

3. PREFERRED ALTERNATIVE



Section 3 describes the Preferred Alternative and reasons for selecting DSA D as the Preferred Alternative. This section also describes additional design work and presents a summary of updated impacts associated with the Preferred Alternative.

3.1 DESCRIPTION OF THE PREFERRED ALTERNATIVE

As presented in Section 2 of the Final EIS, the FHWA and NCTA (a division of NCDOT as of July 27, 2009) identified Detailed Study Alternative (DSA) D as the Preferred Alternative, based on the information in the Draft EIS and input received during the public comment period. DSA D was identified as the Recommended Alternative in the Draft EIS. DSA D, in relation to the other Detailed Study Alternatives, is shown in **Figure 3-1a-c**. After consideration of comments received on the Final EIS (**Section 5**) and additional studies completed since the Final EIS (listed in **Section P.4.5**), FHWA and NCDOT reaffirm DSA D as the Preferred Alternative. **Figure 3-2** shows the Preferred Alternative.

3.1.1 GENERAL DESCRIPTION

The Preferred Alternative is proposed as a four to six-lane controlled-access toll facility. The Preferred Alternative follows existing US 74 for approximately one mile from just east of I-485 to east of Stallings Road (SR 1365) and then proceeds eastward on a new location alignment from east of Stallings Road (SR 1365) to the project terminus at existing US 74 between the towns of Wingate and Marshville. The total length of the Preferred Alternative is approximately 19.7 miles.

From west to east, interchanges are located at US 74, Indian Trail-Fairview Road (SR 1520), Unionville-Indian Trail Road (SR 1367), Rocky River Road (SR 1514), US 601, NC 200, and Austin Chaney Road (SR 1758). Partial interchanges are located at Forest Hills School Road (SR 1754) and US 74 at the eastern end of the project.

The Preferred Alternative includes upgrading an approximately one-mile segment of existing US 74 at the western end of the project to a controlled-access highway facility with frontage roads. For this segment, the toll road is six lanes wide and elevated on retained fill, with one-way frontage roads of two to three lanes on either side, for a total of ten to twelve lanes. For the remainder of the new location portion, the Preferred Alternative has four lanes and a 70-foot median. The median width may be reduced during final design, which would reduce the footprint of the project. However, the wider median width was used to conservatively evaluate impacts of the Preferred Alternative.

Design refinements to the Preferred Alternative incorporated since the Draft EIS are discussed in Section 2.3.1 of the Final EIS and summarized in **Section 3.3.1**, and generally include modifications to improve access to neighborhoods, reduce visual impacts and relocations, and maintain local connectivity.

3.1.2 DESIGN CRITERIA

The design speed for the tolled highway segments is 70 miles per hour (mph), which would accommodate a posted speed limit of 65 mph. The design speed for the frontage roads on

reconstructed US 74 is 40 mph, which would allow for a posted speed limit of 35 mph. The general design criteria for the project are presented in Appendix B of the Draft EIS.

Two typical sections were developed for the Preferred Alternative – one for the segment on new location and one for the segment that includes upgrading an approximately one-mile portion of existing US 74. These typical sections are depicted in **Figure 3-3**. The typical section for the new location roadway has four 12-foot travel lanes with a 70-foot median and 12-foot inside and outside paved shoulders. The right of way needed for this typical section is approximately 300 feet, with additional right of way required for interchanges, frontage roads, and improvements to intersecting roads.

The typical section for the upgraded portion of existing US 74 includes a six-lane tolled highway elevated on fill with retaining walls. One-way frontage roads of two to three lanes would be built immediately at the base of the retaining walls to carry local traffic on either side of the elevated toll road. The number of lanes on the frontage roads would vary depending on the proximity to u-turn locations, along with on and off ramps. In areas where ramps are present, three lanes are necessary to provide adequate distance to allow vehicles to merge into traffic. The right of way required for this section is approximately 260 feet.

Since the publication of the Final EIS in May 2010, the American Association of State Highway and Transportation Officials (AASHTO) published an updated edition of the “Green Book” (*A Policy on Geometric Design of Highways and Streets, 6th Edition*, 2011), which contains current design research and practices for highway and street geometric design. This updated reference was reviewed and does not include any new information that would necessitate any changes to the design of the project as presented in the Final EIS.

3.1.3 TOLLING INFORMATION

Planning for Tolls. As shown in Table 6-2 of the MUMPO 2030 LRTP, tolls were indicated as the funding source for the Monroe Connector (I-485 to US 601) portion of this project, but not for the Monroe Bypass portion of the project (US 601 to US 74). On March 24, 2010, MUMPO endorsed its 2035 LRTP, which includes tolls as a funding source for the entire project.

Toll Collection System. Tolls would be collected by an electronic toll collection (ETC) system. There would be no cash toll booths. The primary means of ETC involves setting up an account with NCDOT and using a transponder/receiver system. The transponder is a small device usually mounted on the windshield of a vehicle. The receiver is typically mounted over the roadway, and it electronically collects tolls from a driver’s account as the vehicle travels under it at highway speed.

The NCDOT will work with other toll authorities to enable, where possible, other systems’ transponders to work on the Monroe Connector/Bypass. Toll road users also will have the option of acquiring transponders with prepaid tolls. For travelers who do not have a transponder, a video system will capture license plate information and NCDOT will bill the vehicle’s registrant.

In addition, in accordance with NC General Statutes §136-89.213(b), NCDOT will operate a facility in the immediate vicinity of the project that accepts cash payments for prepaid tolls, so establishing an account is not required. It is anticipated that this storefront-type facility would operate from an existing commercial building or strip shopping center within the project area. The facility is not expected to generate a high volume of traffic that would impact local streets.

Incorporating Tolls into Functional Engineering Designs. There are minimal differences between a roadway design with and without an ETC system. The ETC equipment, which is primarily mounted on an overhead structure, takes up little space, and does not require additional right of way. While the right-of-way requirements may not differ between a non-toll facility and a toll facility, the alignment of loop ramps that have ETC equipment may slightly differ. At these locations, the loop ramp is modified slightly to provide a tangent section that facilitates accurate video capture of license plates.

Financial Feasibility of Tolling and Toll Rates. The financial feasibility of tolling the proposed project was evaluated in progressively more detail in the following documents. These documents were incorporated by reference into the Final EIS and are available for review and download on the project Web site: www.ncdot.gov/projects/monroconnector.

- *Proposed Monroe Connector Preliminary Traffic and Revenue Study* (Wilbur Smith Associates, October 2006). This document was included by reference into the Draft EIS. This preliminary study concluded that tolling the entire Monroe Connector/Bypass project would generate significantly more revenue than the Monroe Connector alone. In addition, the study found that the Monroe Connector in combination with the Monroe Bypass would reduce congestion by providing a good alternative to US 74.
- *2009 Update for Monroe Connector/Bypass Preliminary Traffic and Revenue Study* (Wilbur Smith Associates, April 2009). The update was conducted at a preliminary level of study. Updates from the 2006 study included toll collection methods and alignment and interchange configurations.
- *Final Report Proposed Monroe Connector/Bypass Comprehensive Traffic and Revenue Study* (Wilbur Smith Associates, October 2010). This report documented certified anticipated revenue for use by bond rating agencies and investors to evaluate financial return on the project.

The initial price of the toll was determined as part of the *Comprehensive Traffic and Revenue Study* (Wilbur Smith Associates, October 2010). The price of the toll likely will vary over time, based upon variables such as managing demand, financing the initial construction of the project, and paying for roadway operations and maintenance. The toll rate will differ for cars and trucks, and will also be dependent on the collection method, i.e., transponder, registered license plate, or bill via US Mail. Initial toll rates for those utilizing a transponder are expected to be approximately \$0.13 per mile for cars and \$0.51 per mile for trucks.

3.2 REASONS FOR SELECTING DSA D AS THE PREFERRED ALTERNATIVE

According to FHWA regulations (23 CFR 771.125) and Council on Environmental Quality regulations (40 CFR 1502.14), the lead agency(ies) should identify a Preferred Alternative in a Final EIS. This is the alternative the lead agency(ies) believes would fulfill its statutory mission and responsibilities, giving consideration to social, economic, environmental, technical and other factors.

The FHWA and NCDOT identified DSA D as the Preferred Alternative in the Final EIS, for the reasons listed below. DSA D was also identified by the FHWA, NCTA, and NCDOT as the Recommended Alternative in the Draft EIS (Section 2.8). After consideration of comments received on the Final EIS and additional studies completed since the Final EIS, the reasons cited

in Section 2.2 of the Final EIS for selecting DSA D as the Preferred Alternative still apply. The comparisons listed below were made prior to the design refinements described in **Section 3.3**. However, the relative comparisons listed below still apply, since it is expected that if designs were refined for each DSA, the relative values would remain similar.

Additional information regarding input received during the Draft EIS and Final EIS public review periods is included at the end of this section under “Public Involvement.” Please note this list is not in order of importance and does not represent all benefits or impacts of DSA D, just those elements that differentiated DSA D when compared to the other DSAs.

Cost and Design Considerations

- DSA D is one of the shortest alternatives at 19.7 miles (all alternatives range from 19.6 to 20.6 miles).
- DSA D is one of the eight alternatives that would not require the relocation of Rocky River Road and the associated wetland impacts. The relocation of Rocky River Road is required for the eight alternatives that include DSA Segment 22A.
- DSA D is higher in the range of median total project costs with a median cost of \$777.4 million (the median costs of the DSAs range from \$752.5 million for DSA A2 to \$785.3 million for DSA D1). The higher cost of the Preferred Alternative is offset by lower impacts in several other areas as described below. Updated cost estimates for the Preferred Alternative, which incorporate design refinements discussed in **Section 3.3**, as well as increases due to inflation as a result of the updated project opening date, are provided in **Section 3.3.4**. It is expected that relative costs amongst the DSAs would remain similar if updated costs were provided for all DSAs, and therefore the conclusions listed in this bullet would not change.

Human Environment Considerations

- DSA D is one of the four DSAs with the fewest residential relocations at 107 (the range being 94 to 149 residential relocations). Through design refinements for the Preferred Alternative, this number has been reduced by 12 residential relocations for a total of 95 residential relocations.
- Although DSA D is higher in the range of business relocations at 48 (the range being 14 to 49 business relocations), this number has been reduced from preliminary estimates by one business relocation through design refinements for a total of 47 business relocations. Most of the impacted businesses are located along existing US 74 at the western end of the project. The relocation of these businesses is in exchange for the other positive factors associated with DSA D, including having the roadway located farther away from densely developed residential subdivisions and farther from Stallings Elementary School.
- DSA D would have no direct impacts to schools and would avoid any indirect impacts to Stallings Elementary School. DSA D is one of eight alternatives that would have no direct impacts to schools. The other eight alternatives would have a direct impact to Central Piedmont Community College and would be adjacent to Stallings Elementary School.
- DSA D is one of the four alternatives that would impact only three church properties (other DSAs impact four or five church properties). None of the DSAs would impact church buildings.
- DSA D is one of the eight alternatives that would avoid impacts to the proposed

Matthews Sportsplex property, a public park to be developed by the Mecklenburg County Park and Recreation Department. Also see Cultural Resource Considerations below.

Physical Environment Considerations

- DSA D is one of the alternatives that has the least impacts to active agricultural lands at 499 acres. Impacts range from 494 acres for DSA C to 627 acres for DSA B3.
- DSA D is one of eight DSAs (DSAs C, D, C1, D1, C2, D2, C3, and D3) that would potentially impact the most hazardous materials sites (11-12 sites impacted, with the lowest impacts being 6-7 sites). However, the anticipated impact severity is “low” for all potentially impacted sites. An updated survey of potentially contaminated sites conducted for the Preferred Alternative revealed only five potentially contaminated sites, as discussed in **Section 4.2.6**.

Cultural Resources Considerations

- DSA D is one of eight alternatives that would not have impacts on the proposed Matthews Sportsplex property, a future public park and Section 4(f) resource. The other eight alternatives would affect this proposed park.

Natural Resources Considerations

- DSA D is in the middle range of impacts to upland forest at 450 acres (all alternatives range from 358 to 514 acres). As discussed in **Section 4.4.3**, impacts to terrestrial communities from all the DSAs were updated to account for an area near the western end of the project where 3.9 acres of upland forest were cleared within DSA Segment 2. Based on this update, DSA D would still be in the middle of the range of upland forest impacts at 446 acres (all alternatives range from 354 to 514 acres).
- DSA D is lower in the range of impacts to ponds at 2.6 acres (all alternatives range from 2.5 to 3.8 acres).
- DSA D is in the middle range of impacts to wetlands at 8.1 acres (all alternatives range from 6.2 to 11.0 acres).
- DSA D would have the least impacts to perennial streams with 9,794 linear feet of impact (all alternatives range from 9,794 to 12,383 linear feet).
- DSA D is lower in the range of impacts to intermittent streams at 11,915 linear feet (all alternatives range from 10,767 to 13,020 linear feet).
- DSA D would have the least linear feet of streams requiring mitigation at 12,550 linear feet (all alternatives range from 12,550 to 16,387 linear feet). While final decisions with respect to mitigation requirements have not been made by the regulatory agencies, for estimation purposes, streams were considered to require mitigation if they were perennial or if they were intermittent and had a stream rating issued by the NCDENR-DWQ of greater than or equal to 26. This implies that streams impacted by DSA D are of lower quality than those impacted by other DSAs.
- DSA D is one of eight alternatives that would cross only two 303(d)-listed streams, while the other eight alternatives would cross four. Both 303(d)-listed streams are proposed to be bridged.

Public Involvement Prior to Publication of the Draft EIS

- Substantial public input regarding the DSAs, particularly at the western end of the project (DSA Segment 2 versus DSA Segment 18A), was received throughout the alternatives screening process. Much of this public input has been generated by C.A.R.E., a community-based group focused on informing and mobilizing residents against DSA Segment 18A of the Monroe Connector/Bypass (included in DSAs A, B, A1, B1, A2, B2, A3, and B3). C.A.R.E. submitted more than 2,000 signatures in opposition to DSA Segment 18A. Specifically, the group is concerned about noise, visual, and air quality impacts to the new Stallings Elementary School and adjacent neighborhoods, as well as impacts to North Fork Crooked Creek, which is a 303(d)-listed stream. While this input was a factor in the decision to recommend DSA D, the recommendation was based on a wide range of factors included in the comprehensive review and analysis of the potential impacts of all DSAs, as described above.

Public Involvement between the Draft EIS and Final EIS

- The formal public review period for the Draft EIS was from May 1, 2009 (the day the Notice of Availability of the Draft EIS was published in the Federal Register [Vol. 74, No. 83, Page 20297]) to June 15, 2009. However, the Draft EIS was available on the project Web site beginning April 2, 2009, and a press release was issued that day announcing the document's availability for public review.
- A series of Public Hearings and Open Houses was held the week of May 18, 2009. The purpose of the public review period and the Pre-Hearing Open Houses/Public Hearings was to receive input on the Draft EIS and project corridors and design, as well as the selection of DSA D as the Recommended Alternative. Section 3.1.2 of the Final EIS has additional information on this topic. Of the comments received during the public review period that expressed an opinion on the selection of DSA D as the Recommended Alternative, 382 were in favor of DSA D and 50 were opposed to it. An additional 150 names were submitted on an electronic petition opposing DSA D; however, NCDOT cannot verify the validity of the signatures on this petition.
- None of the public comments received resulted in changes to any of the reasons listed above for selecting DSA D as the Preferred Alternative. Detailed information regarding comments received from the public, as well as local, state, and federal agencies, is presented in Section 3 of the Final EIS. Substantive comments on the Draft EIS and responses to those comments are included in Section 3.3 of the Final EIS. All comments received on the Draft EIS and responses to the comments are included in Appendix B of the Final EIS.

Public Involvement after Publication of the Final EIS

- The formal public review period for the Final EIS was from June 11, 2010 (the day the Notice of Availability of the Final EIS was published in the Federal Register [Vol. 75, No. 112, Page 33300]) to July 12, 2010. Chapter 5 of the Final EIS includes a full list of agencies and organizations that received copies of the document, as well as a list of local libraries and government offices where the Final EIS was made available for public review. The Final EIS in its entirety was also made available for download on the project Web site.
- Detailed information regarding comments received from the public on the Final EIS, as well as local, state, and federal agencies, is presented in **Section 5** of this document.

All comments received on the Final EIS and responses to the comments are included in **Appendix A**. None of the comments received resulted in a change in the Preferred Alternative.

- Two Citizens Update Workshops were held on June 18 and 19, 2012. Both meetings included a formal presentation that described the project's legal proceedings, status of the right-of-way process, and the next steps. The presentation was followed by a question and answer session and project team members were available to answer one-on-one questions before and after the presentation. A total of 207 citizens signed in at the workshops (102 in Stallings and 105 in Monroe). At the meeting in Stallings, one comment form was submitted to state support for the project. At the meeting in Monroe, four comment forms were submitted – three in support of the project and voicing frustration with the delay, and one with a suggestion to widen NC 218. **Section 5.2.1** provides additional information about the workshops.
- Since the Final EIS, the project study team met with several organizations and agencies to provide updates on the project or make a presentation about the project at the request of community groups. These small group meetings are described in **Section 5.2.2**. Additional agency coordination since the Final EIS is presented in **Section 5.3**.

3.3 DESIGN REFINEMENTS TO THE PREFERRED ALTERNATIVE

The following sections summarize design refinements to the Preferred Alternative since the Draft EIS was published, as presented in Section 2.3 of the Final EIS. There have not been any additional design refinements since the Final EIS was published. The refinements include design modifications made as a result of public involvement activities since publication of the Draft EIS, avoidance and minimization of impacts to Waters of the US, and proposed service roads based on the results of the *Final Monroe Connector/Bypass Service Road Study* (PBS&J, April 2010). This section also summarizes cost estimates, traffic forecasts, and operational analysis for the Preferred Alternative.

Figure 3-4a-t (previously Figure 2-3 from Final EIS) shows the refined functional design for the Preferred Alternative that incorporates the design modifications, minimization efforts, and service roads discussed below. The base mapping for **Figure 3-4a-t** has been updated with 2012 parcel data for Union and Mecklenburg Counties, a 2012 subdivision layer from Union County, 2012 303(d)-listed streams, and new development in the study area. The names of some resources have also been updated.

3.3.1 DESIGN REFINEMENTS SUMMARY

As a result of the public involvement activities and public review period associated with this project after the Draft EIS was published, six areas of concern regarding the functional design were raised by the members of the public, local municipalities, and regulatory agencies.

Design modifications were made in the following areas: Forest Park subdivision, Beverly Drive, Bonterra Village, Unionville-Indian Trail Road interchange, and Austin Chaney Road interchange/McIntyre Road. Design revisions also were considered for the Maple Hill Road area, but were not implemented. These design modifications, which generally reduced residential relocations and potential noise and visual impacts, are described in detail in Section 2.3.1 of the Final EIS.

3.3.2 SERVICE ROADS SUMMARY

The *Final Monroe Connector/Bypass Service Road Study* (PBS&J, April 2010) was prepared for the Preferred Alternative. This document is incorporated by reference and available on the project Web site (www.ncdot.gov/projects/monroeconnector/). The objective of this study was to identify and evaluate parcels whose access would be eliminated by the Preferred Alternative (i.e., land-locked parcels) and to evaluate the feasibility and reasonableness of providing service roads to restore access to those parcels.

The service road evaluation methodology and design assumptions are described in detail in Section 2.3.2.1 of the Final EIS. Based on the analysis conducted, fourteen areas (including 89 parcels) were recommended for preliminary service roads. The proposed service roads are presented in Section 2.3.2.2 of the Final EIS. Service roads were generally recommended where the cost of purchasing isolated or remnant parcels was greater than the cost associated with providing the service road. The service road functional designs are shown on Figure 2-4a-h of the Final EIS and included on **Figure 3-4a-t** of this document. Impacts associated with the service roads are included with the impacts of the Preferred Alternative presented in **Section 3.4**.

3.3.3 AVOIDANCE AND MINIMIZATION OF IMPACTS TO WATERS OF THE US

Throughout the alternatives development process, the alternative corridors and engineering designs were developed considering avoidance and minimization of impacts to Waters of the US (wetlands, streams and ponds) where possible. As part of the Draft EIS, a preliminary hydraulic analysis was performed to identify preliminary sizes and locations of major drainage structures along the DSAs that would be needed to adequately carry floodwaters. Major drainage structures are bridges, box culverts, or pipe culverts greater than 72 inches in diameter.

As discussed in Section 4.6.3 of the Draft EIS, major drainage structures and crossings were reviewed by the environmental resource and regulatory agencies at the Turnpike Environmental Agency Coordination (TEAC) meeting on October 7, 2008, and at a bridging location field review on October 21, 2008. As a result of these meetings, the agencies agreed on several recommended bridge and culvert locations, and NCDOT agreed to include bridges at several locations previously recommended for culverts in order to avoid or minimize stream and wetland impacts. Locations where NCDOT agreed to include bridges to avoid or minimize impacts to streams and wetlands along the Preferred Alternative were as follows:

- Crossing 19– recommended twin 150-foot bridges to avoid 307 linear feet of impacts to South Fork Crooked Creek (Stream S047).
- Crossing 20– recommended 75-foot bridge to avoid 196 linear feet of impacts to South Fork Crooked Creek (Stream S047).
- Crossing 30– recommended twin 240-foot bridges to avoid 519 linear feet of impacts to Stewart’s Creek (Stream S082).
- Crossing 37– recommended twin 320-foot bridges to avoid 522 linear feet of impacts to Richardson Creek (Stream S111).
- Crossing 38– recommended twin 280-foot bridges to avoid 378 linear feet of impacts to Ray’s Fork (Stream S112).
- Crossing 47– replace culvert with twin 575-foot bridges to avoid 2.28 acres of impacts to Wetlands W170 and W167 and 395 linear feet of impacts to Meadow Branch (Stream S152).

The Preferred Alternative was selected, in part, because it had the least perennial stream impacts among all the DSAs and the second least total stream impacts. All 303(d)-listed streams are proposed to be bridged. Strict adherence to standard Best Management Practices (BMPs), including those for sedimentation and erosion control and the NCDOT *Design Standards in Sensitive Watersheds*, will minimize project impacts.

As presented in Section 2.3.3 of the Final EIS, in addition to the measures listed above, specific areas where design refinements for the Preferred Alternative resulted in net reductions to stream impacts include:

- The area around Beverly Drive where a bridge was removed, resulting in an impact reduction of approximately 109 linear feet to Stream S036, which was anticipated to require mitigation;
- The area around Bobwhite Circle where a service road was removed and a bridge was modified, resulting in an impact reduction of approximately 189 linear feet to Streams S114b, S140f and S140g, all of which were anticipated to require mitigation;
- The area surrounding the Austin Chaney Road interchange where design modifications resulted in a net impact reduction of approximately 423 linear feet to Streams S156b, S157a and S157b, 344 linear feet of which were anticipated to require mitigation; and
- The area east of the Forest Hills School Road interchange where a previously shown NCDOT service road was shortened, resulting in an impact reduction of approximately 67 linear feet to Stream S169a, which was anticipated to require mitigation.

The changes in jurisdictional resource impacts resulting from the individual refinements to the Preferred Alternative are listed in **Table 3-1**. A summary of changes in jurisdictional resource impacts to the Preferred Alternative between the Draft EIS and Final EIS are summarized in **Table 3-2**, and include the impacts from service roads. There have not been any additional refinements to the functional design of the Preferred Alternative since the Final EIS. Updated wetland and stream impacts based on the refined functional design for the Preferred Alternative are described in **Section 3.4**.

TABLE 3-1: Changes in Jurisdictional Resource Impacts Due to Design Refinements

Design Refinement	Change in Impact to Resource Compared to Draft EIS DSA D Conceptual Design ¹				
	Perennial Streams (linear ft)	Intermittent Streams (linear ft)	Total Streams (linear ft)	Wetlands (acres)	Ponds (acres)
Eliminate Beverly Drive Bridge	-109	0	-109	0	0
Secret Shortcut crossing	+196	0	+196	-0.1	0
Compress Unionville-Indian Trail Road Interchange	-116	+127	+11	+0.1	0
Re-Design Austin Chaney Road Interchange	-285	-138	-423	0	+0.3
TOTAL CHANGE (from design refinements listed above)	-314	-11	-325	0	+0.3

Source: *Natural Resources State Technical Report for the Monroe Connector/Bypass* (ESI, December 2008) with updated y-line and service road information provided October 2009.

Notes: ¹Impacts calculated based on slope stake limits plus a 40-foot buffer.

TABLE 3-2: Changes in Jurisdictional Resource Impacts Since the Draft EIS

Impacts ¹	Perennial Streams (linear ft)	Intermittent Streams (linear ft)	Total Streams (linear ft)	Wetlands (acres)	Ponds (acres)	Stream Impacts Requiring Mitigation ²
Impacts Reported in Draft EIS for DSA D	9,794	12,269	22,063	8.1	2.6	12,550
Impacts for Preferred Alternative (no service roads)	9,205	12,389	21,594	8.0	3.1	11,975
Add Service Road Impacts	+1,148	+341	+1,489	+0.1	+0.0	+1,260
TOTAL IMPACTS FOR PREFERRED ALTERNATIVE	10,353	12,729	23,083	8.1	3.1	13,235
Change from Draft EIS to Preferred	+559	+460	+1,020	0	+0.5	+685

Source: *Natural Resources State Technical Report for the Monroe Connector/Bypass* (ESI, December 2008) with updated y-line and service road information provided October 2009.

Notes: ¹Impacts calculated based on slope stake limits plus a 40-foot buffer. ²Based on assumption that all perennial stream impacts require mitigation as well as any impacts to intermittent streams with NCDWQ stream ratings greater than 26.

3.3.4 COST ESTIMATES FOR THE PREFERRED ALTERNATIVE

Cost estimates revised since the Final EIS for the Preferred Alternative are presented in **Table 3-3**. The cost estimates presented in Section 2.3.4 of the Final EIS assumed a construction contract award date of December 2010 and a project opening in December 2014. The revised cost estimate assumes a construction start date of October 2014 and a project opening in October 2018. No other assumptions or data were changed; therefore, the resulting \$97 million increase in project costs is entirely attributable to inflation. The costs presented in the table are based on the Preferred Alternative refined functional engineering design, as described in Sections 2.3.1 and 2.3.2 of the Final EIS. The estimates are in year-of-expenditure dollars, as described in the table notes. Cost estimates are provided as a range of probable project costs for construction, right-of-way acquisition, and environmental mitigation (mitigation of impacts to streams and wetlands). The total project cost provided represents the 70 percent confidence level. This means that there is a 70 percent probability that the construction phase of the project will cost less than or equal to \$898.0 million.

TABLE 3-3: Cost Estimates for Preferred Alternative

	Approximate Length (miles)	Probable Range of Costs Through Year of Expenditure (millions \$)*				Project Cost (millions \$) (70% chance costs will be less)
		Construction Cost	Environmental Mitigation Cost	ROW & Utility Cost	Total Cost	
Preferred Alternative	19.7	638.6 to 690.9	11.3 to 11.9	195.8 to 220.5	845.7 to 923.3	898.0

Source: HNTB, April 26, 2013.

Notes: * Assumptions and notes regarding costs:

1. Construction cost includes construction, utilities, engineering, and administrative costs.
2. Year of expenditure costs were modeled using a range of possible inflation rates.
3. Future construction costs were modeled to mid-point of construction using inflation rates ranging from 2.5% to 4%, with 3% being most likely.
4. Future right-of-way costs were modeled to anticipated year of acquisition using inflation rates ranging from 0% to 4%, with 2% being most likely.
5. Future administrative costs were modeled to anticipated year of expenditure using inflation rates ranging from 2.5% to 4.5%, with 4% being most likely.
6. Ranges of costs are based on cost projections in which the lowest 10% and highest 10% were discarded.
7. Prior calculations (April 13, 2010) for year of expenditure costs assumed an award date of December 2010 and an opening in December 2014.
8. Revised calculations (April 26, 2013) for year of expenditure costs assume an award date of October 2014 and an opening in October 2018.
9. Environmental mitigation costs are based on NCEEP fee schedule dated July 1, 2009 for estimated impacts to streams and wetlands and assume mitigation for impacts to all wetlands, all perennial streams, and intermittent streams with a NCDENR-DWQ stream rating greater than or equal to 26.
10. Right-of-way costs were provided by Carolina Land Acquisitions in January 2009. The cost estimate was updated in March 2010 to reflect new assumptions.

Design-Build Procurement

In April 2010, NCDOT solicited Statements of Qualifications (SOQ) from prospective design-build teams for the design and construction of the Monroe Connector/Bypass. Seven teams submitted SOQs in May 2010. Upon review of each team’s credentials, NCDOT reduced the list from seven to three and requested that the remaining teams submit technical and price proposals on October 14, 2010. On October 28, 2010, NCDOT opened the design-build price proposals and read the technical scores. The team selected through the best-value procurement process was Monroe Bypass Constructors (a joint venture of United Infrastructure, Boggs Paving, and Anderson Columbia) with a construction bid of \$367,700,000.

As presented in the Final EIS, the total project cost was expected to range from \$749 million to \$824 million. Construction costs were estimated to range from \$558 million to \$617 million. Within the construction cost estimate, the highway design-build bids were expected to range from \$465.7 million to \$513.7 million. The remaining costs were for non-highway construction costs (i.e., landscaping, toll integration, construction management, administration, and agency reserve funds).

The actual design-build cost estimates ranged from \$367.7 million to \$424.4 million, resulting in a mean estimate of \$398 million. This mean estimate represents a 14.5 percent and 22.5 percent reduction in the predicted range of design-build costs presented in the Final EIS. This difference can be attributed, in part, to the following factors:

- *Scope changes:* The NCDOT cost estimate was based on the refined functional design plans, which included a 70-foot median width. The design-build teams were directed to include a reduced 46-foot median in their proposal, saving an estimated \$25 million in

reduced quantities of earthwork, bridges and drainage systems. Other scope changes included narrower inside paved shoulder widths and the option to eliminate angular offsets at loop ramp deceleration lanes.

- *An extremely competitive bidding environment:* In 2010, NCDOT experienced bids that were, on average, 20 percent lower than the engineer's estimates.

Within their Technical Proposal, the selected team proposed a four-year design and construction timetable, with a project opening date of December 31, 2014, based upon the award of the project in December 2010. On October 26, 2010, \$233.92 million in State Appropriation Revenue Bonds were sold; however, the remainder of the project financing was delayed until the successful resolution of a lawsuit filed by the Southern Environmental Law Center (SEL) challenging the EIS. NCDOT prevailed in the initial lawsuit filed by the SELC in the United States District Court in the opinion published on October 24, 2011. Following the favorable court opinion, and along with a written agreement from the design-build team to retain their original price, the following activities took place:

- November 9, 2011 - \$10 million Senior Lien Turnpike Revenue Bonds sold
- November 16, 2011 - \$214.505 million State Appropriation Revenue Bonds sold
- November 23, 2011 - Design-build highway construction contract awarded
 - Revised Substantial Completion Date (project opening) to December 31, 2015
 - Revised Final Completion Date to July 1, 2016
- December 15, 2011 - \$145.535 million GARVEE bonds sold

Following award of the design-build contract in November 2011, the engineering team began preparation of final construction plans and the contractor began mobilizing equipment and work force. NCDOT suspended the work of the design-build team on May 22, 2012 following the decision of the United States 4th Circuit Court of Appeals. For the six months between project award and work suspension, the design-build team was paid \$35 million, largely for design work, mobilization, bonds, and insurance. In order to retain the design-build team and their favorable bid, NCDOT has agreed to pay monthly damage claims. These payments are based on actual costs incurred by the contractor during the suspension. Payments for damages between May 22, 2012 and May 31, 2013 total \$1.538 million. An additional \$69,000 in damages is currently being processed and NCDOT will continue to compensate the contractor for actual costs until a new Notice to Proceed is given or the contract is terminated. The bonds sold in 2010 and 2011 have funded these damages; and the budgeted contingency fund has been reduced by this amount. In addition to the monthly damage claims for work suspension, the contractor has requested that an inflationary adjustment be applied to the base bid. As of September 2013, NCDOT and the design-build team have not agreed to an adjustment amount.

3.3.5 UPDATED TRAFFIC FORECASTS AND OPERATIONS ANALYSIS IN THE FINAL EIS

Since the publication of the *Final Year 2035 Build Traffic Operations Technical Memorandum* (PBS&J, April 2009), which presented traffic operations information used in the Draft EIS, an addendum was prepared for the Final EIS to re-evaluate traffic conditions. The addendum analyzed traffic volumes and operations based on the refined functional design of the Preferred Alternative's interchanges with the US 74 Frontage Road, Unionville-Indian Trail Road, and

Austin Chaney Road (SR 1758). The addendum found that each of these interchanges would still operate at an acceptable level of service (LOS D) in 2035 using the refined functional design.

Detailed information on the revised traffic operations analysis is presented in the *Final Addendum to Year 2035 Build Traffic Operations Technical Memorandum* (PBS&J, February 2010). This document is incorporated by reference and is available for review and download on the NCTA Web site: www.ncdot.gov/projects/monroconnector/. A complete summary of updated traffic forecasts and operations analysis is provided in Section 2.3.5 of the Final EIS. Additional discussions about traffic forecasts are included in **Section 2.5**.

3.4 SUMMARY OF IMPACTS FROM THE PREFERRED ALTERNATIVE

Section 3.2 presents the reasons cited by FHWA and NCDOT for selecting DSA D as the Preferred Alternative. Impacts from the Preferred Alternative are discussed in detail in Section 2 of the Final EIS and any updates to those impacts are presented in **Section 4** of this document. A summary of the impacts from the Preferred Alternative, including updates presented in **Section 4**, is presented in the following sections:

HUMAN ENVIRONMENT

Impacts to the human environment are documented in the *Community Impact Assessment* (PBS&J, 2009), Section 3 of the Draft EIS, Section 2.5.1 of the Final EIS, and **Section 4.1** of this document.

- The Preferred Alternative impacts seven neighborhoods:
 - Forest Park (relocation of homes on end of road or at edge of neighborhood and change in access)
 - Acorn Woods (relocation of homes in neighborhood and change in access)
 - Bonterra (change in access)
 - Poplin Farms (relocation of homes in neighborhood)
 - Avondale Park (right-of-way encroachment only)
 - Silverthorn (right-of-way encroachment only)
 - Glencroft (right-of-way encroachment only)
- The Preferred Alternative does not directly impact any schools in the project study area. However, implementation of the Preferred Alternative will alter access to Central Piedmont Community College (CPCC). CPCC Lane, which provides access to the campus from existing US 74, will be closed to allow for control of access in the vicinity of the I-485 interchange. New access would be provided from existing US 74 via the proposed McKee Road. The Preferred Alternative also may alter traffic patterns on existing US 74 and Forest Hills School Road in the vicinity of Forest Hills High School. None of these changes would preclude operations of the schools.
- The Preferred Alternative may impact three church properties (no church buildings would be taken with implementation of the Selected Alternative):

- Benton Heights Presbyterian Church – right of way required along US 601 to accommodate improvements associated with the proposed US 601 interchange; control of access requirements may necessitate altering existing entrances.
- Trinity Baptist Church – right of way required along US 601 to accommodate improvements associated with proposed US 601 interchange.
- Lee Park Baptist Church (formerly Morgan Mill Road Baptist Church) – right of way required along NC 200 to accommodate improvements associated with the proposed NC 200 interchange.
- The Preferred Alternative requires relocation of approximately 95 residences, 47 businesses, and 3 farms. Business relocations are concentrated along existing US 74. These total numbers have not changed since the Final EIS. However, since the approval of the original ROD in August 2010 (rescinded July 2012), NCDOT has acquired three commercial properties, 22 residential properties, and one vacant parcel under hardship situations. Requests for right-of-way acquisition for hardship situations are being considered on a case by case basis. The purchase of this right of way did not influence NCDOT's or FHWA's decision to move forward with the Preferred Alternative as presented in the Final EIS. If updated information since the Final EIS led to a change in the Preferred Alternative, the purchased right of way would be sold and new right of way acquired for a different alternative.
- The construction of the Preferred Alternative does not have a disproportionately high and adverse impact on minority and low-income populations.

PHYSICAL ENVIRONMENT

Impacts to the physical environment are documented in a variety of technical memorandums as noted below, as well as in Section 4 of the Draft EIS, Section 2.5.2 of the Final EIS, and **Section 4.2** of this document.

- Noise impacts are documented in *Final Traffic Noise Technical Memorandum* (PBS&J, March 2009), *Addendum Traffic Noise Technical Memorandum* (PBS&J, January 2010), and *Traffic Noise Analysis Update for the Monroe Connector/Bypass* (Atkins, November 2013). The number of impacted receptors is estimated to be 153. Five preliminary feasible and reasonable noise barriers have been identified for the Preferred Alternative:
 - Noise wall NW2C – Along the shoulder of westbound Monroe Connector/Bypass near White Oak Lane and Strand Drive.
 - Noise wall NW4 (Previously N4-1) – Along the shoulder of eastbound Monroe Connector/Bypass near Beverly Drive.
 - Noise wall NW7B (Previously N7-1) – Along the shoulder of eastbound Monroe Connector/Bypass near Avondale neighborhood (Dusty Hollow Road).
 - Noise wall NW11 (Previously N9-1) – Along the shoulder of westbound Monroe Connector/Bypass near Glencroft Drive.
 - Noise wall NW12 - Along the cut slope of eastbound Monroe Connector/Bypass near Phifer Circle.

A Design Noise Study will be prepared during the final design process to update the noise analysis based upon the most recent traffic forecasts and the final design of the Selected Alternative.

- An assessment of air quality is documented in *Final Air Quality Technical Memorandum* (PBS&J, February 2009). The project will not cause or contribute to any new localized carbon monoxide violations or increase the frequency or severity of any existing carbon monoxide violations, and a quantitative carbon monoxide hot-spot analysis is not required. The Monroe Connector/Bypass is currently included in the approved MUMPO 2035 LRTP, which conforms to the intent of the State Implementation Plan (SIP). The USDOT made a conformity determination on the 2035 LRTP on May 3, 2010, with amendments approved by FHWA/FTA on December 19, 2011; July 6, 2012; and May 29, 2013. This conformity determination meets all of the applicable Clean Air Act (CAA) Section 176(c) requirements for federally funded or approved transportation projects. Specifically, the requirements for carbon monoxide hot-spot analysis are codified at 40 CFR 93.116 and 40 CFR 93.123. By meeting these regulatory requirements as well as other requirements in the conformity regulations, this conformity determination demonstrates compliance with the requirements of CAA Section 176(c)(1).
- The Preferred Alternative impacts approximately 184 acres of prime farmland soils and 751 acres of statewide important farmland soils. There are no farmland soils classified as unique or locally important within the right of way for the Preferred Alternative.
- Utility coordination will be conducted during final design. All utility providers will be contacted and coordinated with to ensure that the proposed design and construction of the project does not substantially disrupt service.
- On the eastern end of the project, the Preferred Alternative crosses the CSX Railroad line that parallels existing US 74. NCTA will coordinate with the NCDOT Rail Division and CSX Railroad during final design for the project's eastern terminus at US 74, which would affect the east-west rail mainline through Union County.
- Five potentially contaminated parcels are within the project corridor. When the final design is complete and right-of-way limits are determined, a hazardous materials site assessment will be performed to determine levels of contamination at any potential hazardous materials sites. The assessment will be made prior to right-of-way acquisition.
- The Preferred Alternative includes six bridge crossings and 35 major culverts or pipes. There would be five crossings of floodways and 11 crossings of floodplains. During final design, a detailed hydrologic and hydraulic analysis will be performed for each crossing location to determine the actual size and configuration of each structure. Also, for all new location crossings on FEMA-regulated streams (streams where a floodway and/or floodplain has been identified), a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) will be prepared and submitted to the NC Floodplain Mapping Program or Mecklenburg County, as applicable, for approval. In National Flood Insurance Program flood hazard areas, the final hydraulic designs for the Selected Alternative would be such that the floodway would carry the 100-year flood without a substantial increase in flood elevation.

CULTURAL RESOURCES

Impacts to cultural resources are documented in Section 5.2 of the Draft EIS, Section 2.5.3 of the Final EIS, and **Section 4.3** of this document.

- The Preferred Alternative would not result in an Adverse Effect to any historic property on or eligible for listing on the National Register of Historic Places (NRHP). No property would be acquired from any of the historic resources identified within the project corridor. The effects determinations are No Adverse Effect for Secrest Farm, Hiram Secrest House, and Perry-McIntyre House. The effects determination for William Bivens House is No Effect. These determinations were reconfirmed with the HPO on September 29, 2009. The NCDOT Historic Architecture Group confirmed on August 17, 2012 that there are no changes to the findings presented in the Final EIS.
- The proposed action would have no effects on any archaeological resource on or eligible for listing on the NRHP. An intensive ground penetrating radar survey was conducted at the Hasty-Fowler-Secrest Cemetery (Site 31UN351**) in May 2012, where human remains are suspected to be present. According to the survey, there is no indication of possible burials outside the area with extant markers. As included in the project commitments, all possible burials identified in the survey will be treated as potential human graves and treated appropriately under North Carolina burial removal laws. The NCDOT Archaeology Group confirmed on August 8, 2012, that there are no changes to the findings presented in the Final EIS.
- The Preferred Alternative would not impact any Section 4(f) or Section 6(f) resources.

NATURAL ENVIRONMENT

Impacts to the natural environment are documented in Section 6 of the Draft EIS, Section 2.5.4 of the Final EIS, and **Section 4.4** of this document.

- Table 6-3 of the Draft EIS presents the acreage of terrestrial communities that would be impacted by each DSA (area within each DSA's proposed right of way based on functional engineering designs). **Table 4-4** of this document provides an update to the table from the Draft EIS to reflect a change of 3.9 acres of Mesic Mixed Hardwood Forest to Urban/Disturbed within the proposed right of way for DSAs that include DSA Segment 2. Table 2-10 of the Final EIS presents impacts to terrestrial communities for the Preferred Alternative right of way based on the refined functional design. The impacts of the Preferred Alternative presented in the Final EIS are updated below to reflect a change of 3.9 acres of Mesic Mixed Hardwood Forest to Urban/Disturbed since the Final EIS. Terrestrial communities will be impacted permanently by project construction from clearing and paving, as follows:
 - Agriculturally maintained – 489 acres
 - Basic mesic forest (Piedmont subtype) – 22 acres
 - Mesic mixed hardwood forest (Piedmont subtype) – 390 acres
 - Piedmont/Low mountain alluvial forest – 21 acres
 - Pine forest – 13 acres
 - Successional – 97 acres
 - Urban/disturbed – 216 acres
 - Open water – 6 acres
 - Impervious surface – 58 acres

- The Preferred Alternative will impact 8.1 acres of wetlands and 23,082 linear feet of streams, including 10,353 linear feet of perennial stream and 12,729 linear feet of intermittent stream. Impacts were calculated using the refined functional design estimated construction limits, plus 40 feet, in accordance with NCDOT procedures for functional level designs. It is expected that the stream and wetland impact estimates likely will decrease as the level of design detail increases, since smaller buffers are used in estimating impacts from preliminary design (construction limits plus 25 feet) and from final design (construction limits plus 5-10 feet).
- Protected species information is presented in Section 6.5 of the Draft EIS, and summarized in Section 1.3.4.5 of the Final EIS. Following the publication of the Draft EIS, the *Biological Assessment for the Monroe Connector-Bypass Project (R-3329/R-2559)* (The Catena Group, May 2010) was prepared to evaluate protected species that may be impacted by the Preferred Alternative. A summary of the Biological Assessment is presented in Section 2.5.4.5 of the Final EIS. Since the Final EIS, additional coordination has occurred with the USFWS (**Section 5** and **Appendix C-2**), and additional surveys and analysis have been conducted. Additional surveys were conducted for protected plant species in September 2012 and additional freshwater mussel surveys were performed in October 2012. The surveys did not identify any protected species in the project area. NCDOT requested re-initiation of Section 7 informal consultation with USFWS on October 23, 2013 and submitted a new Biological Assessment (The Catena Group, October 2013) along with the *Draft Technical Report on Direct, Indirect and Cumulative Impacts to Federally Listed Species* (Michael Baker Engineering, Inc., October 2013) (**Appendix C-2**). This additional information is summarized in **Section 4.4.5**. The biological conclusions for federally protected species have not changed since the Final EIS and are listed below:
 - Michaux's sumac – No Effect
 - Smooth coneflower – No Effect
 - Schweinitz's sunflower – May Affect/Not Likely to Adversely Affect
 - Carolina heelsplitter – May Affect/Not Likely to Adversely Affect
 - Carolina heelsplitter Designated Critical Habitat – May Affect/Not Likely to Adversely Affect

NCDOT and FHWA are currently working with USFWS to reach concurrence on the biological conclusions presented in the new Biological Assessment. Consultation with USFWS will be complete prior to issuance of the Final Supplemental Final EIS/ROD.

LAND USE AND TRANSPORTATION PLANNING

- The project is consistent with local land use plans and the MUMPO 2035 Long Range Transportation Plan (LRTP).

INDIRECT AND CUMULATIVE EFFECTS

Potential indirect and cumulative effects of the project are documented in *Indirect and Cumulative Effects Assessment* (HNTB, January 2009), *Monroe Connector/Bypass (R-3329/R-2559 Indirect and Cumulative Effects Quantitative Analysis* (Michael Baker Engineering, Inc., April 2010), and *Monroe Connector/Bypass (R-3329/R-2559) Indirect and Cumulative Effects Water Quality Analysis* (PBS&J, April 2010).

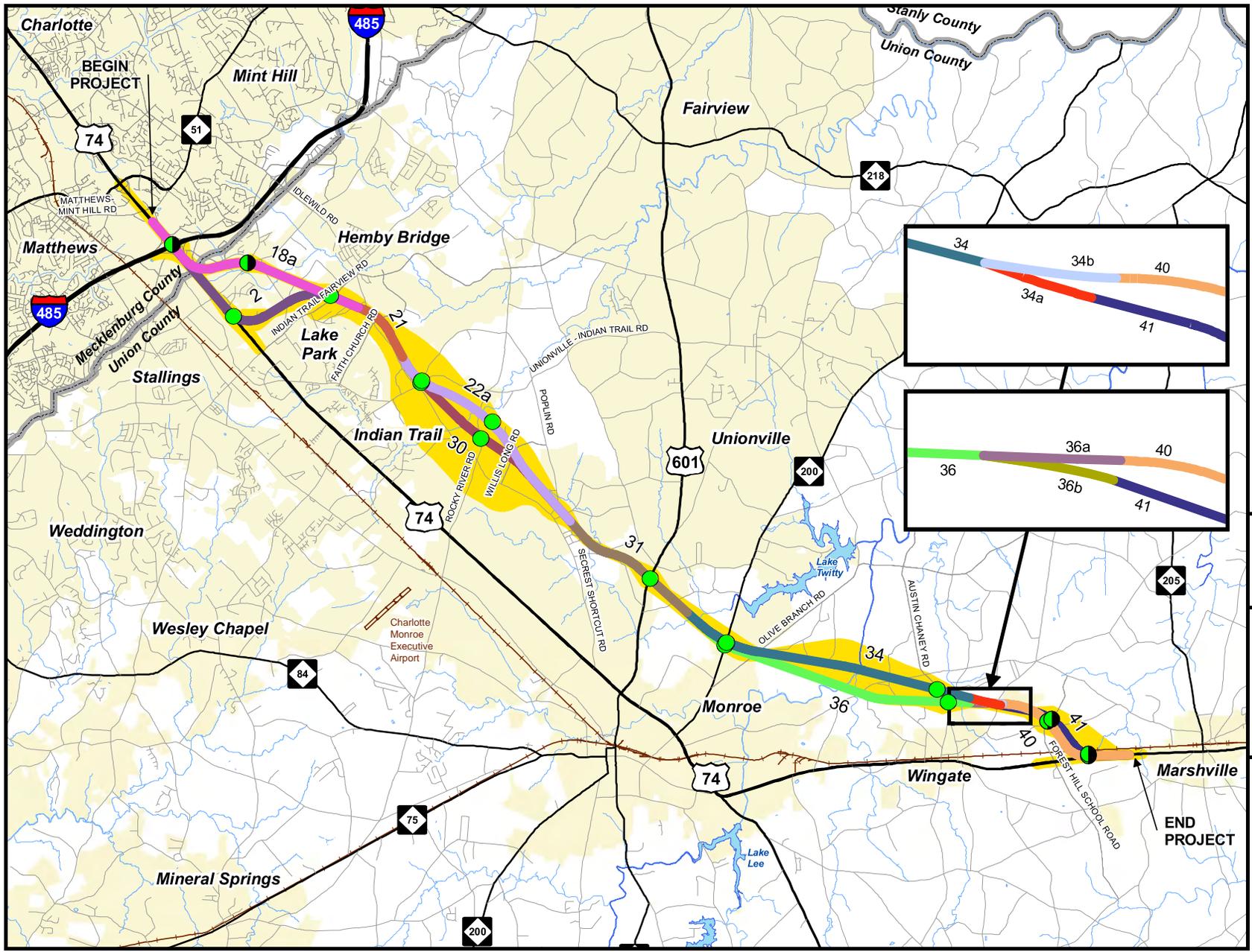
Since the Final EIS was published, an updated quantitative analysis of indirect and cumulative effects was prepared for the project. The *Indirect and Cumulative Effects Quantitative Analysis Update* (Michael Baker Engineering, Inc., November 2013) addresses questions raised about the assumptions used in the previous quantitative ICE and incorporates new information gathered since the previous report. Conclusions from the updated quantitative analysis are summarized as follows:

- The prior use of the Metrolina Regional Model (MRM) socioeconomic forecasts as a No-Build control total was a reasonable assumption. The high level of growth forecasted in the No-Build Scenario is reasonable given past trends and current conditions.
- Overall, the land use results are similar to the results of the previous quantitative ICE analysis. The overall results for the study area are generally one to two percent greater in the updated analysis. Impervious surface impacts are generally similar to previous results, with shifts of less than two percent in five watersheds only.
- All changes in land use within the entire study area from the Baseline to the 2030 Preferred Alternative are within approximately two percent (i.e., between negative one percent and one percent) of the change that is predicted for the 2030 No-Build Scenario.
- The indirect land use effects are modest, totaling about 2,300 acres of additional development, an increase of less than 2 percent over the No-Build Scenario and an increase in development of about 1 percent of the total land area within the study area.
- The incremental effect of the 2030 Preferred Alternative will be an approximately one percent increase in impervious surface throughout the study area as compared to the change predicted for the 2030 No-Build Scenario.
- With the 2030 Preferred Alternative, increases in percent impervious surface as compared to the change predicted for the 2030 No-Build are found in 7 of the 18 watersheds. These increases are between approximately one and three percent.
- No measurable differences in impervious surface were found between the 2030 No-Build and the 2030 Build Scenario within the Goose Creek or Sixmile Creek watersheds (habitat for the endangered Carolina heelsplitter). Therefore, no indirect effects are anticipated to the Carolina heelsplitter. As there are no indirect effects anticipated, the project does not contribute an incremental effect that would yield potential cumulative effects. Potential direct effects are not anticipated, and are addressed in the *Biological Assessment* (The Catena Group, October 2013) discussed in greater detail in **Section 4.4.5**.

As presented in Section 2.5.5.2 of the Final EIS, a water quality modeling analysis was conducted to determine if induced land use change resulting from the Preferred Alternative would affect water quality within the project study area. Specifically, the modeling effort attempted to quantify the differences between the stream flow and pollutant loadings (total sediment, nitrogen, and phosphorous) of the Build and No-Build future land use scenarios.

The results of the analysis generally suggest that the water quality effects of the project are relatively minor compared to those expected from growth under the No-Build Scenario. Based upon the findings of the updated ICE analysis summarized above, which were very similar to the results of the original quantitative ICE, NCDOT and FHWA determined that additional water quality modeling is not necessary as the differences are not large enough to see substantial differences compared to the prior water quality analysis. Therefore, the conclusions of the water quality modeling analysis presented in the Final EIS are still valid.

Additional information on indirect and cumulative effects is presented in **Section 4.5**.

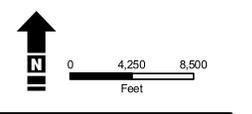


- Legend**
- Potential Interchange
 - Potential Partial Interchange
 - Interstate Highway
 - US Highway
 - NC State Highway
 - State Road
 - Railroad
 - ▭ Parcels
 - ▭ Corridor Study Area
 - River / Stream
 - Lake
 - ▭ County Boundary

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



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



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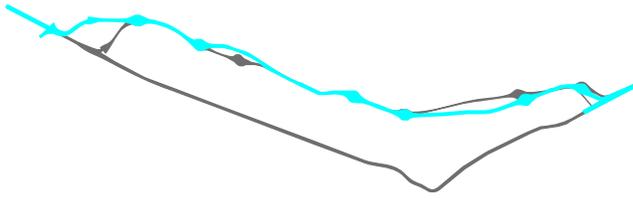
**MONROE CONNECTOR/
BYPASS**

**DETAILED STUDY
ALTERNATIVES**

Figure 3-1a

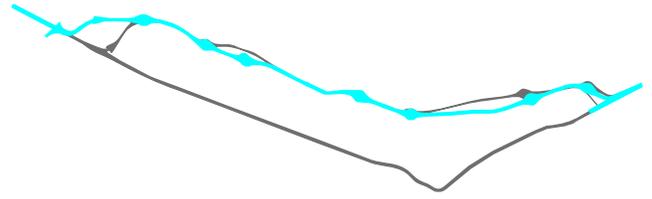
Alternative A

(Segments 18A, 21, 22A, 31, 36, 36A, and 40)



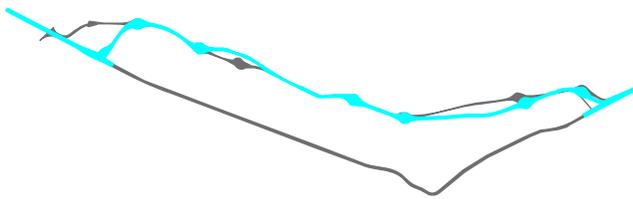
Alternative B

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



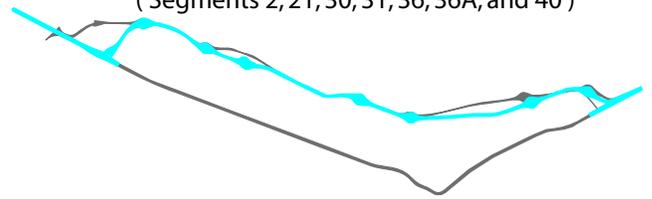
Alternative C

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



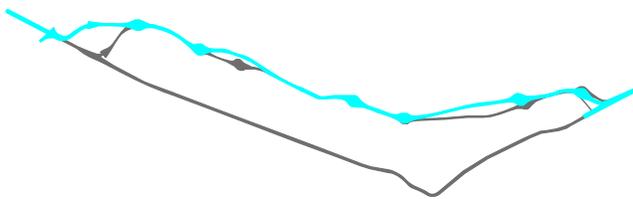
Alternative D

Recommended Alternative in Draft EIS
Preferred Alternative in Final EIS
(Segments 2, 21, 30, 31, 36, 36A, and 40)



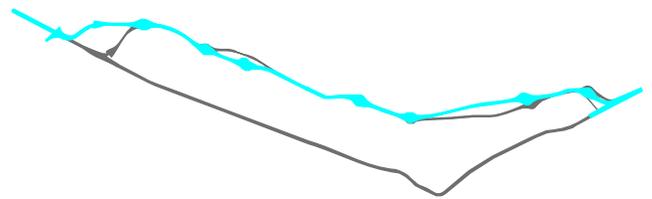
Alternative A1

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



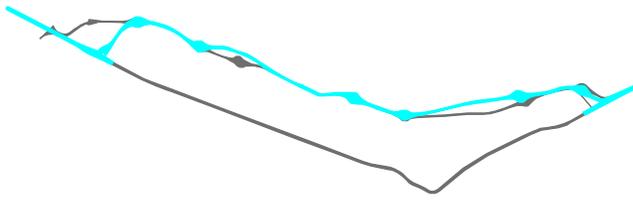
Alternative B1

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



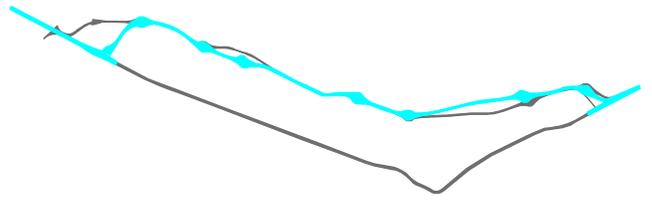
Alternative C1

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



Alternative D1

(Segments 2, 21, 30, 31, 34, 34B, and 40)



MONROE CONNECTOR / BYPASS

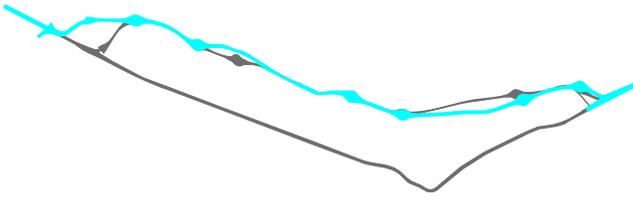
STIP PROJECT NO. R-3329 / R-2559
Mecklenburg County and Union County

DETAILED
STUDY ALTERNATIVES

FIGURE 3-1b

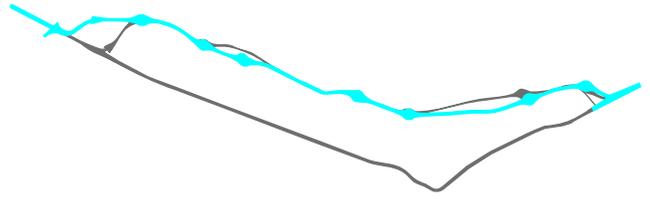
Alternative A2

(Segments 18A, 21, 22A, 31, 36, 36B and 41)



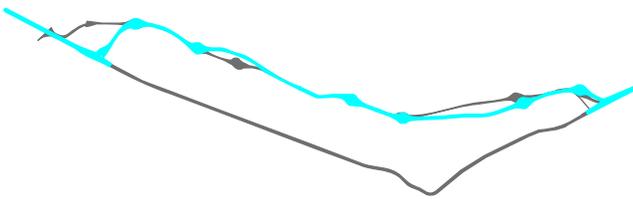
Alternative B2

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



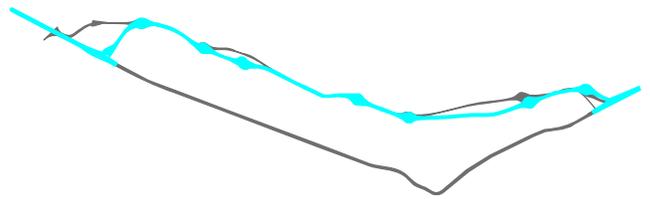
Alternative C2

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



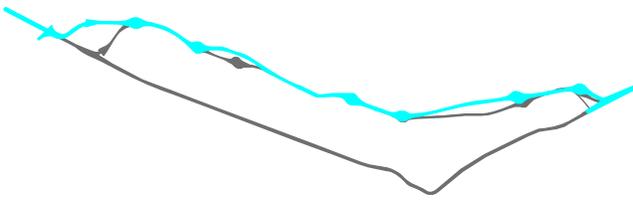
Alternative D2

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



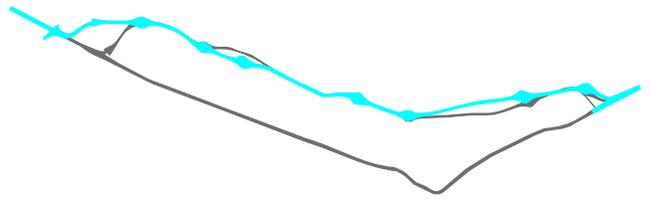
Alternative A3

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



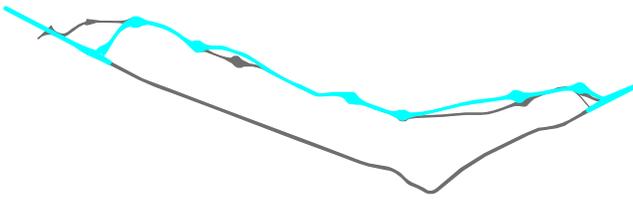
Alternative B3

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



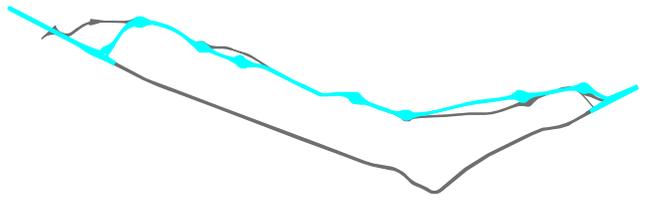
Alternative C3

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



Alternative D3

(Segments 2, 21, 30, 31, 34, 34A, and 41)

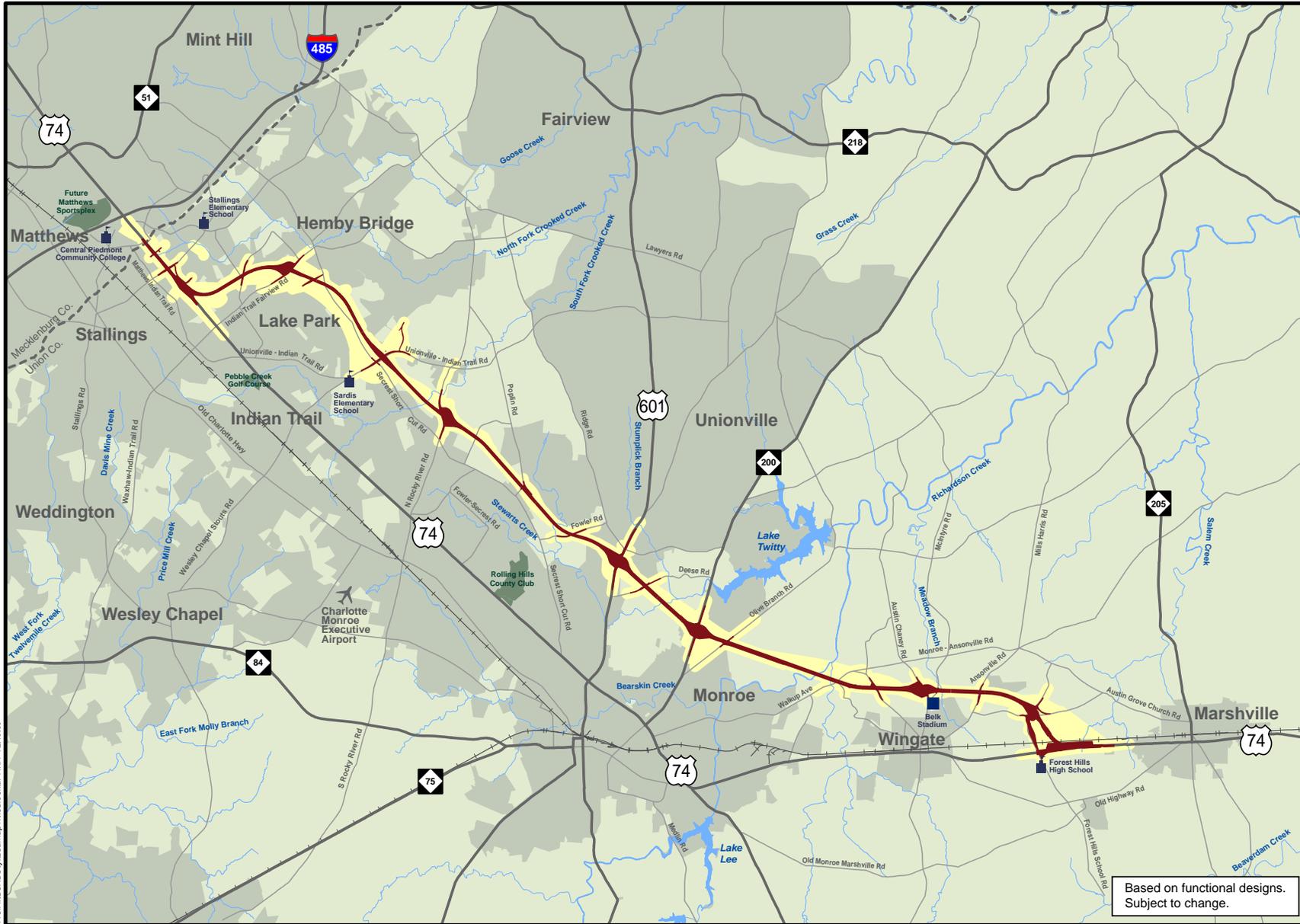


MONROE CONNECTOR / BYPASS

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DETAILED
STUDY ALTERNATIVES

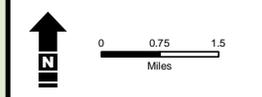
FIGURE 3-1c



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



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



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

MONROE CONNECTOR / BYPASS

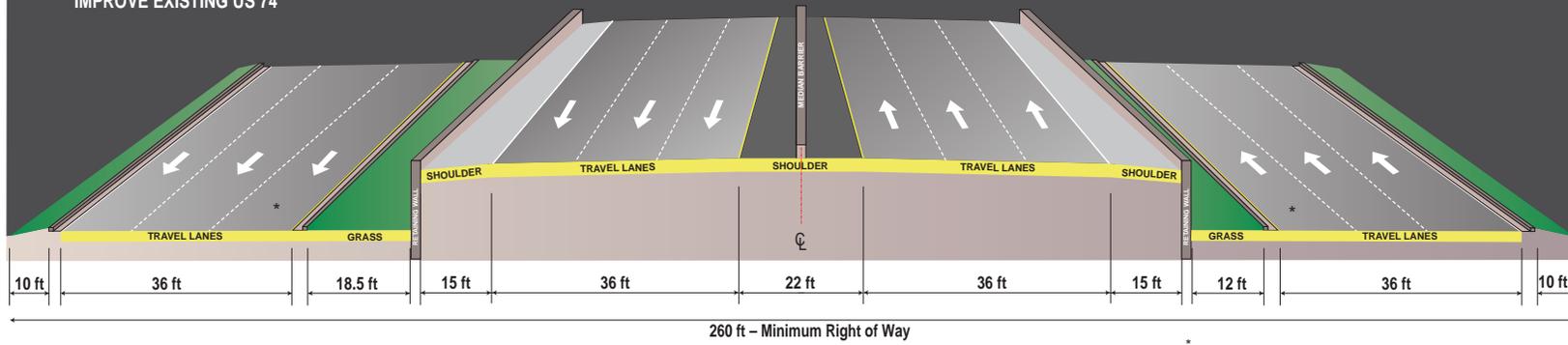
PREFERRED ALTERNATIVE DSA D

Based on functional designs.
Subject to change.

Figure 3-2

Pre:ARSDSADStylizedMapTitleBlock.kat AKH 12.19.09

**TYPICAL SECTION No. 1
IMPROVE EXISTING US 74**



260 ft – Minimum Right of Way

* Areas with turn lanes or near access points will require three lanes on the service roads. Other areas will only have two lanes.

 NOT TO SCALE



STIP PROJECT
NO. R-3329/R-2559

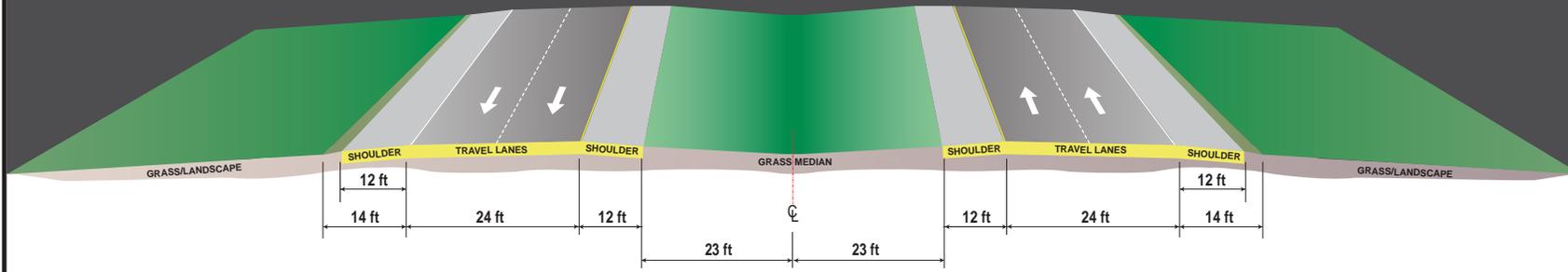
Union County and
Mecklenburg County

MONROE CONNECTOR /
BYPASS

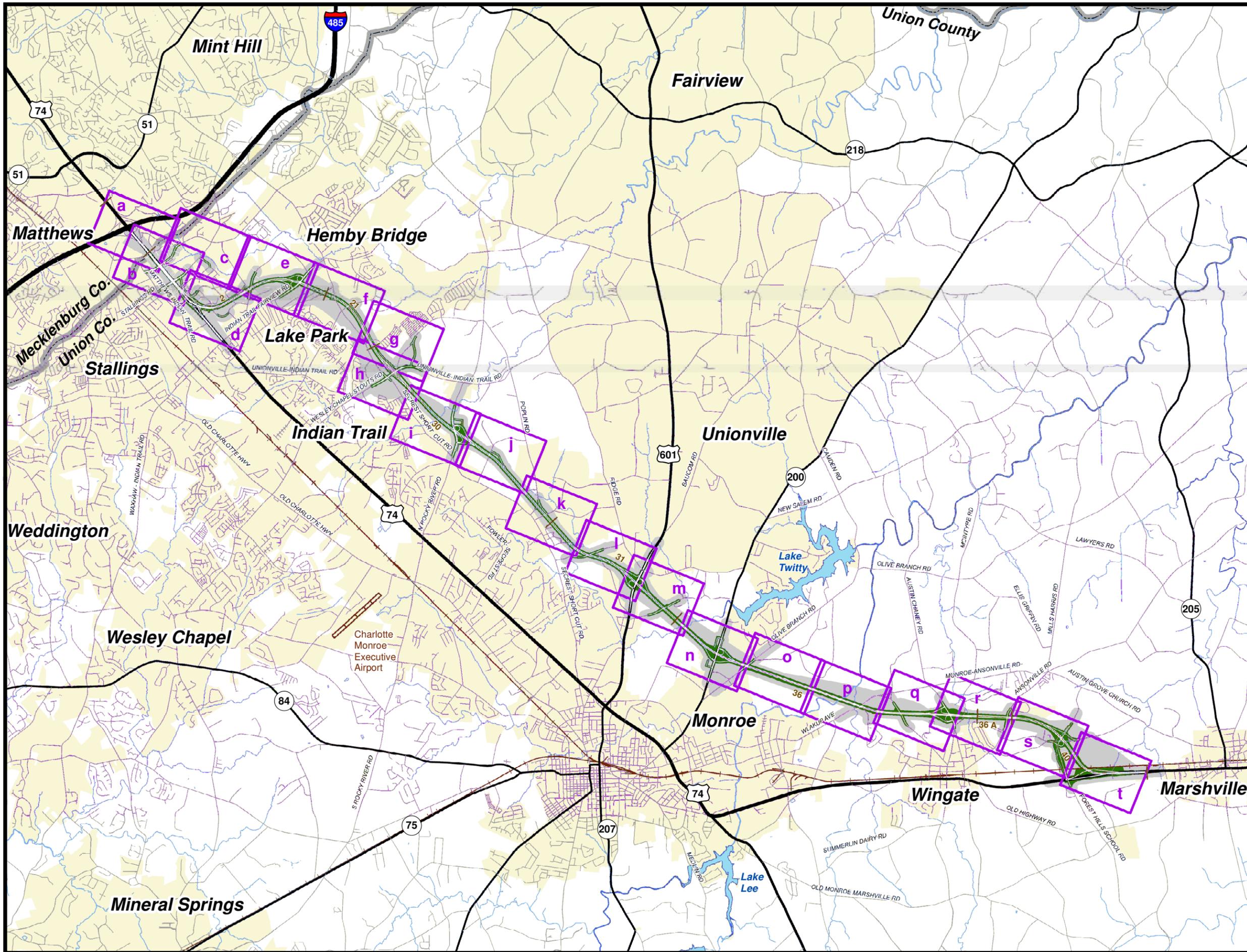
TYPICAL SECTION

Figure 3-3

**TYPICAL SECTION No. 2
NEW LOCATION**



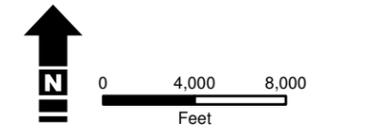
300 ft – Minimum Right of Way



- Legend**
- Functional Design
 - Right of Way
 - Segment Breakline
 - 41** Segment Name
 - Map Grid
 - City Limits
 - Corridor Study Area
 - Interstate Highway
 - US Highway
 - NC State Highway
 - Major Road
 - Railroad
 - River / Stream
 - Lake
 - County Boundary



Source: Mecklenburg County and Union County GIS.
Map Printed May 2013.



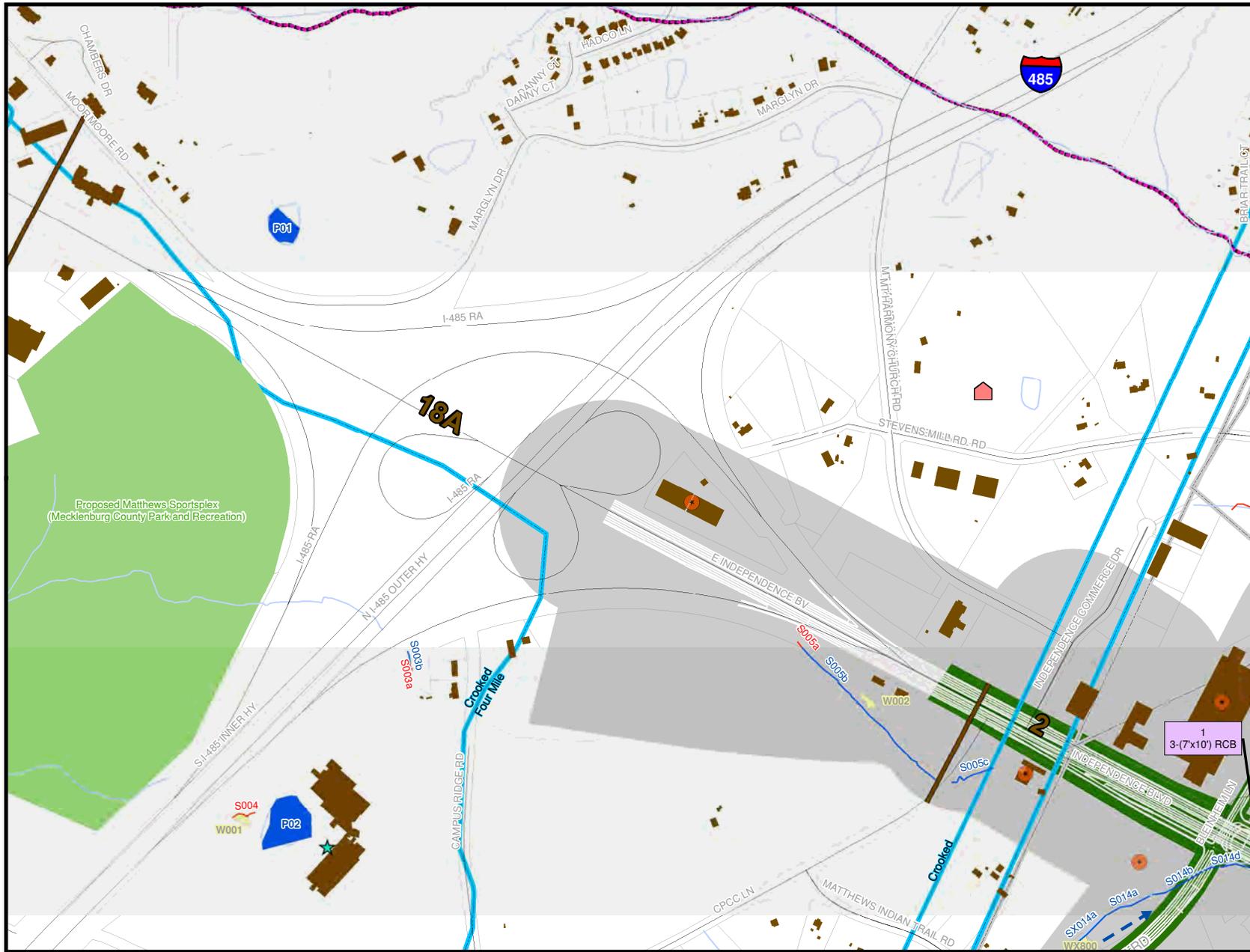
STIP PROJECT
NO. R-3329/R-2559
Mecklenburg County and
Union County

**MONROE CONNECTOR/
BYPASS**

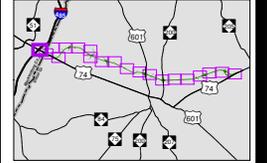
**PREFERRED
ALTERNATIVE
FUNCTIONAL
DESIGNS**

Figure 3-4 INDEX

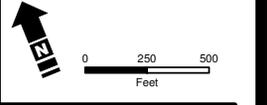
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Source: Mecklenburg County and Union County GIS.
Map Printed May 2013.



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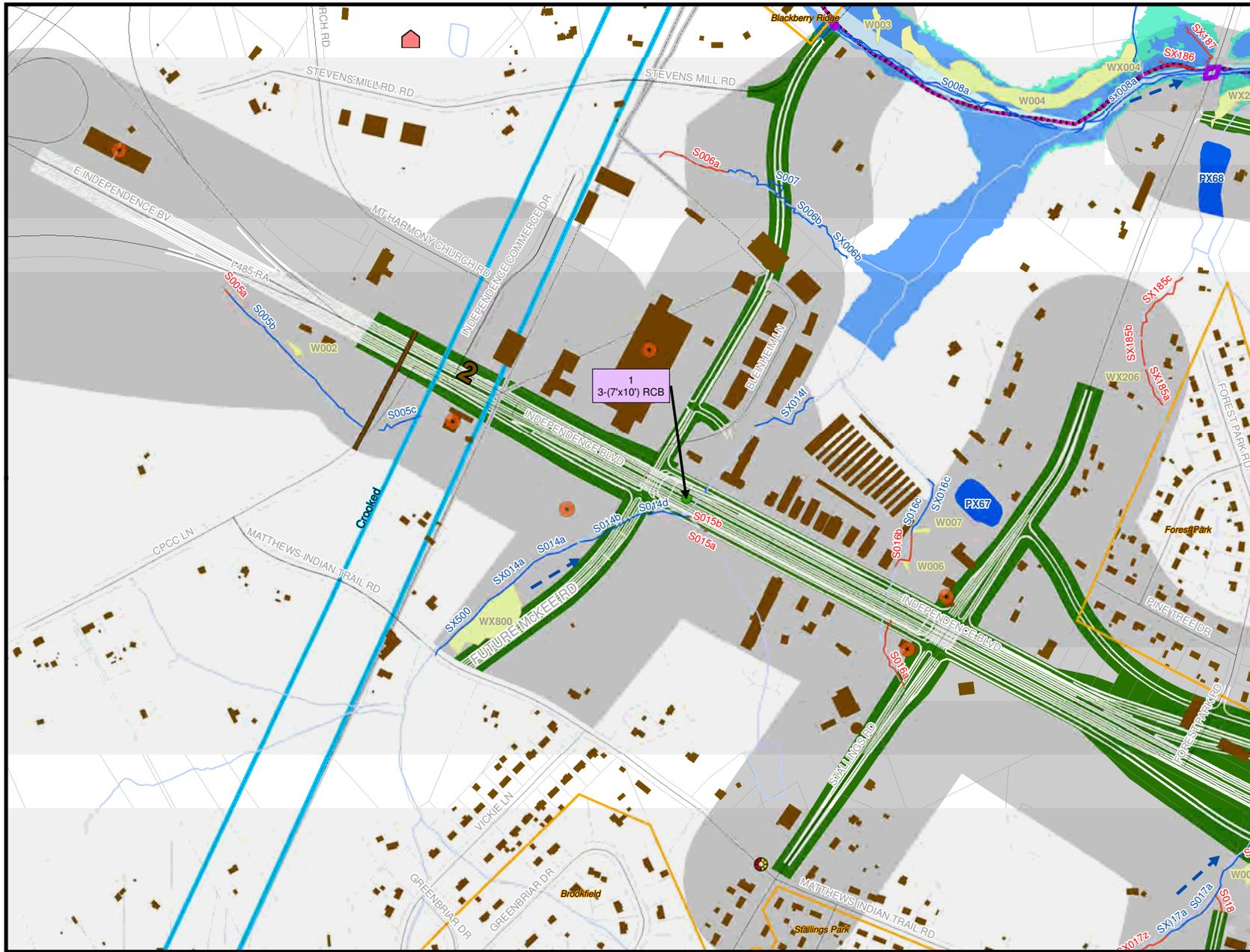
STIP PROJECT
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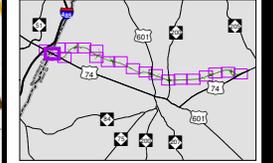
**MONROE CONNECTOR/
BYPASS**

**PREFERRED
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Figure 3-4a



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Map Printed May 2013.



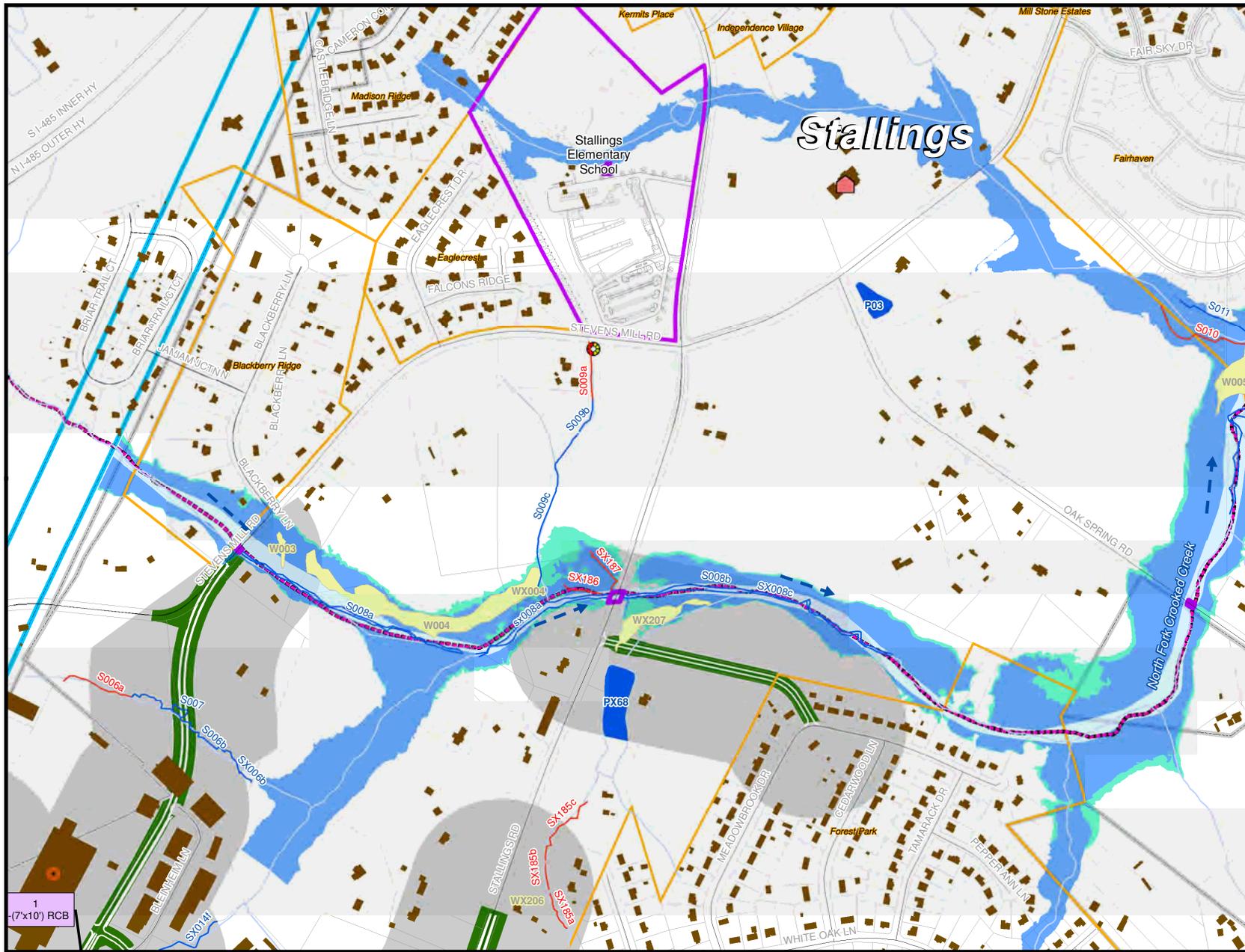
TURNPIKE AUTHORITY

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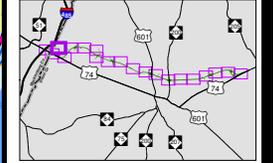
**MONROE CONNECTOR/
BYPASS
PREFERRED
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Figure 3-4b

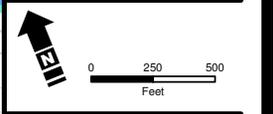


1
(7'x10') RCB

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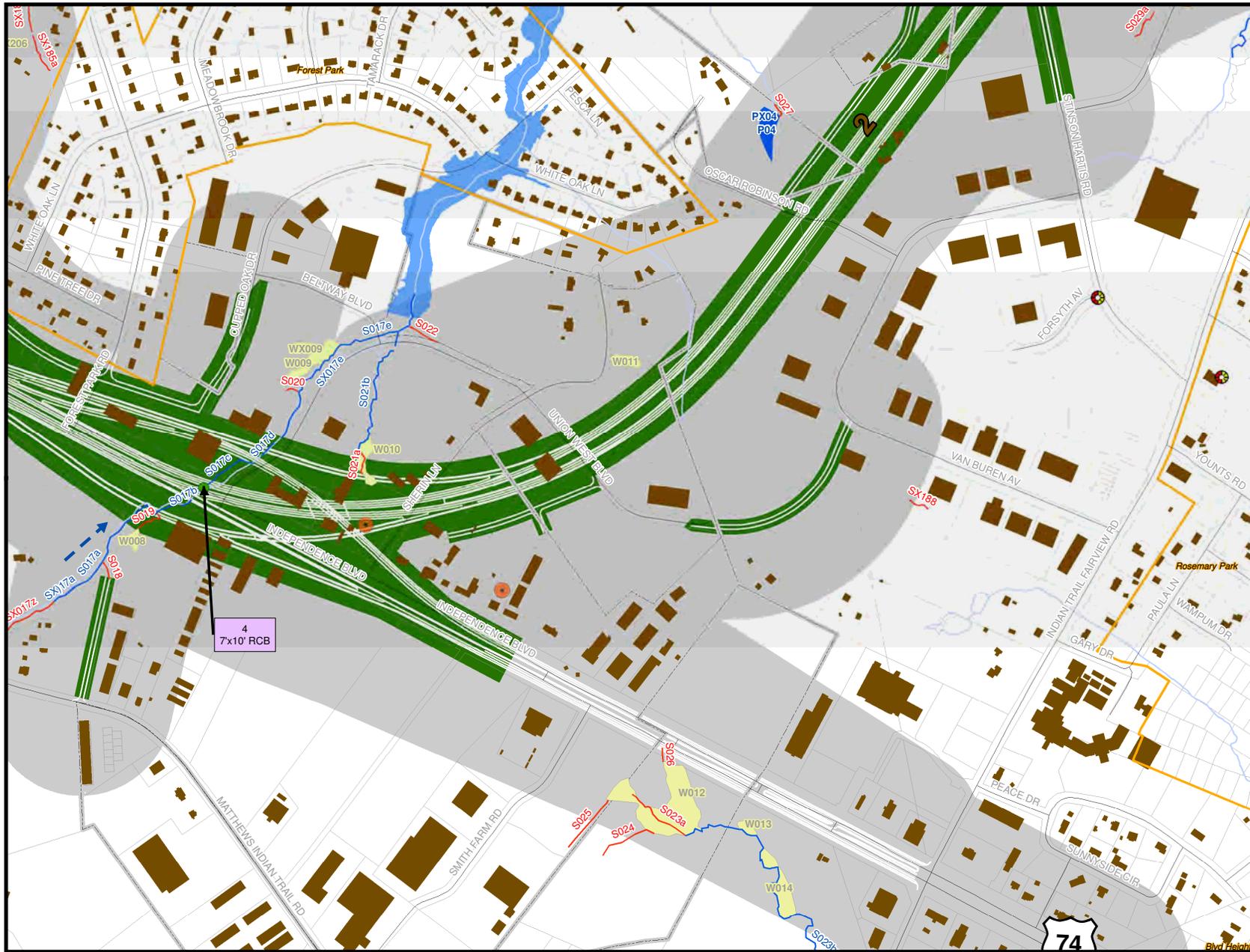
STIP PROJECT
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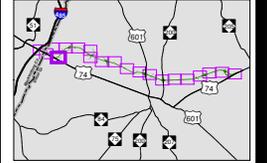
**MONROE CONNECTOR/
BYPASS**

**PREFERRED
ALTERNATIVE
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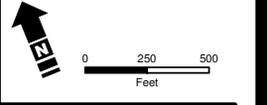
Figure 3-4c



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Map Printed May 2013.



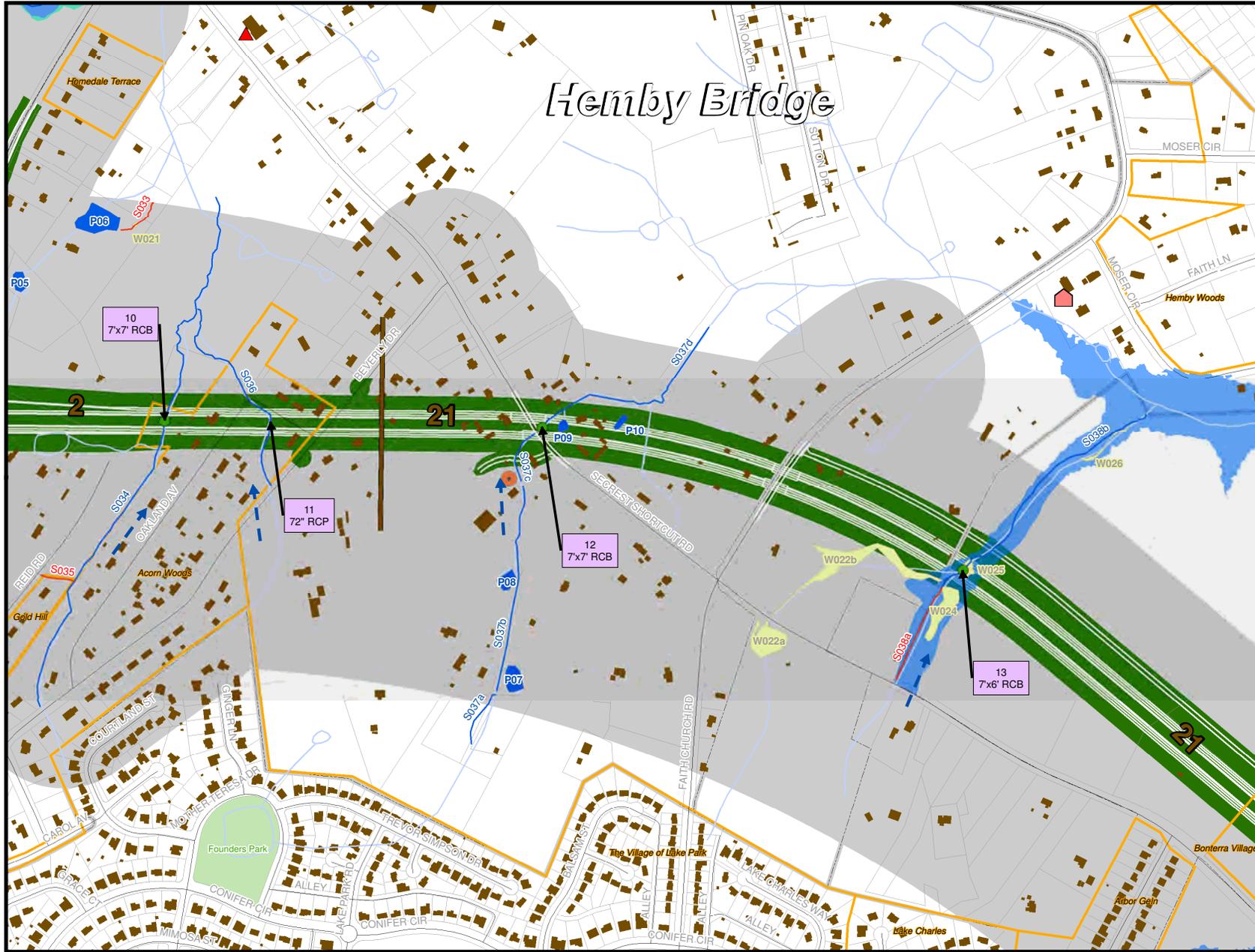
TURNPIKE AUTHORITY

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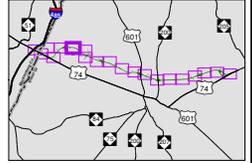
Mecklenburg County and Union County

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ALTERNATIVE
FUNCTIONAL
DESIGNS**

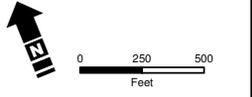
Figure 3-4d



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Map Printed May 2013.

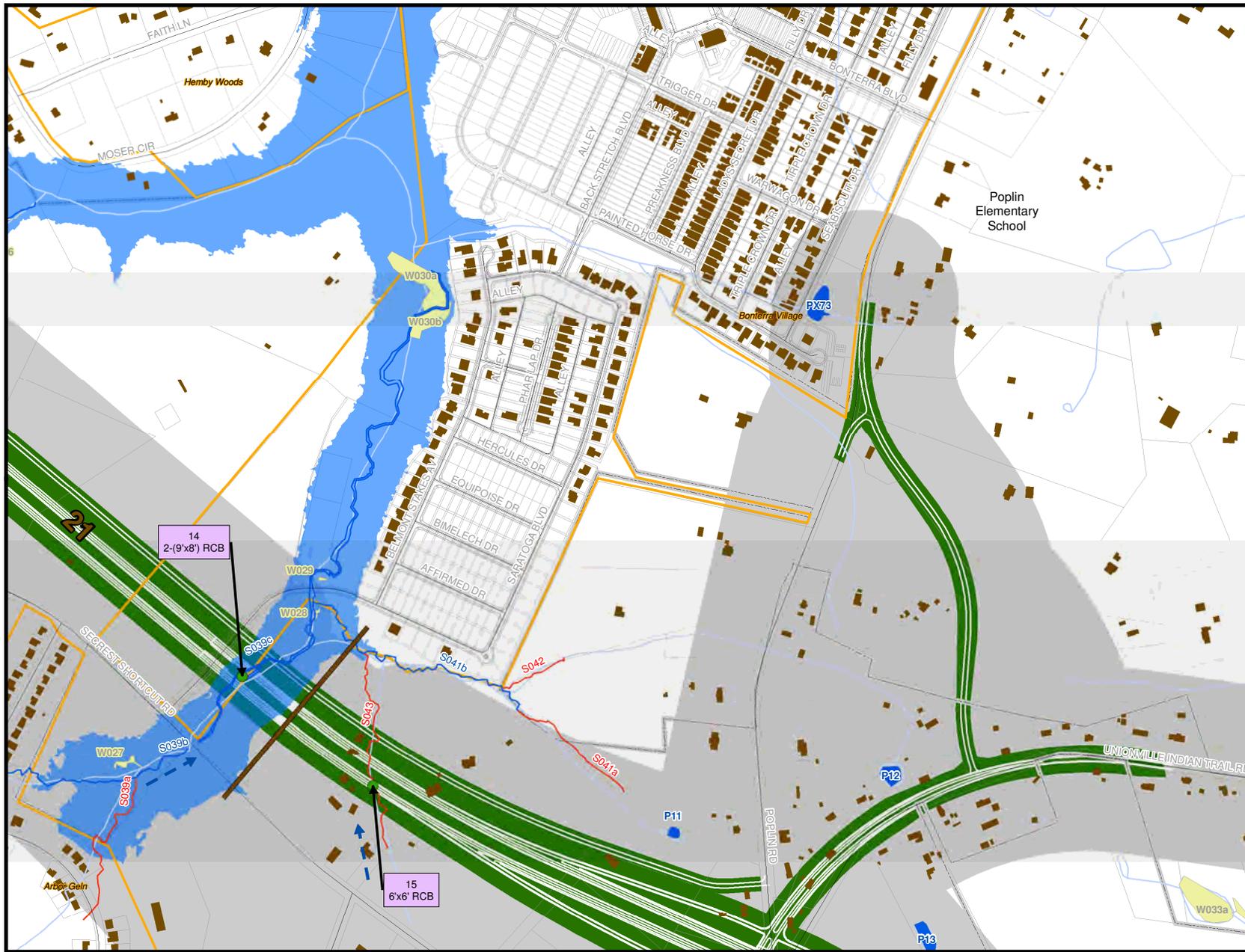


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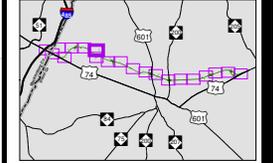
**MONROE CONNECTOR/
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ALTERNATIVE
FUNCTIONAL
DESIGNS**

Figure 3-4f

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Map Printed May 2013.



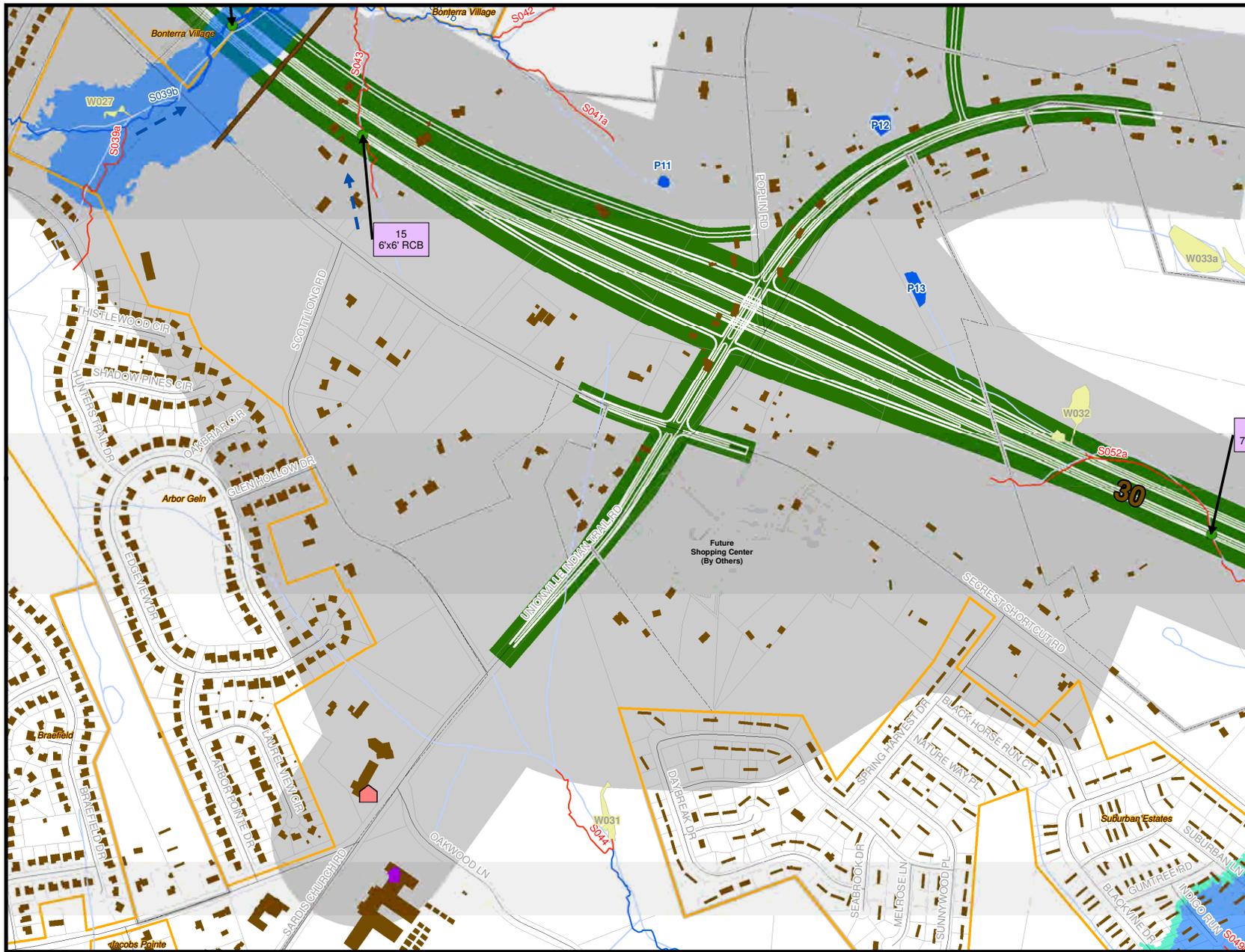
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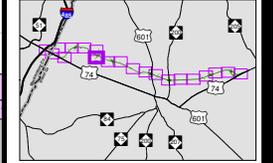
**MONROE CONNECTOR/
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Figure 3-4g

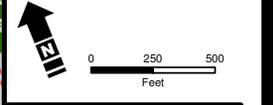
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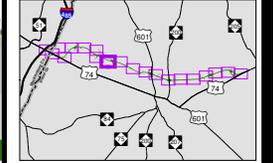
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BYPASS**

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ALTERNATIVE
FUNCTIONAL
DESIGNS**

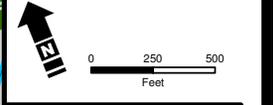
Figure 3-4h



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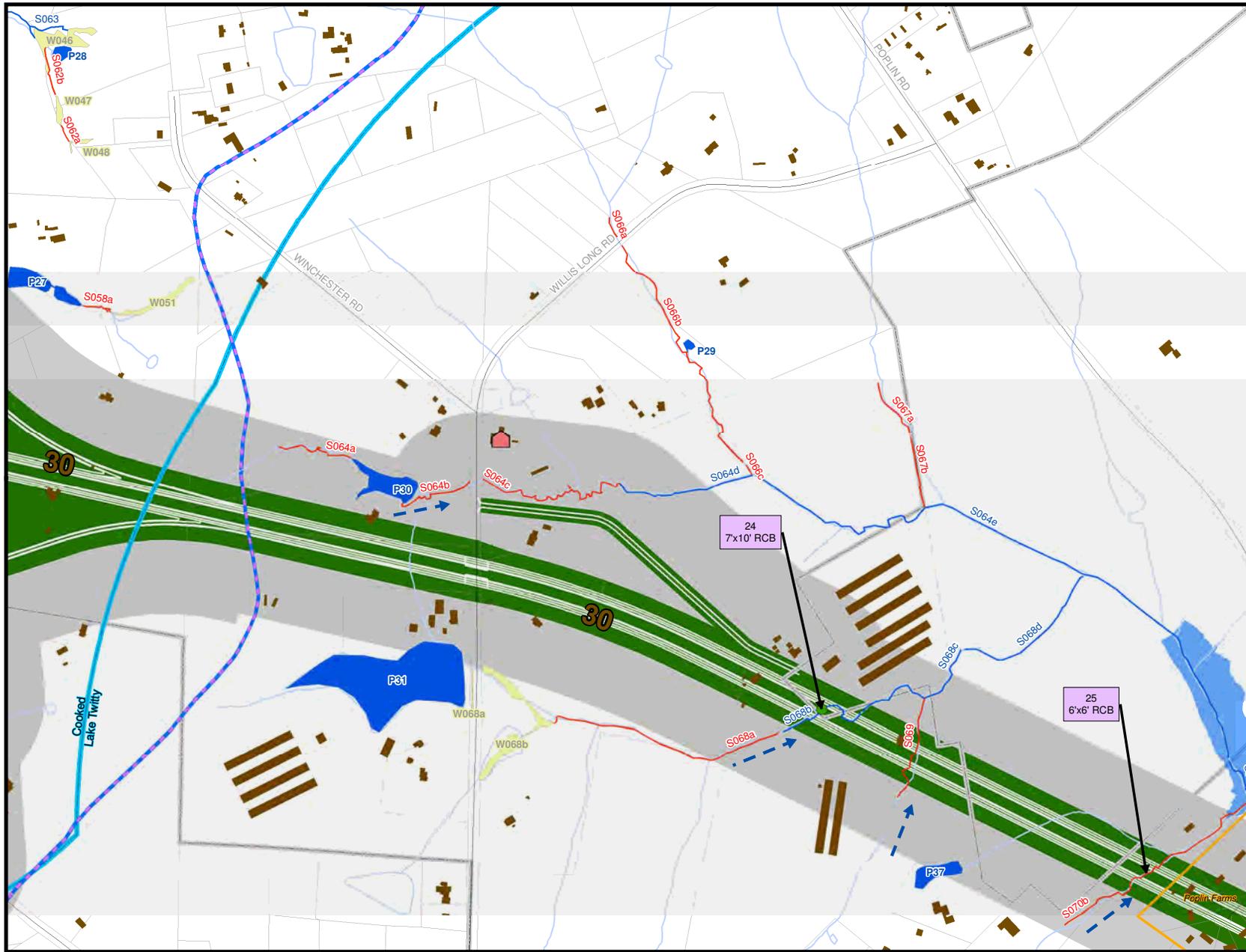
Mecklenburg County and Union County

**MONROE CONNECTOR/
BYPASS**

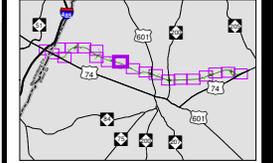
**PREFERRED
ALTERNATIVE
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DESIGNS**

Figure 3-4i

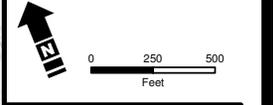
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Map Printed May 2013.



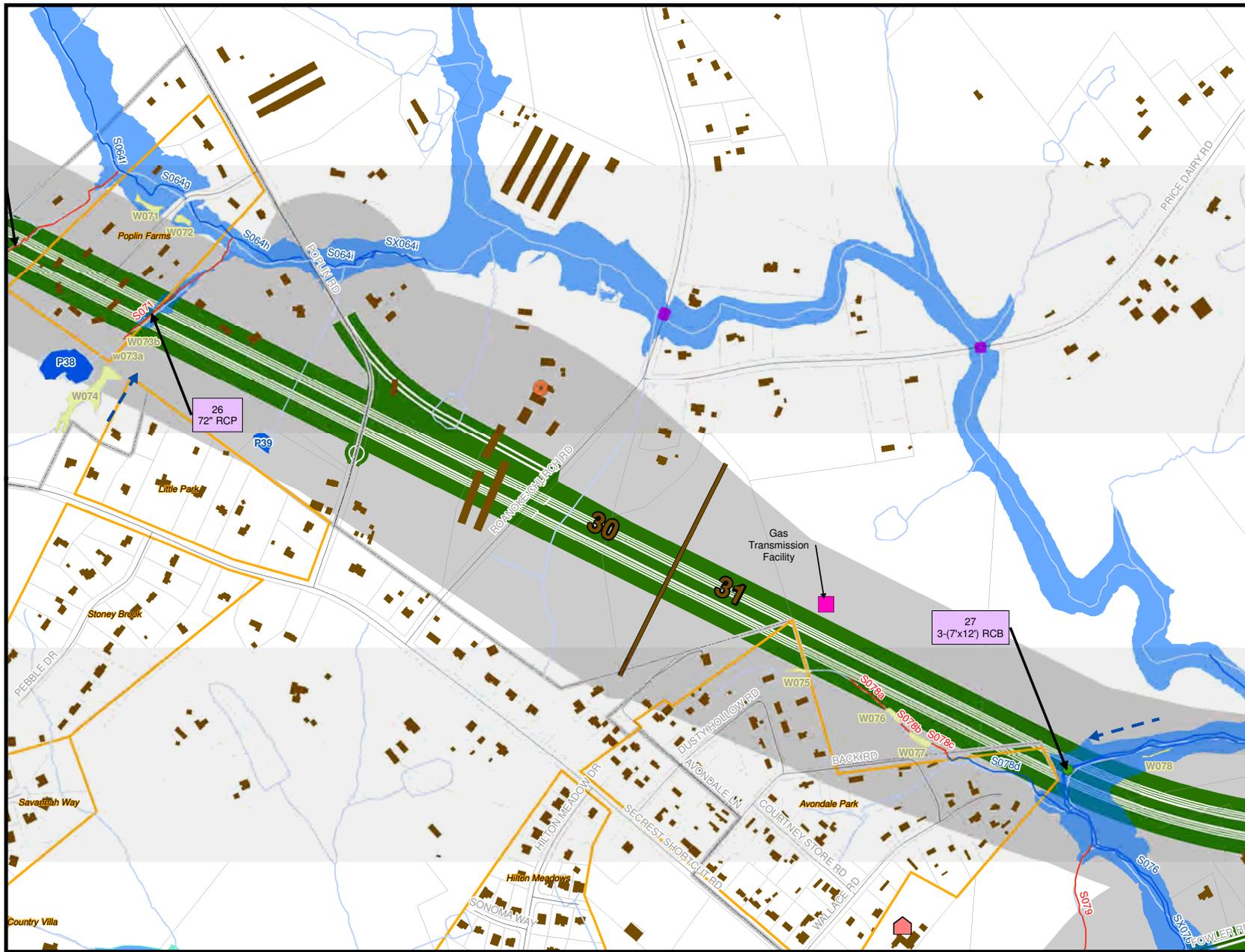
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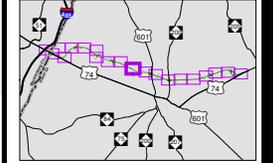
**MONROE CONNECTOR/
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Figure 3-4j

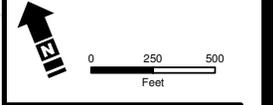
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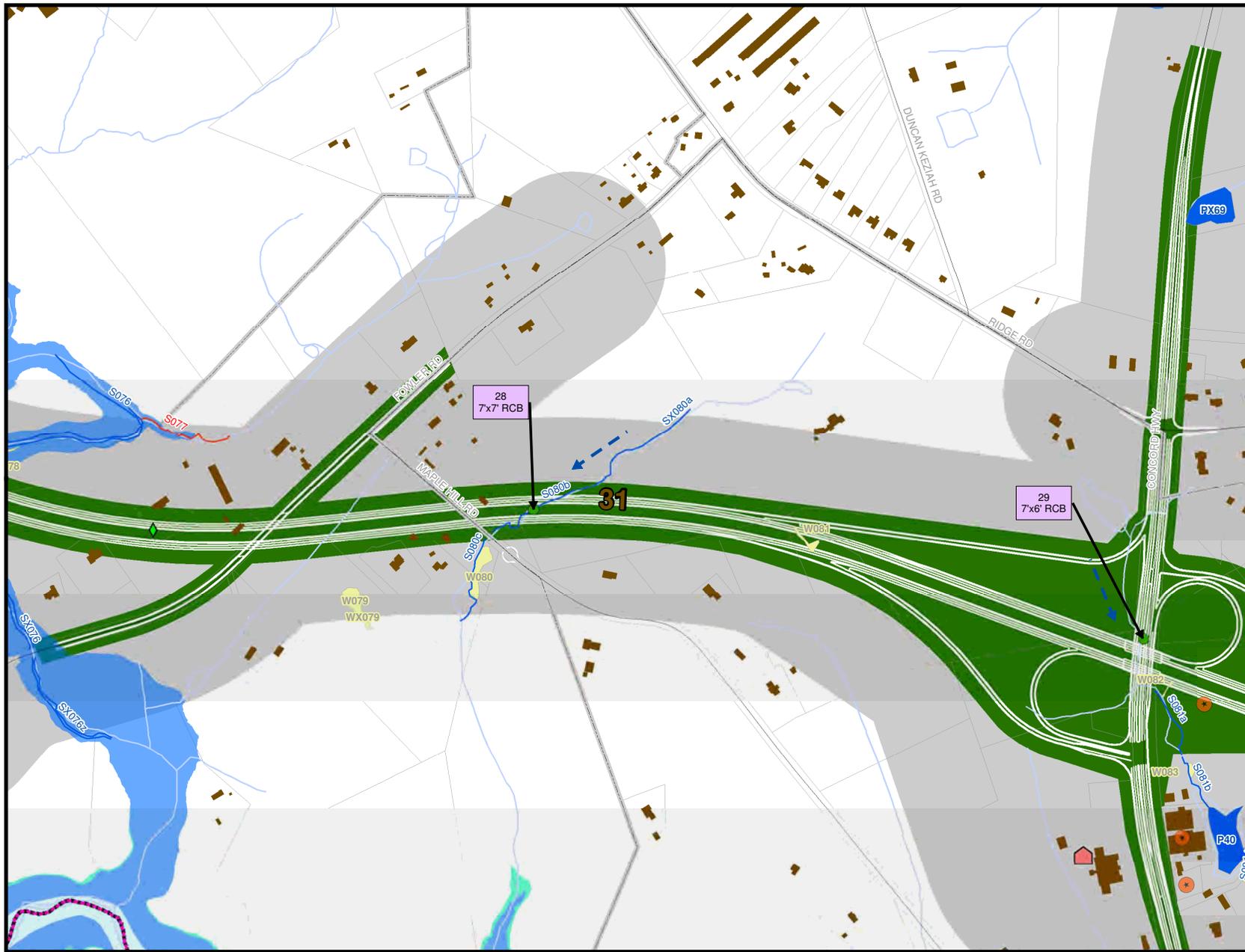


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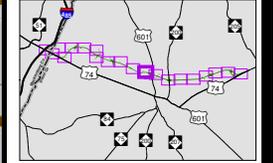
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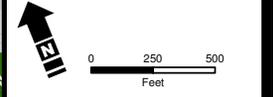
Figure 3-4k



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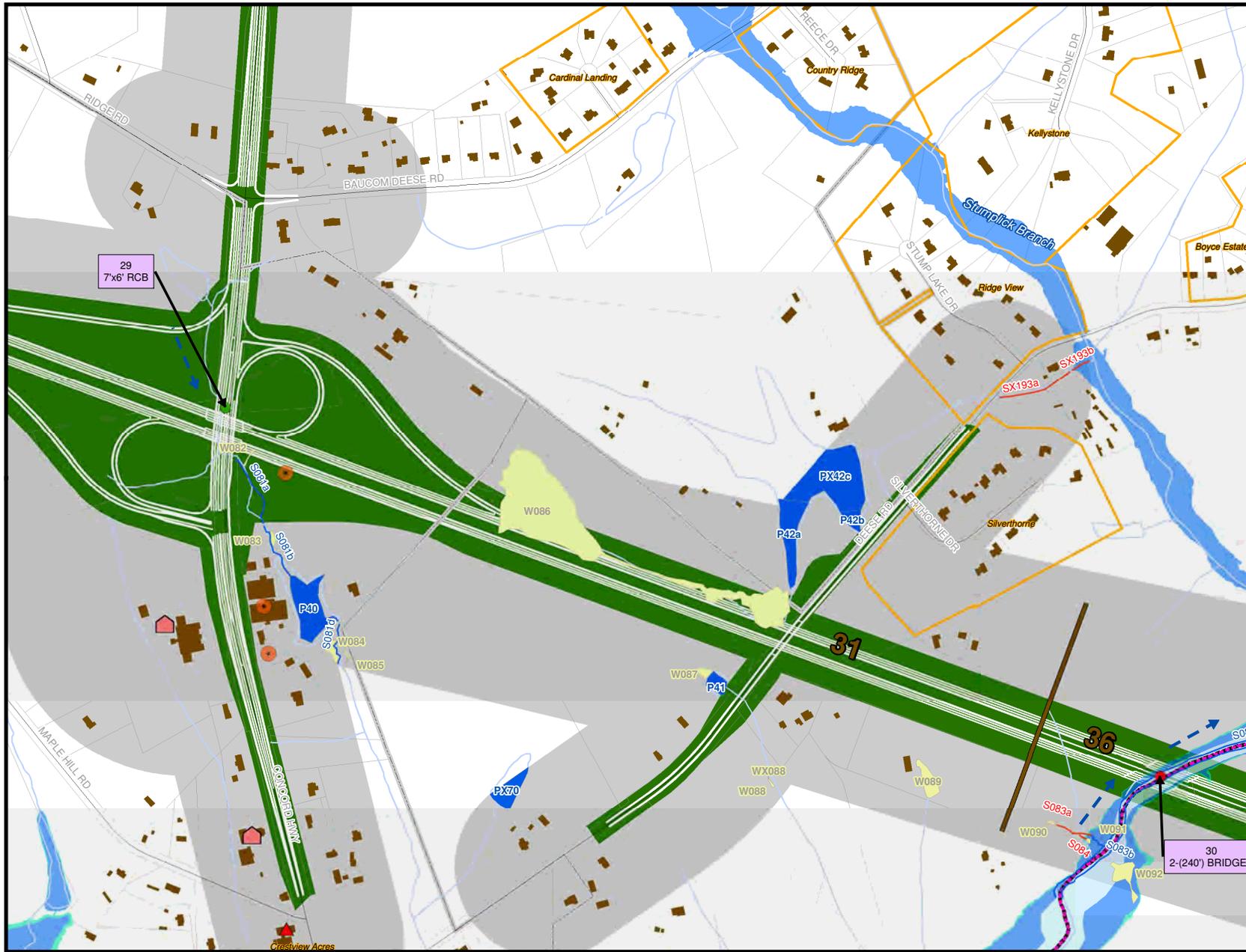
TURNPIKE AUTHORITY

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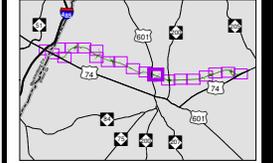
Mecklenburg County and Union County

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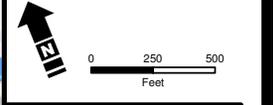
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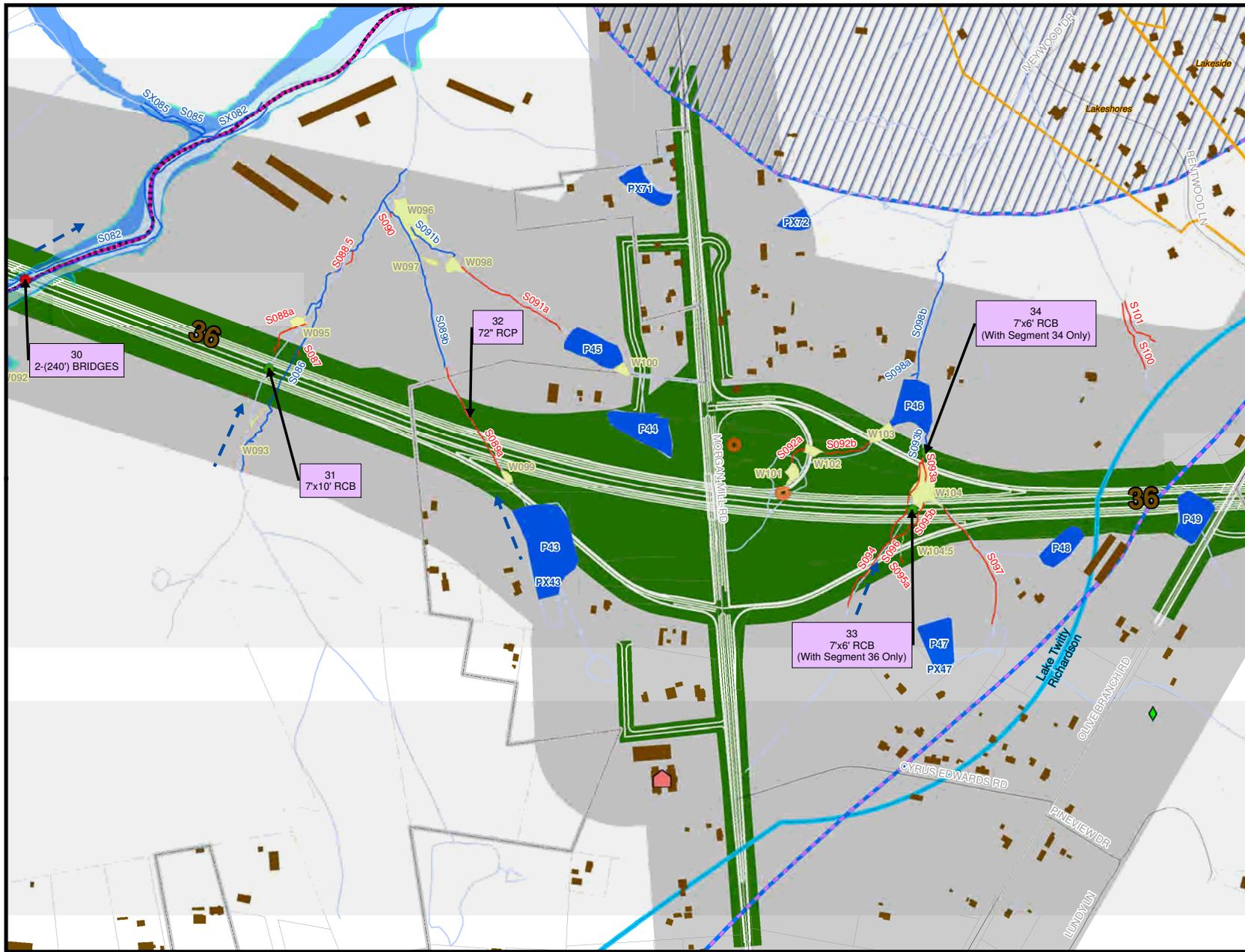


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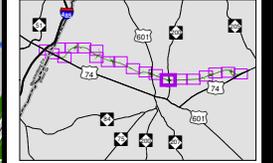
STIP PROJECT
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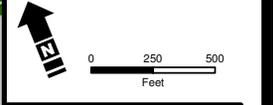
Figure 3-4m



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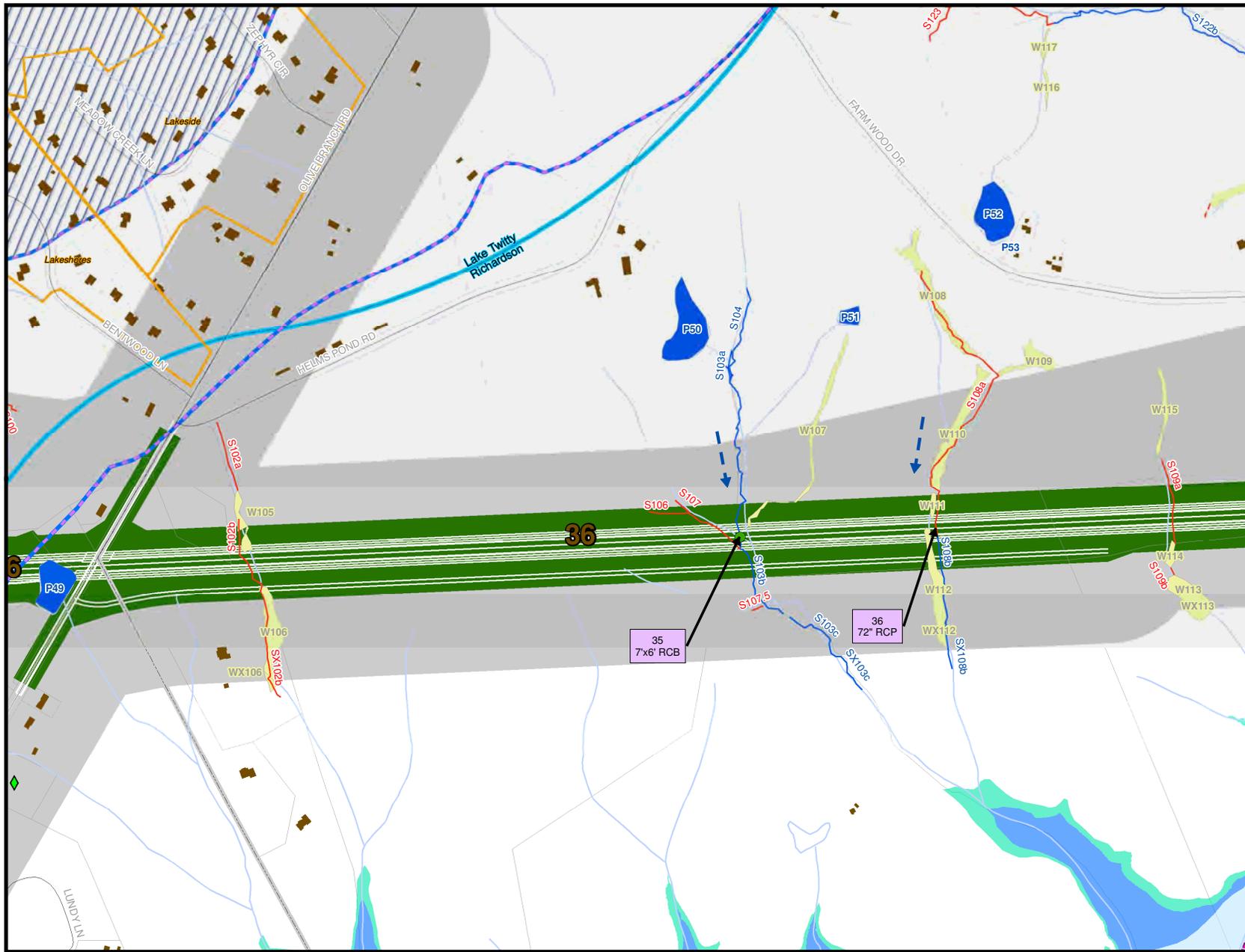
Mecklenburg County and Union County

**MONROE CONNECTOR/
BYPASS**

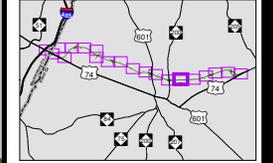
**PREFERRED
ALTERNATIVE
FUNCTIONAL
DESIGNS**

Figure 3-4n

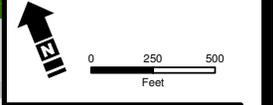
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- Legend**
- Functional Design
 - Right of Way
 - Segment Breakline
 - Segment Name
 - Corridor Study Area
 - Structures
 - Parcels
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 - Notable Features
 - Stream Crossings
 - Culvert (72" dia. or larger)
 - Bridge
 - Flow Direction



Source: Mecklenburg County and Union County GIS.
Map Printed May 2013.



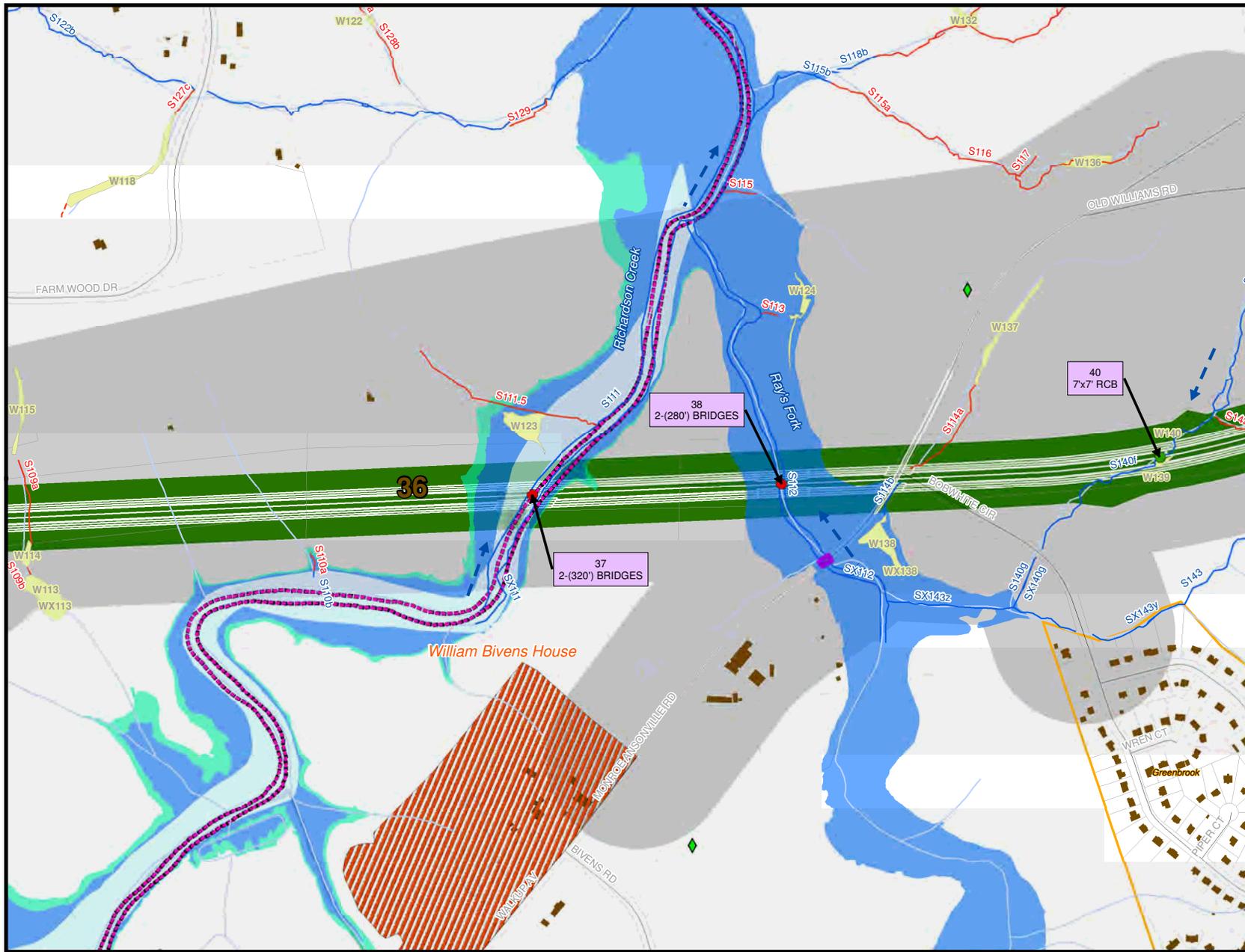
TURNPIKE AUTHORITY

STIP PROJECT
NO. R-3329/R-2559

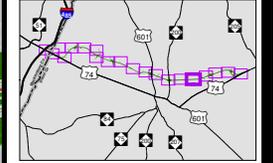
Mecklenburg County and Union County

**MONROE CONNECTOR/
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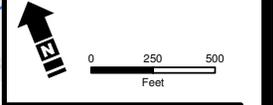
Figure 3-4o



- Legend**
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Map Printed May 2013.



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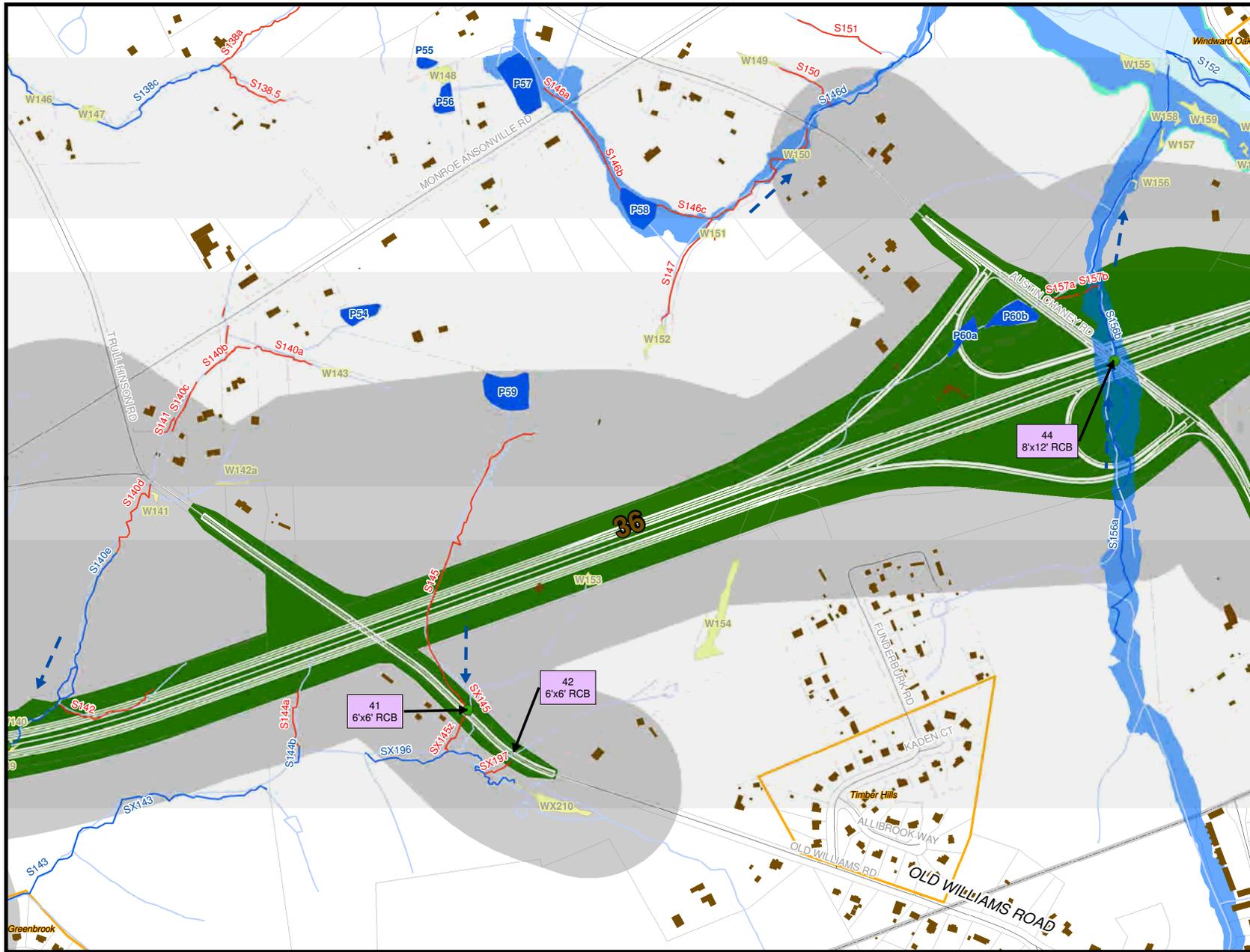
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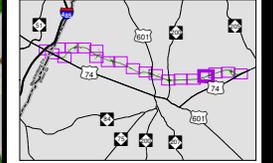
**MONROE CONNECTOR/
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**PREFERRED
FUNCTIONAL
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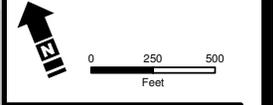
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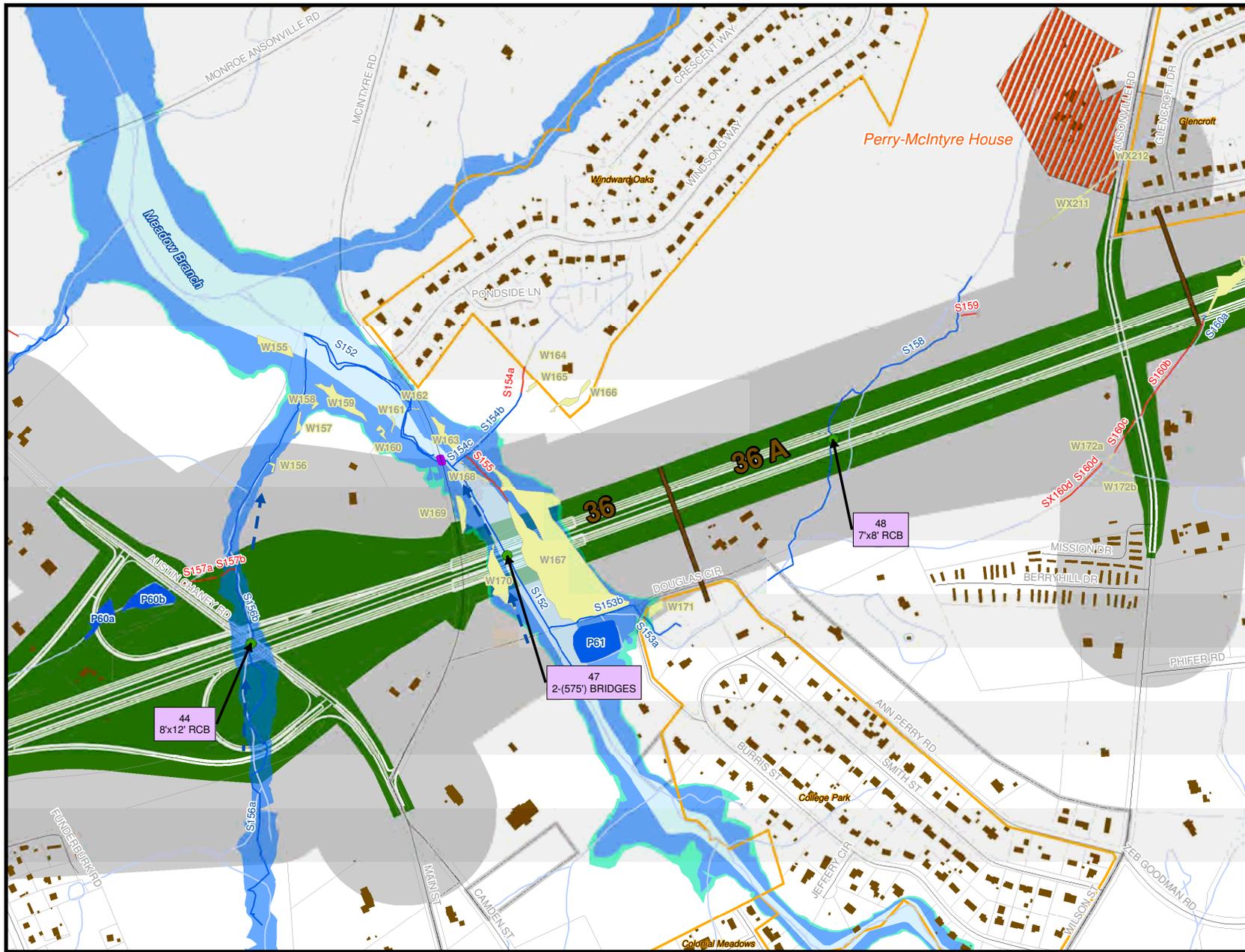
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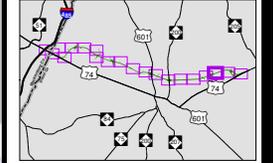
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DESIGNS**

Figure 3-4q

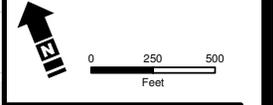
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Source: Mecklenburg County and Union County GIS.
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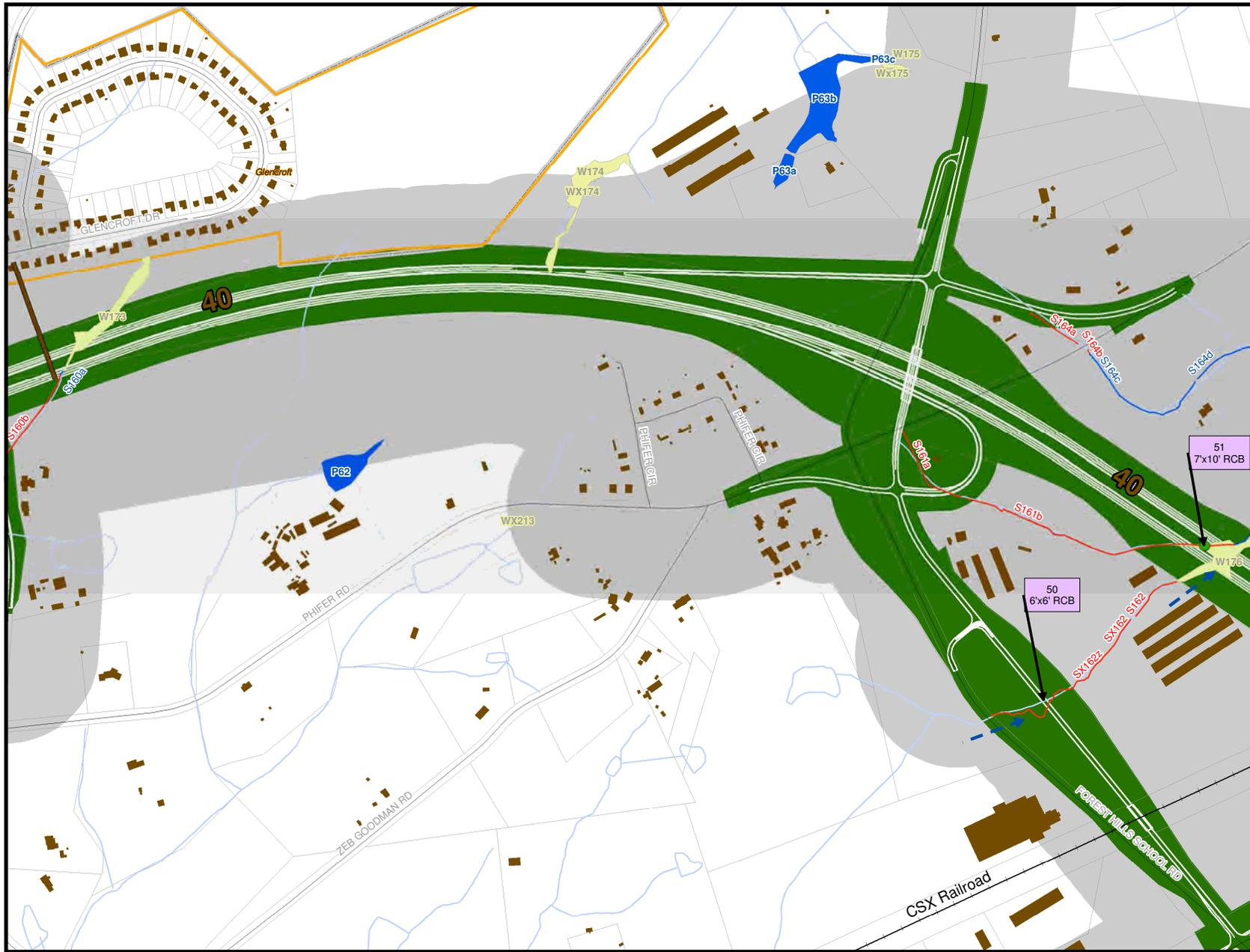
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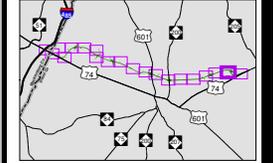
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Figure 3-4r



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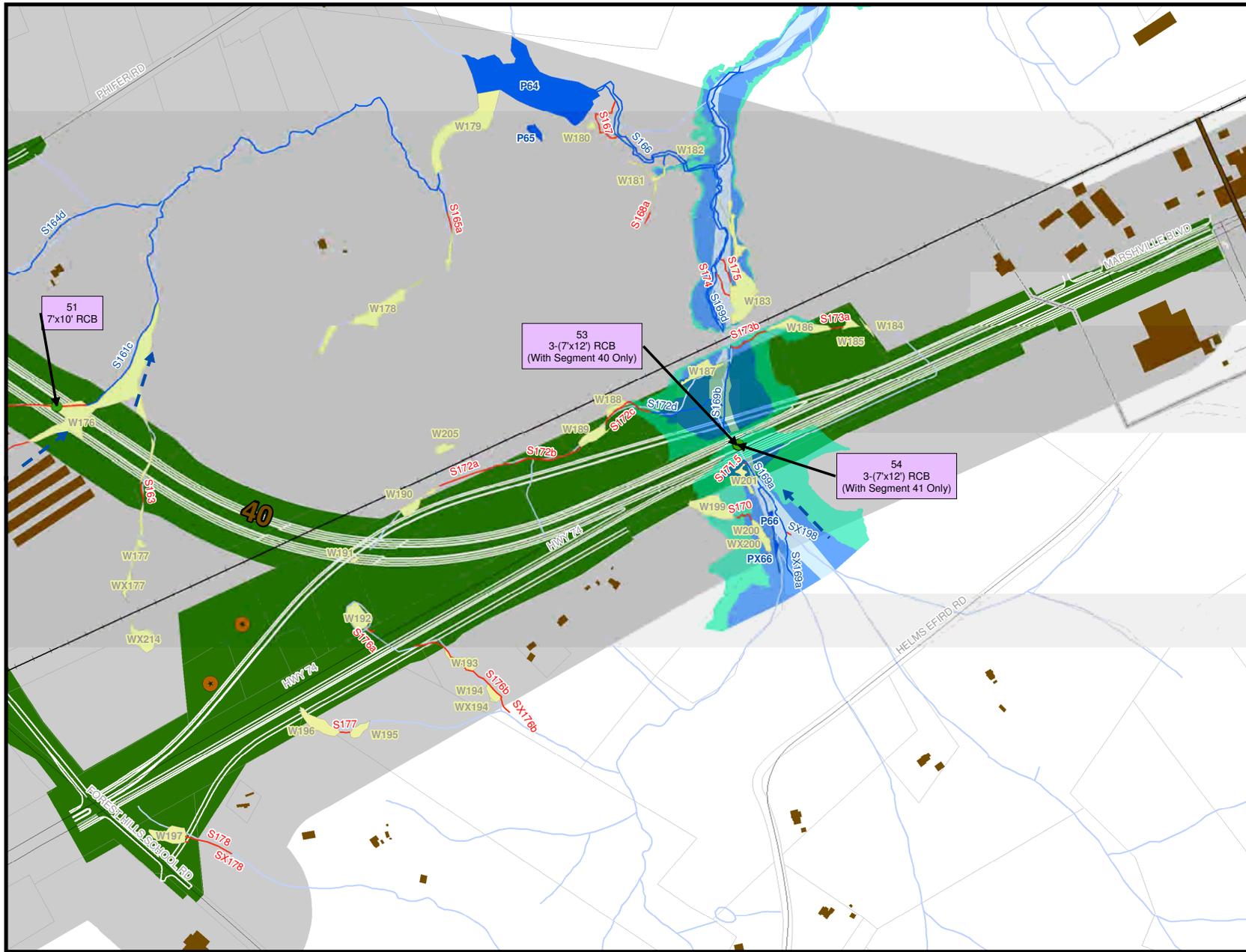
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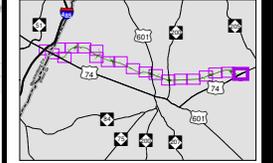
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Figure 3-4s

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Figure 3-4t