the charrette, and deliverables.

Mr. Noonkester then asked the group several questions to move forward with planning the charrette event, as follows:

#### **When should the event be held?**

The event will last three days and should be held using a Tuesday through Thursday format. The critical path for scheduling the event will be completion of NCDOT’s forecast/operations analysis for the corridor. We are targeting mid-July for the event subject to securing a location for the event (see below).

#### **Where is the best location for the event?**

We need to find a location in the study area that could accommodate up to 100 people at a time. Possible locations discussed included Sun Valley High School, retail owners in the study area (use of vacant store fronts), and the Stone Theatre. Officials for Indian Trail will examine their potential for hosting a multi-day design charrette in mid-July and report back during the next quarterly call (June 4, 2013).



### **Key Planning Themes for the Event**

A list of key themes for the design charrette was developed using responses from the small group exercise completed earlier in the day. This list will be used for staffing the event with professionals knowledgeable in planning, engineering, and landscape architecture. This list of themes for the event includes:

- Land Use & Urban Design
- Public utilities
- Transportation (typical street section, intersection improvements, right-of-way)
- Business & Neighbourhood Concerns (access, construction phasing, etc.)
- Corridor Aesthetics (gateway treatments, traffic signals, other branding elements)
- Natural resources & open space

### **Advertising the Event**

We need to get the word out for a successful event. It will be advertised through press releases, newspaper advertisements, HOA newsletters, and a project website. Meeting participants were asked to think of other ways to get the word out and bring their suggestions to the next quarterly coordination call (June 4, 2013).

### **Key Deliverables**

Key deliverables for the multi-day design charrette should tie back to requirements for the Environmental Assessment (primarily Chapter 2 – Detailed Alternatives Study). Key targets for the event will include typical street cross sections; community impact assessment measures of effectiveness; and consideration of alignment avoidance, minimization, and accommodations.

### ***Closing***

The meeting closed with an opportunity for participants to add last comments for making this a successful planning process. NCDOT and the consultant team encouraged project partners to stay involved, continuing our collaboration for planning the multi-day design charrette and keeping open communication throughout the planning process.

The next coordination event for the project will be a quarterly call on June 4, 2013. Call-in information is provided below.

### **Join by Phone**

- +1 (877) 537-6648 (US Toll Free 1)
- +1 (877) 537-6647 (US Toll Free 2)
- +1 (704) 665-4409 (US Local)
- +1 (919) 431-5239 (US Local)

Conference ID: 805372

## Local Visions and Tools – Breakout Session Feedback

|   | Matthews   | Stallings   | Indian Trail   |
|---|--|---|--|
| <b>1-Long-term, what is your vision for the corridor? What does the road look like, function like, and what type of development (i.e. use, pattern, intensity, and design features) occurs within the corridor?</b> | <ul style="list-style-type: none"> <li>• I-485 as Gateway</li> <li>• Multi use path on one side and sidewalk on other</li> <li>• Landscaped median</li> <li>• Buried utilities</li> <li>• Lighting</li> </ul>  | <ul style="list-style-type: none"> <li>• 4-lane median divided facility</li> <li>• Multi use path on one side and sidewalk on another</li> <li>• Gateway downtown</li> <li>• Decorative lighting, banners, other aesthetics for OMR/Potter/Stallings</li> <li>• Mast arm signals</li> <li>• Pedestrian crossings</li> <li>• Improvements at Pleasant Plains and OMR (signalization?)</li> <li>• Way-finding and civic features</li> </ul> | <ul style="list-style-type: none"> <li>• 4-lane urban section (C&amp;G)</li> <li>• Divided, landscaped median</li> <li>• 2 enhanced gateway locations</li> <li>• Multi modal design</li> <li>• Good access management</li> <li>• Compact land use design at Village Centers</li> <li>• Decorative design features ( lighting and opp. for Town branding with banner)</li> <li>• Street print ped crosswalks</li> </ul> |
| <b>2-How do we get there? What are the challenges? Who needs to be involved?</b>  | <ul style="list-style-type: none"> <li>• Land use plan recently updated</li> <li>• South of 485 has more open land and northern portion more impacts</li> <li>• Trade Street constraint</li> </ul>   | <ul style="list-style-type: none"> <li>• Funding</li> <li>• Neighborhood connections /access</li> <li>• Rock Store protection</li> <li>• Involve larger tract owners and adjacent businesses</li> </ul>   | <ul style="list-style-type: none"> <li>• Have basics in place (Comp. Plan)</li> <li>• Constructability and MOT</li> <li>• Business owners (particularly at ITR who are very vocal about site access)</li> <li>• Involve/communicate with MUMPO, business leaders, Town staff, EOs</li> <li>• Educate EOs</li> </ul>  |
| <b>3-What can be done with the local regulatory tools to realize the stated vision?</b>   | <ul style="list-style-type: none"> <li>• Conditional zoning</li> <li>• Ped thoroughfare plan</li> <li>• Standards for higher density mixed use</li> <li>• New design controls</li> <li>• How to do best job with dev and redevelopable land</li> </ul> | <ul style="list-style-type: none"> <li>• Design controls</li> <li>• Protect right-of-way in corridor</li> <li>• Require new developers to make some necessary improvements</li> <li>• Bury utilities</li> <li>• Shared access /driveways</li> </ul>   | <ul style="list-style-type: none"> <li>• When cross section and footprint determined, amend Comp Plan/Ordinances, which are in progress for implementation</li> <li>• “A little of everything”</li> </ul>  |
| <b>4-How do we ensure a successful project? Planning process? Deliverables?</b>   | <ul style="list-style-type: none"> <li>• Good communication</li> <li>• Engage property owners</li> <li>• Updates from NCDOT to town staff</li> </ul>   | <ul style="list-style-type: none"> <li>• Engage larger land owners early</li> <li>• Involve neighborhoods/HOAs and businesses</li> <li>• Stay committed and focused to this approach and funding opps.</li> <li>• Keep public informed</li> <li>• Project website</li> </ul>  | <ul style="list-style-type: none"> <li>• Good communication between staff/project manager/EOs</li> <li>• Real buy-in from Old Monroe village Center business owners</li> <li>• News article style update for Town websites and newsletters</li> <li>• Project website</li> </ul>   |

## **Partner Identification for Multi-Day Design Charrette**

- All US 74 Corridor Study participants
- MUMPO (Stuart or Anil)
- All HOAs that touch John Street/Old Monroe Road (participants will provide contacts)
- Joe Lesch (Union County Transportation Coordinator)
- Chestnut Connector design team (STV)
- John Street, LLC (Matthews)
- Citizens Transportation Advisory Board (Matthews)
- Downtown Group (Matthews)
- Lat Purser
- Emergency Services (Williams EMS station and Stallings VFD in Indian Trail)
- Union County School Board (Union County Public Schools)
- Union County Public Works (Parks and Utilities)
- Mecklenburg County School Board (Charlotte Mecklenburg Schools)
- Dick Black-Union County Planning(unincorporated)
- NCDOT Division 10 (Louis Mitchell or Scott Cole)
- NCDOT PDEA
- CATS (Brian H.)
- CPCC Levine Campus
- Mecklenburg County Park and Recreation
- Auto Bell (Thomas M.)
- Union County Chamber of Commerce???







# *Town of Stallings*

MAYOR  
Wyatt Dunn

MAYOR PRO TEMPORE  
Walt Kline

TOWN COUNCIL  
Rocky Crenshaw Regis Griffin  
Deborah Romanow  
Shawna Steele Fred Weber

TOWN MANAGER  
Kevin Woods

TOWN CLERK  
Erinn Nichols

---

John Underwood  
District Engineer  
District 3: Counties-Anson & Union  
130 S. Sutherland  
Monroe, 28112

Mr. Underwood:

The Stallings Town Council meet on July 11<sup>th</sup> to discuss the alignment alternatives for the Old Monroe Road widening project and have gone on record with the following recommendation:

1. The superstreet configuration as the road alignment preference;
2. The 10' multi use path as a destination path using both sides of Old Monroe Road with possible cost share; and
3. Landscaping in the medians and in the intersection of Old Monroe Road and Potter/Stallings Roads, the Town to be included in the landscape planning for these areas and that hardscape elements be included that will further the Town's efforts in developing the Downtown Master Plan.

The Town appreciates NCDOT's willingness to work with the Town on ensuring that this project is designed in a manner that will enhance efforts to develop properties along this corridor in concert with the Stallings Downtown Master Plan.

If you have any questions or need additional information please do not hesitate to contact me.

Sincerely,

*Lynne Hair*

Lynne Hair  
Town Planner/Zoning Administrator

cc: Kim Bereis, Atkins Group  
Carl Gibilaro, Atkins Group





STATE OF NORTH CAROLINA

TOWN OF INDIAN TRAIL

RESOLUTION #

**RESOLUTION TO SUPPORT A FULL MOVEMENT INTERSECTION  
AT WESLEY CHAPEL-STOUTS ROAD**

**WHEREAS**, the Indian Trail Mayor and Town Council have been working with the North Carolina Department of Transportation (NCDOT) on the intersection alignment along Old Monroe Road, and

**WHEREAS**, the Indian Trail Mayor and Town Council have been listening to constituent concerns about a Michigan Left or Super Street intersection alignment on Wesley Chapel-Stouts Road, and

**WHEREAS**, the Michigan Left and Super Street intersection alignments are untested in North Carolina within a business district, and

**WHEREAS**, the Town strongly recommends to the NCDOT that the Wesley Chapel-Stouts Road intersection be a Full Movement Intersection, and

**WHEREAS**, a Full Movement intersection allows the traditional free movement of traffic for residents, visitors, and businesses, and

**WHEREAS**, a Full Movement intersection still meet the state standards for future traffic impact, and

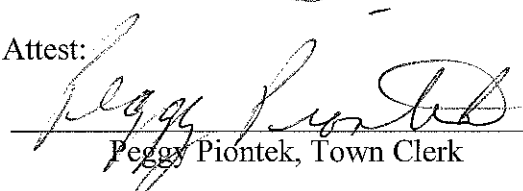
**NOW, THEREFORE, BE IT RESOLVED THAT** the Indian Trail Mayor and Town Council only support having a Full Movement intersection at Wesley Chapel-Stouts Road.

Adopted this 14th day of October, 2014.

TOWN COUNCIL OF INDIAN TRAIL NORTH CAROLINA

  
Michael Alvarez, Mayor

Attest:

  
Peggy Piontek, Town Clerk