



VII. PROJECT REQUIREMENTS

PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT) seeks \$156 million in Multimodal Project Discretionary Grant (MPDG), INFRA or Mega, funds to maintain the project schedule for the shovel ready 321 CONNECT (Calibrating Our National Network to Encourage Commerce and Tourism) project between Gastonia and Lenoir, North Carolina. The funding will allow NCDOT to move forward with 2024 - 2033 State Transportation Improvement Program (STIP) project U-4700. Due to costs, the project has been split into multiple construction phases. U-4700A will improve US 321 from US 70 to US 321 Business in Hickory and is the only funded phase in the current STIP. MPDG funds will allow for the construction of NCDOT STIP project U-4700A, which has already been delayed due to escalating materials costs, to move forward. MPDG funding will allow NCDOT to construct critically needed improvements to US 321 in this western Piedmont area, including the replacement of two aging, functionally obsolete bridges over the Catawba River. MPDG funding will also allow the installation of broadband from Gastonia in Gaston County to Lenoir in Caldwell County, addressing critical educational and commercial needs.

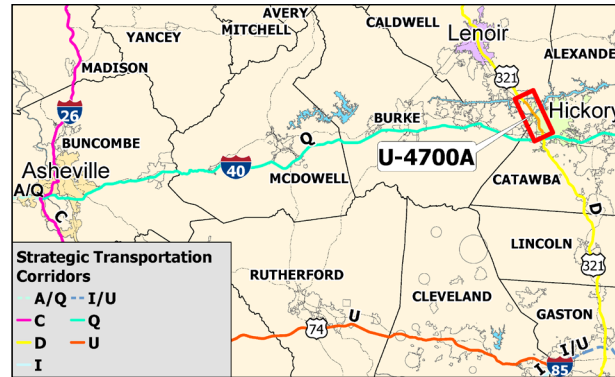


Figure 1: NCDOT Strategic Transportation Corridors

REQUIREMENT 2: COST EFFECTIVENESS

USDOT has established clear guidance to applicants to ensure that federal expenditures should lead to greater benefits than the proposed cost of the project. NCDOT details in the [Benefit-Cost Analysis \(BCA\) Narrative](#) and proves through the [BCA Calculations](#) that the 321 CONNECT project yields substantial benefits to North Carolina and the rest of the nation, with a calculated **Benefit-Cost Ratio of 1.53**. Please refer to the BCA submittals for additional details.

REQUIREMENT 1: NATIONAL OR REGIONAL BENEFITS

321 CONNECT will improve US 321, which is part of the National Highway System and is classified as a North Carolina Strategic Transportation Corridor (Corridor D). As shown in Figure 1, Corridor D connects I-85 and I-40 to northwestern North Carolina (the Boone area and points north and west). The facility is an important freight and tourism corridor.

CAPITAL COSTS	\$265,445,000
PROJECT COSTS (NPV 2021)	\$156,456,544
TOTAL NET BENEFIT	\$443,487,245
TOTAL NET BENEFIT (NPV 2021)	\$239,299,697
BENEFIT-COST RATIO	1.53



REQUIREMENT 3: MEETS HIGHWAY PROGRAM GOALS

321 CONNECT meets multiple goals of the Highway Program. Please refer to the Project Outcome Criteria for additional information.

- **Safety** - demonstrated under Criterion 1, 321 CONNECT is anticipated to reduce vehicular total crashes and fatalities and provide safer crossing options for bicyclists and pedestrians.
- **Infrastructure Condition** - demonstrated under Criterion 2, 321 CONNECT will replace structurally deficient bridges with new structures that fully meet current design standards and are anticipated to require minimal maintenance for the next 50 years. In addition, the proposed ITS installation provided by 321 CONNECT is designed to accommodate the future needs of automated/connected vehicles without the need for costly upgrades. The project will also install needed drainage infrastructure improvements.
- **Congestion Reduction** - congestion reduction is highlighted under Criterion 1 and quantified in the BCA. Based on the National Transportation Dashboard Mobility Indicator, the 219 miles of National Highway System roadways in the Hickory Urban Area experienced 1,356 hours of truck delay in 2022. The Dashboard estimates that in 2022, the cost of congestion for the Hickory Urban Area was over \$21.8 million. It is anticipated that 321 CONNECT will improve level of service for US 321 throughout the project corridor.
- **System Reliability** - demonstrated under Criterion 1, removal of the at-grade train crossing improves system reliability. The project will also replace a grade separated Norfolk Southern (NS) Railroad crossing over US 321 with a new structure. This will ensure that the NS line will need minimal maintenance for the foreseeable future. Under Criterion 2, the application notes how maintaining this critical route in a state of good repair is vital for system reliability. The reliability of the system is also demonstrated under Criterion 4 as the proposed changes make the facility more resilient.
- **Freight Movement and Economic Vitality** -

demonstrated under Criterion 3, 321 CONNECT will add capacity to a North Carolina Strategic Transportation Corridor.

- **Environmental Sustainability** - demonstrated under Criterion 2 and Criterion 4, 321 CONNECT will construct more sustainable bridges over the Catawba River, install a flood gauge on Frye Creek and upgrade drainage structures along the US 321 corridor. NCDOT Divisions 11 and 12 encourage the use of recycled asphalt, recycled concrete as aggregate material and warm mix asphalt, as appropriate.
- **Reduced Project Delivery Delays** - 321 CONNECT would ensure that NCDOT can deliver the U-4700A project as scheduled, as the risk of delay due to increasing cost of materials will be mitigated.



Figure 2: View of Catawba River Bridges Looking East

REQUIREMENT 4: PRELIMINARY ENGINEERING

321 CONNECT can begin construction within the designated timelines for the INFRA program. The Environmental Assessment for U-4700 was finalized in February 2016 and the FONSI was completed in Fall 2017. ROW designs were completed in 2018 and included hydraulic and utility design, work zone traffic control, hazardous material site assessments, and geotechnical investigations. Partial right of way (ROW) acquisition was initiated in 2019. Construction costs for the project were updated in January 2023. Construction Let (contract award) for U-4700A is programmed in the STIP for 2026.



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Broadband installation for 321 CONNECT can be processed through a Categorical Exclusion and the vast majority of the work will be within existing NCDOT ROW. NCDOT has extensive experience in moving through the environmental documentation, permitting (if needed) and construction process on multiple broadband installation projects.

It should also be noted that NCDOT has worked extensively with resource agencies to ensure the project can be rapidly permitted. For example, because the northbound bridge over the Catawba River will be maintained and converted to a bicycle pedestrian facility, NCDOT has agreed that the replacement bridges will match the current span dimensions in the river. While this increases the overall cost of the project, it will ensure a consistent pier spacing that will maintain boater expectations as they cross under the three bridges.

REQUIREMENT 5: STABLE AND DEPENDABLE FINANCIAL PLAN

U-4700A is currently programmed for construction in the STIP in 2026. Were 321 CONNECT to be awarded funding under the MPDG, construction would be advanced to begin within 12 months of obligation. The Financial Plan for the project is included with this application.

REQUIREMENT 6: IMPACT OF FEDERAL FUNDING

321 CONNECT would significantly advance the construction timeline of U-4700A. Costs have continually risen for the project based on materials costs as well as site constraints for ROW in Hickory, replacement of a Norfolk Southern railroad bridge over US 321, the costs of the grade separation over the Caldwell County Railroad (CWCY) line just south of the Catawba River, and the need to replace both bridges over the Catawba River. Any advancement of the project will provide the benefits described more quickly and will reduce maintenance needs for the bridges and other parts of the corridor. In addition, without MPDG funding, the proposed ITS and broadband construction cannot proceed. Pushing

off these necessary improvements will not only delay immediate safety improvements, it will ensure that the ultimate needed upgrades of the US 321 corridor to implement automated/connected vehicle infrastructure will be even more costly.

This section is continued on Page 4.

REQUIREMENT 7: 18 MONTHS TO BEGIN CONSTRUCTION

321 CONNECT has completed ROW design and is ready to finalize ROW acquisition, complete designs for construction and permitting. Construction will begin within the allotted timeline.

TABLE 3. PROJECT SCHEDULE	
Month 0	MPDG Funding Obligated
U-4700A	
Month 6	Permitting Complete
Month 12	Letting Complete
Month 16	Construction Initiation
Year 6	Construction Completion
Broadband ITS	
Month 6	Documentation/Permitting
Month 12	ITS Letting
Year 3	ITS Completion

REQUIREMENT 8: LEGAL, FINANCIAL, AND TECHNICAL CAPACITY

NCDOT has a long history of successful project delivery. The final roadway designs are included in the application as [supplemental materials](#). The financial plan, as discussed in Requirement 5, is in place. NEPA documentation is complete and the risks of the project are clearly defined and have been mitigated. NCDOT has successfully delivered many USDOT grant projects and is in the process of finalizing contracting for the I-85 FUTURES and STERLING projects, which were awarded MPDG funds in 2023.



REQUIREMENT 6: IMPACT OF FEDERAL FUNDING (CONTINUED)

MPDG funding is critically needed for this project. As shown in the Future Eligible Costs (Table 4), MPDG funds not only provide NCDOT with the ability to move forward with U-4700A improvements, it also supplies the only matching funds available for broadband installation.

TABLE 4. 321 CONNECT Future Eligible Costs				
ITEM	STATE FUNDS	OTHER FEDERAL FUNDS	MPDG FUNDS	TOTAL FUNDS
U-4700A				
Roadway	\$26,000,359	\$27,055,590	\$75,981,956	\$129,038,000
Structures	\$17,674,251	\$17,711,796	\$52,329,986	\$87,716,000
Contingency (16%)	\$7,001,109	\$7,015,981	\$20,728,909	\$34,746,000
Total	\$50,675,719	\$51,783,368	\$147,040,852	\$251,500,000
Flood Gauge	\$22,500		\$22,500	\$45,000
Broadband & ITS Installation				
Fiber	\$3,891,280		\$3,891,280	\$7,782,560
DMS	\$600,000		\$600,000	\$1,200,000
Cameras	\$275,000		\$275,000	\$550,000
5-Year O&M Costs	\$495,808		\$485,808	\$991,616
Program Costs	\$789,313		\$789,313	\$1,578,626
Contingency (15%)	\$907,710		\$907,710	\$1,815,420
Total	\$6,959,111		\$6,959,111	\$13,963,222
Combined Total	\$57,657,330	\$51,783,368	\$156,000,000	\$265,463,160



REQUIREMENT 9: DATA PLAN

This application presents detailed information on the proposed costs associated with the project, as well as appropriate contingencies. If selected for a Mega award, NCDOT will provide detailed information throughout the life of the grant on the project costs, the progress of the proposed broadband and ITS installation, and the integration of the project with the Hickory Trail network. The data plan is included in the application materials. In addition, the following information will be gathered and reported:

Measure — Travel Time Savings

- **Description:** Travel time savings for traffic measured during daily peak and off-peak traffic
- **Outcome Criterion:** Quality of Life
- **Measurement Frequency:** Quarterly
- **Measurement Location:** US 321 at US 70 to US 321 at Business 321 intersection
- **Projected Outcome:** Improved travel times

Measure — Bridge Condition Rating

- **Description:** The condition report of the bridges based on Bridge Inspection Reports
- **Outcome Criterion:** State of Good Repair
- **Measurement Frequency:** Biennial
- **Measurement Location:** US 321 northbound and southbound bridges over the Catawba River
- **Project Outcome:** Structures that are not rated as structurally deficient or functionally obsolete.

Supplemental Materials can be found on the [321 CONNECT website](#).