Appendix E Alternatives Analysis

CATAWBA CROSSINGS

ALTERNATIVE ANALYSIS MEMORANDUM

Final Version
October 2021

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This Alternative Analysis Memorandum summarizes the alignment alternative under evaluation for the Catawba Crossings Feasibility Study (**Figure 1**). The Catawba Crossings alignment is the product of decades of local, regional, and state transportation planning efforts. The roughly 6.5-mile Project Study Corridor is based on the former Gaston East-West Connector Preferred Alternative (i.e., Detailed Study Alternative [DSA] 9) and other more recent NCDOT Feasibility Studies. Finally, this memorandum will discuss a handful of design options reviewed by the Catawba Crossings Project Team during development of the Feasibility Study.

Project Description

The Catawba Crossings Feasibility Study is evaluating an approximately 6.5-mile new alignment roadway between NC 279 (S. New Hope Road) in southeastern Gaston County to NC 160 (Steele Creek Road) in western Mecklenburg County. The proposed project would include new bridges over the South Fork Catawba River and Catawba River (Lake Wylie) and a new, or expanded, interchange with I-485 south of the West Boulevard interchange. The Catawba Crossings is an important component of the region's future transportation system.

Both Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO) and Charlotte Regional Transportation Planning Organization (CRTPO) Comprehensive Transportation Plans (CTPs) recommend a Boulevard cross-section. Based on the traffic analyses conducted to support this Feasibility Study, GCLMPO is recommending a four-lane median divided cross section except for the Catawba River bridge which is recommended six-lanes (**Exhibit 1** and **2**). This project is currently not included in the NCDOT State Transportation Improvement Program (STIP) and is not funded.

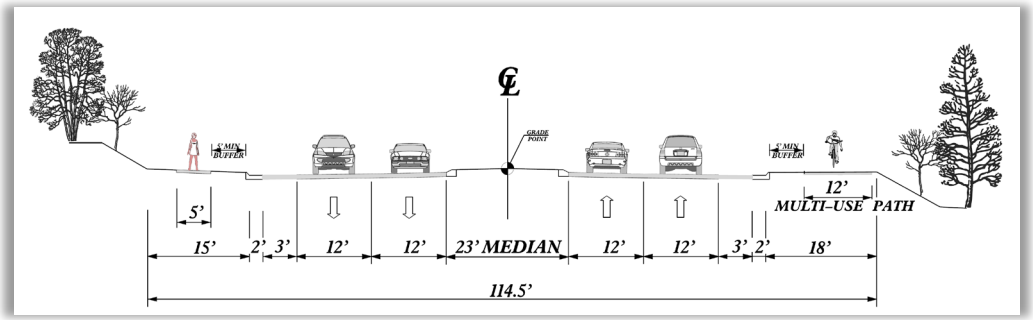

Exhibit 1. Proposed 4-Lane Curb and Gutter Typical Section

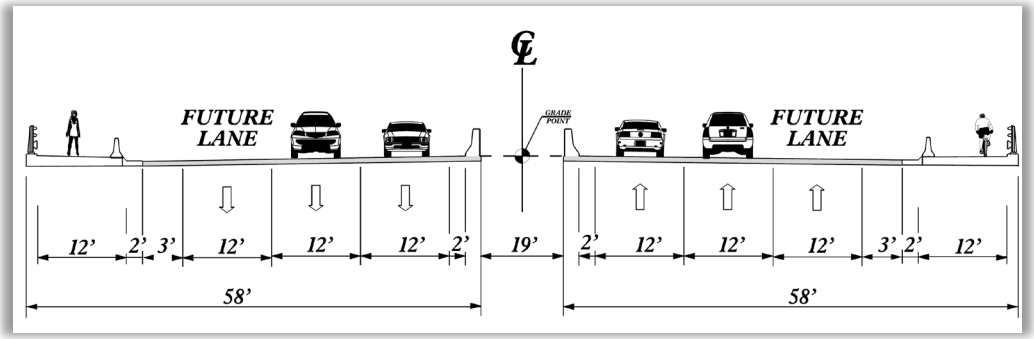

Exhibit 2. Proposed 6-Lane Catawba River Bridge Typical Section

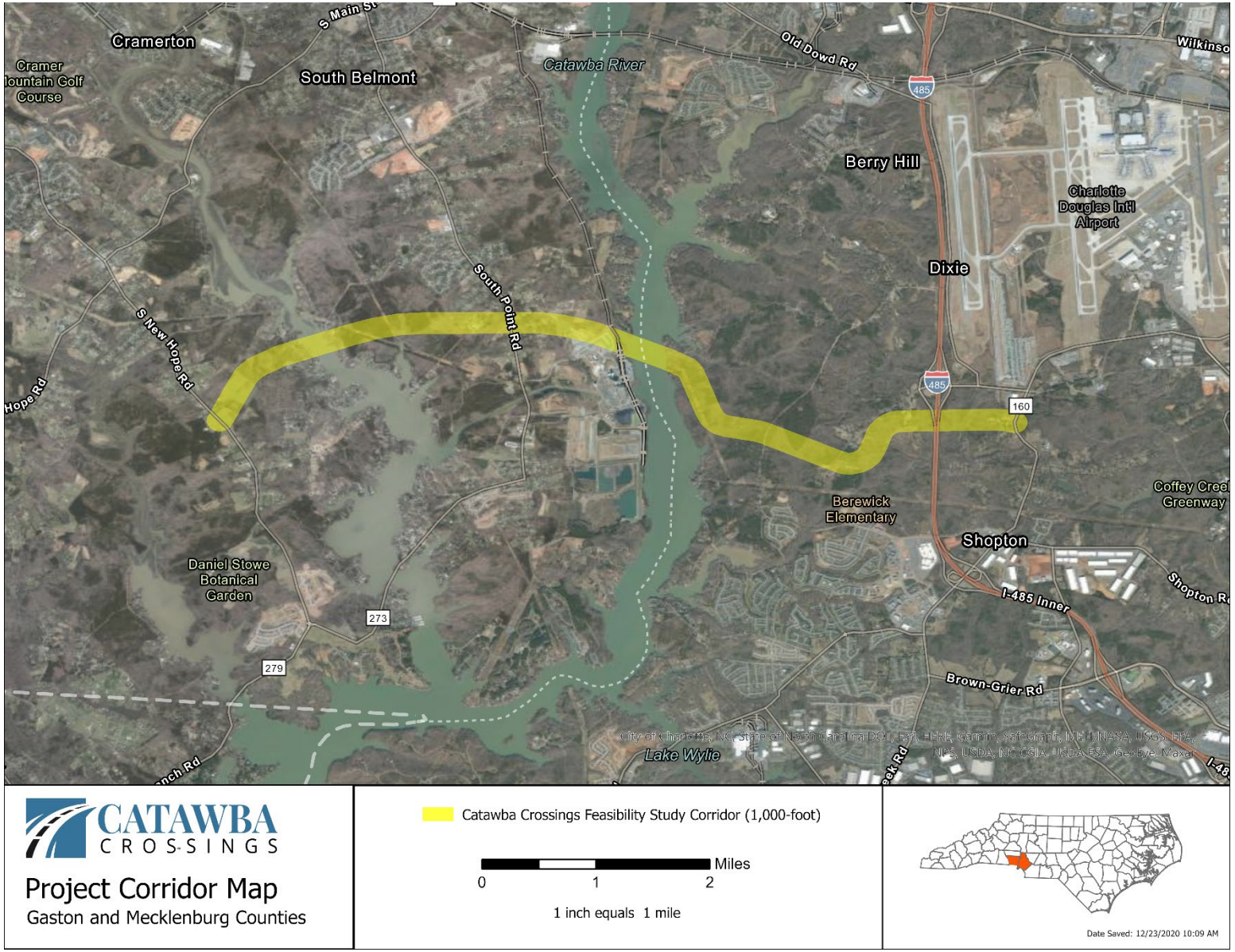
Cramerton
South Belmont
Catawba River
Old Dowd Rd
Berry Hill
Charlotte Douglas Int'l Airport
Dixie
South Point Rd
S New Hope Rd
Hope Rd
160
Berewick Elementary
Shopton
Coffey Creek Greenway
Daniel Stowe Botanical Garden
273
279
I-485 Inner
Brown-Grier Rd
Lake Wylie
CATAWBA CROSSINGS
Project Corridor Map
Gaston and Mecklenburg Counties
Catawba Crossings Feasibility Study Corridor (1,000-foot)
Miles
0
1
2
1 inch equals 1 mile
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Figure 1

The Catawba Crossings Feasibility Study is the first step in reimagining what a new alignment roadway crossing the Catawba River could look like. Additional design and environmental studies will have to be conducted after the proposed project is programmed in the State Transportation Improvement Program (STIP). Considering the scale of the proposed transportation project and the likelihood that federal funds would be required to implement the project, Catawba Crossings will be subject to review in compliance with the National Environmental Policy Act (NEPA) following programming in the STIP and initiation of preliminary engineering.

Preliminary Project Need Statement

The Catawba River creates a barrier between western Mecklenburg County (NC) and southeastern Gaston County (NC) and northeastern York County (SC). Considering the existing transportation deficiencies and the amount of future development planned in the region, there is a significant need to address congestion, increase mobility options, improve the vitality and resiliency of the regional transportation network, and enhance quality of life standards (e.g., reduced travel time).

The identified transportation needs include:

- Additional east-west connectivity within and between Gaston and Mecklenburg counties which will also accommodate trips to and from York County;
- Improved network resiliency to accommodate residents, commuters, commerce, and emergency response;
- Additional mobility and transportation options to alleviate congestion in the network; and
- Equitable access to jobs, services, and recreational opportunities.

Preliminary Project Purpose Statement

The purpose of the Project is to improve mobility within and between Gaston, Mecklenburg and York counties by providing an additional connection over the Catawba River in an environmentally sensitive manner and establishing direct access to other regional transportation facilities, including the Charlotte Douglas International Airport.

- The Project is expected to have secondary benefits including:
    - Improved and expanded multimodal connections;
    - Improved level of service (LOS) capacity on adjacent transportation corridors including US 29/74;
    - Improved response times and access for emergency response; and
    - Greater access and connections to jobs, services, and recreational opportunities.

New Alignment Alternative Analysis

The Catawba Crossings Feasibility Study is a pre-NEPA activity, loosely following the guidelines of the NCDOT Express Design Process. This study is not designed to include an exhaustive alternatives analysis, but to provide the GCLMPO with the details needed to submit this Project for NCDOT's Strategic Prioritization 7.0 in 2023. The scope of the alternatives analysis for this study is limited to new alignment corridors meeting the need and purpose statements referenced above. A comprehensive alternatives analysis will likely be required as part of the NEPA process later and would include a No-Build Alternative, Mass Transit and Multimodal Alternatives, Traffic Management of Existing Roadways Alternatives, Improvement of Existing Roadways Alternatives, and New Alignment Alternatives.

The proposed Catawba Crossings Project Study Corridor is familiar to those with past and current local knowledge or involvement with transportation planning. The Project Study Corridor is based on the previously identified Detailed Study Alternative (DSA) 9, which was determined to be the "Preferred Alternative" and "least environmentally damaging practicable alternative" (LEDPA) for the Gaston East-West Connector. That decision was based on extensive analyses and coordination, the results of which appear to remain a reasonable conclusion based on development trends for the purposes of this Feasibility Study. The DSA 9 alignment remains on the CRTPO and GCLMPO Comprehensive Transportation Plans (CTP). These CTPs influence past, current, and future planning and development adjacent to this corridor. For these reasons, the Feasibility Study did not evaluate other new alignment alternatives as the effort was considered redundant.

Background

Transportation Planning Context

For many years, regional discussions have taken place regarding the need to provide additional east-west transportation capacity by way of additional bridge crossings of Lake Wylie (i.e., South Fork Catawba River and Catawba River) between southeastern Gaston County and western Mecklenburg County. Limited existing crossings of Lake Wylie constrain local and regional travel. Records of these discussions began in the late 1980's by the Gaston Urban Area Metropolitan Planning Organization (GUAMPO). The GUAMPO conducted a citizen participation process during 1989 to 1991 for the need for improved east-west mobility that included five citizen workshops, six public meetings, and 13 formal public hearings before adopting an update of the Gaston Urban Area Thoroughfare Plan that was locally named the US 321/74 Bypass in 1991. In 1992, the GUAMPO's Transportation Advisory Committee (TAC) requested the Mecklenburg-Union MPO (MUMPO) TAC to place the US 321/74 Bypass on their thoroughfare plan since the project's eastern terminus was in Mecklenburg County. In 1994, the MUMPO TAC adopted a conceptual regional thoroughfare plan proposed by the Charlotte Committee of 100, which included the US 321/74 Bypass. The thoroughfare plan began at I-85 in Gaston to I-485 in Mecklenburg County. The North Carolina Department of Transportation (NCDOT) began environmental studies for this same newly named Gaston East-West Connector in 2001.

Gaston East-West Connector

The Gaston East-West Connector Project (aka Garden Parkway) was placed in the Section 404/NEPA Merger Process in 2001, which is NCDOT's process for projects that require an individual permit from the US Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA). The Section 404/NEPA Merger Process requires concurrence from the Section 404/NEPA Merger Team at major project milestones such as purpose and need, alternatives to be studied in detail, the selection of the least environmentally damaging practicable alternative (LEDPA), and other milestones. The Section 404/NEPA Merger Team for the Gaston East-West Connector included the Federal Highway Administration (FHWA), NCDOT, GUAMPO, MUMPO, USACE, US Environmental Protection Agency (EPA), US Fish and Wildlife Service (FWS), NC Department of Environment and Natural Resources - Division of Water Quality (DWQ), State Historic Preservation Office (SHPO), and the NC Wildlife Resources Commission (WRC).

The Garden Parkway initially screened approximately 116 miles of corridor (1,200-foot wide) with the public and resource and regulatory agencies in 2003. The first pass screening eliminated approximately 44 miles and advanced approximately 72 miles of functional design corridors (1,400-foot wide) that could be pieced together in 90 possible endpoint-to-endpoint combinations (I-85 to I-485). Based on estimated

impacts, engineering consideration, and input from local, state, and federal resource and regulatory agencies, 16 detailed study alternatives (DSAs) were presented to the public in 2006. Four DSAs were eliminated due to unavoidable interference with critical operations at Duke Energy Corporation's Allen Steam Plant.

The public was involved in the decision-making process and narrowing of DSAs at six public involvement opportunities between 2003 and 2006. Regulatory and resource agencies were also closely involved in the development of the Garden Parkway DSAs through the Section 404/NEPA Merger Process. The North Carolina Turnpike Authority (NCTA), in association with the Federal Highway Administration (FHWA), published the NEPA-required Draft Environmental Impact Statement (DEIS) analyzing the proposed Garden Parkway in April 2009 for public review and comment. The 12 new-location alternatives and the no-build alternative were analyzed. The DEIS recommended Detailed Study Alternative (DSA) 9 as the preferred alternative for the proposed project. DSA 9 spanned 21.9-miles from I-85 in Gaston County to I-485 in Mecklenburg County and included the crossings of the South Fork Catawba River and Catawba River in the approximate locations of the river crossings for the current proposed Catawba Crossings.

Though the Garden Parkway was discontinued in 2015, local municipalities and jurisdictions continue to acknowledge the need for an additional Catawba River crossing in local transportation plans and have retained the DSA 9 alignment in those plans. (See GCLMPO and CRTPO CTPs.) Local land planning relies on these transportation plans to inform development permitting decisions and the DSA 9 alignment has since been identified in approved local development plans.

Other NCDOT Feasibility Studies

NCDOT completed a high-level design study in 2017 to evaluate potential construction costs associated with a four- or six-lane median divided boulevard between NC 279 (S. New Hope Road) and NC 160 (Steele Creek Road) (NCDOT Project No. SP 1710A). This study utilized the DSA 9 alignment, but laid out a Boulevard section – opposed to the freeway section proposed by the Gaston East-West Connector. The Catawba Crossings Feasibility Study is carrying this Boulevard concept forward for public and stakeholder review and comment.

In 2019, NCDOT initiated the Airport Area and River District Feasibility Study (NCDOT Project No. H184060) which is evaluating the Catawba Crossings corridor in Mecklenburg County only to account for planned and permitted development in the River District and at Charlotte-Douglas International Airport (CLT). Through coordination with stakeholders, NCDOT refined the alignment east of the Catawba River (Lake Wylie) to accommodate the River District Master Plan and developed a conceptual interchange with I-485. The Catawba Crossings Feasibility Study incorporated these corridor refinements. The Airport Area and River District Feasibility Study is not complete.

Note: In August 2021, Charlotte-Douglas International Airport (CLT) informed the GCLMPO and CRTPO of plans to utilize this area (west of NC 160) for a Norfolk Southern (NS) Multimodal Yard expansion. This segment may need to be further evaluated in coordination with CLT as better information becomes available regarding the NS Multimodal Yard expansion.

Catawba Crossings New Alignment Alternative

The decision by federal, state, and local agencies and stakeholders to select Gaston East-West Connector DSA 9 as the least environmentally damaging practicable alternative was based on extensive analyses. Through the Section 404/NEPA Merger Process, the locations of the major river crossings (i.e., South Fork

Catawba River and Catawba River) were scrutinized and ultimately determined to be permittable. Therefore, the bridge crossings are treated as fixed points for this Feasibility Study. Beyond the river crossings, the scope of the Garden Parkway was broader than the Catawba Crossings; however, the physical constraints and factors that contributed to the prior alignment decision remain viable for the purposes of this Feasibility Study. Local land use decisions and private development permitting further harden constraints on the corridor.

A review of current aerial imagery and current permitted private development in Gaston and Mecklenburg counties shows the Catawba Crossings Study Corridor remains the likely alignment alternative for the Project. An alternative to the north would involve impacts to public school facilities (i.e., South Point High School, Belmont Middle School); impacts to several established residential communities; commercial relocations (i.e., South Point Storage); and impacts to a historic African American community (i.e., Henry's Chapel AME Zion Church). An alternative to the south would involve impacts to the Duke Energy Allen Steam Plant, a coal ash pond associated with the Allen Steam Plant, the Daniel Stowe Botanical Gardens, and other established and developing residential communities.

The Catawba Crossings new alignment alternative would address the transportation need and meet the Project's preliminary purpose to improve mobility within and between Gaston, Mecklenburg and York counties by providing an additional connection over the Catawba River. The new alignment alternative would establish direct access to other regional transportation facilities, including I-485 and Charlotte Douglas International Airport. The new alignment alternative affords the opportunity to improve multimodal connections; improve LOS capacity on adjacent transportation corridors including US 29/74; improve response times and access for emergency response; and provide improved access and connections to jobs, services, and recreational opportunities.

No-Build Alternative

The No-Build Alternative would not provide any transportation improvements in the study corridor and would not address the transportation need or meet the Project's preliminary purpose. The No-Build Alternative would not improve mobility within and between Gaston, Mecklenburg and York counties nor would it provide an additional connection over the Catawba River or direct access to regional transportation facilities. Travelers in the region would be limited to existing transportation corridors (e.g., NC 273, NC 279, US 29/74, I-85, I-485, etc.). The No-Build Alternative would not improve multimodal connections or improve LOS capacity on adjacent transportation corridors (e.g., US 29/74). Emergency response times and access would remain the same, and likely worsen in the future No-Build Alternative, and no new access would be provided to connections to jobs, services, and recreational opportunities.

The No-Build Alternative would not incur right of way or construction costs and there would be no impacts to streams, wetlands, or other natural and cultural resources. While the No-Build Alternative does not meet the Project's preliminary purpose, it provides a baseline for comparing the adverse impacts and benefits of a Build Alternative and should be retained for future study for that reason.

Conceptual Design Options Considered

The Project Team evaluated at a high level the following design options or alignment shifts along the corridor while refining the overall corridor.

Grassed Shoulder Typical Section

The proposed Catawba Crossings Boulevard typical section includes curb and gutter. An alternate typical roadway section using a grassed shoulder instead of curb and gutter was reviewed at a conceptual level (**Exhibit 3**). The grassed shoulder would include roadside ditches that could provide treatment for stormwater runoff from the roadway. These grassed ditches are generally less expensive to construct and maintain when compared to a stormwater collection system associated with curb and gutters. These potential benefits are offset by the overall wider project footprint (138.5-ft. minimum compared to 114.5-ft minimum) resulting in higher right of way costs and higher potential impacts to the human and natural environment. Additionally, because separated bicycle and pedestrian accommodations would have to be located behind the grassed ditch, multimodal connections – particularly to future potential transit options – would be complicated.

As a result of this high-level evaluation, it was determined that a shoulder section would not meet the expectation of a Boulevard section, particularly when applied to multimodal accommodations. However, the shoulder section may be appropriate in some areas (e.g., at stream crossings or river approaches) and could be further evaluated as design concepts progress.

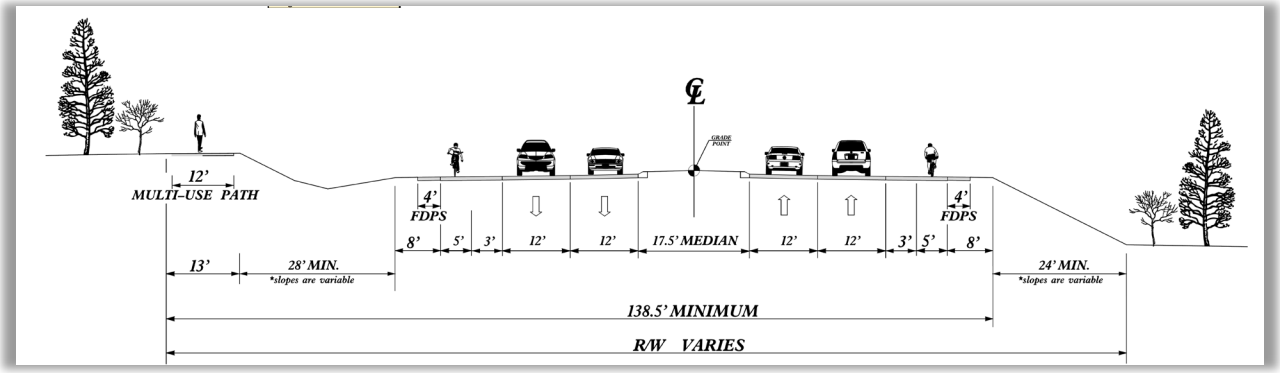


Exhibit 3. Potential Grassed Shoulder Section, Catawba Crossings

South Fork Catawba River Bridge

This proposed bridge layout spans the South Fork Catawba River, Lake Wylie Road and Gaither Road. While crossing these residential roads would preserve access and connectivity without impacting Catawba Crossing's operations, it would control the proposed structure's height. These roads are currently approximately 35-40 feet above the edge of water based on contours (not final survey). The resulting structure would be approximately 60 feet above the water surface. This contributes to a higher cost per square foot and overall functional cost estimate. Such a structure would not be compatible with surrounding development and should be avoided. Additional study should address a more cost-effective solution for this river crossing that weighs traffic operations and safety and meets the needs of the local community. A high-level review of the following options, or combinations of each, appear to have the potential to reduce the construction costs for this bridge.

Cross the residential streets on separate structures:

This option would reduce the river span distance to approximately 1,000 feet and allow for the roadway profile to follow the existing grade more closely, reducing the structure height and cost. Separate, shorter structures may span the residential roads (**Exhibit 4**).

Intersect the residential streets at-grade, with potential modifications:

At-grade intersections with these residential streets would be challenging due to their proximity to the structure. Line-of-sight and sight distances would have to be further evaluated to determine whether this could be accomplished safely. Further, the Catawba Crossing's operations will need to be considered; it may not be desirable to include at-grade intersections with these local streets that serve a relatively small number of residents.

Truncating (or dead ending) these streets would not affect existing access for residents north of the proposed Catawba Crossings, as Lake Wylie Road and Gaither Road currently intersect NC 279 and NC 273, respectively. Connectivity to the road segments south of the proposed Catawba Crossings would need to be reestablished. Lake Wylie Road could be connected to Edgewater Drive to the south, if needed, with a short new alignment road (**Exhibit 5**). However, the economic feasibility of this would need to be further evaluated with more detailed design and right-of-way estimates.

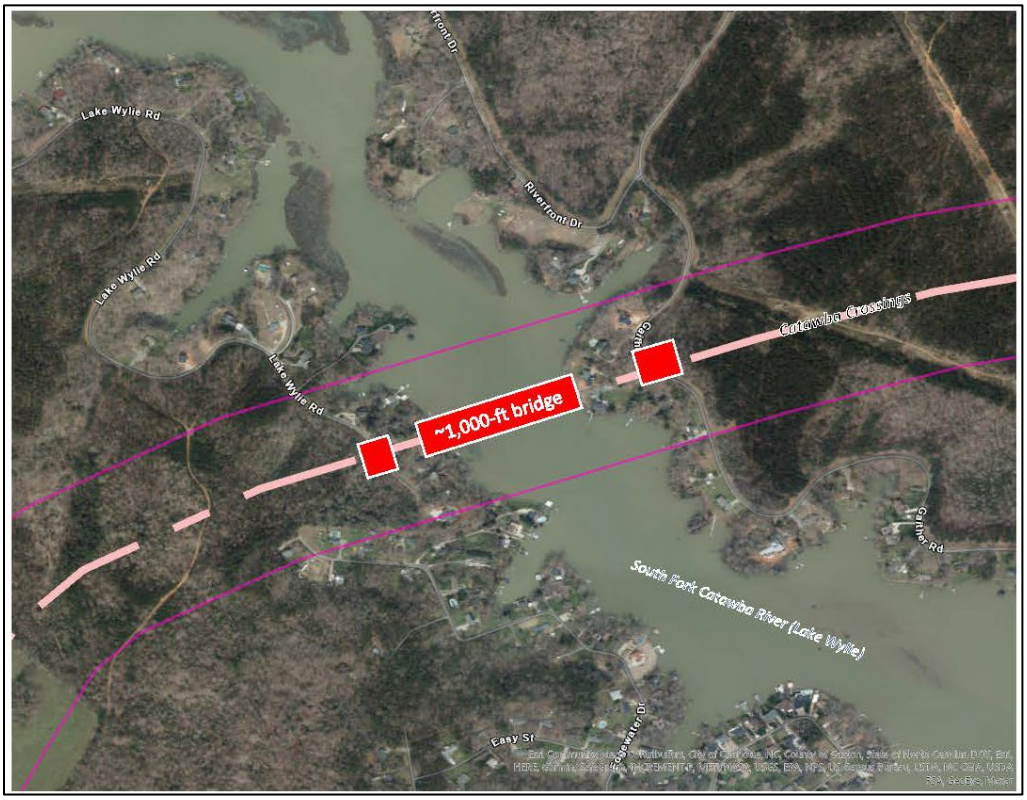


Exhibit 4. South Form Catawba River Bridge Concept, Cross Residential Streets on Separate Structures

Gaither Road south of Catawba Crossings serves about 20 residences and connectivity would need to be reestablished. There may be an opportunity to realign the curve in Gaither Road south of Riverfront Drive to a new intersection with Catawba Crossings (**Exhibit 5**). Such a realignment may also be prudent to evaluate in conjunction with a grade separated crossing as this would bring Gather Road perpendicular to the Catawba Crossing's alignment and minimize the structure length.

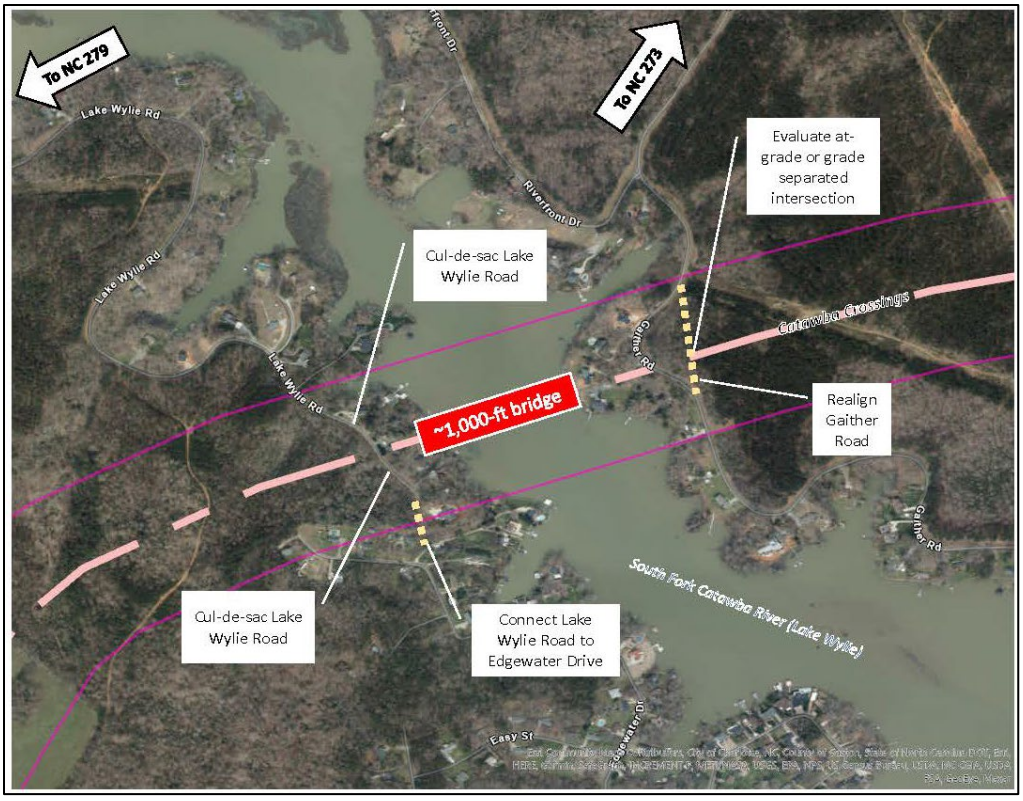


Exhibit 5. South Form Catawba River Bridge Concept, Residential Street Modification

Private developments are proposed on both sides of the lake at this location. Project sponsors must continue to collaborate with the private interests and property owners at this location to determine a solution that serves current and future land uses.

Project Corridor Alignment Shifts

As mentioned, this Feasibility Study considered the placement of the proposed bridged crossings of the South Fork Catawba River and the Catawba River fixed. This decision was based on the comprehensive environmental analysis conducted in conjunction with the Gaston East-West Connector EIS which was in turn coordinated with federal and state regulatory and resource agencies. The fixed location of the bridge crossings and the constraints applied by existing and permitted development in Gaston and Mecklenburg counties limited evaluation of a true alignment alternative. However, the following localities were evaluated at a high level.

NC 279 T-Intersection

The current location of the project's western terminus is based on the NCDOT Feasibility Study which is in turn based on DSA 9. The Project Team must consider the future potential extension of the Catawba Crossings, or another new alignment roadway, to the west; the GCLMPO CTP includes a freeway extending from NC 279 to the west. Further, the Town of Cramerton negotiated the reservation of right of way for the Project through the permitted Overlook at Riverside mixed use development along the west bank of the South Fork Catawba River, which applies an additional consideration to the proposed alignments west of the South Fork Catawba River.

Shifting the Catawba Crossings intersection with NC 279 to the north could impact the Overlook at Riverside development and existing residences east of NC 279. By moving this proposed T-intersection, existing development on the west side of NC 279 would also become susceptible to the potential future extension of the roadway to the west, as included in local transportation plans. Shifting this intersection to the south introduces the potential to directly impact more residences in the Edgewater Drive area.

NC 273 Intersection

An alignment shift to the south was presented to the Project Team at this location to avoid impacts to the Joye Mobile Home Park. The option also avoided impacts to existing residences on Tucker Road but resulted in additional residential impacts east of South Point Road (e.g., Wilson Street, Allison Street) (**Exhibit 6**).

An alignment shift to the north could impact the South Forest/Brook Forest (i.e., Singing Brook Trail) neighborhood and other residences on Boat Club Drive. More dense residential development characterizes the Belmont peninsula north of South Forest/Brook Forest and the Allen Steam Plant constrains alignment options to the south.

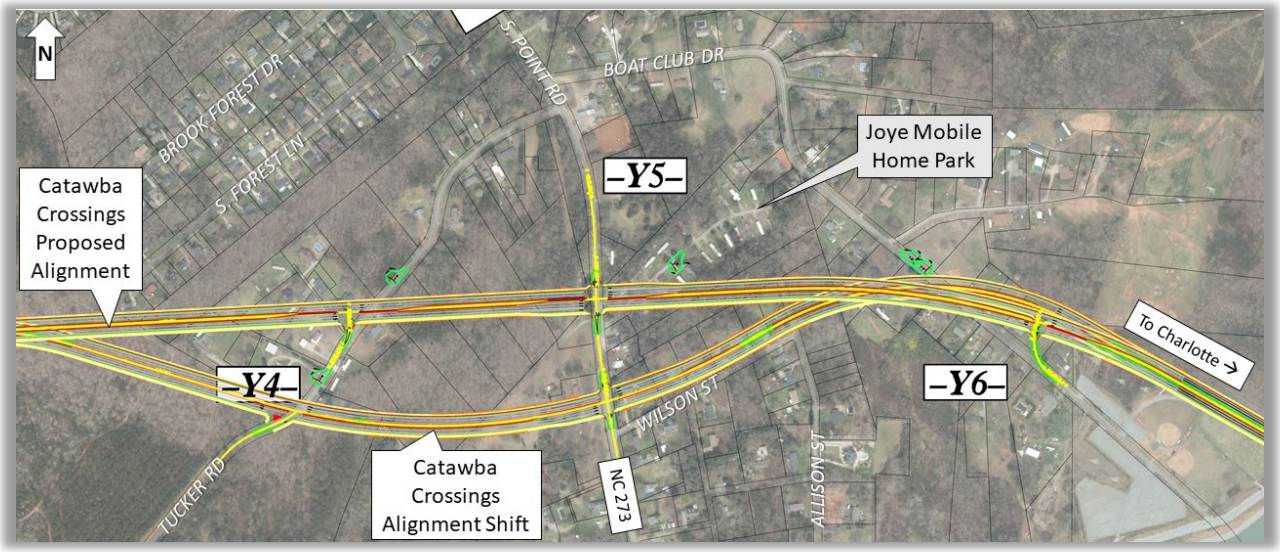


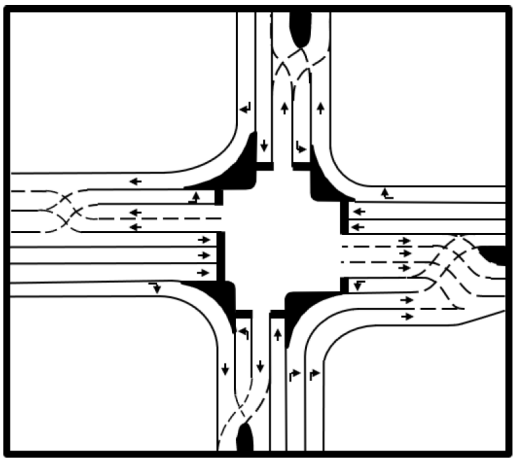
Exhibit 6. Catawba Crossings Potential Alignment Shift at NC 273 (South Point Road). This option was reviewed by Project Team but not recommended for inclusion in the conceptual design.

Based on the traffic analyses conducted for this Feasibility Study, the proposed Catawba Crossings intersection with NC 273 would experience high travel demand. For this reason, potential alternative intersection configurations were considered at this location with an understanding that more detailed analyses would be performed at this intersection in future planning and design phases to identify the preferred intersection configuration through coordination with the appropriate transportation officials, stakeholders and the public (refered to in the "Catawba Crossings Transportation Technical Memorandum").

The Virginia Department of Transportation's Junction Screening Tool (VJuST) was used to identify potential alternative intersection configurations that would be most appropriate at this location to advance to further study and analysis. VJuST uses peak-hour volumes and laneage inputs to evaluate

different innovative intersection configurations based on the projected volume to capacity (V/C) ratio, intersection safety based on conflict points, and pedestrian accommodations. VJuST includes 20 potential intersection configuration alternatives. For the purposes of this study, unsignalized and tee-intersection configurations were not considered, leaving 15 potential configurations. Based on review of the VJuST results, 7 alternative intersections configurations are projected to have V/C ratios less than 1.0 during both peak hours under 2045 build conditions.

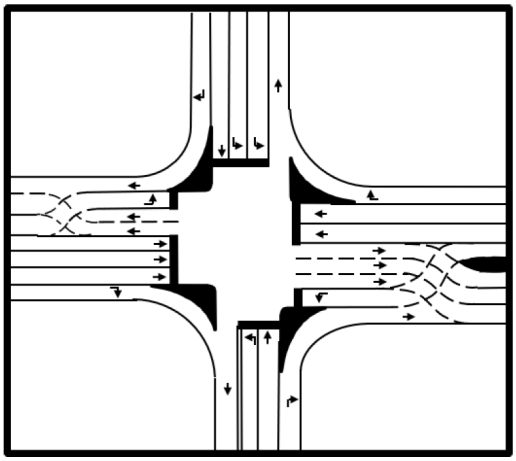
These potential configurations are illustrated and explained below; also refer to Figures 21a-c in the Catawba Crossings Transportation Technical Memorandum. Further evaluation of these potential configurations is recommended to determine the best innovative intersection configuration for the proposed intersection of Catawba Crossings and NC 273.



Full Displaced Left Turn

A full displaced left-turn intersection is one in which left-turn vehicles cross to the other side of the roadway in advance of the main intersection. Protected left turns and opposing through movements occur simultaneously at the main intersection. In a full displaced left-turn intersection, all four approaches are displaced, and the intersection would run with two-phase signal control. Although there are 8 less conflict points than the conventional intersection, the larger intersection increases the crossing distance for pedestrians, and can create confusion because traffic does not flow in the expected direction.

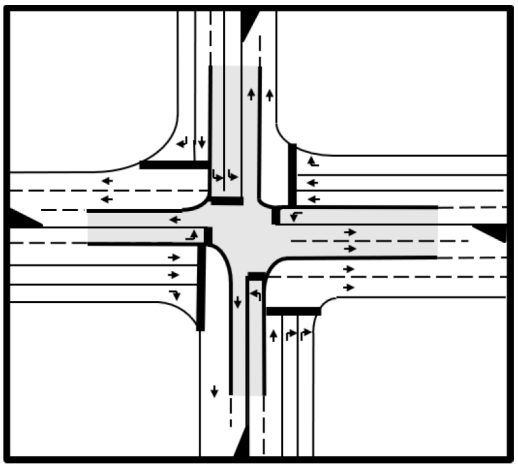
With the laneage shown to the left, the full displaced left-turn produces a V/C of **0.91** and **0.94** in the AM and PM peak hours, respectively.



Partial Displaced Left Turn

A partial displaced left-turn intersection is one in which left-turn vehicles in two directions of travel cross to the other side of the opposing through traffic in advance of the main intersection. In this case, the EB and WB approaches are those with the displaced left-turning movements. These protected left turns and opposing through movements occur simultaneously at the main intersection. Although there are 4 less conflict points than the conventional intersection, the larger intersection increases the crossing distance for pedestrians, and can create confusion because traffic does not flow in the expected direction.

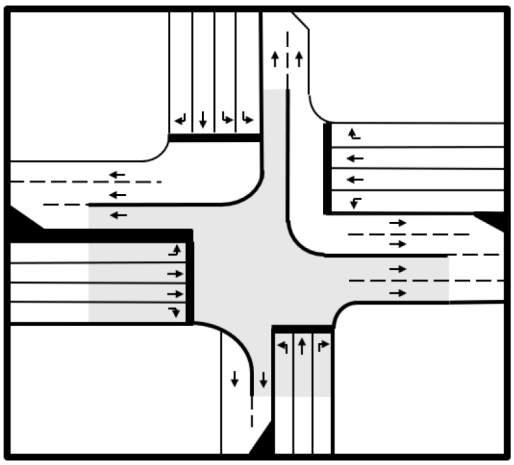
With the laneage shown to the left, the partial displaced left-turn produces a V/C of **0.94** and **0.90** in the AM and PM peak hours, respectively.



Center Turn Overpass

A center turn overpass is an intersection in which all left-turn movements are relocated to a grade-separated intersection using narrow ramps within the median. Then the left-turning vehicles merge back into through traffic from left of the through lanes. It requires two two-phase traffic signals and reduces corridor travel times. There are 16 less conflict points than the conventional intersection and all pedestrians cross one direction of travel at the ground level, never conflicting with left-turning vehicles. The center turn overpass should be considered at high-volume urban or suburban intersections.

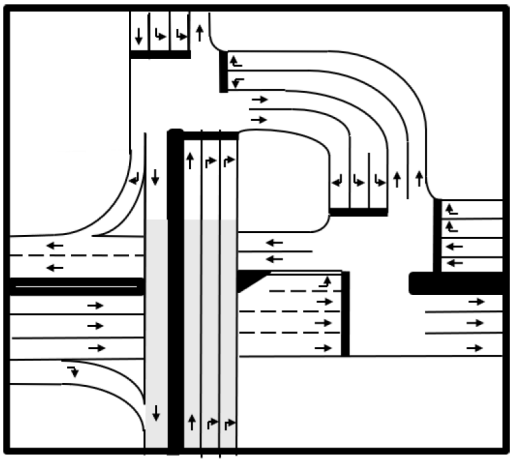
With the laneage shown to the left, the center turn overpass produces a V/C of **0.77** and **0.71** in the AM and PM peak hours, respectively.



Echelon

An echelon intersection has one approach on both roadways elevated to a grade-separated intersection. Like the center turn overpass, it requires two two-phase traffic signals and reduces corridor travel times. An echelon intersection has 20 fewer conflict points than a conventional intersection and all pedestrians cross one direction of travel at the ground level. The echelon should be considered at high-volume urban or suburban intersections.

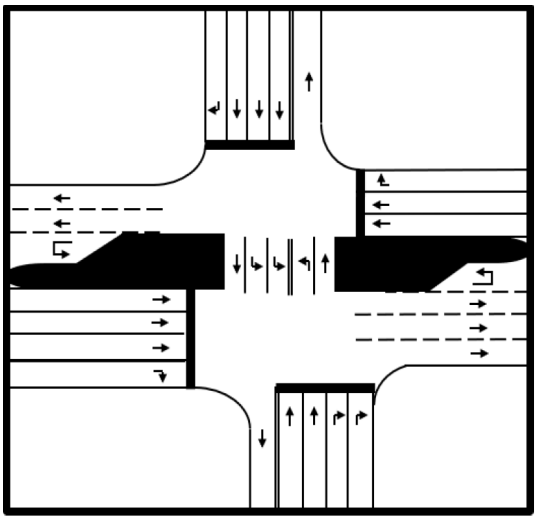
With the laneage shown to the left, the echelon produces a V/C of **0.86** and **0.69** in the AM and PM peak hours, respectively.



Single Loop: N-E

Under a single loop intersection configuration, a connector road is constructed in one quadrant of the intersection to accommodate all four left-turn movements and some right-turn movements while the major and minor roadways are grade separated. This intersection configuration creates two three-phase signalized intersections rather than one 8-phase signalized intersection. Compared to conventional intersections, a single loop intersection has 20 fewer conflict points. This configuration is typically considered at intersections where low to medium left-turn volume is present.

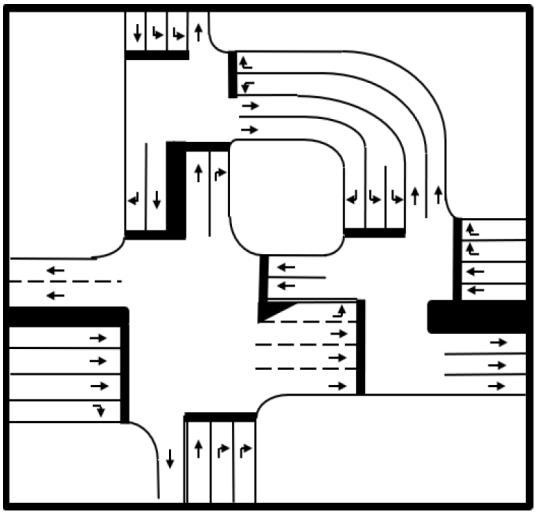
With the laneage shown to the left, the single loop produces a V/C of **0.91** and **0.78** in the AM and PM peak hours, respectively.



Partial Median U-Turn

A partial median U-turn is an intersection in which left-turns are removed from the mainline and instead rerouted to make U-turns at dedicated median openings downstream while left-turns along the side streets remain. This intersection configuration creates three signalized intersections (two 2-phase and one 3-phase signal) rather than one 8-phase signalized intersection. Compared to conventional intersections, partial median U-turn intersections have 20 fewer conflict points. Partial median U-turn configurations are typically considered on median divided highways with moderate left-turn volume on the mainline.

With the laneage shown to the left, a V/C of **0.99** and **0.94** is expected in the AM and PM peak hours, respectively.



Quadrant Roadway: N-E

Under a quadrant roadway configuration, a connector road is constructed in one quadrant of the intersection to accommodate all four left-turn movements while the main intersection serves only through and right-turn movements. This intersection configuration creates three signalized intersections (one 2-phase and two 3-phase signals) rather than one 8-phase signalized intersection. Compared to conventional intersections, quadrant roadways have 8 fewer conflict points. This configuration is typically considered at intersections where high major and minor street through and left-turn volume is present.

With the laneage shown to the left, a V/C of **0.88** and **0.84** in the AM and PM peak hours, respectively is expected.

This analysis assumed the Catawba Crossings Project terminates at NC 279. As noted, the GCLMPO CTP shows potential future extension of the corridor west through southern Gaston County. If the Catawba Crossings corridor is extended further west in the future, traffic analysis results would be expected to change, and additional configurations may need to be considered.

NC 160 Intersection

According to the CRTPO CTP, this proposed new intersection is expected to operate as a through movement from Catawba Crossings onto NC 160. Further, this intersection is adjacent to the National Register of Historic Places (NRHP)-eligible Byrum-Croft House (9134 Dorcas Lane, Charlotte). As a result, the Catawba Crossings alignment was curved to the north to align better with NC 160 and accommodate through traffic while minimizing impacts to the NRHP-eligible resource. However, as noted in the "Other NCDOT Feasibility Studies" Section, additional coordination with CLT will be necessary in the development of the Catawba Crossings approach to, and intersection with NC 160.

Conclusion

The Catawba Crossings Feasibility Study will not evaluate new alignment alternatives. The alternative analysis conducted for the Gaston East-West Connector EIS provides a valid reference for potential alternative alignments through the project vicinity. The Gaston East-West Connector Section 404/NEPA LEDPA/Preferred Alternative (DSA 9) alignment was selected through consultation with resource and regulatory agencies and vetted with stakeholders and the public. DSA 9 has remained in local transportation long-range plans and refined by more recent NCDOT feasibility studies. A review of existing conditions in southeast Gaston County and western Mecklenburg County supports the conclusion that the environmental and human constraints which contributed to the Garden Parkway alignment remain present and, in some locations, have become more restrictive (e.g., private residential development). It is likely that a comprehensive alternatives analysis will be required at a later date as part of the NEPA process as planning for the Catawba Crossings Project continues.

The Project Team has reviewed several design options through the Catawba Crossings Feasibility Study process. The following design options should be further considered and analyzed in later stages of project development:

- A shoulder section may be appropriate at some locations along the corridor, particularly in sensitive water quality areas. Detailed analysis of multimodal accommodations would need to be a part of this analysis.
- More detailed design investigations at the South Fork Catawba River bridge would likely result in a more cost effective and context sensitive solution.
- Traffic projections for 2045 anticipate that a non-conventional intersection will be required to maintain efficient operations at the proposed project intersection with NC 273 in the future build condition.