

# USDOT RAISE Grant Application



STATE OF  
GOOD REPAIR



EMERGENCY  
RESPONSE



PARTNERSHIP



SAFETY



RURAL-URBAN  
CONNECTIVITY



BICYCLE AND  
PEDESTRIAN

## iBRAGG

Improving Bragg Roads and  
Access for Greater Growth



JULY 2021

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### Application Information

Supplemental Materials are available online at <https://connect.ncdot.gov/resources/RAISE2021-FB/Pages/default.aspx>

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## I. Project Description

The *Improving Bragg Roads and Access for Greater Growth Project* (“iBRAGG” or “the Project” hereafter) will repair and rehabilitate approximately 47 miles of publicly accessible roadways within United States Army Garrison (USAG) Fort Bragg, but outside of the cantonment and other secured areas. These roads, which include Lamont Road, Manchester Road, Morrison Bridge Road, Morganton Road, King Road, Plank Road, and Raeford Vass Road (see Figure 3) were originally constructed for military training use. Today, they are used both for military training activities and as commuter routes for all drivers within Fort Bragg and the Fayetteville metropolitan area. These roads are characterized by deteriorating pavement conditions, pavement edge drop-offs, substandard guardrails, inadequate signage, vegetation encroaching on roadway clear zones and erosion; all leading to unsafe and inefficient travel. By bringing these roads into a state of good repair, and up to State standards, the Project will enhance rural-urban economic connectivity; invest in multimodal facilities to benefit underserved communities, address erosion and stormwater management concerns and improve resilience to climate change, improve travel time and reduce greenhouse gas (GHG) emissions; reduce the incidence and severity of vehicular accidents; save taxpayer money by more efficient operation and maintenance; and decrease emergency response impediments.

iBRAGG is the result of a regional partnership among the (i) Fayetteville Area Metropolitan Planning Organization (FAMPO), which includes the Cities of Fayetteville and Raeford, the Towns of Spring Lake, Hope Mills, Eastover, and Parkton, and portions of Cumberland, Hoke, Robeson, and Harnett Counties; (ii) North Carolina Department of Transportation (NCDOT); and (iii) USAG Fort Bragg to strengthen the regional road network for both civilian and military travelers.

### **Project Eligibility**

The iBRAGG Project will improve the road system within Fort Bragg, which serves Fort Bragg’s military and civilian personnel as well as commuters within the broader regional community. Although the roads are Federally owned, Fort Bragg will grant NCDOT an easement for the Project roads. **NCDOT will be responsible for funding and performing repair and maintenance activities once the roads have been brought into a state of good repair and added to the state maintenance system by the Board of Transportation.** This unique partnership between NCDOT and Fort Bragg is memorialized in a Memorandum of Agreement (MOA), dated May 2, 2019, that outlines each party’s roles and responsibilities for construction, repair, and maintenance of Fort Bragg’s training area roads.

### **Changes from Last Year's Application**

This application includes updated construction costs, operating and maintenance (O&M) costs, and safety data compared to the 2020 application.

The Project added 6 miles of 5-foot wide paved shoulders along Plank Road for a new bicycle and pedestrian facility that completes an important link in the region’s multimodal network and benefits adjacent environmental justice populations.

Fort Bragg will contribute \$4.68 (YOES) million in Army O&M funds finance needed for the new bicycle/pedestrian facility on Plank Road, improvements on Morganton Road and a portion of King Road, as well as funding for Honeycutt Road.

The Project will allow NCDOT to take over long-term road repair and maintenance responsibilities. Through the Army Community Partnership Program<sup>1</sup>, NCDOT and Fort Bragg developed a Memorandum of Agreement (MOA) that sets forth the terms by which NCDOT will perform maintenance of the Project roads. Bringing the roads into a state of good repair, consistent with NCDOT's standards, is a condition of the MOA. Upon confirmation that the Project roads have been brought into a state of good repair, Fort Bragg will petition the NCDOT to add the roads to the State Highway System. This addition will be accomplished in accordance with NCDOT road addition procedures, which includes approval by the NCDOT Board of Transportation. Once the roads have been brought to a state of good repair, NCDOT will fund all maintenance and repair activities. By transferring roadway repair and maintenance responsibilities to NCDOT, annual road maintenance and repair costs will be reduced by 40 percent annually, while the traveling public will enjoy well maintained roads. The iBRAGG Project will provide the needed financial resources to repair the Project roads and serve as the catalyst for NCDOT to assume responsibility for future maintenance and repair activities.

<p style="text-align: center;"><b>Major Projects Benefits</b></p> <ul style="list-style-type: none"><li>• Reduced Fatalities and Crashes</li><li>• Operation and Maintenance Savings</li><li>• Travel Time Savings</li><li>• Vehicle Maintenance Savings</li><li>• Resilience Repair Cost Savings</li><li>• Improved Emergency Response/ Access</li><li>• Multimodal benefits for underserved communities</li></ul>
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### The Transportation Challenge

Fort Bragg is a critical military facility, as well as an economic anchor for the Fayetteville metropolitan area, whose contributions are a key driver of regional growth and economic resiliency. Fort Bragg has an annual economic impact of \$8.3 billion,<sup>2</sup> and supports a population of over 276,000 (2020) active duty soldiers, reservists, students, Department of Defense (DoD) civilians and contract employees, retirees, and family members, making Fort Bragg integral to the economic vitality of the Fayetteville metropolitan area. As the region has grown, the Project roads, originally built to support the Army's training activities, carry a higher volume of traffic than envisioned when they were constructed.

Currently, the Project roads are used daily by the general public to access destinations within the Fayetteville metropolitan area, including essential services and employment centers within Fort Bragg. Commuter traffic, for which Fort Bragg is neither an origin nor a destination, has grown in recent years. Travelers use the Project roads to avoid nearby congested arterials and to reduce vehicle miles traveled. Consequently, a rising volume of trips are being made on poorly maintained roads that do not meet NCDOT's standards for acceptance to the system. The roads are cracking, rutting, crumbling, with inadequate shoulders, unsafe drop-offs, and potholes. Figure 1 illustrates the poor condition of the Project roads. The transfer of operation and maintenance responsibilities to NCDOT shifts this activity to an agency that is better equipped to maintain the roads to a higher quality and at a lower cost. Road quality in this instance is measured primarily in terms of safety and rideability of pavement that results in less wear and tear on vehicles.

<sup>1</sup> <https://dcs9.army.mil/partnerships/index.html>

<sup>2</sup> Refer to the Fort Bragg Overview provided in the Supplemental Materials

Aside from commuter travel, the Project roads play a critical role in the movement of military equipment and training exercises. Due to this dual functionality, Fort Bragg is unable to fully close the Project roads to traffic even when their condition is not safe for civilian travel. King Road has been closed to the public since 2018 due to its poor condition; however, barricades and signage meant to deter commuter traffic are often ignored or removed by travelers (see Figure 2). A permanent barrier cannot be installed because this road is used for emergency response by Fire Station #8 (see Figure 7) and for military training activities.

**Figure 1: King Road Pavement Condition**



**Figure 2: Removed Barricade to Deter Commuter Traffic on King Road**



Additionally, the Project roads suffered damages ranging from sink holes to total wash outs in September and October 2016 from extremely heavy rains followed a week later by Hurricane Matthew. As a result, Manchester Road was closed to traffic and officials diverted traffic to NC 690, NC 87, and US 401. Later that year, Fort Bragg expended \$7 million to repair the Project roads in response to the damage caused by these events. Although the repairs were successful, this is a temporary fix due to the underlying poor conditions of the Project roads.

The Project will address this challenge on a long-term basis by bringing the roads into a state of good repair and incorporating specific design elements to reduce stormwater velocity, prevent erosion and improve infiltration and filtration of stormwater. Together, these improvements will improve the Project's resilience to increasingly severe weather events.

Finally, road closures and poor roadway conditions impact emergency services. Emergency response vehicles must travel at slower speeds on Project roads when responding to calls, and the condition of the roads cause a variety of vehicle and equipment maintenance issues above and beyond normal wear and tear. These factors negatively impact emergency response capabilities, which in turn affect property and human health and safety.

## **COVID-19**

Rural areas in North Carolina are underserved when it comes to access to medical care. COVID-19, or any other future pandemic, exacerbates existing health care gaps. Approximately 11.5 percent of the Fayetteville metropolitan area population is 60 or older, and 39.9 percent of them live alone.<sup>3</sup> Older populations have more underlying health conditions making them more susceptible to illnesses and injury. Delays in emergency response have potential for a substantially greater loss of life for these at-risk populations. Improving the Project roads will help narrow the health gap, allowing for greater mobility for caregivers and family to check on the elderly living alone and, if needed, for emergency vehicles to arrive faster.

<sup>3</sup> American Community Survey 2019 for Fayetteville, North Carolina, Metro Area. Tables S0102 and S0101.

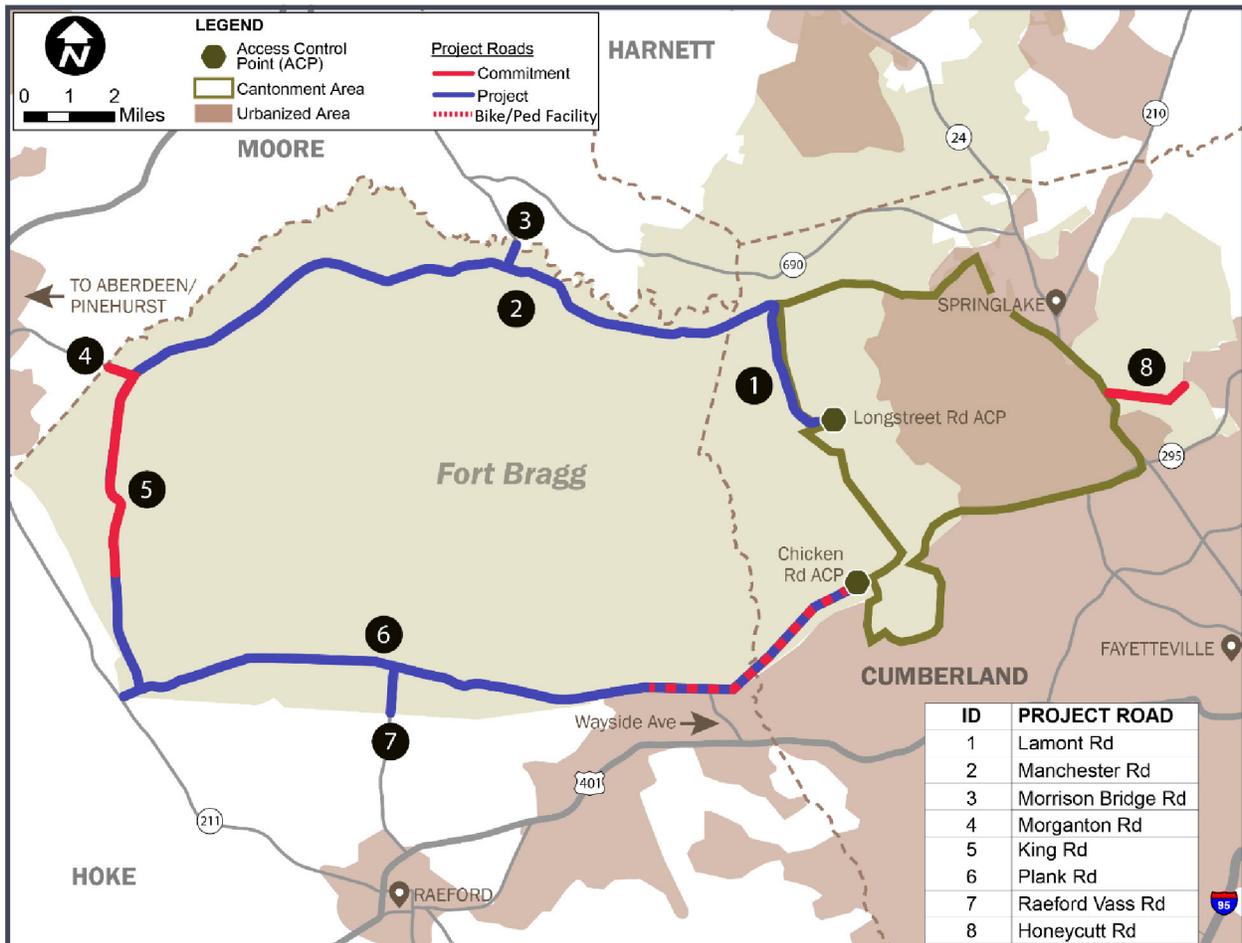
## II. Project Location

The Project is located in rural areas of Cumberland and Hoke Counties in central North Carolina. Figure 3 shows the Project location, highlights the Project roads, and illustrates the relationship of Fort Bragg and the Project to the surrounding region. The Project roads are publicly accessible and located outside of the cantonment and other secure areas. Table 1 presents the Project latitude and longitude coordinates by the main road intersections.

**Table 1: Project Coordinates by Road**

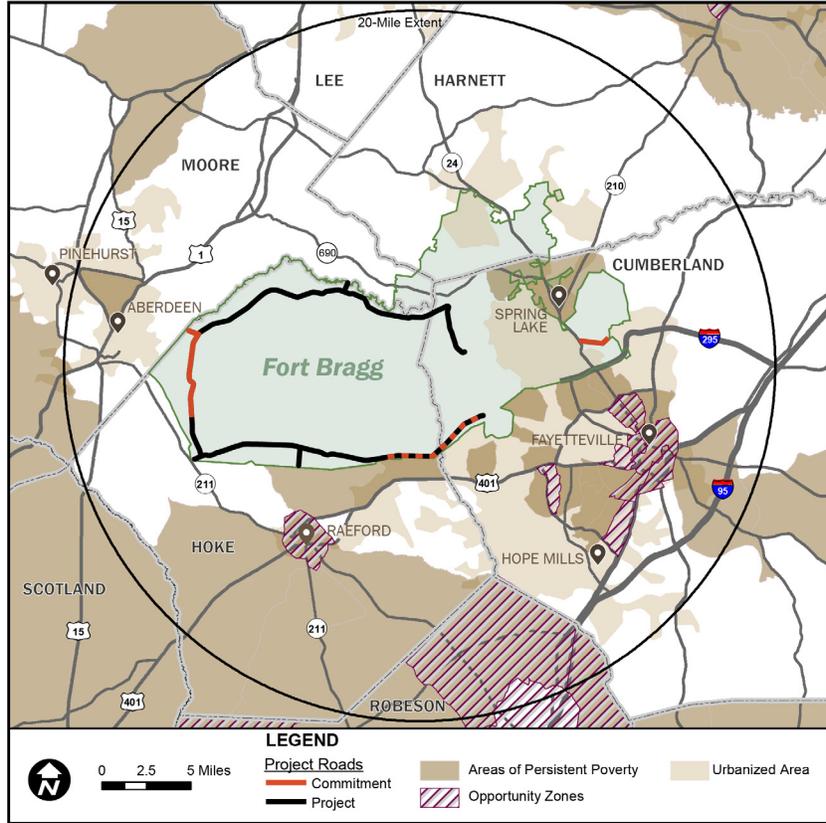
Intersection Name	Latitude	Longitude
Lamont Road and Manchester Road	35.173498	-79.083135
Morrison Bridge Road and Manchester Road	35.184513	-79.187292
Connecticut Road and Manchester Road	35.14978	-79.33353
Connecticut Road and King Road	35.14978	-79.33353
Manchester Road and King Road	35.14978	-79.33353
Plank Road and King Road	35.048955	-79.329703
Plank Road and Raeford Vass Road	35.056472	-79.231461
Plank Road and Wayside Road	35.049659	-79.112818
Honeycutt Road	35.143139	-78.937854

**Figure 3: Project Roads to be Maintained by NCDOT**



The City of Fayetteville, located in Cumberland County and immediately adjacent to Fort Bragg, is the sixth largest municipality in the state as of 2019 and its growth from 2010 to 2019 ranks 20th out of 553 North Carolina municipalities.<sup>4</sup> Hoke County is also experiencing rapid population growth. By 2030, the regional population<sup>5</sup> is projected to reach nearly 785,000 residents, an overall growth rate of nearly 35 percent. Hoke County, where the majority of the Project roads are located, is projected to see its population grow to approximately 71,000 residents by 2030, which is more than double its population in 2000. Some municipalities in the region are experiencing similar growth; Pinehurst, Spring Lake, Aberdeen, and Southern Pines grew by 17 percent, 11 percent, 9 percent, and 6 percent, respectively, between 2010 and 2015.<sup>6</sup>

**Figure 4: Areas of Persistent Poverty and Opportunity Zones in Project Vicinity**



Despite this rapid population growth, communities that rely on the Project roads for their transportation needs face significant socioeconomic challenges. In 2021, Cumberland and Hoke Counties were among the most economically distressed counties in the state and have been designated Tier One (most distressed) for economic development. Cumberland County was ranked #16 and Hoke County, ranked #31, shifted from Tier Two to Tier One, largely

**Table 2: Demographic Characteristics of the Project Region**

	People of Color	Low-Income	Limited English Proficiency	Elderly
North Carolina	37%	36%	2%	15%
Cumberland County	56%	42%	2%	11%
Hoke County	60%	43%	3%	9%
Lee County	42%	41%	4%	16%
Scotland County	56%	52%	0%	17%
Richmond County	43%	49%	2%	17%
Moore County	23%	29%	1%	24%

<sup>4</sup> NC Office of Budget and Management Municipal Population estimates, <https://www.osbm.nc.gov/demog/municipal-population-estimates>.

<sup>5</sup> Regional population includes Cumberland, Harnett, Hoke, Moore, Richmond, and Scotland Counties

<sup>6</sup> Fort Bragg Joint Land Use Study, prepared by Benchmark Planning, September 2018 (provided by FAMPO)

driven by a change in the county’s median household income<sup>7</sup>. While the Project is not located within an Area of Persistent Poverty, there are 63 Areas of Persistent Poverty within 20 miles of the Project that would benefit from the Project. Seventeen of these tracts are located in the Fayetteville urbanized area; the remainder are concentrated in areas south and west of the Project in Hoke, Scotland, and Richmond Counties. Census Tract 9701.01, which includes communities in Raeford and Fayetteville, is an Area of Persistent Poverty located immediately adjacent to the Fort Bragg boundary with access to Plank Road from Hobson Street and Wayside Road. Neighborhoods within this tract will directly benefit from the Project’s bicycle and pedestrian facility along Plank Road, as well as improvements to the state of good repair that will provide safety and emergency response benefits. Moreover, all but one of the counties within 20 miles of Fort Bragg exceed the state average for People of Color and Low-Income populations. Improved accessibility to major employment centers in Fort Bragg and Fayetteville is of notable economic interest to residents of these areas. Figure 4 shows the Areas of Persistent Poverty and opportunity zones within 20 miles of Fort Bragg, and Table 2 outlines the demographic characteristics of the counties in this area.

The majority of the Project is located in rural areas. Table 3 summarizes each road by the percentage spending on rural components. The total spending on rural components is 96 percent, with a corresponding 4 percent spent on urban components. In accordance with the Notice of Funding Opportunity guidance, the Project is submitted as a rural project. The Project will support United States Department of Transportation’s (USDOT’s) Rural Opportunities to Use Transportation for Economic Success (ROUTES) initiative to address deteriorating conditions and disproportionately high fatality rates on rural transportation infrastructure. Detailed information on spending is included in the Supplemental Materials.

**Table 3: Summary of Urban and Rural Project Spending**

Route Name	Rural/Urban	Percent Rural	Percent Urban
Lamont Road	Rural	100%	-
Manchester Road	Rural	100%	-
Morrison Bridge Road	Rural	100%	-
Connecticut Avenue	Rural	100%	-
King Road	Rural	100%	-
Plank Road	Rural/Urban	91%	9%
Raeford Vass Road	Rural	100%	-
Honeycutt Road	Rural/Urban	98%	2%
Total		96%	4%

Note: The total is calculated using total project spending by road component.

<sup>7</sup> The North Carolina Department of Commerce annually ranks the state’s 100 counties based on economic well-being and assigns each a Tier designation. See [https://files.nc.gov/nccommerce/documents/Research-Publications/2021-Tiers-memo\\_asPublished\\_113020.pdf](https://files.nc.gov/nccommerce/documents/Research-Publications/2021-Tiers-memo_asPublished_113020.pdf)

### III. Grant Funds, Sources, and Uses of all Project Funding

The following section outlines the funding strategy for the iBRAGG Project. The estimated cost to reconstruct the roads and bring them to a state of good repair, in accordance with State standards, is \$29.68 million (YOES). Without Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant funding, this project will likely not be completed. North Carolina General Statute §136-102.6(h) prohibits state expenditures to bring the Project roads, which are currently owned and maintained by Fort Bragg, into a state of good repair, consistent with NCDOT standards, such that they can be added to the State Highway System. Moreover, available Army and DoD funding sources are used to finance mission essential infrastructure. To maintain the Project roads at State Highway System standards is not within Fort Bragg’s training mission. Therefore, the necessary funding cannot be justified, and thereby approved, by Fort Bragg’s command structure.

The capital costs, sources, and uses of funds are summarized in Table 4. Details on the capital costs are provided in the Supplemental Materials provided with this application. The budget identifies the RAISE grant, and other federal sources as requested in the guidance.

In summary:

- **Project ask:** FAMPO, the Project applicant, on behalf of Project partners NCDOT and Fort Bragg, is requesting \$25.0 million of RAISE grant capital funding.
- **Previously incurred expenses:** There are no previously incurred expenses.
- **Eligible Project costs:** The total estimated cost to complete the iBRAGG Project is \$29.68 million (YOES). This includes a 20 percent contingency to account for risks and uncertainties in the project delivery process.
- **Federal matching funds:** Fort Bragg has committed a total of \$4.68 million from the Army O&M Fund to support the Project. This includes \$3.3 million to bring Morganton Road and a portion of King Road into a state of good repair and to construct a bicycle and pedestrian facility along Plank Road. Fort Bragg will contribute an additional approximately \$1.38 million towards Project financing to fund the culvert replacement for Honeycutt Road.
- **Non-Federal Funds:** No non-Federal funds are proposed to be used for this project.
- **Funding commitment:** A letter of funding commitment from Fort Bragg is provided in the Attachments for this application.

**Table 4: Sources and Uses of Funds for the iBRAGG Project (YOES)**

Summary	Design	Right-of-Way	Utilities	Construction	Total	% of Total
RAISE Grant	\$69,587	\$0	\$62,209	\$24,864,331	\$24,996,127	84%
Other Federal (Fort Bragg)	\$144,973	\$0	\$56,553	\$4,477,582	\$4,679,108	16%
Grand Total	\$214,560	\$0	\$118,762	\$29,341,912	\$29,675,235	100%

Note: Construction cost for RAISE grant Project components includes 20 percent contingency..

**Table 5: Evaluation Criteria Narrative Matrix**

Criteria		How the Project Satisfies the Criteria
<b>Primary</b>	Safety	<p>The Project roads will be improved to adhere to State standards. Between 2015 and 2020, there have been 6 fatalities, 38 incapacitating injuries, 62 non-incapacitating injuries, 26 unknown injuries, and 279 property damage only crashes on the Project roads.</p> <p>Reconstructing King Road will allow for the public to safely use the roadway and avoid longer trips, resulting in safety benefits.</p> <p>Emergency vehicles from two fire stations on the Project roads would be able to respond to incidents faster and with less vehicle wear and tear</p>
	Environmental Sustainability	<p>The Project incorporates climate change and environmental justice by improving the resilience of the Project roads to increasingly severe weather events through stormwater management improvements and incorporating climate change and environmental justice policies and considerations in project planning and delivery.</p> <p>The reduced travel times and vehicle miles traveled on detours decrease GHG emissions and improve local air quality, in accordance with North Carolina Executive Order 80.</p> <p>Design elements will reduce stormwater velocity, prevent erosion and improve infiltration and filtration of stormwater to improve the Project’s resilience to increasingly severe weather events.</p>
	Quality of Life	<p>Safer and better roads improve the daily life for those living, working and commuting on Project roads.</p> <p>The Project will improve connectivity to essential services and job opportunities in the USAG Fort Bragg cantonment area and city of Fayetteville for underserved communities across the region.</p> <p>Targeted multimodal investments to extend the All-American Trail will improve mobility for minority and low-income communities immediately adjacent to Fort Bragg along Plank Road.</p>
	State of Good Repair	<p>The Project will bring 47 miles of roadway into a state of good repair, resulting in benefits for commuters and emergency responders who sustain vehicle damages and unsafe conditions without the Project.</p> <p>Bringing the roads into a state of good repair will increase resiliency, allowing Fort Bragg to avoid costly repairs from damages caused by extreme weather events.</p> <p>By adding the Project roads to the state maintenance system, NCDOT will be able to perform future construction, maintenance, and repair services for the subject roads at a higher quality and 40 percent lower cost than before.</p>
	Economic Competitiveness	<p>Fort Bragg is integral to the vitality of the regional economy. The Project roads, which are located outside the secured areas of Fort Bragg, enhance rural-urban connectivity and provide links between rural areas in Hoke, Moore, Robeson, Lee, Scotland, and Richmond counties and the dual economic centers of Fort Bragg and the City of Fayetteville. Trips where Fort Bragg is neither an origin nor a destination is a growing percentage of traffic as the regional population grows. Safe and reliable roads support economic growth.</p> <p>With the upgrade of the Project roads, vehicles can safely travel at the posted speeds and take more direct routes, resulting in travel time savings as well as operating cost savings.</p> <p>There are numerous Areas of Persistent Poverty and Opportunity Zones within 20 miles of the Project that will benefit from enhanced mobility and rural-urban connectivity.</p>

Criteria		How the Project Satisfies the Criteria
Secondary	Innovation (Project Delivery)	The Federal Highway Administration (FHWA) and NCDOT executed a Categorical Exclusion (CE) Checklist, last updated in 2019, to help streamline project delivery. NCDOT will use this CE checklist to complete National Environmental Policy Act (NEPA) compliance for the Project.  NCDOT and Fort Bragg will be leveraging the MOA, signed May 2, 2019, to achieve an estimated 40 percent cost decrease annually for road maintenance and repair, simplify and streamline the contracting process, and leverage NCDOT’s vast expertise in delivering high-quality roadway projects.
	Partnership	FAMPO is the grant applicant, NCDOT will lead the Project delivery, and Fort Bragg is a funding partner for the Project. The Project partners have a long history of working together and are fully committed to enhancing accessibility and rural-urban connectivity in the region

#### IV. Selection Criteria

The investments described in this RAISE grant application will generate a variety of benefits for local residents and businesses, regional travelers, and North Carolina taxpayers. Some of these benefits can be quantified and captured in the benefit-cost analysis (BCA). Table 5 provides a summary overview of how the Project aligns with the evaluation criteria

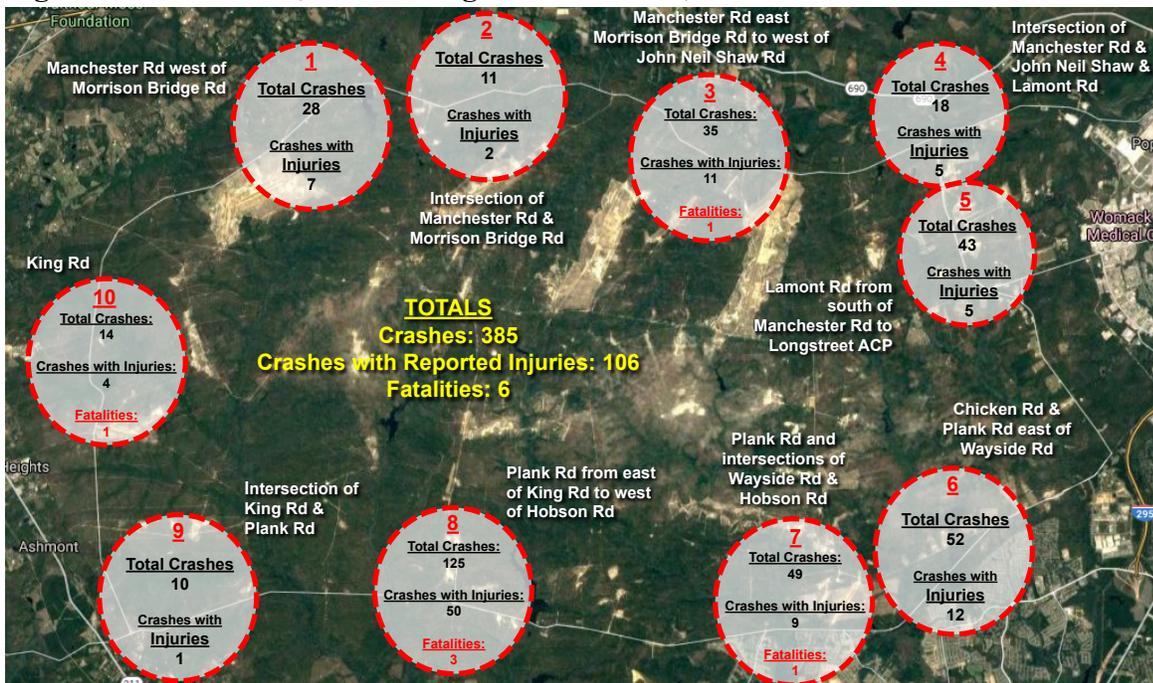
#### Primary Selection Criteria

This section provides additional detail on the Project features that align with the 2021 RAISE program’s primary selection criteria.

#### Safety

The Project improves safety in several ways. First, the roads will be improved to meet State standards which will reduce the potential for fatalities, injuries, and crashes. There have been

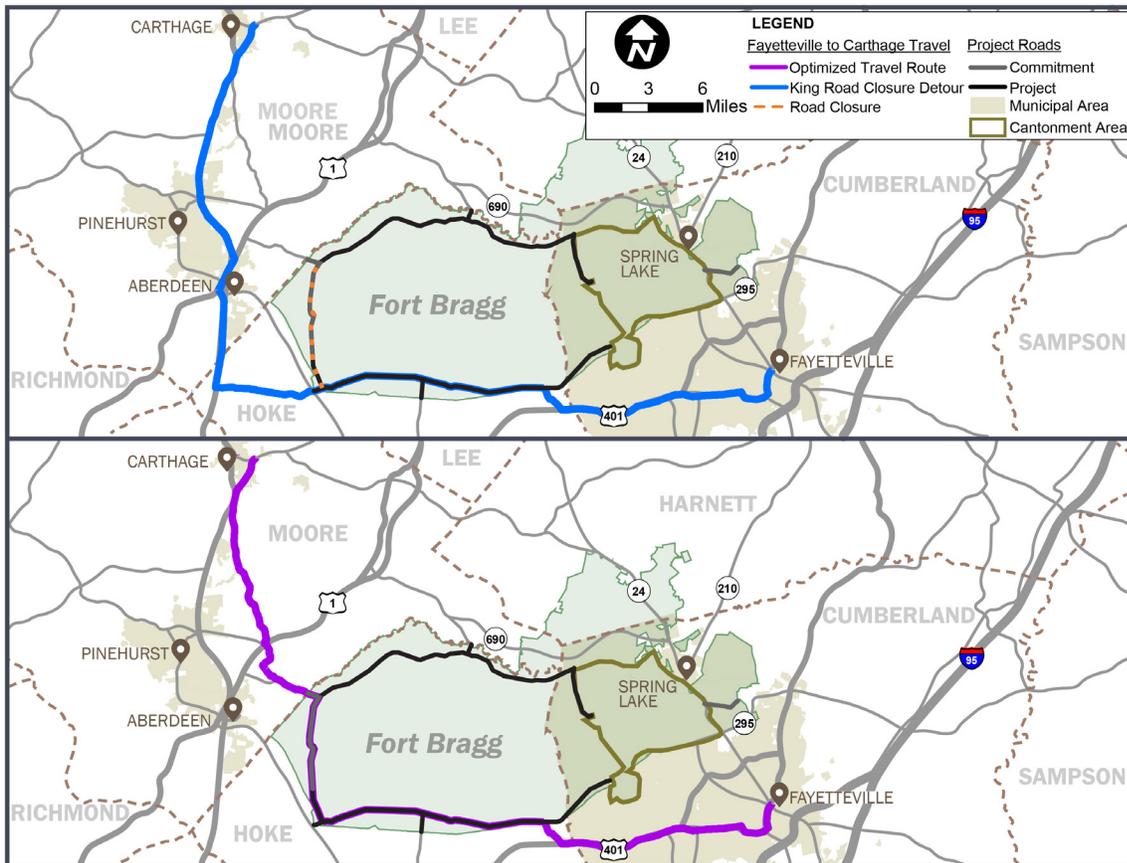
**Figure 5: December 1, 2015 through November 30, 2020 Crash Locations**



385 crashes reported over a 5-year period on the Project roads, including crashes where drivers lose control and run off the road. Figure 5 summarizes the crash history between December 1, 2015 and November 30, 2020. A detailed account of all crash incidents during this time period can be found in the Safety Technical Memo included with the supplemental materials. Based on the scope of the Project, NCDOT provided a crash and injuries reduction factor of 20 percent, which corresponds to roadway modernization projects. The improved design and smoother pavement will all contribute to safer travel in the vicinity of Fort Bragg. For more information, please refer to the safety memo in the Supplemental Materials.

Moreover, with King Road closed to the general public due to unsafe conditions, some drivers are forced to take longer routes, incurring safety risks and additional vehicle miles traveled. Example detour routes are shown in Figure 6; safety and travel time benefits are estimated for a portion of commuters using the southern route between approximately the Town of Carthage and the City of Fayetteville. The analysis assumes 50 percent of commuters who would drive the southern route to Fayetteville will utilize the close King Road “detour.” The safety, travel time, and vehicle operating cost savings from eliminating the need for these detours totals \$5.8 million.<sup>8</sup> Please refer to the BCA Technical Memo for more information.

**Figure 6: Detour Routes for Closure of King Road**



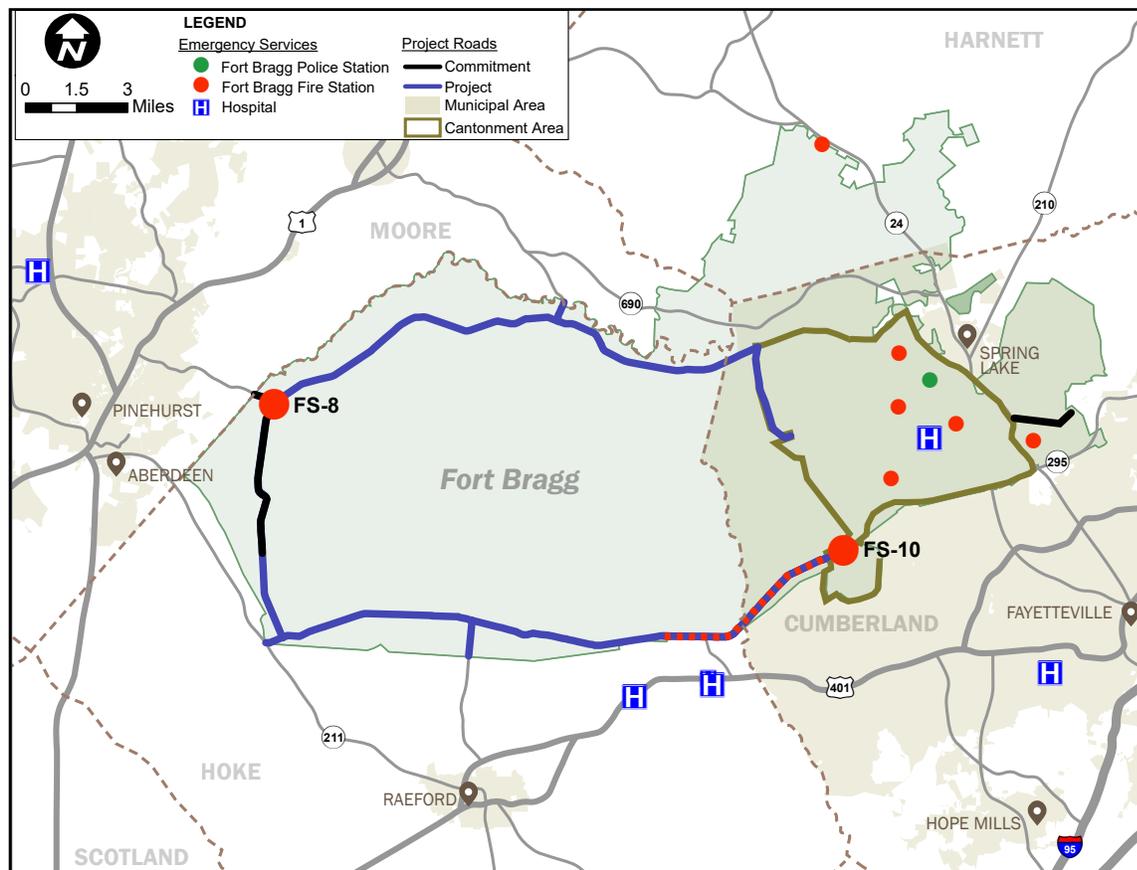
Finally, the Project roads are used by Fort Bragg’s fire and police departments to respond to emergencies both within Fort Bragg and in the larger regional community. Fort Bragg has mutual aid agreements with the municipalities of Spring Lake, Fayetteville, and Hope Mills

<sup>8</sup> In discounted 2019\$ over a twenty-year benefit period

as well as six surrounding counties. Two Fort Bragg Fire Stations, #8 and #10, are located along Project roads as shown in Figure 7. In addition to responding to incidents within Fort Bragg, Fire Station #8 responds to incidents in Moore County, including the municipalities of Aberdeen, Southern Pines, and Pinehurst; Fire Station #10 responds to incidents in Hoke and southern Cumberland County, including the municipalities of Raeford and Fayetteville.<sup>9</sup> The poor condition of the Project roads hampers emergency response in two ways. Firstly, response times are slowed. The numerous potholes and missing sections of asphalt require emergency responders to take a more cautious approach in order to avoid damaging vehicles and equipment, and to avoid causing an accident due to losing control of the vehicle being operated.<sup>10</sup> This problem is exacerbated during evening hours due to the limited visibility of the Project roads. Secondly, the poor road conditions cause a variety of vehicle and equipment maintenance issues. These issues include tire punctures, lug nuts getting sheared off, and front-end alignment beyond normal wear and tear which they associate with the poor road conditions.<sup>11</sup> Bringing the roads to a state of good repair will improve response time – potentially saving lives – and will reduce the financial and manpower resources needed to maintain emergency response equipment. The value of improving emergency response is \$2.4 million.<sup>12</sup>

<sup>9</sup> Fort Bragg Fire incidents spreadsheet, provided by Fort Bragg Fire Chief on June 9, 2021

**Figure 7: Emergency Response**



<sup>10</sup> Email from Fort Bragg Fire Chief, dated May 1, 2020

<sup>11</sup> Fort Bragg Fire Potential Road Condition Related Work Orders FTM May 2020-May 2021, provided by Fort Bragg Fire Chief on June 8, 2021

<sup>12</sup> In discounted 2019\$ over a twenty-year benefit period

## Environmental Sustainability

Eastern and Central North Carolina, like many other communities around the world, are bearing the brunt of climate change impacts. Hurricanes and extreme weather events are becoming more frequent and more severe. The impacts from climate change are exacerbating environmental, public health, and economic disparities, disproportionately affecting already vulnerable low-income and minority communities in the region. The Project addresses environmental sustainability by improving the resilience of the Project roads to increasingly severe weather events through stormwater management improvements and incorporating climate change and environmental justice policies and considerations in project planning and delivery.

As described in Section II, there are numerous environmental justice populations in the vicinity of Fort Bragg who will benefit from the Project. FAMPO has published an Environmental Justice Element of their 2045 Metropolitan Transportation Plan that uses quantitative and qualitative methodologies to ensure the fair distribution of benefits and burdens in the region's transportation projects during long-range planning. Together, FAMPO, NCDOT, and Fort Bragg will ensure future subsequent public engagement efforts will take these Environmental Justice populations into account for locations and time of day for all live meetings. Areas with limited access to high-speed internet or notable elderly populations will be assessed for the appropriate combination of digital, web, and mobile phone-based outreach in conjunction with traditional print outreach and informational efforts. Engagement in all areas will need to include language assistance ranging from translation of vital documents to real time interpretation.

In 2018, shortly after Hurricane Florence, Governor Roy Cooper issued EO80, "North Carolinas Commitment to Address Climate Change and Transition to a Clean Energy Economy." The Project supports two primary goals of this plan, which are to reduce GHGs in the state to 40 percent below 2005 levels by 2025 and improve the state's resilience to climate change. Transportation is a large generator of emissions, including volatile organic compounds, nitrogen oxides, and particulate matter. Improvements to the Project roads, including the reopening of King Road, will improve the efficiency of the project roads to create travel time savings for users resulting in lowered emissions of harmful GHGs. The Project's travel time savings result in \$6.5 million in benefits.<sup>13</sup> These emissions reductions are also consistent with the goal of the City of Fayetteville's Sustainability Master Plan to minimize air pollution, including climate-impacting emissions.

The Project roads traverse USAG Fort Bragg training areas that preserve one of the largest remaining areas of long-leaf pine ecosystem in the country.<sup>14</sup> This reservoir of biodiversity is home to several federally endangered plant and animal species, including the Red-cockaded Woodpecker, Saint Francis' Satyr, Michaux's Sumac, Rough-leaved Loosestrife, and American Chaffseed.<sup>15</sup> By improving stormwater management, the Project will help protect water quality and maintain the health of this nationally significant ecosystem. The Project will incorporate specific design elements where practicable to reduce stormwater velocity, prevent erosion, improve infiltration, and improve filtration of stormwater to improve water quality and the USAG Fort Bragg road network's resilience to increasingly severe weather events.

<sup>13</sup> In discounted 2019\$ over a twenty-year benefit period

<sup>14</sup> <https://www.denix.osd.mil/awards/previous-years/fy09secdef/nrcit/natural-resources-team-fort-bragg-north-carolina/Natural-Resources-Team-Fort-Bragg-North-Carolina.pdf>

<sup>15</sup> <https://home.army.mil/bragg/index.php/about/garrison/directorate-public-works/environmental-division/endangered-species-branch>

**Pipe and Culvert Replacement:** The Project will make accommodations for wildlife passage of two culverts (one located on King Road at Wolf Pit Creek and one located on Honeycutt Road) by burying the pipe inverts below stream bed level while upsizing to provide hydraulic capacity.

**Ditch stabilization:** The Project includes lining approximately 1,500 feet of ditches to slow stormwater velocity, reduce sedimentation, and stop gullyng and scour. In areas of the Project where roadside ditches will be incidentally impacted by other project activities, ditches will be updated to the extent practicable to meet NCDOT swale criteria by easing longitudinal slopes, easing side slopes, and installing sediment trapping check dams. Ditches that are not incidentally impacted by the Project will remain undisturbed to maintain established vegetation, thereby preventing release of sediments into waterways during construction.

**Vegetation Management:** The Project will plant and maintain grass in locations with sparse vegetative cover in accordance with state standards, which will improve stormwater filtration and infiltration, as well as prevent the erosion of exposed soil. Conversely, the Project will remove excess vegetative growth in roadside ditches and swales. Uncontrolled ditch vegetation diminishes the ability of these ditches to convey water downstream, leading to ponding and a reduction in roadbed stability.

**Shoulder Improvements:** The Project will address unsafe and substandard shoulders that result in vehicles running off the pavement, creating soil instability which leads to roadside scour and gullyng during precipitation events. These conditions allow water to pond and promotes erosion. The Project's reconstruction of shoulders to meet state standards will prevent erosion by stabilizing the soil and eliminating shoulder rutting, gullyng and drop-offs improving grading along the roadway edge.

Additional stormwater best management practices such as filter strips (which filter, slow, and infiltrate stormwater runoff) and preformed scour holes (riprap-lined basins at pipe outlets to induce diffuse flow conditions) will be implemented at critical locations alongside other Project improvements, in accordance with NCDOT's Stormwater Best Management Practices Toolbox.

These improvements align with FAMPO's 2045 MTP Environmental Mitigation Plan which prescribes the improvement of stormwater management for transportation projects and the development of strategies that will help reduce the severity of impacts for future extreme weather events and natural disasters. These improvements also align with Directive 2020-8, issued by the Secretary of the Army to protect critical assets, improve safety, and ensure mission resilience against threats caused by changing climate and extreme weather events.

## Quality of Life

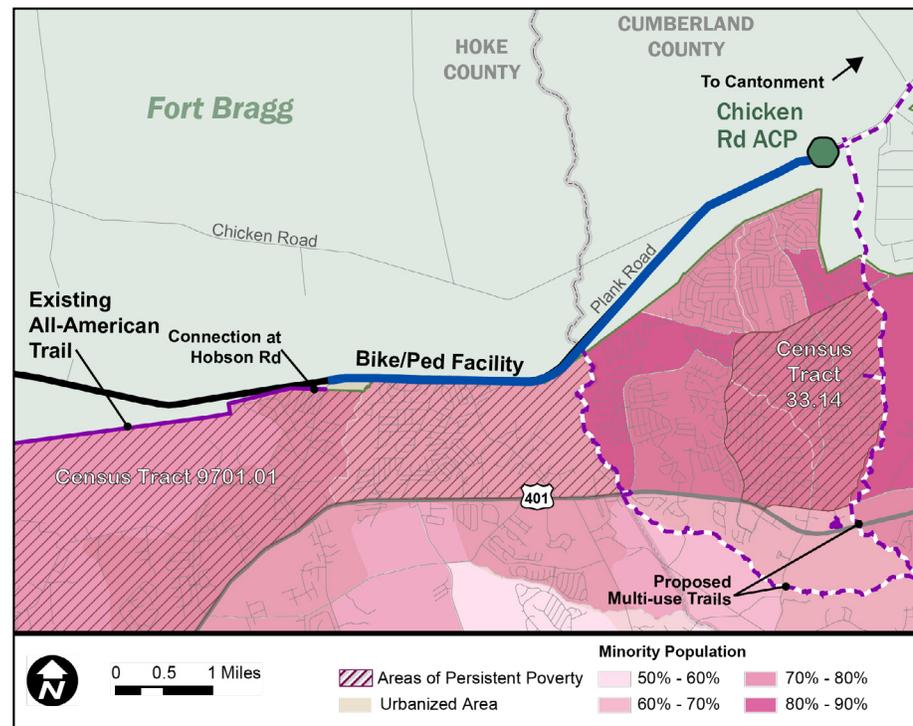
Safer and better roads improve the daily life for those living and working at or around Fort Bragg. Bringing the Project roads into a state of good repair allows for improved regional mobility and enhanced rural-urban connectivity, resulting in improved access to employment and services for civilian commuters and DoD contractors, residents, soldiers, military family members and retirees, and tourists. This improved mobility saves users time and transportation costs, allowing for greater efficiency in the regional Fayetteville economy.

As the region’s top employer, Fort Bragg provides a host of goods, services, and employment opportunities for the region. Womack Army Medical Center, DoD Child Nutrition office, physical fitness centers, and dental and behavioral health directorates are all located in the cantonment area, providing a diverse and substantial array of healthcare jobs. Nine schools are located on the base, providing an education to over 4,000 students and employment opportunities for teachers, counselors, and janitorial staff. Additionally, Fort Bragg provides careers for civilian engineers, planners, facility maintenance staff, construction companies, and security staff among numerous other opportunities. The Project also improves access to goods and services such as the Fort Bragg Soldier Support Center, Army & Air Force Exchange Service (AAFES) stores, Commissary, Chapels, and multiple child development centers and schools serving the families of military members and/or civilian employees.

The Project will improve connectivity for underserved minority and low-income communities across the region to essential services and job opportunities in the USAG Fort Bragg cantonment area and city of Fayetteville. The neighborhoods directly adjacent to USAG Fort Bragg, which largely qualify as Environmental Justice communities and include areas of persistent poverty will benefit the most from the proposed improvements.

The Project also includes an approximately 6-mile extension of the All-American Trail along Plank Road. The All-American Trail is an approximately 20-mile-long unpaved, educational, and scenic trail that follows the perimeter boundary of Fort Bragg through preserved longleaf pine forest land with a wealth of plant and wildlife species. This trail is planned to eventually extend through Cumberland, Hoke and Moore Counties linking the Fayetteville Metropolitan Area

**Figure 8: Multimodal Mobility Improvements along Plank Road**



with Southern Pines. This extension will be constructed as 5-foot outside paved shoulders. The inclusion of wide outside shoulders on these rural roads will allow pedestrians and bicyclists to travel in a separate space from traffic, increasing actual and perceived safety for active modes of transportation. As shown in Figure 8, this multimodal mobility investment was targeted to improve walking, biking, and rolling access for underserved, predominantly minority and low-income neighborhoods adjacent to USAG Fort Bragg. This Project element proactively advances the region’s plans to expand bicycle and pedestrian infrastructure, provides a missing link in

the bicycle and pedestrian infrastructure between the All-American Trail and Fort Bragg’s cantonment area, and improves the connectivity of surrounding communities to activity centers in Moore County as well as essential services located within Fort Bragg’s cantonment area.

### State of Good Repair

The Project roads are characterized by deteriorating pavement conditions, pavement edge drop-offs, substandard guardrails, inadequate signage, vegetation encroaching on roadway clear zones, substandard drainage structures and erosion. These conditions lead to unsafe and inefficient travel. The Project roads were not built for the level of use that they currently receive, nor to the standards that NCDOT uses in the state’s road system. The Project is needed to bring these roads into a state of good repair. In this grant application, a state of good repair is defined as meeting State standards established by the Board of Transportation for inclusion of roads in the State Highway System. By bringing the Project roads into a state of good repair, drivers avoid periodic vehicle maintenance costs. This benefit is estimated at \$5.1 million. Emergency vehicles similarly save on maintenance costs, valued at \$0.8 million.<sup>16</sup>

With the addition of the Project roads to the State Highway System, the roads will be maintained to an acceptable standard of performance at a lower cost than when Fort Bragg performed maintenance. This will result in ongoing savings for taxpayers as NCDOT is well-equipped and experienced in constructing, repairing, and maintaining roads; Fort Bragg, on the other hand, prioritizes military activities over road maintenance. NCDOT is estimated to spend 40 percent less on road repair and maintenance than Fort Bragg would spend on the same activities. This cost reduction was estimated by Fort Bragg during the development of the MOA and Intergovernmental Service Agreement (IGSA); documentation is included in the BCA workbook. NCDOT has estimated annual O&M costs after the transfer at approximately \$1.2 million (2019\$) per year, resulting in a net savings of \$809,000 (2019\$) annually.

To bring the roads to a state of good repair, the Project needs to address several design elements, including drainage, guardrails, pavement width, pavement condition, shoulders, pavement markings, signing, and vegetation management. The scope of the Project for each road is described in Table 6.

**Table 6: Road Improvements**

Road Name	Road Segment	Length (Miles)	Description of Improvements
Lamont Road	Manchester Road to Longstreet Road	3.29	Drainage, signing, vegetation management, guardrail, pavement rehabilitation, resurfacing, shoulder reconstruction, and pavement markings
Manchester Road	Lamont Road to Connecticut Road	15.88	Drainage, signing, vegetation management, guardrail, full depth pavement reclamation, resurfacing, widening, shoulder reconstruction, and pavement markings
Morrison Bridge Road	Manchester Road to Fort Bragg Boundary	0.59	Drainage, signing, vegetation management, guardrail, resurfacing, shoulder reconstruction, and pavement markings
Morganton Road	Manchester Road to Fort Bragg Boundary at SR 2033	0.65	Drainage, signing, vegetation management, pavement rehabilitation, resurfacing, shoulder reconstruction, and pavement markings

<sup>16</sup> In discounted 2019\$ over a twenty-year benefit period

Road Name	Road Segment	Length (Miles)	Description of Improvements
King Road	Manchester Road to Plank Road	7.23	Drainage, signing, vegetation management, guardrail, full depth reclamation, pavement rehabilitation, resurfacing, widening, pipe replacement at Wolf Pit Creek, ditch stabilization, shoulder reconstruction, and pavement markings
Raeform Vass Road	Plank Road to Fort Bragg Boundary	1.05	Drainage, signing, vegetation management, resurfacing, shoulder reconstruction, and pavement markings
Plank Road	Chicken Road ACP to Fort Bragg Boundary	17.96	Drainage, signing, vegetation management, full depth pavement reclamation, pavement repairs, resurfacing, widening, shoulder reconstruction, pavement markings, 6 miles of wide paved shoulders for bike and pedestrian facility
Honeycutt Road	Texas Pond	N/A	Culvert replacement and guardrail improvements

The photographs in Figure 9, taken in 2019 -2021, illustrate the poor conditions of the pavement, shoulders, and guardrails for the Project roads, and highlight ongoing problems with erosion and stormwater management. Because most shoulders along the Project roads are not paved, the shoulder erosion shown for Plank Road is observed in many portions of the Project area. The potential for run-off-the-road crashes is exacerbated by the poor shoulder conditions. Future heavy precipitation events may further undercut portions of Plank Road and other Project roads with heavily eroded shoulder conditions, resulting in potholes in the travel lane. The improved

**Figure 9: Road Condition Photographs**



Pavement condition, Manchester Road



Shoulder condition, King Road



Guardrail damage, Manchester Road



Ditch Erosion, King Road



Shoulder erosion on Plank Road



Sedimentation near Mott Lake Dam

pavement conditions will reduce wear and tear on personal and emergency services vehicles that use these roads daily, saving drivers and emergency responders operating costs.

Finally, the Project will increase resiliency by reducing the need for costly repairs to address heavy precipitation events. Because of the poor underlying conditions of the Project roads, these extreme weather events cause damages ranging from sink holes to total wash outs. The Project will address this challenge on a long-term basis.

## Economic Competitiveness

Fort Bragg is integral to the economic vitality of the region. The total direct and indirect economic impact of Fort Bragg on Bladen, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Robeson, Sampson, and Scotland County is over \$8.3 billion dollars.<sup>17</sup> Historically, Fort Bragg is responsible for approximately \$1 billion in prime military contracting in Cumberland County, representing approximately 39 percent of North Carolina's total military contracting.<sup>18</sup> Moreover, according to a 2017 study, each 100 active-duty military jobs in the region supports as many as 60 other jobs (including civilians at Fort Bragg). Each active-duty military job can support an average of as much as \$90,000 in labor income.<sup>19</sup> Keeping the roads that support mobility and connectivity at Fort Bragg safe and in a state of good repair supports the health of this critical economic and military asset. The Project will promote economic opportunities in the region by strengthening the transportation network in the region's rural areas and by creating temporary construction jobs and permanent O&M jobs associated with the Project.

Along with the increased economic and population growth in the region, the regional road network is experiencing increasing levels of congestion. According to FAMPO's 2045 Metropolitan Transportation Plan, approximately 6.5 miles of the regional roadway network, primarily along NC 24/87 (Bragg Boulevard) in Spring Lake, US 401 (Raeford Road), US 401 Bypass (Skibo Road), and South Reilly Road, experience failing Levels Of Service (LOS) in the 2015 base year. By 2045, regional roadway congestion is expected to grow to almost 17 miles of roadways with failing LOS.<sup>20</sup> Some commuters use Fort Bragg's road network to avoid these and other increasingly congested regional roads.

An estimate of the commuter traffic was developed for specific turning movements at two intersections along the Project roads. These turning movements represent 1) vehicle trips entering Fort Bragg property, but moving away from the cantonment area and other employment centers within the installation; and 2) vehicle trips traveling through the portion of Fort Bragg that does not contain employment centers and exiting the installation. Table 7 shows the commuter traffic volumes for both intersections, as well as the commuter traffic percentage of the total intersection traffic. The Wayside Road and Plank Road intersection has a higher level of cut-through commuter traffic because it is highly accessible to urban areas in Fayetteville and Cumberland County. The adjacent roads are substantially congested during the AM and PM peak periods in these areas. The Morrison Bridge Road and Manchester Road intersection is used by a substantially smaller number of commuters because NC 690 (Vass Road) provides comparable east-west access with substantially less traffic congestion than the roadways on the south side of Fort Bragg.

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<sup>17</sup> Fort Bragg Home of the Airborne and Special Operation Forces FY20 Statistical Card

<sup>18</sup> The Economic Impact of the Military on North Carolina, A joint publication of the North Carolina Department of Commerce and the North Carolina Military Affairs Commission.

<sup>19</sup> Impact Greater Fayetteville, Regional Impact Analysis for Reduction of Personnel at Fort Bragg and Recommendations for Economic Diversification in Cumberland, Hoke, and Harnett Counties, prepared by Fayetteville State University, School of Business and Economics and Creative Economic Development Consulting, LLC, May 2017.

<sup>20</sup> Refer to the 2045 MTP Highway Projects by 2015 Base Year Level of Service Map in the Supplemental Materials

**Table 7: Estimated Non-Military/Commuter Traffic Using Project Roads (2018)**

Intersection	Vehicle Type	AM Peak Hour	PM Peak Hour	13-hours	Movements Considered Commuter Traffic
Wayside Road and Plank Road	Truck	12 (46%)	11 (35%)	143 (47%)	Left turn onto Plank Road Westbound Right turn onto Wayside Avenue Southbound
	Passenger	345 (22%)	11 (35%)	3,110 (28%)	
Morrison Bridge Road and Manchester Road	Truck	1 (3%)	11 (35%)	10 (2%)	Right turn onto Manchester Road Westbound Left turn onto Morrison Bridge Road Northbound
	Passenger	34 (3%)	41 (4%)	317 (2%)	

Source: See Supplemental Materials for traffic count data provided by Onyx Group/Fort Bragg. Traffic counts were collected on February 6, 2018.

In addition to commuters using the Project roads to avoid congested regional roads, the Project roads serve other types of regional commutes. Fort Bragg is a major regional employer. In 2014, the Armed Forces made up approximately 11 percent of Cumberland County’s adult population, 9 percent of Hoke County’s adult population, and 5 percent of Harnett County’s adult population.<sup>21</sup> According to the North Carolina Department of Commerce, the DoD is the number one employer in Cumberland County for the fourth quarter of 2020.<sup>22</sup> Therefore, soldiers residing off-base as well as civilians rely on the Project roads to access their place of employment on Fort Bragg. Additionally, military family members and retirees rely on Project roads to access medical care, commissaries, recreational activities, retail and dining services, social activities, and a variety of essential and community-based services. Table 8 shows the estimated truck and vehicle traffic at the Chicken Road and Longstreet Road Access Control points (refer to Figure 3). Vehicles entering the Chicken Road gate generally originate in

**Table 8: Estimated Military Traffic Using Project Roads (2018)**

Intersection	Vehicle Type	AM Period (6AM to 9AM)*	PM Period (3PM to 6PM)*	13-hours	Project Roads Used
Chicken Road Access Control Point	Truck	65 (2%)	36 (2%)	169 (2%)	Plank Road
	Passenger	3,197 (98%)	1,742 (98%)	8,046 (98%)	
Longstreet Road Access Control Point	Truck	182 (5%)	154 (5%)	387 (6%)	Manchester Road, Lamont Road
	Passenger	3,451 (95%)	2,925 (95%)	6,294 (94%)	

Notes: Data provided by Fort Bragg. Data was collected in 2018.

\*Volumes per vehicle type are approximate and were calculated based on applying the 13-hour vehicle class percentages to the AM/PM period volumes..

<sup>21</sup> Impact Greater Fayetteville, Regional Impact Analysis for Reduction of Personnel at Fort Bragg and Recommendations for Economic Diversification in Cumberland, Hoke, and Harnett Counties, prepared by Fayetteville State University, School of Business and Economics and Creative Economic Development Consulting, LLC, May 2017

<sup>22</sup> <http://d4.nccommerce.com/QCEWLargestEmployers.aspx>

Cumberland, Hoke, and Scotland Counties, while vehicles entering the Longstreet Road gate generally originate in Cumberland, Moore, and Chatham Counties. The high proportion of passenger vehicle traffic indicates that these gates are primarily used for commutes and to access services on-base, rather than for military and training activities. This Project will create more reliable and efficient access to employment centers and job opportunities in Fort Bragg and Fayetteville.

With the upgrade of the Project roads, vehicles can travel:

- More safely, avoiding 4 injuries/fatalities and 19 property damage only crashes annually;
- At higher posted speeds, estimated at 2 percent higher than the current average; and
- With less vehicle wear and tear.

Lastly, while the region has seen some population and economic growth in recent years, there remains a need for further assistance to revitalize one of the most economically distressed areas in North Carolina. As described in Section II, Cumberland and Hoke Counties are designated Tier One Counties (most distressed) and there are 63 Areas of Persistent Poverty within 20 miles of the Project. These economic challenges demonstrate the need for continued investment within the region. By improving mobility and rural-urban connectivity, the Project will help spur investment and revitalization in these tracts.

## **Secondary Selection Criteria**

This section provides additional detail on the Project features that align with the 2021 RAISE program's secondary selection criteria.

### **Innovation (Project Delivery – Two Innovations)**

#### *CE Checklist*

In 2019, FHWA and NCDOT executed a CE Programmatic Agreement. The agreement prescribed use of a CE checklist, rather than the larger document-style CE, to help streamline project delivery. The checklist was refined and the agreement was updated in 2019.<sup>23</sup> NCDOT anticipates that 95 percent of all environmental documentation requirements can be met with this CE Checklist pursuant to this agreement. Based on the nature of the Project and NCDOT's past experience, it is anticipated that the completion of a CE checklist will satisfy NEPA requirements.

#### *MOA and IGSA*

Building on the success of previous partnership efforts, NCDOT and Fort Bragg are leveraging two innovative instruments for the repair, operation and maintenance of the Project roads: an MOA specifically for the Project roads, and an IGSA for all roads controlled by Fort Bragg. These agreements, both signed on May 2, 2019, were developed through a collaborative process that identified mutual benefits based on each stakeholder's needs and capacities; taken together, these agreements represent an innovative public-public partnership that will create efficiencies in the repair, operation and maintenance of all roads within Fort Bragg, especially on the Project roads.

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<sup>23</sup> NCDOT and FHWA CE Agreement, included in Supplemental Materials

As a whole, IGSA's were established through the fiscal year (FY) 2013 National Defense Authorization Act, codified at 10 USC §2679. IGSA's are formal public-public partnership agreements between military installations and State or local governments to receive, provide, or share installation support services, where the State or local government currently provides the service for its own residents. Fort Bragg and NCDOT executed an IGSA for road construction, repair, and maintenance which will be leveraged to bring Honeycutt Road, Morganton Road, and a portion of King Road into a state of good repair, using approximately \$4.68 (YOES) million in Fort Bragg funding sources to reimburse NCDOT for the services performed. This will substantially simplify the contracting process for this portion of the Project. Fort Bragg will engage NCDOT to bring the aforementioned roads into a state of good repair on a sole source basis. Moreover, the road improvements completed pursuant to the IGSA are not subject to Federal Acquisition Regulations which can be cumbersome and time consuming to navigate. By simplifying and streamlining the contracting process, Fort Bragg will be able to focus its limited resources in a more efficient manner and expedite the project delivery process.

Alongside the IGSA, NCDOT and Fort Bragg will use the MOA to advance the Project. The terms of the MOA will govern NCDOT and Fort Bragg's responsibilities to bring a portion of King Road, Plank Road, Manchester Road, Raeford Vass Road, Morrison Bridge Road, and Lamont Road, into a state of good repair. Once the Project roads are brought into a state of good repair, they will all be maintained by NCDOT in accordance with the provisions of the MOA. The MOA documents the responsibilities of both USAG Fort Bragg and NCDOT concerning the maintenance of the Project roads. The MOA is contingent upon the acceptance of the roads by NCDOT after being brought into a state of good repair. Per the terms of the agreement, Fort Bragg will petition NCDOT to add the Project roads to the State Highway System in accordance with NCDOT road addition procedures, which includes approval by the NCDOT Board of Transportation; grant NCDOT a right of way easement for future maintenance activities; allow NCDOT to access to the Project roads for the performance of maintenance activities; and maintain existing heavy vehicle/tank crossings. NCDOT will be responsible for all maintenance activities including roadway pavements and shoulders, roadway drainage, traffic signs and pavement markings, guardrail, and vegetation. NCDOT will also issue encroachment agreements for utility and non-utility encroachments upon Fort Bragg approval. Lastly, NCDOT will be responsible for all environmental actions and documentation and will provide a Road Maintenance Improvement Program and planning documents to USAG Fort Bragg, 30 days prior to any planned road closure.

Together, these agreements provide the following beneficial innovations:

- Due to the increased efficiency by NCDOT in the project delivery process; road construction, repair, and maintenance activities will achieve a 40 percent cost savings annually.
- The contracting process is streamlined and simplified.
- Fort Bragg is able to leverage NCDOT's vast expertise in delivering roadway projects across the state of North Carolina. NCDOT staff specialize in the design and O&M of the state's road system. By engaging NCDOT's expertise, Fort Bragg's roads will be constructed and maintained with higher quality.

## Project Applicant and Partnerships

FAMPO (the Project applicant) along with NCDOT and Fort Bragg (the Project partners) are strong advocates for the Project and have obtained the endorsement of several regional and local stakeholders. The Project letters of support are in the grant application website (<https://connect.ncdot.gov/resources/RAISE2021-FB/Pages/default.aspx>).

### FAMPO

FAMPO was established in 1975 to ensure regional cooperation in transportation planning. FAMPO's goal is to develop regional plans that will provide the safest and most efficient transportation while protecting and enhancing the environment. The Metropolitan Planning Area includes:

- Cities of Fayetteville and Raeford
- Towns of Spring Lake, Hope Mills, Eastover, and Parkton
- Portions of Cumberland, Hoke, Robeson, and Harnett Counties

FAMPO's role for the Project includes RAISE 2021 Discretionary Grant applicant and recipient.

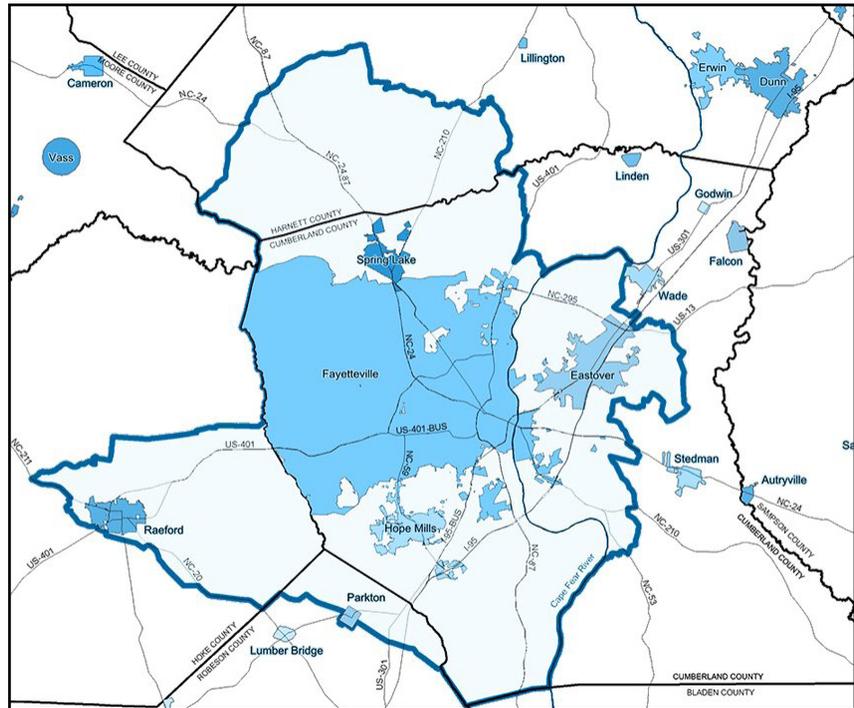
### NCDOT

NCDOT is responsible for maintaining approximately 80,000 miles of roadways and 18,000 bridges and culverts across North Carolina, as well as supporting rail, aviation, ferry, public transit, bicycle, and pedestrian transportation.

With an annual operating budget of about \$5.0 billion, the NCDOT is responsible for building and maintaining the State's transportation network. Federal funding accounts for a little over 20 percent of NCDOT's overall budget and about 45 percent of its construction budget, generated through the federal motor fuel tax and vehicle fees (mostly on trucks). NCDOT understands USDOT reporting requirements and maintains the administrative systems that will allow it to comply with USDOT's reporting and administration requirements.



Figure 10: FAMPO Area Map



The Department's role(s) for the Project includes:

- Administration of the Grant
- Operate and maintain the Project roads following the transfer to the State system after Grant obligation and the road improvements are completed
- Aid in ensuring efficient integration of the RAISE 2021 Project into the existing regional transportation network
- Oversight of the capital project delivery

### *USAG Fort Bragg*

Fort Bragg, established in 1918, is the largest army installation by population.<sup>24</sup> Fort Bragg spans roughly 500 square miles in Cumberland, Hoke, Harnett, and Moore Counties, and contains more than 1,400 miles of paved road.<sup>25</sup> It is home to several important commands, including the United States Armed Forces Command, XVIII Airborne Corps, the 82nd Airborne Division, and several other brigades and battalions, including Special Forces. These groups support the nation's Immediate Response Force (IRF) that is built for rapid response to unforeseen and unplanned operations. Selected Army airborne forces provide a large portion of the IRF, many of which are based at the Fort. Fort Bragg is home to the 82nd Airborne Division's 1st, 2nd, and 3rd Brigade Combat Teams (BCT) that are the nucleus of the IRF and the Army's Special Forces team. As their IRF assignments are typically responses to suddenly manifested threats, longer term planning and mission-focused training exercises are rarely applied to prepare for IRF operations. These are highly trained military forces whose preparation for IRF assignments entails regularly implemented realistic exercises and habitual planning. The Fort Bragg BCT forces that support the IRF mission are "on-call" 24/7 and must remain ready to deploy within 18 hours. Training exercises recreate this scenario. Since 2000, Fort Bragg Soldiers have participated in combat and humanitarian operations in countries around the world. Fort Bragg responded to provide support to those impacted by Hurricane Katrina in 2005 and in Haiti after the 2010 earthquake. Fort Bragg also serves a vital role in the war on terror, deploying and supporting more troops than any other installation in support of Operations Enduring Freedom, Iraqi Freedom, and New Dawn.<sup>26</sup>



Including active and reserve military, DoD and contract civilians, military family members and retirees, Fort Bragg supports a population of over 325,000 (2020). The full military installation covers over 171,982 acres. Travel movements within Fort Bragg are a mix of daily commuting to on-base employment and services, base residents leaving Fort Bragg, training exercises, travel to support deployments and general regional travel that circulates around the base but is separate from base traffic.

<sup>24</sup> Fort Bragg Home of the Airborne and Special Operation Forces FY 19 Statistical Card

<sup>25</sup> Fort Bragg Visitor Information, <https://home.army.mil/bragg/index.php/about/fort-bragg-history>

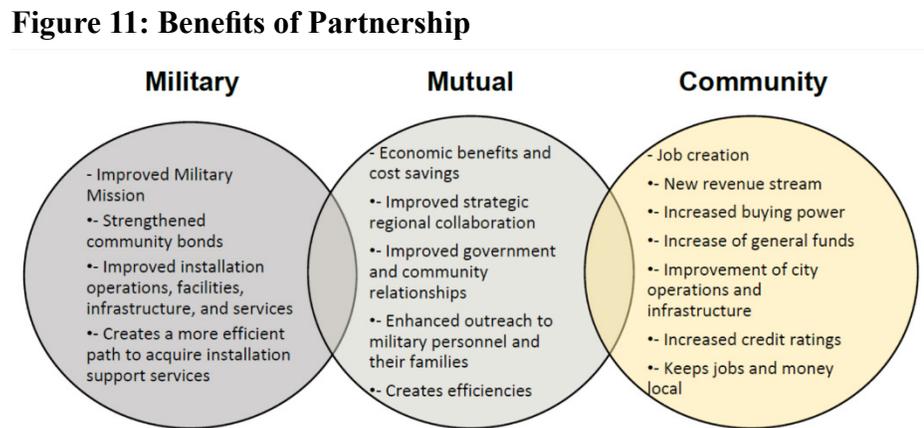
<sup>26</sup> Fort Bragg History, <https://home.army.mil/bragg/index.php/about/fort-bragg-history>

Fort Bragg's role(s) for the Project includes:

- Petitioner to NCDOT to add the roads to the State Highway System
- Grantor of a right of way easement to NCDOT, after the Project roads are brought to a state of good repair, if selected for award
- Signatory to the MOA transferring repair and maintenance responsibilities of the Project roads to NCDOT
- Funding partner, contributing \$4.68 (YOES) million from the Army O&M funds

### Regional Cooperation

Fort Bragg is intimately linked to the regional community. Soldiers, civilian contractors, and their families live, work, and obtain community and educational services in the municipalities surrounding Fort Bragg. Through its partnership with NCDOT and FAMPO



to repair and maintain the Project roads, the military mission is improved, safety is improved for the traveling public, community bonds are strengthened, and federal and state tax dollars are used more efficiently. By forming a partnership with NCDOT, Fort Bragg is able to leverage available authorities to increase installation readiness, efficiently utilize resources, and modernize Fort Bragg's infrastructure. Figure 11 describes the benefits for the innovative partnership.

Prior to the execution of the IGSA and MOA on May 2, 2019, NCDOT and Fort Bragg have a long history of partnering together with local municipalities to achieve regional objectives; and continue to partner on a daily to basis regarding ongoing operations. Past collaborations include:

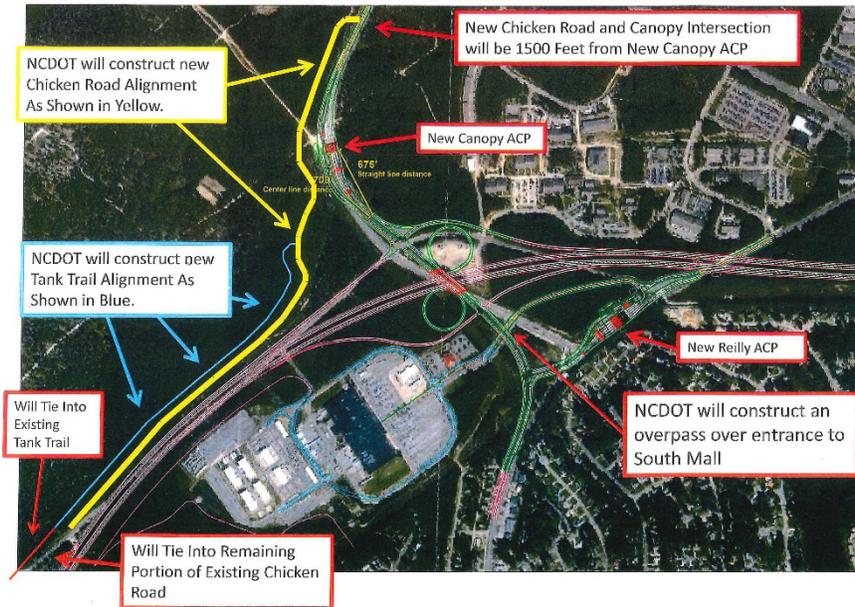
- The Regional Land Use Advisory Commission (RLUAC) has fostered collaboration across the region for nearly three decades to protect the civilian population from military training impacts; to protect the Longleaf Pine Ecosystem; and to protect the military training mission from incompatible development. RLUAC membership includes the counties of Cumberland, Harnett, Hoke, and Moore as well as the municipalities of Aberdeen, Fayetteville, Pinehurst, Raeford, Southern Pines, Spring Lake, and Vass (among others). NCDOT works with the RLUAC members and Fort Bragg to implement the committee's findings.<sup>27</sup>
- Prior to September 11, 2001, NCDOT maintained a section of the All-American Expressway inside USAG Fort Bragg's cantonment area. In the aftermath of 9/11, NCDOT coordinated with Fort Bragg on gate closures and enhanced security measures.

<sup>27</sup> Fort Bragg Joint Land Use Study, prepared by Benchmark Planning, September 2018, Provided by FAMPO

- Prior to 2006 the Fort Bragg crash data was entered into the NCDOT-North Carolina Department of Motor Vehicle crash system, providing coordinated data for all agencies with accident oversight.
- After September 11, 2001, NCDOT partnered with Fort Bragg to close Bragg Boulevard by improving Murchison Road. The DoD contributed approximately \$36 million and the NCDOT contributed \$10.7. As part of the project Fort Bragg provided a perpetual easement, valued at \$6.9 million to accommodate the improvements.<sup>28</sup>
- Fort Bragg, NCDOT, Spring Lake and Fayetteville assist with traffic control for special events affecting traffic in the surrounding region.
- The NCDOT Intelligent Transportation System extends through the I-295 corridor connecting to the I-95 System. This provides all agencies with emergency information transferred throughout this part of the state.
- Fort Bragg is a contributing partner with the Cumberland County Incident Management team, NCDOT Division 8, Fayetteville, and Spring Lake. This response team has been pivotal to ensuring positive outcomes during emergencies such as during hurricanes Florence and Matthew.
- NCDOT has coordinated traffic signal equipment with Fort Bragg, enhancing interagency communication.
- NCDOT Division 6 staff provides periodic training to the Fort Bragg traffic signal staff, integrating the adjoining signal systems for better vehicle progression both on- and off-base.

**Figure 12: NCDOT and Fort Bragg Collaboration Project**

- NCDOT partnered with Fort Bragg to design six interchanges that connect Fort Bragg directly to I-295. Fort Bragg (DoD) provided perpetual easement to accommodate the outer loop. In return, NCDOT upgraded affected tank trails, a tank trail bridge, lengthened a ramp bridge to accommodate a tank trail and, built a tunnel to provide training area access.



In order to accommodate this new road infrastructure, NCDOT and Fort Bragg worked together to reconstruct access control points and roads impacted by construction. Figure 12 shows the interchange of I-295 at Canopy Lane and Riley Road which required extensive collaboration and coordination. As part of the project Fort Bragg provided a perpetual easement, valued at \$45.5 million to accommodate the improvements.<sup>29</sup>

<sup>28</sup> Refer to Land Value for I-295 Construction and Murchison Road Improvements transfer to NC Department of Transportation in the Supplemental Materials

<sup>29</sup> Ibid

- NCDOT employees are granted semi-permanent security passes to enter the base.
- Fort Bragg and NCDOT Divisions 6 and 8 are active partners in the FAMPO, and often work together to provide engineering oversight into joint projects that affect all roadway systems. Fort Bragg has a consulting transportation contractor (the Onyx Group) that provides technical data to NCDOT.
- Fort Bragg and the City of Fayetteville collaborate to permit the city bus system (FAST) access onto the base.
- Fort Bragg works with NCDOT Division 6 and Division 8 staff, providing engineering oversight into joint projects that affect the regional roadway system.
- Fort Bragg is a monthly contributing partner on NCDOT construction projects affecting the base.

*Regional Transportation Investments*

NCDOT is committed to providing the Fayetteville metropolitan area the necessary transportation infrastructure to support regional growth. Over the next 5 years, NCDOT has programmed 53 roadway and bridge projects in the region of the Project, totaling approximately \$1.55 billion. Between 2010 and 2020, just over \$1.45 billion was spent on transportation construction in Cumberland County alone, with an additional \$330 million spent on transportation construction in Moore, Lee, and Hoke Counties. Currently, there are 26 projects under construction within 20 miles of Fort Bragg, totaling approximately \$1.2 billion in construction cost. Table 9 summarizes projects in the region that are included in the North Carolina State Transportation Improvement Program (STIP) and slated to begin construction in FY 2022 through 2026.

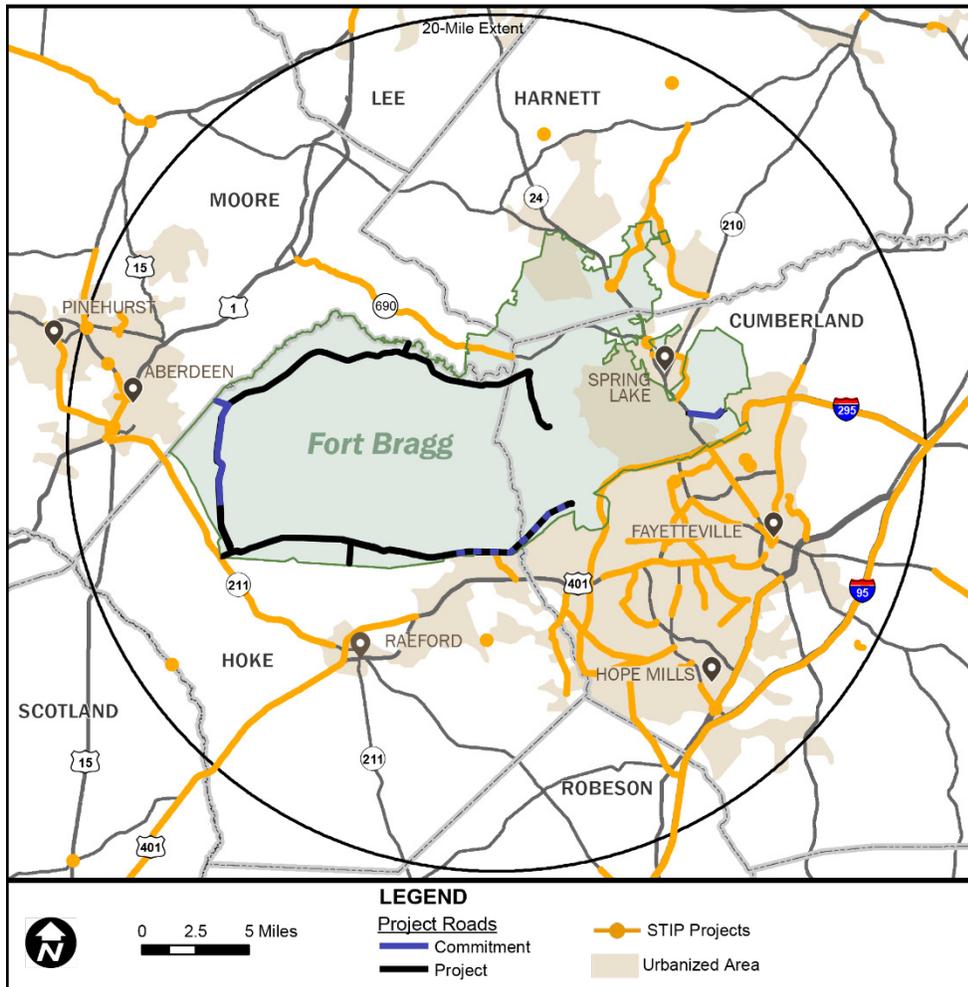
**Table 9: NCDOT’s Investments in the iBRAGG Region**

Construction Begins (FY)	Number of STIP Projects	Total Investment (Thousands)
2022	13	\$286,275
2023	14	\$698,999
2024	6	\$373,545
2025	14	\$139,496
2026	6	\$52,366
<b>Total</b>	<b>53</b>	<b>\$1,550,681</b>

Source: NCDOT STIP, Feasibility Studies, and Strategic Prioritization (excludes aviation and transit projects)

Figure 13 illustrates the location of STIP projects within approximately 20 miles of Fort Bragg. The detailed list of the STIP projects in the region are provided in the Supplemental Materials.

Figure 13: STIP Projects in the iBRAGG Region



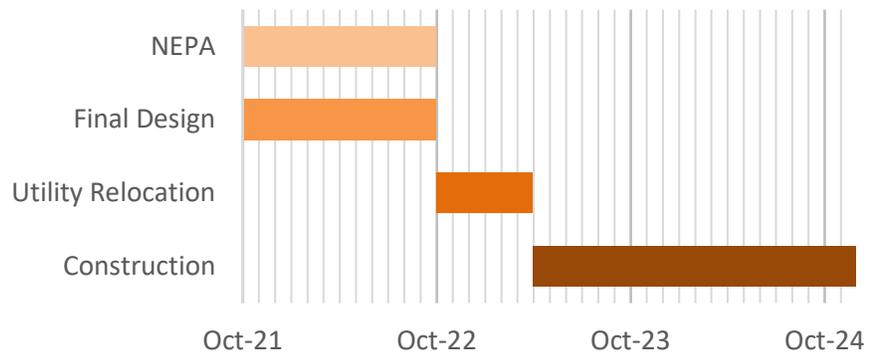
## V. Environmental Risk

The iBRAGG Project is has low levels of environmental and project risk. NCDOT has delivered thousands of similar projects. Road construction and maintenance is one of NCDOT’s primary functions; this grant funding will allow maintenance and repair to be shifted to NCDOT, an agency better equipped to perform these activities at substantial savings to the taxpayer. Should the Project be approved for RAISE grant funding, NCDOT is ready for obligation as soon as the necessary documentation is executed. All proposed investments are located within an active roadway corridor, with no change in the existing land use.

## Project Schedule

Figure 14 depicts the Project schedule. Upon obligation of funds, NCDOT, will work collaboratively with Fort Bragg to complete the CE Checklist, final design, utilities coordination/relocation, and to complete the right of way easement transfer. All preconstruction activities are expected to be

**Figure 14: Project Schedule Timeline**



Note: This schedule assumes award in October 2021.

completed within approximately 18 months. Construction to bring the roads into a state of good repair is anticipated to last another 18 months. Fort Bragg would then petition NCDOT to add the Project roads to the State Highway System. Thereafter NCDOT will assume construction, maintenance, and repair responsibilities. The Project can get underway immediately after the grant agreement is signed, with construction completed well in advance of the September 30, 2029 deadline to expend all funds, as outlined in the Notice of Funding Opportunity.

## Required Approvals

### Environmental Permit and Reviews

All of the Project roads were evaluated in a Record of Environmental Consideration undertaken by Fort Bragg, which is included in the Supplemental Materials. To comply with NEPA, the Project will be processed using NCDOT’s CE Checklist as described in the Project Delivery Innovation Section.

NCDOT will coordinate with Fort Bragg environmental personnel prior to any ground or vegetation disturbance to comply with all applicable environmental regulations, which may include Section 7 of the Endangered Species Act, the Clean Water Act, and Section 106 of the National Historic Preservation Act. Fort Bragg environmental personnel will review all proposed disturbance and corresponding environmental documentation prior to execution as a condition of the easement agreement.

The Project will likely be required to comply with permitting requirements pursuant to Sections 401/404 of the Clean Water Act. Permitting requirements would be coordinated with the United States Army Corps of Engineers (USACE) and the North Carolina Department of Environmental Quality (NCDEQ). The improvements will cross Waters of the United States; therefore, the Project would likely fall under requirements for the Nationwide Permit 14 (Linear Transportation Projects). The USACE holds the final discretion as to what permit will be required to authorize construction. Any mitigation required as a condition of the permit will be provided by NCDEQ’s Division of Mitigation Services.

## State and Local Approvals

No legislative approvals are required to complete the Project. Of note, the MOA that governs the road transfer has already been negotiated and signed by both Fort Bragg and NCDOT.

## Federal Transportation Requirements

Beyond the NEPA process described above, there are no federal requirements affecting state or local planning for the Project.

## Assessment of Project Risks and Mitigation Strategies

The NCDOT has completed work similar to the proposed Project and has not experienced significant procurement delays. The Project area is currently utilized for transportation purposes and is situated within an active roadway corridor, reducing many potential risks.

NCDOT tracks Construction Project Delivery in terms of budget and schedule as part of its own performance metrics. The 2020 Annual Report on Performance describes the outcomes for FY 2020 and the prior year comparator (the most recent data available). Project delivery metrics are on page 12 of the report. Table 10 illustrates that the Department met its target. The NCDOT is familiar with federal funding obligations and construction procedures.

**Table 10: NCDOT Project Delivery Performance**

Performance Measure	How NCDOT Measures It	Target	Previous (FY 2019)	Current (FY 2020)	Target Met
Construction Projects – On Schedule	Percentage completed on schedule	More than 90%	91%	92%	✓
Construction Projects – On Budget	Total budget overrun on completed projects	Less than 5%	-1.9%	-0.1%	✓

Source: NCDOT STIP, Feasibility Studies, and Strategic Prioritization (excludes aviation and transit projects)

## VI. Benefit-Cost Analysis

The Project construction anticipates completion in 2024. To capture a full 20 years of operation, a benefits period of 2025-2044 was selected. The exhibit below summarizes the discounted value of the benefits and costs of the total Project during the 20-year analysis period. The Project provides over \$40.6 million dollars of net benefits, as shown in Table 11. Compared to a similarly discounted cost estimate, the benefit-cost ratio for the total Project is 2.75. This estimate includes the disbenefit of construction disruption.

For details on the BCA and the methodologies used, please see the technical memorandum and BCA workbook included as Attachments and in the Supplemental Materials (<https://connect.ncdot.gov/resources/RAISE2021-FB/Pages/default.aspx>).

**Table 11: Total Project Benefit-Cost Analysis Results**

	<b>20 Year Benefits Period(2025-2044) Values stated in 2019\$ (Millions) Discounted at 7%</b>
<b>Costs</b>	
Capital Costs	\$23.2
<b>Total Costs</b>	<b>\$23.2</b>
<b>Benefits</b>	
<b>Safety</b>	
Reduced Highway Fatalities and Crashes	\$35.0
King Road Detour Safety Savings	\$1.9
Emergency Response and Access	\$2.4
<b>Subtotal Safety Benefits</b>	<b>\$39.3</b>
<b>Economic Competitiveness</b>	
Delays During Construction	-\$2.5
Travel Time Savings	\$6.5
King Road Detour Travel Time Savings	\$1.5
King Road Detour Vehicle Operating Cost Savings	\$2.4
Truck Operating Savings	\$0.3
Regional Congestion Relief	Qualitative
<b>Subtotal Economic Competitiveness</b>	<b>\$8.2</b>
<b>State of Good Repair</b>	
Residual Value	\$3.1
Vehicle Maintenance Savings	\$5.1
Emergency Vehicle Maintenance Savings	\$0.8
Resilience Repair Cost Savings	\$0.1
<b>Subtotal State of Good Repair</b>	<b>\$9.1</b>
<b>Environmental Sustainability</b>	
Emissions Savings (auto – includes King Road Detours)	\$0.08
Emissions Savings (truck)	\$0.01
<b>Subtotal Environmental Sustainability</b>	<b>\$0.09</b>
<b>Quality of Life</b>	
Regional Mobility	Qualitative
O&M Savings (Costs)	\$7.0
<b>Subtotal Quality of Life</b>	<b>7.0</b>
<b>Net Operations and Maintenance</b>	<b>\$7.0</b>
<b>Total Benefits</b>	<b>\$63.7</b>
<b>Benefit-Cost Ratio</b>	<b>2.75</b>
<b>Net Present Value</b>	<b>\$40.6</b>

## VII. Summary

The Project delivers multiple types of benefits including environmental sustainability, quality of life, safety, state of good repair, economic competitiveness, innovative project delivery, and partnerships. The Project is cost effective and its benefit-cost ratio for all major components is 2.75. The Project is expected to begin construction no later than 18 months after the date of obligation of funds. Letters of commitment from the Project sponsor (FAMPO) and its partners (NCDOT and Fort Bragg) are provided in the Supplemental Materials to this application. Lastly, the Project likely cannot be completed without RAISE grant funding. Receipt of RAISE grant funding is imperative to the Project due to limitations on state expenditures to improve the Project Roads to State Highway System standards, as well as Army constraints on funding non-mission essential infrastructure, as described in Section III.