NORTH CAROLINA MPDG APPLICATION

MAY 2022

SAFETY

STATE OF GOOD REPAIR

ECONOMY

RESILIENCY

EQUITY

INNOVATION

I-85 FUTURES

North Carolina MPDG Application

I-85: FUnding Transportation Utilizing Resilient, Equitable Solutions (I-85 FUTURES)

BASIC PROJECT INFORMATION	
What is the Project Name?	I-85: FUnding Transportation Utilizing Resilient, Equitable Solutions (I-85 FUTURES)
Who is the Project Sponsor?	North Carolina Department of Transportation (NCDOT)
Was an application for USDOT discretionary grant funding for this project submitted previously?	(If Yes, please include project title and applicable grant programs) Yes, INFRA 2021
A project will be evaluated for eligibility for consideration for all three programs, unless the applicant wishes to opt-out of being evaluated for one or more of the grant programs.	__ Opt-out of Mega? __ Opt-out of INFRA? X Opt-out of Rural?
PROJECT COSTS	
MPDG Request Amount	Exact Amount in year-of-expenditure dollars: $259,000,000 ($2022)
Estimated Other Federal funding (excl. MPDG)	Estimate in year-of-expenditure dollars: $64,000,000 ($2022)
Estimated Other Federal funding (excl. MPDG) further detail	Other Federal funding from Federal Formula dollars: $64,000,000 ($2022) Other Federal funding being requested from other USDOT grant opportunities?: $0 From What Program(s)?:N/A
Estimated non- Federal funding	Estimate in year-of-expenditure dollars: $318,270,000 ($2022)
Future Eligible Project Cost (Sum of previous three rows)	Estimate in year-of-expenditure dollars: $646,270,000 ($2022)
Previously incurred project costs (if applicable)	Estimate in year-of-expenditure dollars: $12,660,151 ($2022)
Total Project Cost (Sum of 'previous incurred' and 'future eligible')	Estimate in year-of-expenditure dollars: $658,930,151 ($2022)
INFRA: Amount of Future Eligible Costs by Project Type	1) A highway freight project on the National Highway Freight Network: $646,270,000 ($2022) 2) A highway or bridge project on the Highway System: $646,270,000 ($2022) 3) A freight intermodal, freight rail, water (including ports), or intermodal facility and that is a surface transportation infrastructure project necessary to facilitate direct intermodal interchange, transfer, or

INFRA: Amount of Future Eligible Costs by Project Type (cont'd)	access into or out of the facility: $0 4) A highway-railway grade crossing or grade separation project: $0 5) A wildlife crossing project: $0 6) A surface transportation project within the boundaries or functionally connected to an international border crossing that improves a facility owned by fed/state/local government and increases throughput efficiency: $0 7) A project for a marine highway corridor that is functionally connected to the NHFN and is likely to reduce road mobile source emissions: $0 8) A highway, bridge, or freight project on the National Multimodal Freight Network: $0
Mega: Amount of Future Eligible Costs by Project Type	1) A highway or bridge project on the National Multimodal Freight Network: $0 2) A highway or bridge project on the National Highway Freight Network: $646,270,000 ($2022) 3) A highway or bridge project on the National Highway System: $646,270,000 ($2022) 4) A freight intermodal (including public ports) or freight rail project that provides public benefit: $0 5) A railway highway grade separation or elimination project: $0 6) An intercity passenger rail project: $0 7) A public transportation project that is eligible under assistance under Chapter 53 of title 49 and is a part of any of the project types described above: $0 8) A grouping, combination, or program of interrelated, connected, or dependent projects of any of the projects described above: $0
Rural: Amount of Future Eligible Costs by Project Type	N/A
PROJECT LOCATION	
State(s) in which project is located	North Carolina
INFRA: Small or Large project	Large
Urbanized Area in which project is located, if applicable	Gastonia, NC-SC Urbanized Area
Population of Urbanized Area (According to 2010 Census)	169,333
Is the project located (entirely or partially) in Area of Persistent Poverty or Historically Disadvantaged Community?	CT 309.01, 309.02, 310.01, 312.01, 312.02, 313.02, 314.01, 315, 316, 318, 319, 320, 321, 322, 323.01, 323.02, 326, and 327.03

Is the project located (entirely or partially) in Federal or USDOT designated areas?	Opportunity Zones: Yes. The I-85 FUTURES corridor includes the following Opportunity Zones from east to west : 37071032200, 37071031302, 37071031401, 37071032000, 37071031900, 37071031500, 37071031600, and 37045950500. Empowerment Zones: No. Promise Zones: No. Choice Neighborhoods: No.
Is the project currently programmed in the: • TIP • STIP • MPO Long Range Transportation Plan • State Long Range Transportation Plan • State Freight Plan	Yes. STIP Project No. I-5719, I-85 Widening; Gastonia, Cleveland, Lincoln MPO, Metropolitan Transportation Plan (LRTP), included as I-85 Widening from NC 273 to US 321;

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Supplemental Materials are available online at: https://connect.ncdot.gov/resources/INFRA2022-I85/Pages/default.aspx

UEI Number: XSN8A4TT1DY5

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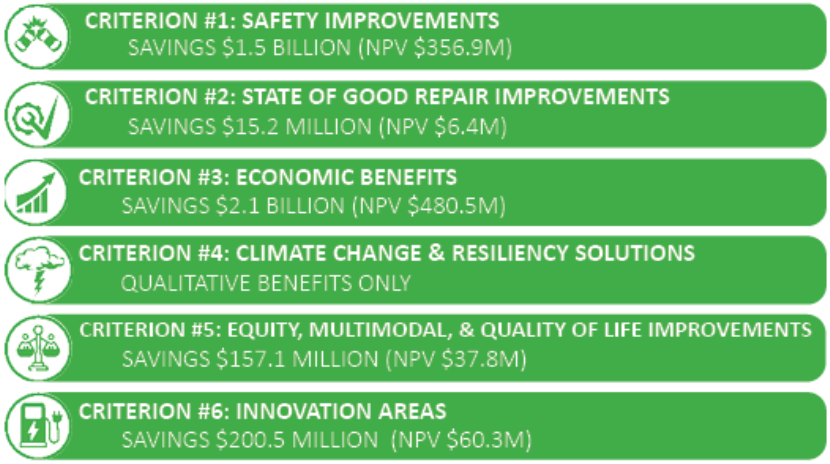
1. PROJECT DESCRIPTION

I-85 FUnding Transportation Utilizing Resilient Equitable Solutions (I-85 FUTURES) focuses on I-85 from the North Carolina/South Carolina state line to Charlotte, NC. This portion of I-85, from Charlotte, NC to Atlanta, GA has been dubbed "Charlanta," and powers the nation's third largest economic region and is a major travel route moving people and goods. Further, I-85 serves as the redundant north-south route to I-95 through the state. This route also serves as a critical east-west link between the State's largest metropolitan area and tourist destinations in the NC mountains, including Great Smokey Mountains National Park, the Blue Ridge Parkway, Dupont State Forest, Cherokee, and many others. Locally, it serves as a primary facility for residents and businesses providing direct access to freight rail and the Charlotte-Douglass International Airport. The I-85 facility, when completed in 1965, split existing communities, creating inequities that still need to be addressed. Due to recent increases in right-of-way and construction costs, Multimodal Project Discretionary Grant (MPDG) funds are needed to allow the North Carolina Department of Transportation (NCDOT) to improve access for all modes of transportation through the corridor, improve the efficiency and effectiveness of the network, and install broadband and electric vehicle (EV) charging stations. Through the combined use of state and federal funds, this vital part of our nation's infrastructure will support the transition to a more sustainable future.

The I-85 FUTURES project will provide a substantial return on the requested grant investment. **The Benefit Cost Analysis (BCA) anticipates a return of 2.32. Total benefit savings are $4 billion with a 2020 net present value (NPV) of $907 million.**



The combination of through and commuter traffic on I-85 has led to congestion and safety concerns, particularly in the section between US 321 in Gastonia to just east of NC 273 in Mount Holly, approximately 10 miles. With its current traffic demand, this section of I-85 is at or approaching capacity and is anticipated to operate over capacity by design year 2045. To address these deficiencies, NCDOT, in cooperation with the Federal Highway Administration (FHWA), has proposed improvements to I-85 including widening the road from six to eight lanes. The proposed project is fiscally constrained in the 2020-2029 State Transportation Improvement Program (STIP) as Project Number I-5719 and is referred to as the "I-5719 Project" throughout this proposal. Recent cost estimate increases have jeopardized the delivery of this critical project

in future STIP iterations due to the "corridor cap", which is described in detail in Section 4. This proposed I-85 FUTURES project would provide the funding to keep the I-5719 Project moving forward, while also providing broadband, ITS, and resiliency improvements from the NC/SC border to Kings Mountain.

I-85 EASTBOUND COMMUTER TRAFFIC

1.1 Transportation Challenges and Proposed Solutions through I-85 FUTURES

ROADWAY

CHALLENGES

Based on US Census data the population of the Charlotte-Concord-Gastonia, NC-SC Metropolitan Statistical Area (MSA), which includes I-85 FUTURES, has grown by approximately 54 percent from 2010 to 2020. The Gastonia, NC-SC Urbanized Area (UZA) has grown by almost 24 percent. This growth is largely attributed to the exponential growth of the City of Charlotte and Mecklenburg County. This growth has increased pressure on an already strained transportation network.

The average annual daily traffic (AADT) of 89,342 vehicles per day (vpd) travel I-85 from the NC/SC state line to the Catawba River. However, within the limits of the I-5719 Project, the AADT is approximately 128,800 vpd. The truck percentage (2015 %TTST flow) through the I-5719 Project ranges from 15 to 17 percent. These heavy traffic conditions occur daily, resulting in frequent congestion and delays that hinder east-west mobility within central and eastern Gaston County. Currently, drivers traveling north from South Carolina have little warning about the congestion and delay caused by heavy traffic or crashes in Gaston County. Early notification would enable drivers to access US 74 at Kings Mountain (Exit 10B), which serves as the closest parallel route to I-85. I-85 south of Kings Mountain lacks broadband and other critical ITS infrastructure, which will become increasingly needed as the vehicle fleet transitions to accommodate automated/connected vehicles.

The I-85 corridor also impacts those who lack access to vehicles. Construction of the highway in the 1960s created a barrier to north-south mobility. While some minor sidewalk facilities are provided, they do not connect to a larger network; area residents have few options for crossing I-85 to access goods and services. This is an acute issue through the I-5719 Project corridor, where the number of zero or one car households is over 50 percent of the total population for the US Census Tracts along the I 5719 Project. This lack of accessibility compounds historic impacts the facility has had on area communities.

Congestion experienced along I-85 within the I-5719 Project area is not only a function of capacity deficiencies, but also roadway deficiencies. The freeway and interchanges in this section of I-85 have substandard design elements such as poor sight distances, narrow median shoulders and poor entrance/exit ramp designs. Several bridges are classified as functionally obsolete, and nearly all structures over I-85, within the I-5719 Project area, do not have the horizontal or vertical clearance required to accommodate widening improvements.

Due to its statewide and regional importance, I-85 is designated as a Strategic Transportation Corridor (STC) (Corridor I) by NCDOT. The existing I-85 FUTURES corridor is designated as part of the National Highway System's (NHS) Strategic Highway Network (STRAHNET). Both designations call for this corridor to serve high-speed regional travel. The existing and projected poor levels of service (LOS) along the I-5719 Project study corridor diminish the roadway's ability to function as part of the STRAHNET. Congestion and frequent crashes on I-85 also inhibit regional travel and reduce the ability of I-85 to function as a STC.

SOLUTIONS

The purpose of the proposed improvements for the I-5719 Project is to reduce congestion and improve mobility along the corridor. To do this, I-85 will be widened to eight lanes, plus auxiliary lanes, as needed, for the interchanges. Safety will be improved by bringing the interstate up to current design standards, through improved acceleration and deceleration lanes for interchanges, the addition of auxiliary lanes where appropriate, improved vertical curves, revised horizontal curves, widened median shoulders, and improved median barriers.

The structures will be replaced at five interchanges, six overpasses, and four railroad crossings to accommodate the interstate widening and because many of the structures are functionally obsolete. The interchange configurations will be modified to accommodate the increased traffic capacity and improve sub-standard geometry. In addition to all roadway bridges spanning up to a future ten-lane section (including auxiliary lanes), the typical sections of these intersecting grade-separated roads also include bicycle and pedestrian accommodations.

The I-85 FUTURES project will address historic impacts that area communities have faced since the 1960s. The project would add about 9 miles of active transportation with a mix of sidewalks, bike lanes, and multi-use paths across 12 structures over I-85 within the I-5719 Project limits. This will increase access to transit, including Gastonia bus routes, employment opportunities, medical care, as well as goods and services.

Because I-85 is an important north-south backup to I-95, it is imperative that it be resilient. While the I-85 FUTURES corridor was built predominantly on a ridge, the surrounding roadway network experiences flooding. For example, in February 2020, multiple facilities required repairs due to flood damage, with a total cost of approximately $671,000. This example highlights long-term resiliency concerns in the project corridor and demonstrates the importance of I-85 as a parallel route. In addition to verifying that the I-5719 Project can withstand extreme weather events, including localized flooding due to stormwater, I-85 FUTURES will also address resiliency on the I-85 corridor through additional hydraulic monitoring systems and a Flood Risk and Vulnerability Assessment.

The proposed ITS improvements south of Kings Mountain may enable the implementation of Active Traffic Management and Quick Clearance strategies and more efficiently detect safety risks. These strategies may reduce the likelihood of chain-reaction crashes and improve the efficiency of traffic movement through the corridor.

RAILROAD

CHALLENGES

There are two railroads operating within the I-5719 Project area, Norfolk Southern Railway (NSR), a Class I freight railroad, and the Piedmont and Northern Railway (P&N), a short line. Each railroad has two existing bridges over I-85 within the project limits. The general location of these railroads is shown in Section 4, Criteria 3 - State of Good Repair. The NSR Coastal Division mainline is parallel to NC Highway 7 and crosses I-85 twice as it passes through the Cities of Gastonia and Lowell, the Towns of McAdenville and Cramerton, and the City of Belmont. This corridor is NSR's main east coast route from New Orleans, LA and Atlanta, GA to Washington, DC and the northeast. It handles approximately 25 to 30 freight trains per day at speeds up to 60 mph. In Belmont, NSR has a spur that serves a Duke Energy power plant. The other line goes across the Catawba River into Mecklenburg County.

NSR MAINLINE ADJACENT TO GROVES ST.

The Amtrak Crescent service operates two passenger trains running from New York, NY to New Orleans, LA on the NSR mainline through the project limits and from Atlanta, GA to Washington, DC at speeds up to 79 mph. The NSR mainline in the I-5719 Project is also part of the Southeast Corridor (Washington DC/Raleigh, Greensboro/Charlotte) to improve passenger rail service. An extension of the existing Piedmont train service from Charlotte to Kings Mountain and/or commuter rail service has also been studied along the NSR mainline. To introduce expanded passenger service, it is likely that additional capacity (tracks) would be needed to protect NSR existing/future freight needs as well as provide reliable passenger train service.

Both of the NSR bridges over I-85 were built in the 1960s (Bridge 350132 in 1963 and Bridge 350138 in 1961) and are approaching the end of their design life.

The P&N mainline starts in the center of Gastonia and runs through Ranlo, Lowell, and Belmont to Mount Holly. The P&N operates on an NCDOT-owned corridor and interchanges with NSR in Gastonia and CSX in Mount Holly. NCDOT also owns a spur that diverges from the mainline in north Belmont and runs south into downtown Belmont crossing over I-85. This spur is not currently under lease to the P&N but is being preserved for future use. The railroad bridge over I-85 was built in 1961 and is also nearing the end of its design life.

The Charlotte Inland Port serves the I-85 and I-77 corridors and has connections to CSX rail, providing next day transit between Charlotte and the port of Wilmington. With 20 acres, 10 of which are already developed, the port can accommodate 2,000 grounded/wheeled containers. It also provides container yard operations to ocean carriers and serves as a staging area for empty and loaded containers with maintenance and repair service from an on-site vendor.

SOLUTIONS

The four railroad bridges that will be replaced as part of the I-5719 Project will accommodate the needs of the I-85 corridor while providing long-term stability for the local freight network. The new bridges will be designed to accommodate potential future track as projected by NSR to increase their freight service. In addition, improvements to the existing NSR rail yard are also proposed, which will improve rail operations and efficiency, reducing operations costs moving forward.

INNOVATIVE IMPROVEMENTS

CHALLENGES

Access to data is a critical component of life in the United States. The Brookings Institute noted, "Increasing access and usage of broadband infrastructure in rural areas (and the amenities, digital skills, online education, and job search opportunities that come with it) lead to higher property values, increased job and population growth, higher rates of new business formation, and lower unemployment rates." In Cleveland County, less than 70 percent of households have a home PC and broadband internet subscriptions. This has contributed to the challenges historically disadvantaged groups face in this area. Additionally, the lack of broadband limits the connectivity of ITS infrastructure south of US 74 in Kings Mountain.

HOMES WITHOUT A PC/INTERNET

SOLUTIONS

In promoting universal access to telecommunications services in rural and high-cost areas, Telecommunications Act of 1996 (TCA) included among its universal service principles: "Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high-cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas." Rural communities tend to be both high-cost (especially regarding middle-mile and last-mile interconnection costs) and serve a low-income population. TCA directs the FCC to work toward equalizing access to telecommunications by rural communities that are frequently unserved or underserved by advanced telecommunications services such as broadband.

In addition, on March 14, 2019, Governor Roy Cooper signed NC Executive Order (EO) 91, which established a task force on Connecting North Carolina, Promoting the Expansion of Access to High-Speed Internet, and Removing Barriers to Broadband Infrastructure Installation. Actions under the policy include supporting the deployment of last-mile broadband infrastructure, developing a uniform Dig Once policy to reduce repeated broadband installation excavations, and increasing student access to internet at affordable prices. Currently, NCDOT is constructing broadband installations at multiple sites, including under STIP Project HO-0002A - US 74 from I-40 in Asheville to I-77 at I-485 in Charlotte. I-85 FUTURES would expand on these efforts.

According to EO 246, signed by Governor Cooper in January 2022, a primary goal in North Carolina is to increase the number of registered zero emission vehicles (ZEVs) in the state to at least 1.25 million by 2030. ZEVs reduce greenhouse gas (GHG) emissions by upwards of 60 percent if powered by today's utility resources – and this percentage will only increase as our electric grid becomes cleaner and more efficient – ultimately reaching 100 percent if the vehicle is charged on renewable energy. The Order also requires the development of a Statewide Clean Transportation Plan, due April 2023, that includes an update to the ZEV plan.

A key to meeting the goals of EO 246 is to strategically deploy publicly available charging stations

across the state. Without such access, owners of EVs will be hesitant to travel further than the range provided by their at-home or work charging stations. Currently, the nearest DC fast-charging station options that meet the National Electric Vehicle Infrastructure (NEVI) deployment criteria are the Sam's Club Store Number 8278 site in Greenville, South Carolina and the Walmart Store Number 2134 site in Charlotte, North Carolina. These sites are 101 miles apart as shown on the map in supplemental material. The median travel distance on a charge has steadily increased in the past few years. Based on data from energy.gov, the median driving range for all-electric vehicles for model year 2020 was 250 miles. I-85 FUTURES would add new DC fast charging ports to reduce travel distance between chargers along this section of I-85.

The I-85 FUTURES Project will use a multi-faceted approach that employs Six Dimensions of Innovation, as discussed under Criterion 6. The improvements would provide ITS infrastructure throughout the I-85 FUTURES project limits, creating an integrated, resilient ITS corridor that allows connections to both South Carolina and Charlotte to be easily integrated.

1.2 Project History

I-85 is a major thoroughfare that extends 668 miles from Montgomery, Alabama to Petersburg Virginia, where it merges with I-95. It links Gastonia and Charlotte with Greensboro, Raleigh/ Durham, and Richmond to the north and Spartanburg, Greenville and Atlanta to the south. In Gaston County, the construction of I-85, completed in 1964, brought immediate benefits to residents in North and South Carolina and to the nation at large. FHWA noted that "An article in the Columbia State and Record, December 8, 1963, pointed out that land values in Greenville County had doubled in 10 years, with most of the increase occurring along I-85. It had already brought an automobile company with a $300,000 plant to the area and a $2 million shopping center….The boom was so strong that by 1966, businesses along I-85 had one complaint: not enough workers. An article in The New York Times, July 8, 1966, reported: An industrial boom is advancing along the fringes of Interstate Highway 85 from Danville, VA., to Atlanta. It is bringing new prosperity to the region, but it also has caused a severe labor shortage. This labor scarcity, in turn, is spurring a variety of social changes, along the four-state route. Employers report marked improvements in working conditions and wages and new strides in integration …."

FLATS COMMUNITY HISTORICAL MARKER

But these improvements were not without a cost. First incorporated in 1879, the City of Lowell grew to approximately 2,748 residents according to the 1962 U.S. Census. The small African American community in Lowell, known as "The Flats", included a scattered grouping of rental housing anchored by Wright's Chapel A.M.E. Zion Church. The boundaries of "The Flats" were South Main Street, Henderson Street, Branch Street, Kenworthy Street, Cobb Street, Reid Street, Gist Street and Odum Drive. When I-85 was constructed, it splintered the community. The interstate was built just 500 feet south of Wright's Chapel A.M.E. Zion Church. Cobb Street was split by I-85 and Odum Drive was terminated at the interstate. While South Main Street was grade separated from I-85, the road did not have access to I-85, limiting any potential benefits of the facility to the community and cutting off Wright's Chapel from residents south of the facility.

While I-85 has been an integral part of the Nation's economy, the current facility does not meet

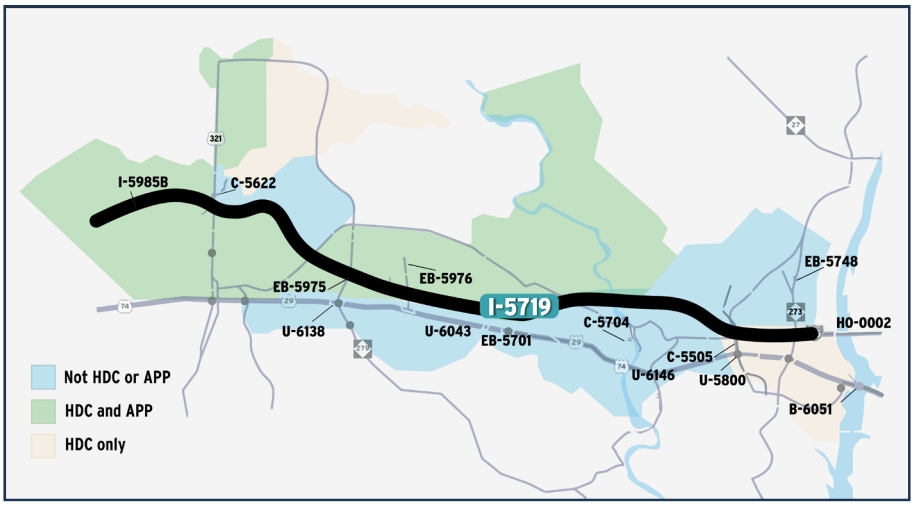
current design criteria, structures are below current height standards, and the facility is frequently congested. In 2006, a feasibility study was completed that evaluated potential improvements to the intersection of I-85 and US 321, which were recently completed in 2021. In 2013, the City of Gastonia passed a resolution of support for the expansion of I-85 from NC 273 (Exit 27) to the US 29/74 interchange (Exit 10B) and adding an additional lane to the northbound ramp to Cox Road (Exit 21). In 2014, GCLMPO identified improvements to I-85 as a top-priority project. In 2015, the project was included in the STIP with its current project limits, and planning and environmental studies were funded.

1.2 Previously Incurred Costs

Based on the NCDOT 2020-2029 STIP, previously incurred costs for I-85 FUTURES, including the I-5719 Project, based on Preliminary Engineering, are $12,660,151, as of May 2022.

1.3 Project's Place in the Grand Scheme of Other Infrastructure Investments

The I-5719 Project is one of a number of planned transportation improvements in NCDOT's Division 12. These improvements include upgrades to the parallel route of US 29/74, which acts as a pressure release valve to I-85 during periods of congestion or rerouting due to crashes. Improvements to US 29/74 also include bicycle and pedestrian infrastructure improvements, which allow for additional active transportation options. These projects, combined with I-85 FUTURES, expand and more importantly connect active transportation infrastructure in the project area, increasing access to bus routes, jobs, food, and other critical resources.

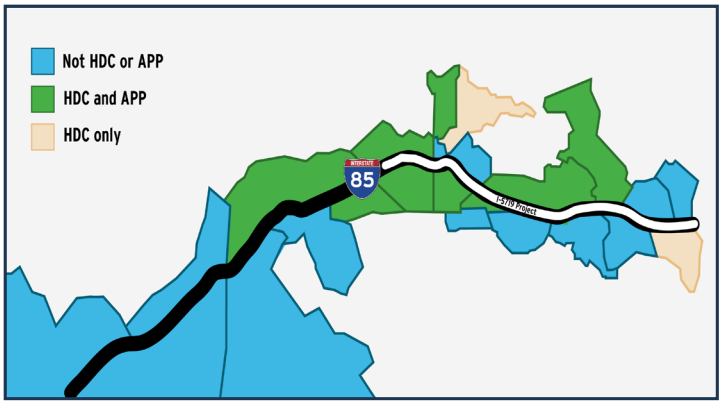


PROJECTS IN THE VICINITY OF I-5719 PROJECT

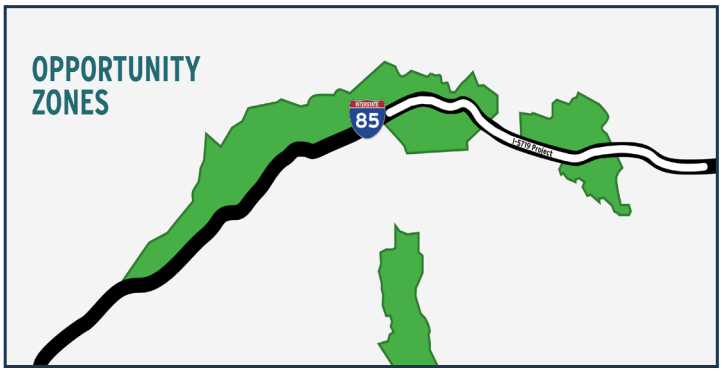
2. PROJECT LOCATION

The I-85 FUTURES project location is the I-85 corridor from the NC/SC state line in Cleveland County through Gaston County to the Catawba River. The I-5719 Project extends from US 321 in Gastonia to NC 273 in Mount Holly and is located in the Gastonia, NC-SC Urbanized Area. Portions of I-85 FUTURES are also included in Areas of Persistent Poverty (APP) and Historically Disadvantaged Communities (HDC) as well as federally designated Opportunity Zones. Based on 2019 data from the American Community Survey, approximately 50 percent of the

population resides in census tracts that meet HDC criteria and 41 percent reside in tracts that meet both APP and HDC criteria.



CENSUS TRACTS MAP WITH APP AND HDC CRITERIA



Census Tracts Along I-85 with APP/ HDC Status
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327.03

3. PROJECT PARTIES

The official applicant of this request for funding through the MPDG Program is the NCDOT. NCDOT will be coordinating with the US Department of Transportation (USDOT) and FHWA to ensure that all federal and state guidelines and requirements are met and that I-85 FUTURES remains consistent with state and regional planning and transportation objectives.

NCDOT is responsible for I-5719 Project financing. NCDOT Division 12 is responsible for construction management and oversight, which includes overseeing the I-5719 Project's Construction Engineering and Inspection (CEI) firm.

NSR is responsible for approval of final plans for the railroad track/roadbed design and structures carrying NSR-owned tracks over I-85. NCDOT is responsible for the construction of the new railroad roadbed and railroad bridge. NSR is responsible for building track once construction of the railroad roadbed and structure are completed and accepted by NSR. NCDOT is also responsible for demolition of the existing railroad bridge and any track components not salvaged by NSR.

The P&N and NCDOT Rail Division will be responsible for approval of final plans for the railroad track and bridge replacement on the P&N mainline in Gastonia. NCDOT Rail Division will be responsible for approval of the final plans for the track and bridge replacement on the P&N spur in Belmont. NCDOT will be responsible for construction of the bridges, roadbed, track, and demolition of the existing trackage at these crossings.

Under the 2019 NCDOT Complete Streets policy, NCDOT is responsible for the cost of including bicycle and pedestrian facilities on the replaced structures over I-85. NCDOT will enter into agreements with the local municipalities transferring responsibility of maintenance costs. NCDOT is responsible for construction of the new multi-use path from just north of Belmont Abbey College along Belmont-Mount Holly Road to the intersection of US 29/74 and N. Main Street in Belmont. NCDOT is also responsible for replacing the railroad bridge carrying the P&N spur over I-85 to accommodate the railroad track and the adjacent multi-use path. Gastonia, Lowell, McAdenville, and Belmont have committed letters of intention to maintain the proposed multi-modal improvements, which are found in the supplemental information.

Additional letters of support for the I-85 FUTURES Project from area communities, businesses, and organizations also included in the supplemental information.

4. Grant Funds, Sources and Uses of Project Funds

North Carolina's Strategic Transportation Investments Act (STI) of 2013 requires that capital projects compete through a data-driven project prioritization process that considers, but is not limited to, cost and mobility improvements for each proposed project. The process has three major competition categories, Statewide Mobility, Regional Impact, and Division Needs. These categories are based on the proposed project's type of transportation asset class. STIP Project I-5719, was selected for funding through the Statewide Mobility category in the 2018-2027 STIP. The total project cost at that time was $387 million, with construction contract letting programmed for December 2023. With recent market challenges facing the industry, the project cost has increased over 60 percent to $624 million. This $237 million increase delivers a near fatal blow to the project due to a component of the STI law known as the Statewide Mobility corridor cap. The corridor cap limits the amount of funding that can be allocated along a continuous corridor in an effort to spread transportation investment throughout the state. The corridor cap is currently $525 million over 5 years.

In addition to the I-5719 Project, I-85 FUTURES, as a whole, adds resiliency, ITS, broadband and EV charging stations to modernize this corridor. However, it also increases the cost by another $22 million. NCDOT is requesting a total of $259 million to fully fund the I-5719 Project and the additional cost to improve this corridor through resiliency, ITS, broadband, and EV charging stations, which will benefit the historically underserved populations in Gaston and Cleveland Counties. This request prevents the I-5719 Project from exceeding the corridor cap since discretionary funds are not included as part of the corridor cap. Without the MPDG program, I-85

FUTURES will not go forward with the resiliency, ITS, broadband and EV charging stations to modernize this corridor and the I-5719 Project would likely have to be segmented into two projects with delivery uncertain.

I-5719 Remaining Costs ($2022)

- Remaining Right-of-way - $110,400,000
- Remaining Utilities - $71,000,000
- Remaining Construction - $442,800,000

Total **$624,200,000**

Source of Funds

ITEM	STATE FUNDS	OTHER FEDERAL FUNDS	MPDG FUNDS	TOTAL FUNDS
I-5719 (remaining)	$318,856,000	$64,000,000	$241,344,000	$624,200,000
Flood Risk and Vulnerability Assessment	$20,000		$80,000	$100,000
Flood Warning System	$20,000		$80,000	$100,000
EV Charging Station	$140,000		$140,000	$700,000
ITS/Broadband from SC State Line to US 74 and ITS only for I-5719				
Active Management	$908,000		$3,632,000	$4,540,000
Incident Management	$720,000		$2,880,000	$3,600,000
Statewide Resilience	$222,000		$888,000	$1,110,000
Fiber/Broadband	$1,024,000		$4,096,000	$5,120,000
Connected Vehicle Technology	$150,000		$600,000	$750,000
Traveler Information	$20,000		$80,000	$100,000
Design	$366,000		$1,464,000	$1,830,000
Construction Administration	$366,000		$1,464,000	$1,830,000
Contingency (15%)	$458,000		$1,832,000	$2,290,000
Total	***$323,270,000***	***$64,000,000***	***$259,000,000***	***$646,270,000***

**Amounts shown in 2022 dollars*

To account for risks related to construction, right-of-way, and utilities costs, NCDOT includes contingency fees on all construction cost estimates. Contingencies include:

I-85 FUTURES COMPONENTS	CONTINGENCY AMOUNT
Right-of-Way	70% contingency added to total right of way cost estimate
Utilities	25% contingency added for the relocation of utilities by owner
Construction	
Roadway Design	45% contingency added to functional design total
Structures/Utilities/ITS/Lighting	15% contingency added to total cost of these items
Engineering and Contingency	15% contingency added to overall total

5. Project Outcome Criteria

Criterion 1 – Safety

An in-depth strip analysis crash report was completed for the I-5719 Project over a 5-year period from June 1, 2016 to May 31, 2021. The crash analysis assessed all 5,237 crashes that occurred during this time, including a breakdown by crash type – fatal, non-fatal injuries and property damage only crashes (types A, B, and C). The analysis found that the I-5719 Project exceeded the statewide urban interstate average crash rates for total crashes, non-fatal crashes, night crashes, and wet weather crashes. Future Year No-Build and Build crash estimates were projected using a combination of monetized values per injury level.

FREIGHTWAVES, in a February 5, 2021 article, declared that I-85 was the most dangerous interstate for truckers. "Busy roads with many types of drivers can increase the odds for accidents, especially for truckers in bad weather. Certain interstate highways are particularly dangerous based on accident rates in recent years… According to the Fatality Analysis Reporting System (FARS), maintained by the National Highway Transportation Safety Administration (NHTSA), Interstate 85 is the most dangerous interstate for truckers. This was based on fatal accident statistics for all drivers that occurred in either rain or snow. The most recent numbers are from 2011 to 2015. Interstate 95 ranks second, Interstate 75 ranks third, Interstate 20 ranks fourth and Interstate 77 ranks fifth."

The I-5719 Project will greatly benefit the safety of drivers on the facility through improved acceleration and deceleration lanes for project interchanges, the addition of auxiliary lanes where appropriate, improved vertical curves, revised horizontal curves, widened median shoulders and improved median barriers. The I-85 FUTURES project will add critically needed ITS infrastructure south of Kings Mountain to the South Carolina state line. This will allow for increased driver notification opportunities, as well as assisting with Active Traffic Management approaches.

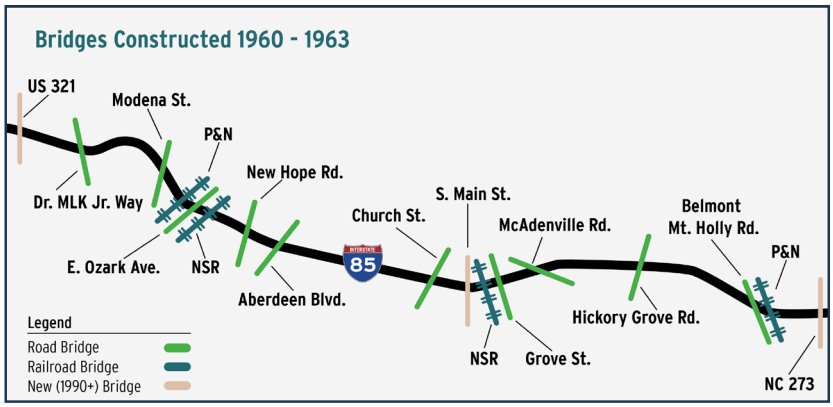
After a review of multiple Crash Modification Factors (CMFs) from the CMF Clearinghouse, it was determined that a 26 percent reduction in crashes for the I-5719 Project is a reasonable estimate based on CMF ID 8336 for widening and the multiple sub-standard features being revised to meet current standards. **The total safety benefit savings was found to be $1.5 billion, with a net present value in 2020 dollars of $336.5 million**.

Criterion 2 – State of Good Repair

There are 14 structures over I-85 within the I-5719 Project that were constructed prior to 1963. Replacing these aging highway and rail structures are a critical component of the proposed project, as they are reaching the end of their useful design life. As the 2017 collapse of the I-85 bridge in Atlanta has graphically shown, structure failures can cause a cascade of supply chain issues along this vital corridor. Other major bridges and culverts along I-85 will also be improved to accommodate the widening as well as to ensure future capacity for storm events.

To both accommodate the widening and due to the many functionally obsolete structures, the five interchanges, six roadway bridges and four railroad bridges will be replaced. In addition to all roadway bridges spanning a potential future ten-lane section, when including auxiliary lanes, the typical sections of these roads will also include bicycle and pedestrian accommodations. The interchange configurations will be modified to accommodate the increased traffic capacity and improve sub-standard geometry. Given the anticipated 75-year lifespan of new bridges, the proposed improvements should minimize maintenance and repair needs for this part of I-85 for the foreseeable future. The new bridges will require less frequent and less costly maintenance including

pavement preservation, bridge maintenance, and general maintenance, on I-85 to keep them in service relative to the current aging, deteriorating facility. **The total state of good repair benefit savings was found to be $19.2 million, with a net present value in 2020 dollars of $7.5 million.**



As noted in Section 3 the municipalities along the I-5719 Project have agreed to enter into maintenance agreements for the sidewalks and multi-use paths approaching the project structures. These agreements ensure that these critical improvements will be maintained.

Criterion 3 – Economic Impacts, Freight Movement and Job Creation

I-85 EASTBOUND, BELMONT

As noted in the Gaston Business Association letter of support, "One of the drivers for business relocations and expansions in [Gaston County] is the proximity to I-85. Issues related to the current and increasing congestion on this main corridor are negatively impacting business operations and overall economic growth on a daily basis. We fully support the I-85 FUTURES project as a means to alleviating these transportation challenges." The I-85 FUTURES Project will result in travel time savings for cars and freight vehicles in the vicinity of Gastonia, which typically has the heaviest congestion from South Carolina through the I-5719 Project area. Vehicle hours of travel – defined as total travel time in hours for passenger cars and trucks – were estimated for the No-Build and Build scenarios in both the opening year and design year (2045). The difference between these two scenarios provides the foundation to quantify the hours saved for passenger cars and trucks. Travel time savings benefits were estimated using total travel time saved by autos and trucks at a value of $17.80 per hour for passenger vehicles and $32.00 per hour for trucks. **This travel time savings is estimated to be $2.2 billion, with a net present value of $453.5 million**.

I-85 FUTURES will include fiber optic cable and ITS improvements in Cleveland County. The Project will connect to fiber optic cable installation secured as part of the US 74 INFRA Grant (2020) and extend to the NC/SC state line along I-85.

In addition to these benefits, it is anticipated that the increase in broadband accessibility will lead to some increase in property values in Cleveland County. According to Applied Economics (2019), "Results show that single-family homes with access to a 25 Mbps broadband connection have a price that is about $5,977, or 3%, more than similar homes in neighborhoods with 1 Mbps. The

rural premium is lower at $5,099. ”

Improvements to I-85 will provide greater consistency of freight movement through this portion of the I-85 corridor. This should provide additional incentives for the complete build-out of the Charlotte Inland Port. In August 2020, North Carolina Ports reported that construction upgrades at the port had doubled the container capacity of the inland facility by enabling the grounding of loaded and empty containers while improving cargo velocity and enhancing trucker experience with improved traffic flow. These upgrades coupled with NC Ports' enhanced next-day intermodal rail service, the Queen City Express, enabled the Ports Authority to double rail volume moving between the Port of Wilmington and Charlotte, North Carolina. This volume is expected to continue to grow as development within the facility is completed.

The I-85 FUTURES project will also support the planned expansion of lithium production in the Kings Mountain area by increasing travel time reliability through the corridor and increasing access to broadband for area residents, making it a more attractive area for tech workers. The Carolina tin-spodumene belt is one of the largest developed reserves of lithium in the world. While there are currently cheaper sources of these minerals, maintaining sufficient access to these resources allows the US flexibility when dealing with sometimes unreliable trading partners. In 2021, North Carolina secured a commitment from Toyota for the development of a ZEV car battery manufacturing facility at the Greensboro-Randolph Mega Site in Liberty, NC. More recently, VinFast announced the development of both batteries and two battery-electric SUVs in Chatham County. The ability to provide lithium to a battery manufacturer without overseas shipping costs could be a boon to the economy in the Kings Mountain area. Expanded mining opportunities and more stable employment may facilitate increased union membership.

By providing increased non-motorized crossing options through the project area, it increases the ability of residents north of I-85 to access transit routes south of I-85.

The proposed improvements also make the corridor more attractive for people in central North Carolina who wish to access parks and recreational facilities in western North Carolina, South Carolina, and Georgia.

Criterion 4 – Climate Change, Resiliency and the Environment

The completion of I-85 brought economic prosperity for much of the region; however, over time, traffic volumes have increased, leading to congestion along the corridor. These increases are primary contributors to the increase in air pollution and greenhouse gas emissions, which disproportionately effect the health and life expectancy of historically disadvantaged communities.

Although it may seem counterintuitive, increasing the capacity of I-85 through the I-5719 Project may improve air quality in the area. Studies show that slower moving traffic emits more pollution than when cars move at freeway speeds. Based on the I-5719 Traffic Analysis, under a No-Build scenario, the average speed during peak traffic is 51 mph in the AM peak (northbound) and 45.2 mph in the PM peak (southbound). Under the Build condition, average speed rises to 60.1 mph in the AM peak and 60.3 mph in the PM peak.

By improving the performance of this section of I-85, the hours of congested traffic in the Gastonia area will decrease compared with the No-Build condition, which should, in combination with the increase in EV usage, improve air quality along the project corridor.

To limit the impacts of climate change and its disproportionate effects on historically disadvantaged communities, North Carolina Governor, Roy Cooper, signed EO 80, North Carolina's Commitment to Address Climate Change and Transition to a Clean Energy Economy, on October 29, 2018. EO 80 directed the Department of Environmental Quality (DEQ), with support of other agencies and stakeholders, to prepare the North Carolina Climate Risk Assessment and Resilience Plan (2020 Resilience Plan). The EO also directed NCDOT, in coordination with DEQ, to develop the ZEV Plan to guide ZEV adoption in North Carolina. The ZEV Plan was finalized in October 2019 and recommended the establishment of interstate and intrastate ZEV corridors, the deployment of additional ZEV infrastructure and outlined best practices for increasing ZEV adoption in North Carolina. Establishment of I-85 as a ZEV corridor with ZEV infrastructure is further described under Merit Criterion #5: Potential for Innovation.

On January 7, 2022, Governor Cooper issued EO 246, North Carolina's Transformation to a Clean, Equitable Economy. In line with EO 80, EO 246 sets goals to reduce statewide GHG emissions to at least 50 percent below 2005 levels by 2030, increase the total number of registered ZEVs to at least 1,250,000 by 2030, and increase the sale of ZEVs such that they make up 50 percent of new vehicle sales by 2030.

EO 80 also called for cabinet agencies to develop State Climate Risk Assessment and Resiliency Plans that support communities and sectors of the economy most vulnerable to the effects of climate change and to enhance the State's ability to protect human life and health, property, natural and built infrastructure, cultural resources and other public and private assets of value to North Carolinians. In response to EO 80, DEQ enlisted subject matter experts to provide the current state of climate science and change, documented in the North Carolina Climate Science Report (NCCSR), September 2020. State agencies developing the 2020 Resilience Plan referenced the key findings and executive summary from the NCCSR to understand the historical and projected climate trends and how they will impact state assets, programs and services. The NCCSR further examined the potential impacts of climate change on the three ecoregions of North Carolina: mountains, coastal plain, and the piedmont region in which this project is located. The report concluded that the piedmont region will very likely face more extreme heat days, higher heavy precipitation days, and there is a high likelihood of severe thunderstorms and periodic droughts in the region due to climate change.

In its review of the Transportation sector, NCDOT determined the following "Critical Impacts and Resilience Strategies":

- Maintaining critical connections and access must be the immediate near-term priority
- All modes of transportation must be assessed for resilience to build adaptive capacity and redundancy moving forward
- NCDOT is committed to collaborating and partnering with communities and businesses to build the resilient infrastructure they require
- NCDOT will develop and apply resilience policies in three main areas: (1) long range transportation planning; (2) individual project planning and design; and (3) operations and maintenance

I-85 FUTURES provides increased resiliency for the national freight network. North Carolina has two predominant north-south routes that connect to the northeast: I-85 and I-95. During Hurricanes

Matthew (2016) and Florence (2018), the southern portion of the I-95 corridor in North Carolina flooded, closing the road for eight days in 2018. NCDOT re-routed all interstate traffic heading toward Richmond, VA to I-85. This additional traffic further burdened the six-lane highway that is already at or over capacity. To improve resiliency, the I-5719 Project will widen I-85 to eight lanes. Structures will be designed to accommodate the wider section ensuring at least a 75-year lifespan.

North Carolina has the dubious distinction of being a location for both frequent tornadoes and tropical system impacts. It is anticipated that climate change will increase these events throughout the state. These impacts are more frequent along the I-95 corridor than the I-85 corridor, but weather impacts are not uncommon in either area. Having redundant transportation options are of critical importance, as most climate models show increased incidence of severe weather in North Carolina in the coming years.

There is a growing understanding that transportation improvements should address communities that have been impacted by past federal efforts. This is at the heart of the Justice 40 Initiative. In North Carolina, EO 246 specifically states that "meaningful, fair, and equitable public engagement in state agency decision-making is necessary to avoid and remedy harmful impacts on communities most severely and frequently impacted by economic and environmental health disparities…the cumulative impacts of multiple sources of exposure to environmental stressors in communities and the roles of multiple decision-making entities in addressing the causes that compromise environmental health and quality of life in these communities requires an interagency response." The integration of active transportation options that reconnect communities across I-85 will also address past impacts to the historically disadvantaged communities along the project corridor. One example can be found in the City of Lowell, NC. First incorporated in 1879, the City of Lowell grew to approximately 2,748 residents according to the 1962 U.S. Census. The small African American community in Lowell, known as "The Flats", included a scattered grouping of rental housing anchored by Wright's Chapel A.M.E. Zion Church.

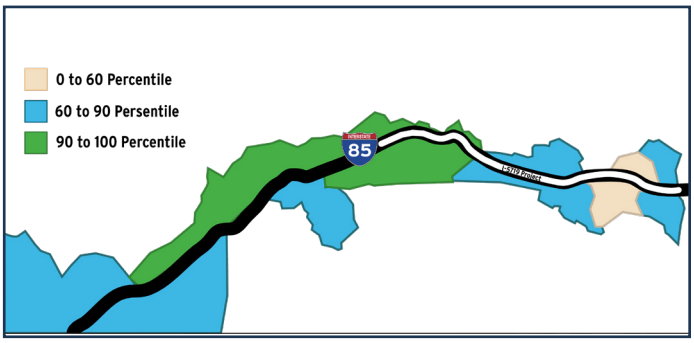
The church was originally constructed in 1908. After a fire destroyed their original sanctuary in the early 1910s, the community went through a long, difficult effort to rebuild the church. The structure, completed in 1923, would become one of the finest examples of Gothic Revival architecture in the county. The Church is eligible for listing on the National Register of Historic Places as a Gaston County historic resource (GS0383). Over time, "the Flats" was home to "hundreds of black families, a black-owned store, and a school for young black children." The boundaries of "The Flats" were South Main Street, Henderson Street, Branch Street, Kenworthy Street, Cobb Street, Reid Street, Gist Street and Odum Drive.

As stated in Section 1.2 Project History , I-85 splintered "the Flats" community. The effects were long lasting. Wright's Chapel was no longer readily accessible to residents south of the new facility. According to Census data, the 1950 population of Lowell was 12 percent African American. By 1980, Lowell's population was just over 8 percent African American, and by 2000, the number had declined to 6.5 percent. Census data from 2019 indicated that 19.6 percent of the current population of Lowell was below the poverty line, more than 1.5 times the rate of the Charlotte-Concord-Gastonia, NC-SC Metro area (11.5 percent). As discussed in Criterion 5, the I-5719 Project will help to reestablish the lost connectivity.

Using the EJSCREEN tool, it is apparent that these effects have translated into long term health impacts to communities along I-85 FUTURES. This is especially noteworthy in in the Gastonia and

Kings Mountain census tracts. People in these census tracts have much higher rates of asthma, diabetes, and heart disease, which translates into lower life expectancy. Many census tracts rank in the highest 90th percentile of the US in terms of low life expectancy. Additional EJSCREEN output is provided in the supplemental materials.

LOWER LIFE EXPECTANCY (I-85 FUTURES)



Criterion 5 – Equity, Multimodal Options and Quality of Life

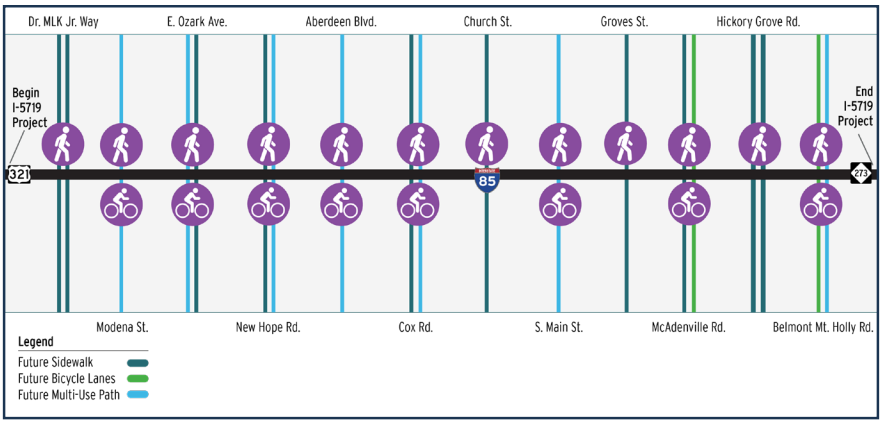
The project team has conducted outreach to a diverse group of stakeholders during project development. For some, such as Donny Hicks, Executive Director of the Gaston County Economic Development Commission, I-85 is the economic engine of Gaston County. Almost all conversations around business development activities revolve around access to I-85. He pointed to a number of current and proposed commercial development activities currently happening in the project area.

To Cherie Jzar, City of Gastonia Diversity, Equity, and Inclusion Coordinator, the construction of I-85 isolated communities, resulted in urban renewal practices that displaced historically disadvantaged populations, and reduced the quality of life by increasing pollution, dust, and vehicle noise. As noted in Criterion 4, it is anticipated that by reducing congestion, the project will improve air quality and reduce start and stop traffic, which increases vehicle noise.

Also, as noted in Criterion 4, the I-5719 Project will improve active transportation options across I-85 between Gastonia and Belmont. While Gastonia has approximately 132 miles of existing sidewalk and 4.6 miles of greenway trails, there are relatively few opportunities for bicyclists and pedestrians to safely cross I-85. Currently, the only accommodations for bicyclists and pedestrians along the I-5719 Project are the sidewalks at Modena Street, E. Ozark Avenue, New Hope Road, Cox Road, McAdenville Road, Belmont Mount Holly Road, and Beatty Drive. At many of these sites, accommodations are only present on the structure. This lack of integration with the larger bicycle and pedestrian network discourages active transportation use. The I-5719 Project will improve and extend bicycle and pedestrian accommodations for all of the municipalities. While transit opportunities in this area are limited, the proposed improvements increase assess to Gastonia bus lines, including the 85X Gaston Express, which extends from Broad Street in Gastonia to the Charlotte Transportation Center. **The bicycle/pedestrian infrastructure and reduced mortality benefits will total $157.1 million, with a net present value in 2020 dollars of $35.4 million.**

African American is used in this application rather than the term used in historic census data.[1]

[1]



BICYCLE AND PEDESTRIAN IMPROVEMENTS (I-5719 PROJECT)

Nine of the ten improved crossings will be in areas classified as APP or HDC. This will provide increased access for residents of these tracts to vital resources, as shown in the supplemental materials. For example, as pointed out in their letter of support, Gaston College is specifically interested in the proposed project as it will increase access to the Dallas Campus, Kimbrell Campus, and the Textile Technology Center. Another important stakeholder, NorthPoint Development noted, "Our developments rely heavily on the local workforce and improvements to non-motorized connectivity allow for more equitable access for the well-paying jobs that our industrial and warehousing developments provide. NorthPoint also understands the importance of taking actionable steps towards this administration's sustainability goals and the promotion of EV charging not only accomplishes that but serves as a tangible benefit for our employees who are taking a mindful step to reduce their carbon footprint."

Criterion 6 – Innovation Areas: Technology, Project Delivery and Financing

INNOVATIVE TECHNOLOGY

The I-85 FUTURES Project has a multi-faceted approach within the corridor that employs **6 Dimensions of Innovation**:

1. Advancement of Automated, Connected, and Electric Vehicle Program
2. Detection and Mitigation of Safety Risks through Active Traffic Management
3. Continued Broadband Deployment
4. Leveraging and Expanding the Regional Integrated Mobility Management System
5. Detection and Mitigation of Work Zone Safety Risks through Quick Clearance Strategies
6. Leveraging and Building Upon the Statewide ITS Resilience Program

Fiber optic cable and ITS benefits were estimated to provide savings and reliability **benefits worth $202.8 million, with a net present value in 2020 dollars of $56.9 million.**

DIMENSION #1 – ADVANCEMENT OF AUTOMATED, CONNECTED AND ELECTRIC VEHICLE PROGRAMS

The project will seek to advance the automated and connected vehicle program by supporting both near-term and intermediate-term deployment of automated and connected vehicle technologies:

- Near-term deployments will utilize vehicle to infrastructure (V2I) and robust systems for vehicle control, traffic optimization and platooning (V2X) technologies that are integrated with the NCDOT Advanced Traffic Management System (ATMS) and Cloud Services to enable direct push of safety data and traveler information to in-vehicle systems. Near-term deployments to be assessed for implementation within the study include work zone alerts, incident alerts, congestion ahead alerts, and alternate route recommendations that coincide with response plans generated through the regional integrated mobility management system.
- Near-term deployments will also include evaluation of autonomous vehicle signage and sensor support along the route.
- Long-term deployment technologies include the construction of a resilient public-private broadband infrastructure to enable the deployment of roadside V2I infrastructure as well as build-out of 5G infrastructure to enable 100 percent V2I and V2X coverage along the project route.
- As recognized in North Carolina's ZEV Plan, building out a network of DC fast chargers along North Carolina's Alternative Fuel Corridors, including I-85, will be critical to enabling the level of ZEV penetration in the state's vehicle fleet as discussed in Criterion 4. North Carolina has awarded $3.4 million from its VW settlement funds to DC fast chargers and is in the process of awarding an additional $4.9 million. North Carolina is also in the process of finalizing its State EV Infrastructure project route.

NCDOT has identified sites along the project corridor that are within 1 travel mile of the interstate for north and southbound travelers, have amenities and adequate parking, and would be accessible 24 hours a day. NCDOT has had local utility providers screen these sites for availability of adequate, highly reliable three phase power. The $700,000 included in this proposal will support the installation of two 150 kW DC fast CCS charging ports via a public and private partnership. The site would be constructed so that it could be upgraded to host four 150kW DC fast CCS charging ports in accordance with the newly released NEVI deployment criteria. The I-85 FUTURES DC fast charging ports could reduce the travel distance between DC fast chargers to less than 50 miles along I-85 between Charlotte, NC, and Boiling Springs, SC. When fully upgraded, the site would provide one of two necessary chargers under the NEVI deployment criteria along I-85 between Charlotte, NC, and Greenville, SC.

The residents of the greater Charlotte area, particularly in Gaston and Cleveland Counties, keenly feel the need for ZEV infrastructure. In 2021, an analysis of available public EV chargers showed that Gaston County only had 7 EV chargers/100,000 people and Cleveland County only had 1 EV charger/100,000 people. According to NC Department of Energy (DOE), there is only one public DC fast charger in Gaston and Cleveland Counties and it is not available 24/7. The installation of the I-85 FUTURES DC fast charging ports along the corridor would not only build out DC fast charging infrastructure along an Alternative Fuel Corridor, they will also provide a critical EV charging resource to local residents. EO 246 prioritized equitable access to clean mobility options and the placement of these charging ports in Cleveland or Gaston County would be a critical step in

achieving this goal.

Installation of additional charging stations along the corridor provides much needed infrastructure.

In addition to supplying a vital supply source for through traffic, EV charging stations will become increasingly necessary as EVs enter the secondary market, bringing them within the economic reach of lower income homes. Charging stations will also encourage communities to electrify their vehicle fleets to reduce their dependence on petroleum products.

DIMENSION #2 – DETECTION AND MITIGATION OF SAFETY RISKS THROUGH ACTIVE TRAFFIC MANAGEMENT (ATM)

The safety, mobility, and environmental benefits of Active Traffic Management (ATM) have been proven through numerous studies by FHWA. I-85 FUTURES will seek to augment existing traffic operations along the corridor with a more extensive ATM program. This will include the following technologies:

- Assessment of variable speed limit systems throughout the I-85 FUTURES corridor from the NC/SC state line to NC 273. These systems have been shown to drastically reduce collision and collision severity along freeways and provide consistent reduction of critical traffic conditions along congested corridors.
- Ramp metering, when combined with variable speed limits have been shown to reduce conflicts by 16.5 percent and crash odds by 6 percent, especially along freeways with recurring congestion. In addition, these systems reduce system delay by 5 percent to 16 percent. These systems will be evaluated for deployment along the I-5719 Project corridor, from US 321 to NC 273, which has the highest recurring congestion.
- Enhanced situational awareness and incident detection technologies will be deployed along the entire I-85 FUTURES corridor (NC/SC state line to NC 273) to enhance detection and mitigation of safety risks.
- Enhanced traveler information capabilities through dynamic message signs at key locations and through the near-term V2I technologies listed under Dimension #1.

DIMENSION #3 – CONTINUED BROADBAND DEPLOYMENT

To ensure the foundational infrastructure is sufficiently robust to support advanced technologies, the Department proposes the use of this grant to build a broadband-ready fiber network from the NC/SC state line to the current broadband fiber deployment at the I-85 and US 74 interchange in Kings Mountain. This network will be constructed in a manner that enables expansion of public-private partnership for broadband connectivity. Extending the limits of the existing broadband fiber network will be a cost-effective value-add for the deployment of technologies along this 10-mile stretch. This tie-in to the existing public-private broadband network opens up connectivity to a network that extends east to the coastline and up-and-down the I-95 corridor to the northern and southern state lines. Additionally, the connectivity to the neighboring states will facilitate agency coordination and support a regional Traveler Information Plan.

In addition to specific benefits for NCDOT, the introduction of high-speed telecommunications can demonstrably improve economic prospects for businesses, individuals, and communities, while also providing a variety of collateral benefits for health care, education, and public safety. The presence of this infrastructure can provide a critical connection point that would encourage the development of advanced telecommunications services for adjacent communities. This is particularly important

in Tier I Cleveland County. The presence of this infrastructure will greatly increase the ability of autonomous delivery networks to reach customers in this rural area. Currently, NCDOT is constructing broadband installations at multiple sites, including under STIP Project HO-0002A - US 74 from I-40 in Asheville to I-77 at I-485 in Charlotte. I-85 FUTURES would expand on these efforts, meeting the directive of the TCA and EO 91.

DIMENSION #4 – LEVERAGING AND EXPANDING THE REGIONAL INTEGRATED MOBILITY MANAGEMENT SYSTEM

NCDOT recently initiated an Integrated Corridor Management (ICM) Program that included deployment of ICM along this corridor. The program uses a decision support response plan database to effectively re-route traffic along I-85 using parallel corridors in the area such as US 74. The pre-developed response plans enable quick activation of coordinated traveler information messaging, coordination signal timing plans along arterial routes, changeable trailblazers pointing vehicles to the alternate routes and pre-planned incident management actions. This project would seek to leverage these existing investments while expanding these efforts into a Regional Integrated Mobility Management System. I-85 FUTURES will implement the following enhancements to expand the program:

- Expand the ICM program along I-85 from the NC/SC state line to the I-85 and US 74 interchange.
- Improve the ICM program from the I-85 and US 74 interchange to NC 273 by enhancing the changeable trailblazer signage in this area.
- Evaluate implementation of a regional integrated mobility management system that adds light rail, bus transit, and park and ride traveler information and response plans to the existing system thus building on transit investments in the area and enhancing transportation for vehicular and transit users within the corridor.
- Evaluate implementation of mobility-as-a-service platforms that enable a one-stop mobile application for traveler information, park-n-ride space availability, transit fare payment, and multimodal trip planning.
- The increased construction activities along interstates necessitates an advertisement and information campaign to inform travelers of construction activities. Coordination with other states and advertisements at Welcome Centers will be instrumental in informing travelers of alternate routes.

DIMENSION #5 – DETECTION AND MITIGATION OF WORK ZONE SAFETY RISKS VIA QUICK CLEARANCE STRATEGIES:

Approximately 20 percent of all traffic incidents are secondary in nature, meaning that they are the result of a previous incident. Being able to quickly detect incidents along freeways and clear the incidents provides drastic reductions in secondary incidents and fatalities. Secondary incidents occur at even higher rates in work zones due to the presence of temporary barrier along either side of the roads. NCDOT has established an effective, performance-based tow contract program that has been proven to reduce secondary incidents and fatalities within multiple deployments across the state. The I-85 FUTURES project would seek to implement a performance-based tow program within the limits of the I-85 widening portion of the project. This program would seek to detect and mitigate work zone safety risks through quick clearance of the roadway. The project will evaluate the integration of tow requests and notifications from motorists with disabled vehicles through the

integrated mobility-as-a-service platform mentioned previously. The I-85 FUTURES project will also extend NCDOT's Incident Management Assistance Patrol (IMAP) from the NC/SC state line to US 321 in Gastonia. The IMAP expansion will enable faster mitigation of safety risks both internal to and within proximity to the work zone. Similarly, IMAP patrols are often the first to detect disabled vehicles or motorists in need of assistance.

In addition to these quick clearance strategies the I-85 FUTURES Project will also evaluate the implementation of a smart work zone that employs the most effective combination of strategies for this corridor, which may include:

- Speed Advisory
- Queue Warning
- Stopped Traffic Warning
- Excessive Speed Warning
- Temporary ramp meter
- Active zipper merge
- In-vehicle work zone alerts through mobile application providers.

DIMENSION #6 – LEVERAGING AND BUILDING UPON THE STATEWIDE ITS RESILIENCE PROGRAM

NCDOT has invested in a Statewide ITS Resilience Program that seeks to implement best practices in ITS and broadband infrastructure resilience. The program employs an integrated work order management, asset management, and network management framework to actively monitor, assess, and improve traffic operations system uptime and availability. This framework, combined with a statewide, performance-based ITS Resilience Contract enables the previously listed technologies (I2V, ICM, ATM, etc.) to remain in constant operation with high availability. This program seeks to enhance these safety and congestion relief strategies through improved infrastructure resilience. This project would propose to extend the performance-based resilience program to provide the following elements as part of the I-85 Futures Project:

- Extension of the existing resilience program to this project for increased reliability and availability of technologies during the project lifecycle.
- Establishes an effective assessment program for proactive evaluation of all technology infrastructure supporting traffic operations along the corridor.
- Establishes an effective technology repair program based on service-level agreements for immediate repair of critical network and ITS infrastructure including fiber optic cable for enhanced regional broadband and traffic operations uptime.

Innovative Project Delivery

NCDOT has explored innovative financing approaches with alternative delivery methods for I-85 FUTURES. Due to the ongoing supply and labor challenges, which are affecting the market and how contractors evaluate risk, the I-5719 Project is anticipated to use collaborative contracting methods through the use of Design-Build delivery. NCDOT plans to have constructability reviews more frequently to engage potential bidders early and often to inform the design and enhance the procurement process. An 8-month advertisement, beginning in March 2023 is anticipated.

NCDOT will explore Public-Private-Partnerships (P3s) to deploy DC fast charging stations in the I-85 FUTURES area. The Department will ensure these agreements comply with Randolph-Sheppard Act (1936) requirements.

Innovative Contracting

I-85 FUTURES seeks to utilize the following innovative practices in contracting:

Use of a P3 model for the broadband elements of the project. NCDOT has successfully begun their broadband program along I-95, US 70, and US 74, which includes I-85 from its interchange with US 74 in Kings Mountain to I-485 in Charlotte. NCDOT leverages the P3 model to allow a private sector partner to commercialize portions of the broadband fiber infrastructure and in-return receives a share of revenue from the commercialization. The revenue received by NCDOT is then utilized to fund long-term operations and maintenance of ITS infrastructure along the facility. This model will be extended to this project for the new broadband connections from the NC/SC state line to the US 74 and I-85 interchange. In addition, ITS and connected vehicle infrastructure installed along the corridor from the US 74 and I-85 interchange to NC 273 will have a long-term commercialization agreement in place.

NCDOT will explore performance-based contracting, which establishes service-level agreements that are tied to operational uptime and reliability for the traffic operations program. NCDOT has successfully implemented a similar contract through the NC Broadband project and is currently seeking to establish a similar program for all other urban areas in the state through the Statewide ITS Resilience Program. This program would be extended to this project for enhanced uptime and reliability from the NC/SC state line to US 321 in Gastonia.

6. BENEFIT COST ANALYSIS

A benefit-cost analysis (BCA) compares the full cost of a project to the estimated benefits. The full cost includes preliminary engineering of the project, right-of-way, construction, ITS and broadband, environmental mitigation, administrative costs, and utilities. It also includes the preliminary engineering and advanced right-of-way purchases. The costs of operating the project for the duration of the analysis period are also included as a negative benefit, or disbenefit. The benefits are estimated for the Build scenario. **The I-85 FUTURES project yields a positive benefit-to-cost ratio of 2.32 and a Total Net Benefit of $4 billion, a NPV of $906,524,770.** Calculated using USDOT guidance. The project's benefits are reasonably expected to justify the financial expenditure.

PROJECT	CAPITAL COSTS	PROJECT COSTS (NPV $2020)	TOTAL NET BENEFIT	TOTAL NET BENEFIT (NPV $2020)	BENEFIT-COST RATIO
I-85 FUTURES	$646,270,000	$391,081,009	$4,093,114,077	$906,524,770	2.32

7. PROJECT READINESS AND ENVIRONMENTAL RISK

Technical Feasibility

The I-5719 Project has followed FHWA's established procedures and guidance for the implementation of a roadway project. This project was proposed by the GCLMPO and included in the STIP. The I-5719 Project is the Section 404/National Environmental Policy Act (NEPA) Merger Process in accordance with the Memorandum of Understanding signed by NCDOT, FHWA, US Army Corps of Engineers (USACE), and NC Division of Water Resources, which will ensure that

the project is permittable when the NEPA document (Categorical Exclusion) is complete. Initial steps in the project delivery process included the development, introduction and approval of the purpose and need and study area by the Merger Team, review of environmental resources in the project area and the development of concepts for widening I-85 and the replacement of the interchanges, overpasses and railroad bridges within the project limits. The Merger Team approved the two Detailed Study Alternatives, a No Build and Build (widen I-85 from six to eight lanes) in January 2019. NCDOT presented the widening and interchange, overpass, and railroad bridge concepts and their potential environmental impacts at two public meetings held in June 2019. Based on public comment, Traffic Operations Analysis, and an initial assessment of impacts, NCDOT chose interchange and bridge design options to move forward into preliminary design. In addition, NCDOT worked with the municipalities and its Integrated Mobility Division to assess needs for multi-modal transportation, which have been included in the typical sections for each structure and its approaches. Based on the preliminary designs a Traffic Noise Assessment, analysis of impacts to historic resources, and further assessment of impacts to the natural and human environment are under way. These preliminary designs will be presented at a second set of public meetings in Summer 2022.

Concurrence on the Least Environmentally Damaging Practicable Alternative (LEDPA) is expected in Fall 2022, with final preliminary design and environmental documentation in December 2022.

Because the I-5719 Project is considered a Federal Major Project, the Cost Schedule and Risk Assessment (CSRA) is anticipated to be completed by FHWA in September 2022, three months prior to signing the environmental document. In addition, the Interstate Access Report (IAR), which is required due to the changes in the interchanges, is anticipated to be completed in the Winter of 2022/2023. The Initial Financial Plan and Project Management Plan will be completed prior to award of the Design-Build contract in December 2023.

Following the Design-Build procurement, it is anticipated that the project will move forward into final design, permitting, and right-of-way acquisition. This will include final design of the railroad structures, including coordination and development of an agreement with NSR.

The I-5719 Project has been shown to be technically feasible, and NCDOT considers the construction risks to be minimal and typical for highway construction in the Piedmont region of North Carolina. The environmental clearances needed to implement the I-5719 Project will be secured. They will be modified by the design-build team, as necessary, as the final design is completed.

All components of the I-5719 Project will adhere to American Association of State Highway and Transportation Officials (AASHTO) Guidelines, state requirements and policies, and other federally recognized guidelines, as applicable. The current cost estimate included in this MPDG application is consistent with NCDOT's STIP for Project I-5719.

I-85 FUTURES will follow NCDOT's established procedures for investigation and deployment of EV charging stations, broadband installation, and ITS design and installation. All necessary agreements with stakeholders, including but not limited to utilities and willing business owners, will be secured prior to installation or deployment of these technologies.

Cost estimates for I-85 FUTURES are found in Section IV.

PROJECT SCHEDULE

2015	I-5719 Included in the 2016 – 2025 STIP
2015	Planning and Design Begins
September 2022	CSRA complete
December 2022	CE signed
Winter 2022/2023	IAR Approved
Winter 2022/2023	Municipal Agreements in Place
March 2023	Design-Build Advertisement
Fall 2023	Project Management Plan
Fall 2023	Initial Financial Plan
December 2023	Design Build Let
January 2024 - December 2026	Final Design, Permitting, Right-of-Way
2024	Begin ITS Investigations
2025	Railroad Agreement with NSR
2025	EV Charging Station Deployment
January 2025 - December 2030	Construction

Required Approvals

The I-5719 Project is following the NEPA process with FHWA as the lead federal agency. Activities completed thus far have included studies on cultural resources that are on or eligible for the National Register of Historic Places; a review of the natural environmental resources; community characteristics survey and analysis; traffic forecast and capacity analysis; and concept development for the interchanges and bridges and preliminary design. To date, the Merger Team has concurred on the I-5719 Project's Purpose and Need and Detailed Study Alternative (Build Alternative). The agreement on Major Hydraulic Structures and Alignment Review is scheduled for June 2022.

Two public meetings were held in May 2019 and presented the proposed concepts for the widening and the improvements to interchanges and bridges. The public was generally in favor of the I-5719 Project. Additional public meetings to show preliminary designs of the project are scheduled to take place in August 2022. The Categorical Exclusion (CE) is scheduled for signature in December 2022.

The I-5719 Project is designated as a Federal Major Project by FHWA, because the project costs exceed $500 million. NCDOT and FHWA have begun coordination on the Cost and Schedule Risk Assessment to be finalized in September 2022. NCDOT will also develop a Project Management Plan and Initial Financial Plan for FHWA review and approval prior to letting the project.

Project Risks and Mitigation Strategies

As noted in Section 4, NCDOT accounts for the risk of increasing cost by incorporating contgency factors in their cost estimates. Project risks have been documented in the Risk Register following FHWA guidance for Federal Major Projects. In addition, NCDOT has conducted a Value Engineering study and constructability reviews to ensure that the proposed designs of the structures can be built while maintaining traffic on I-85.
Another critical component of risk mitigation is early communication. NCDOT Rail has begun coordination with NSR regarding the proposed design of the two railroad bridges and one railyard that are being replaced. NCDOT Utilities has reached out to Colonial Pipeline and Kinder-Morgan Pipeline to initiate coordination regarding the moving of these two pipelines.

8. STATUTORY PROJECT REQUIREMENTS

I-85 FUTURES ELIGIBILITY SUMMARY	
Benefits	The I-85 FUTURES project offers many benefits including safety and technology improvements, increased active transportation access, greater reliability and reduced maintenance needs for critical highway and rail infrastructure. It also upgrades the corridor to accommodate current EV needs while providing necessary infrastructure to meet the needs of the future automated and connected vehicles.
Cost Effective	The I-85 Futures project has a positive benefit-to-cost ratio of 2.32 (Section 6). Please refer to the BCA technical memorandum in the supplemental materials for more information.
Contributes to Section 150 Goals	The I-85 FUTURES project will substantially contribute to Section 150 goals. In addition to the monetary values of these contributions shown in the BCA, the following sections of the document highlight each goal: o Safety - Criterion 1 o Infrastructure Condition - Criterion 2 o Congestion Reduction - Criterion 3 o System Reliability - Criteria 3 and 6 o Freight Movement and Economic Vitality – Criteria 3, 5, and 6 o Environmental Sustainability - Criterion 4 o Reduced Project Delivery Delays - Criterion 6 and Section 7
Based on Preliminary Engineering	As noted in Sections 6 and 7, preliminary engineering for the I-5719 Project have been completed. Based on these designs, concurrence on the LEDPA is scheduled for Fall 2022.
Stable Funding Sources Available for Construction/ Maintenance	As noted in Section 4, NCDOT has committed $318,270,000 in state funds to complete the design and begin construction of the I-85 FUTURES project and has identified $64,000,000 in additional federal funds. With grant funding, the full development of the I-85 FUTURES project can be assured. NCDOT has a statewide maintenance plan. Section 3 details the operations and maintenance responsibilities of each project party. As noted under Criterion 2, municipal agreements are in place for bicycle and pedestrian accommodations constructed as part of I-5719. As detailed in Criterion 6, revenue from P3 partnerships will fund long-term maintenance of broadband and ITS infrastructure
Need for Federal Funds	As noted in Section 4, the current North Carolina Statewide Mobility corridor cap is currently $525 million over 5 years. As the current cost estimate for I-5719 alone is $624 million, the project cannot be fully funded as currently proposed without grant funds. Grant funding is also needed for the proposed ITS, broadband, and EV charging improvements.
Project Begins Within 18 months of Obligation of Funds	As noted in Section 7, the I-85 FUTURES project has already completed a rigorous environmental and technical review and will complete the Categorical Exclusion based on preliminary design in December 2022. The project schedule is summarized in Section 7 and includes letting of the Design Build contract in December 2023.