

AVOIDANCE AND MINIMIZATION FOR NC 49 IMPROVEMENTS

NC 49 from John Kirk Drive to I-485 (widen existing roadway);
realign Back Creek Church Road (SR 2827) on new location to the NC 49
and Mallard Creek Church Road (SR 2833) intersection; close existing
at-grade rail crossing at NC 49 and Back Creek Church Road
Charlotte, Mecklenburg County

STIP Project U-5768

North Carolina Department of Transportation
and
Charlotte Department of Transportation



MERGER CONCURRENCE POINT 4A

July 14, 2021

1. PURPOSE OF THE MEETING

The purpose of this meeting is to reach concurrence on Avoidance and Minimization Measures (CP4A) for the subject project.

2. PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT), in coordination with the Charlotte Department of Transportation (CDOT), proposes to widen NC 49 (University City Boulevard) from John Kirk Drive to I-485. The project will also realign SR 2827 (Back Creek Church Road) (BCCR) to intersect with NC 49 at SR 2833 (Mallard Creek Church Road). The current at-grade intersection of BCCR and North Carolina Railroad/Norfolk Southern Railroad (NCRR/NS) just south of NC 49 will be closed in conjunction with these improvements. The project location is shown in **Figure 1**, the Environmental Features are shown in **Figure 2**, and Jurisdictional Features are highlighted in **Figure 3**.

3. PROJECT STATUS, BACKGROUND, SCHEDULE, AND COST

The project is included in the 2020-2029 NCDOT State Transportation Improvement Program (STIP) and will be funded using both State and local (City of Charlotte) funds. Right of way acquisition and construction are programmed for fiscal years 2022 and 2025, respectively. Both the proposed improvements to NC 49 and the proposed realignment of BCCR are included in the 2018 Charlotte Regional Transportation Planning Organization (CRTPO) Comprehensive Transportation Plan and the 2045 CRTPO Metropolitan Transportation Plan.

The following STIP projects are located in the vicinity of U-5768:

- I-5798, I-485, from I-85 to Rocky River Road: pavement rehabilitation (Cost, \$8.3 million)
- U-5007, NC 51, Matthews Township Parkway to SR 3128 (Lawyers Road): widen to multi-lanes (Cost \$43.25 million)
- I-5860, I-85, SR 2472 (W. Mallard Creek Church Road) to 0.8 mile north of SR 2467 (Mallard Creek Road): pavement rehabilitation (Cost \$5.5 million)
- I-6017, I-85, Mallard Creek Road interchange, improve interchange (Cost not currently listed).

The project start of study letter was sent on August 4, 2014. NCDOT internal scoping took place on November 3, 2015, and the External Scoping Meeting/Merger Screening was held on December 9, 2015. NCDOT coordinated with the U.S. Army Corps of Engineers (USACE) with regards to the need and purpose of the project and segmentation for the proposed realignment of BCCR. A technical memorandum on the issue was provided for the Merger Team on June 24, 2016 for clarification. Subsequent outreach to USACE indicated the memorandum was acceptable.

Merger History

The first Merger Meeting for the project was held on November 16, 2017, with the goal of reaching agreement on Concurrence Points 1 and 2 (Purpose and Need and Study Area Defined, and Design Options for Detailed Study). The Merger Team was able to reach agreement on Purpose and Need; however, additional alternatives were proposed and concurrence was not reached on the project study area. The second Merger Meeting was held on July 19, 2018. At this meeting, concurrence was achieved for Concurrence Points 1 and 2.

Purpose and Need of Proposed Project

The needs to be addressed by this project include:

- NC 49 is currently operating at or close to congested levels.
- From April 2000 through March 2016, there were six highway vehicle/train crashes at the NCRR/NS at-grade rail crossing on BCCR just south of NC 49. Current typical train traffic as reported by Norfolk Southern is 38 trains per day, and train volumes are expected to double in the future, as this crossing is located within the proposed NCDOT Southeast High Speed Rail corridor.
- With the proposed closing of the BCCR railroad crossing, the existing network connectivity between the Rocky River area to the south and NC 49 would be lost.
- Traffic volumes and lack of accommodations along NC 49 limit bicycle and pedestrian activity along regionally important multi-modal transportation routes. CDOT, University of North Carolina at Charlotte (UNCC), and University City Partners (UCP) have cited the need to accommodate pedestrians and bicycles in any proposed improvement.

The primary purposes of the proposed project are to reduce traffic congestion, improve traffic flow, and enhance traffic operations on NC 49. Another purpose is to improve safety and enhance train and vehicle operations.

The screening criteria for this are:

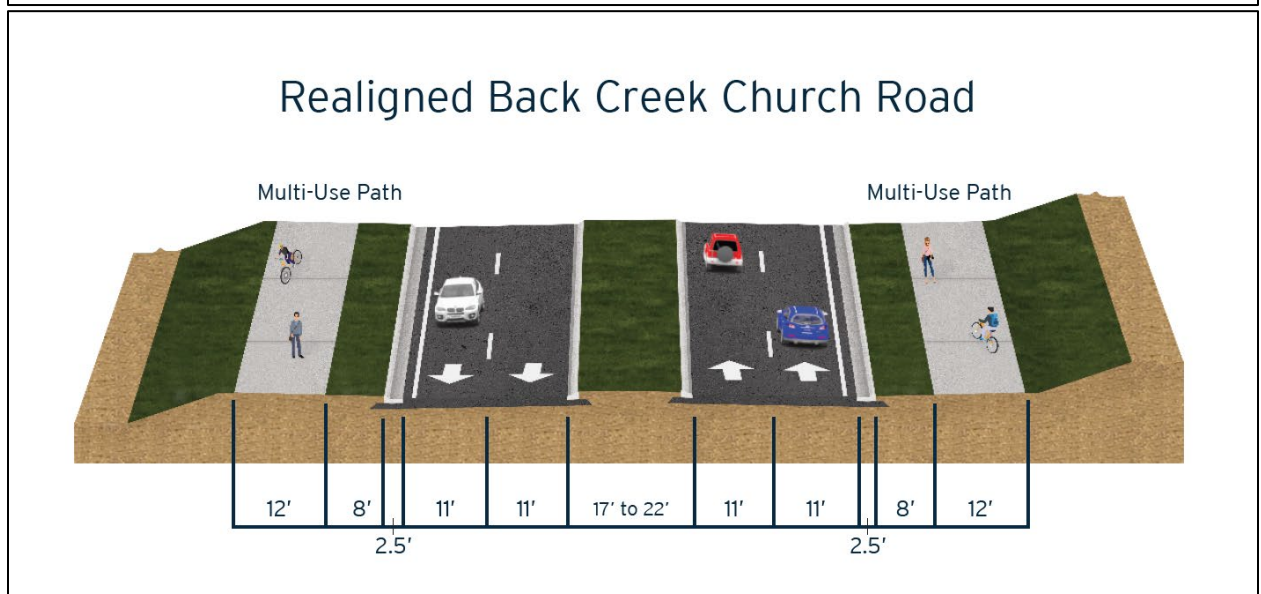
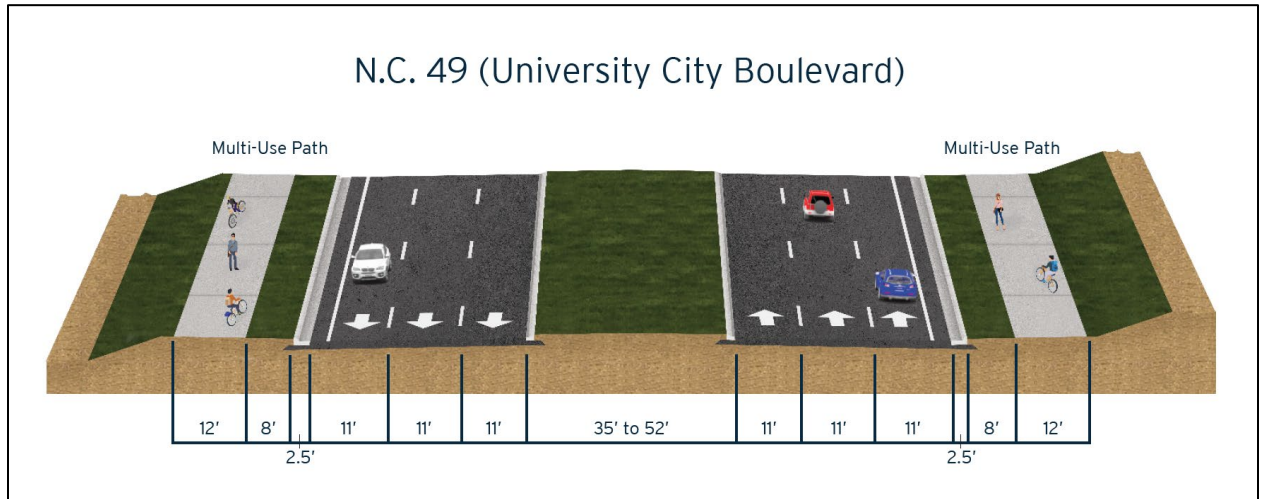
- Achieve an overall Level of Service (LOS) D for intersections along the project corridor in the design year (2040).
- Maintain connectivity from within the existing road network.
- Safely accommodate multi-modal uses of the corridor.

Concepts Recommended for Detailed Study

- No-Build Alternative.
- Alternative 1 (Yellow Option) Best-fit widening along NC 49; relocation of BCCR to NC 49 at Mallard Creek Church Road using the railroad bridge constructed as part of STIP Project P-5208; and traffic flow and connectivity improvements to Old Concord Road (SR 2930) and Thomas Combs Drive.
- Alternative 2 (Purple Option) includes the same improvements as above to NC 49, Old Concord Road, and Thomas Combs Drive, with the relocation of BCCR north of the existing Back Creek crossing to NC 49 at Mallard Creek Road using the railroad bridge constructed as part of STIP Project P-5208.

- **Typical Sections**

Typical Sections for the proposed project are shown below:



Major Hydraulic Structures and Alignment

The third Merger meeting was held on June 13, 2019, with the goal of reaching agreement on Concurrence Point 2A (major crossing structures and alignment review). During the meeting, there was a request for additional information on the bridging and culvert options of one crossing. The information was provided to the team on June 20, 2019, and subsequent meeting was held on June 24, 2019. Formal concurrence and the concurrence form signatures were obtained on July 10, 2019.

Agreed upon major crossing structures are:

- Site 1 (Alternative 1) construct a new three-span bridge approximately 220 feet long.
- Site 2 (Alternative 1) construct a new 7-foot by 6-foot reinforced concrete box culvert extending approximately 150 feet.

- Site 3 (Alternative 2) replace the existing bridge with a single-span bridge approximately 70 feet long (based on the hydraulics report). NCDOT will coordinate with Mecklenburg County and CDOT and will revise the length to 90 feet to accommodate the proposed Back Creek Greenway, contingent on a municipal agreement.
- Site 4 (Alternatives 1 and 2), if the project construction limits are expanded and extension or replacement of the culvert at Site 4 is required, the Merger Team will be informed and will have an opportunity to agree upon an appropriate crossing structure.

Least Environmentally Damaging Practicable Alternative

The fourth Merger Meeting was held on August 16, 2019 with the goal of reaching agreement on Concurrence Point 3 (Least Environmentally Damaging Practicable Alternative (LEDPA)) and to discuss CP 4A (Avoidance and Minimization). Formal concurrence on CP 3 and the concurrence form signatures were obtained on July 10, 2019. Agreed upon LEDPA is:

- Alternative 1 (Yellow Option) Best-fit widening along NC 49; relocation of BCCR to NC 49 at Mallard Creek Church Road using the railroad bridge constructed as part of STIP Project P-5208; and traffic flow and connectivity improvements to Old Concord Road (SR 2930) and Thomas Combs Drive.

The Merger Team stated that they would prefer to see more advanced designs before concurring with CP 4A. While the team was amenable to an email only meeting, their stated preference was for an in-person meeting. They did state that they were willing to review an avoidance and minimization matrix before determining if an in-person meeting was necessary.

Project Schedule

The tentative project schedule is shown below (these dates are preliminary and subject to change).

- | | |
|-----------------------------|----------------|
| • Project Technical Reports | 2017 – 2019 |
| • Public Meeting | April 2019 |
| • Combined SEA/FONSI | September 2019 |
| • Right-of-Way Acquisition | FY 2022 |
| • Construction | FY 2025 |

Cost Estimates

- | | |
|--------------------------------|--|
| • Project Development & Design | \$ 2,000,000 (Current STIP) |
| • Utilities | \$ 8,071,140 (rev 5/4/21) |
| • Mitigation | \$ 1,504,141.13* |
| • Property Acquisition | \$ 30,520,490 (2/04/20) |
| • Construction Costs | \$55,000,000 (rev 5/4/21) |
| • Total Cost | \$97,096,000 (rounded to nearest \$1,000) |

* Stream and wetland mitigation credits updated based on rates effective on June 9, 2021, Streams at \$558.81 per linear foot and wetlands at \$91.984.41 (Yadkin River HUC 03040105) per acre at a 2:1 ratio.

Public Involvement

NCDOT and CDOT have conducted meetings with UNCC and UCP about the proposed project, given its proximity to the UNCC campus. Meetings were held on November 29, 2016, May 30, 2017, April 9, 2019, and July 2, 2019. In addition to these meetings, UNCC and UCP participated in a meeting with CDOT on the typical section for the proposed NC 49 improvements on April 11, 2018. One issue of particular concern to UNCC and UCP are bicycle and pedestrian accommodations through the project corridor.

On April 23, 2019, a public meeting was held to inform the public about the proposed project and obtain input. A project website was developed, and included a survey seeking input on how users interact with the corridor. Comment forms included a question on their preferred alternative for the realignment of BCCR. To date, of those commenters expressing a preference, 16 preferred Alternative 1 (Yellow Option) and one preferred Alternative 2 (Purple Option).

In addition to these meetings, an additional small group meeting was held with representatives from local homeowners associations on November 4, 2019. Discussion topics included neighborhood safety, the noise effects of increased railroad traffic, and the proposed park. On February 19, 2020 an additional coordination meeting was held with UNCC and UCP. At that time it was agreed that both UNCC and UCP would provide input on proposed bicycle and pedestrian accommodations along NC 49 after submission of 25 percent project designs.

USACE posted a public notice for the project, that included a 30-day comment period, which expired on August 20, 2019. USACE received one comment on the project from a resident of the BCCR area, who asked about right of way (ROW) acquisitions associated with Alternative 2 (Purple Option) but had no other comments about the project.

4. CONCURRENCE POINT 4A – AVOIDANCE AND MINIMIZATION MEASURES

Avoidance and minimization measures (AMMs) have been undertaken throughout development of the U-5768 project. The purpose and need of the project allows existing facilities to be upgraded to the extent practicable, limiting the amount of new location alignment needed to achieve process goals. Environmental resources, including stream restoration sites and proposed parks were considered as CP 1 was developed and were disclosed to the Merger Team.

At CP2, project corridors were chosen to cross streams perpendicularly to the extent practicable. As most of the natural systems resources were impacted by the realignment of BCCR, multiple alternatives were explored. Impacts to streams, wetlands, stream mitigation sites, utility lines, and the proposed park and greenway were all considered with respect to the alternatives carried forward for detailed study.

Measures to avoid and minimize impacts to potential jurisdictional waters of the US were incorporated into the best fit design of NC 49 and to the realignment of BCCR. The presence of proposed parks, university properties, and residential and commercial buildings were also taken into consideration when developing the best fit alignment. NCDOT agreed to include bridges at Sites 1 and 3 for Alternatives 1 and 2, respectively. The alternatives were also chosen to minimize impacts to housing developments and to minimize impacts to UNCC and area businesses. The proposed new location component of BCCR was chosen to closely parallel existing neighborhoods. Limiting fragmentation of the park and proposed habitat fragmentation in this highly urbanized corridor.

At CP 2A, all major stream crossings were reviewed. It was determined that bridges would be used for any crossing of Back Creek, to minimize stream and wetland impacts as well as to allow passage of the proposed Back Creek Greenway along Back Creek without having to access the road. It was also

determined that improvements would not require extension or improvements to the culvert at the southern terminus of the project. The Merger Team requested that NCDOT explore alignment shifts to minimize impacts to a parallel stream as part of Alternative 1 (Yellow Option).

At the CP 3 meeting, NCDOT showed that they had adjusted the southern terminus of Alternative 1 to minimize parallel stream impacts. The following AMMs were part of the LEDPA decision:

Based on NCDOT's evaluation, Alternative 1 (Yellow Option) has the following:

- Avoids stream mitigation site easement;
- Accommodates the proposed Back Creek Park while avoiding impacts;
- Accommodates proposed Back Creek Greenway trailhead in the proposed park; and
- Has fewer residential property impacts

Since concurrence on CP 3, NCDOT has worked to further reduce stream and wetland impacts associated with the project, as per discussions with agencies and NEPA requirements. The results of efforts to reduce impacts since CP 3 and publication of the SEA/FONSI are shown in Tables 1 and 2 and summarized in the following paragraphs.

Impact Update

Potential impacts for the Preferred Alternative for streams and wetlands were calculated for the updated design. Table 1 shows the stream length within the project Study Area (from the NRTR), those listed in the SEA/FONSI (using an impact area of slope stake limits plus 40 feet) and those calculated based on the more refined design (using slope stakes limits plus 25 feet). Stream impacts are reduced by just over 50 percent. Table 2 shows the wetland impacts using the same methodology. Wetland impacts were reduced by 50 percent.

Impacts of the Preferred Alternative to the proposed Back Creek Park have increased slightly based on slope stake limits from 1.7 acres to 2.1 acres. This increase is due to the updated design effort to reduce stream and wetland impacts. Potential park impacts are shown in Figure 4.

Table 1. Potential Stream Impacts for U-5768

Stream (Map ID)	Stream Classification	Stream Length (ft)	SEA/ FONSI SS+40 feet (ft)*	SS+25 feet (ft)**
SA	Intermittent	124	0	0
SB	Perennial	587	0	20
SC	Perennial	3,229	1,010	600
SF	Perennial	2,657	0	0
SG	Perennial	279	0	0
SH	Perennial	2,274	0	0
SI	Intermittent	149	0	0
SJ	Intermittent	279	0	0
SK	Intermittent	75	0	0
SL	Perennial	2,462	460	290

Table 1. Potential Stream Impacts for U-5768

Stream (Map ID)	Stream Classification	Stream Length (ft)	SEA/ FONSI SS+40 feet (ft)*	SS+25 feet (ft)**
SM	Perennial	1,118	1,100	370
SN	Intermittent	174	0	0
SO	Intermittent	46	0	0
	Total	13,450	2,570	1,280

*Slope stake limits plus 40 feet using 15 percent design, rounded to the nearest 10 feet

**Slope stake limits plus 25 feet using updated design, rounded to the nearest 10 feet

Stream information/location Source: NCDOT, Natural Resources Technical Report, 2016

Table 2. Potential Wetland Impacts for U-5768

Stream (Map ID)	Classification	Wetland Area (ac)	SEA/ FONSI SS+40 feet (ac)*	SS+25 feet (ac)**
WA	Non- riparian	0.1	0	0
WB	Riparian	0.7	0.2	0.1
WC	Riparian	0.1	0	0
WD	Riparian	0.5	0	0
WE	Riparian	<0.1	0	0
WF	Riparian	0.4	0	0
WG	Riparian	0.1	0.1	0.1
WH	Riparian	0.1	0	0
WI	Riparian	0.6	0	0
WJ	Riparian	0.3	0	0
WK	Riparian	2.7	0	0
WL	Riparian	0.4	0	0
WM	Riparian	0.1	0	0
WN	Riparian	0.3	0	0
WO	Riparian	0.1	0	0
WP	Riparian	0.6	0	0
WQ	Riparian	0.2	0	0

WR	Riparian	1.0	0	0
WS	Riparian	0.1	0.1	0.1
WT	Riparian	0.2	0.2	0
WU	Riparian	0.1	0	0
WV	Riparian	0.1	0	0
WW#	Riparian	0.4	0	<0.1
WX	Riparian	0.3	0.2	0.1
	Total	9.4	0.8	0.4

**Slope stake limits plus 40 feet using 15 percent design, rounded to the nearest 0.1 acre*

***Slope stake limits plus 25 feet using 25 percent design, rounded to the nearest 0.1 acre*

Wetland information/location Source: NCDOT, Natural Resources Technical Report, 2016

Impacts to wetland WW were determined to be 0.01 acres based on slope stake limits plus 25 feet.

After the completion and submittal of the 15 percent Roadway Plans and Preliminary Design Assumptions, Division 10 requested that Back Creek Church Road be designed using superelevation instead of the AASHTO low-speed urban (normal crown) criteria preferred by the City of Charlotte and agreed to during the functional design phase. Utilizing superelevation allowed for revisions to the horizontal alignment to minimize parallel stream impacts.

Summary of specific stream impact changes are summarized below and in Table 1:

Stream SB

Based on current designs, it is anticipated that the edge of pavement on NC 49 will be held at the crossing of Stream SB. However, buffered slope stake limits show a 25-foot impact not previously shown in the previous impact calculations. It is anticipated that this impact will not be realized in final design.

Stream SC

Some reduction was caused by reducing slope stake limits buffering from 40 feet to 25 feet. In addition, slopes in the vicinity of this stream were reduced to 2:1 in the updated design. During updated preliminary designs, the project team identified a conflict between one of the proposed Back Creek Bridge end bents and stream SC, an unnamed tributary (UT) to Back Creek. After evaluation and coordination amongst the project team, NCDOT directed HNTB to revise the -Y4- Back Creek Church Road alignment to the east to avoid the impacts to SC. This moved the structure away from the confluence of SC with Back Creek, reducing stream impacts as well as limiting potential scour of bridge piers if the channel migrated in this location. Although the facility was relocated towards the proposed Back Creek Park, the profile was lowered to minimize park impacts.

Stream SL

In this area, the reduction was caused by reducing slope stake limits buffering from 40 feet to 25 feet. Impacts are associated with the previously agreed upon culvert at this location.

Stream SM

Some reduction was caused by reducing slope stake limits buffering from 40 feet to 25 feet. Slopes were also reduced to 2:1 based on geotechnical data, and the superelevation design also reduced stream impacts. The design had previously shifted prior to CP 3 to minimize impacts to this parallel stream, and this shift caused a more defined reduction of impacts using slope stake limits plus 25 feet.

Wetland impact changes are summarized below and in Table 2:

Wetland WB

The noted reduction in wetland impacts is largely caused by the reduction of slope stakes limits.

Wetland WG

No reduction of impacts to the wetland are noted in the revised design.

Wetland WS

No reduction of impacts to the wetland are noted in the revised design.

Wetland WT

The revised design avoids impacts to this wetland.

Wetland WW

The revised design impacts 0.01 acres of this wetland.

Wetland WX

The noted reduction in wetland impacts is largely caused by the reduction of slope stakes limits. However, it should also be noted that this wetland is largely within railroad right of way and it is not anticipated that the final design will encroach upon railroad right of way in this area.

APPENDIX

- Figure 1 Project Vicinity
- Figure 2 Environmental Features for Alternative 1 (Yellow Option)
- Figure 3 Jurisdictional Features Map
- Figure 4 Potential Park Impacts Map
- Signed CP1, CP2, and CP2A, and CP 3 Concurrence Forms