

powerNC

*Providing Opportunities for Workforce development
and Energy Readiness in North Carolina*

PROJECT MERIT CRITERIA



IN PARTNERSHIP WITH
STEPS4GROWTH & NC COMMUNITY COLLEGE SYSTEM

**USDOT Charging and Fueling
Infrastructure Grant
APPLICATION
JUNE 2023**



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SAFETY

Providing Opportunities for Workforce development and Energy Readiness in North Carolina (powerNC, or “the Project”) will use the United States Department of Transportation’s (USDOT’s) National Roadway Safety Strategy’s (NRSS) Safe Systems Approach to provide holistic and comprehensive safety benefits for all users and support USDOT’s goal of achieving zero roadway deaths. Several siting and design elements of the Project’s new electric vehicle (EV) charging stations will support safe interactions between drivers and active transportation modes by providing multiple layers of interventions to prevent crashes and minimize the harm caused to those involved when crashes do occur. The following siting and design elements will promote safety for all road users and avoid, minimize, or mitigate negative safety impacts for both drivers and non-motorists introduced by the Project:

General Siting: PowerNC will thoughtfully site new EV charging stations to maximize the ability of users to safely access nearby on- and off-campus services, amenities, and resources (including classrooms, libraries, computer labs, student support services, eateries, bookstores, gyms, auditoriums, and community gathering spaces) without a vehicle. The North Carolina Department of Transportation (NCDOT) will also avoid siting the Project’s EV charging station in flood-prone areas. This will protect users from potential injuries due to damage to the charging station, EV battery, or other vehicle malfunctions from water intrusion.

Site-specific Design Elements: Once sites are identified, specific design plans will be developed that integrate proven safety countermeasures from the NRSS toolbox where appropriate and feasible, including sidewalk, pavement, crosswalk, lighting, signage, and other design elements to help mitigate human mistakes, encourage safer behaviors, and protect vulnerable users. These design interventions will include:

- **Wayfinding and Signage:** The Project will install signage to alert drivers to the potential presence of vulnerable users accessing the EV charging stations, assist with wayfinding on-campus, and provide information that will assist EV charging station users to safely charge their vehicle or e-bike. All signage installed as part of the Project will comply with the Manual Uniform Control Devices for Streets and Highways (MUCTD) and applicable requirements in 23 Code of Federal Regulations (CFR) Part 750.

- **Crosswalk Visibility Enhancements:**

The Project will implement new high-visibility crosswalk treatments to provide safe connectivity for active transportation modes between the new charging stations and the surrounding multimodal network. These enhancements will support the needs of active transportation modes to access the new charging stations. High-visibility crosswalk patterns and materials like thermoplastic tape may be used to further improve visibility around the EV charging stations for all modes during both daytime and nighttime use.

- **Lighting:** According to USDOT’s [Pedestrian Safety Dashboard](#), 77 percent of pedestrian fatalities in 2021 occurred during dark conditions. PowerNC addresses this risk by including lighting near each EV charging station to reduce crash risks for users during non-daylight hours, improve visibility, and improve personal security for all users.

- **Speed Restrictions:** During design, a range of factors such as pedestrian and bicyclist activity, crash history, land use context, roadway geometry, roadside conditions, traffic volume, and observed speeds will be considered to identify any needed speed restrictions to provide safety benefits.



The Project’s signage will promote safe interactions between modes, and alert drivers to the potential presence of vulnerable road users





Siting: Maximizes safe access to nearby on- and off-campus services, amenities, and resources without the need for personal vehicles.

Signage: Promotes safe interactions between motorists and non-motorists, and alerts drivers to the potential presence of vulnerable road users accessing the EV charging stations.

Visibility: Includes high-visibility crosswalks to improve driver and pedestrian visibility.

Lighting: Reduces safety risks for users during non-daylight hours.

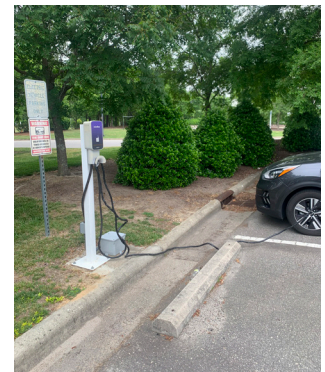
Speed: Identifies potential speed reductions based on pedestrian and bicyclist activity, crash history, land use context, among other factors.

ADA Compliance: Ensures ADA-compliant access and operations for users of all abilities.

- **ADA Compliance:** PowerNC will provide safely accessible EV charging stations for users of all abilities by ensuring compliance with the Americans with Disabilities Act (ADA) and all applicable USDOT and US Department of Justice (USDOJ) accessibility standards (see **Siting and Design Framework** for more information).

Lastly, powerNC incorporates important safety considerations during operations. The operation of EV charging stations carries certain safety-related risks for users, including the risks of shock, burns, electrocutions, and fire hazards. The Project will provide safety benefits for all users and avoid negative safety impacts by procuring EV charging stations that meet the safety standards outlined in 23 CFR § 680, as well as the safety requirements of the National Electric Vehicle Infrastructure (NEVI).

When students and professionals are observing/performing installation, maintenance, and repair activities, a portion of the parking lot surrounding the EV charging stations will temporarily close to accommodate this activity. Temporary traffic control measures and signs will be used to demarcate zones for students to safely gather in and to alert drivers and other users of the closure and the presence of students and instructors within the parking lot.



Current EV charging stations at Wake Technical CC



CLIMATE CHANGE, RESILIENCE, AND SUSTAINABILITY

Reducing greenhouse gas (GHG) emissions from fossil fuel combustion is one of the primary purposes of powerNC, and addressing climate change, resilience, and environmental justice (EJ) in planning and project delivery are essential components of the Project. PowerNC will incorporate evidence-based climate resilience measures and avoid adverse environmental impacts through siting and design elements. The Project supports State and national efforts to accelerate the adoption of zero-emission vehicles and will target much of the GHG reductions and other environmental benefits to disadvantaged communities in North Carolina, which face disproportionately negative impacts of climate change and pollution.

GREENHOUSE GAS (GHG) EMISSIONS REDUCTIONS

According to the North Carolina Department of Environmental Quality's (NCDEQ's) [2022 GHG Inventory](#), the transportation sector is responsible for the largest share of GHG emissions in North Carolina, accounting for 36 percent of emissions in the State between 2005 and 2018. Under the reference case projection of the inventory, gasoline and diesel highway emissions in North Carolina are projected to reach over 46 million metric tons of carbon dioxide equivalent (MMTCO_{2e}) by 2025, which equates to 89 percent of the transportation sector's total GHG emissions. North Carolina has taken actions to rapidly grow the EV market and decrease GHG emissions through multiple initiatives and laws. These efforts will work towards lowering this projection, even as the State's population continues to grow.

The most important step toward decarbonization of transportation are North Carolina's laws regarding the electricity sector. [Session Law \(SL\) 2007-397](#) and [SL 2021-165](#) implemented energy efficiency and renewable energy requirements and goals. As a result, North Carolina is one of the top states in the US for installed solar capacity. As of February 2023, over 45 percent of the State's electricity generation is from low-carbon sources such as nuclear, hydropower, and renewables, according to the [US Energy Information Administration](#). PowerNC's new EV charging stations will be supplied with electricity generated from these low-carbon sources.

In doing so, powerNC aligns with State and Federal decarbonization goals and will reduce transportation-related GHG emissions by

91.1 short tons annually, according to the Alternative Fuel Life-Cycle Environmental and Economic Transportation ([AFLEET](#)) Emissions Tool (see **Supplemental Materials**). The Project will increase public access to EV charging stations across North Carolina to accelerate the adoption of EVs and remove barriers to EV ownership, thereby reducing range anxiety for EV drivers and increasing safe and convenient access to charging stations. Since electric transportation modes are less carbon-intensive than conventional fuels, they will support a continued reduction of the transportation sector's share of GHG emissions in North Carolina.

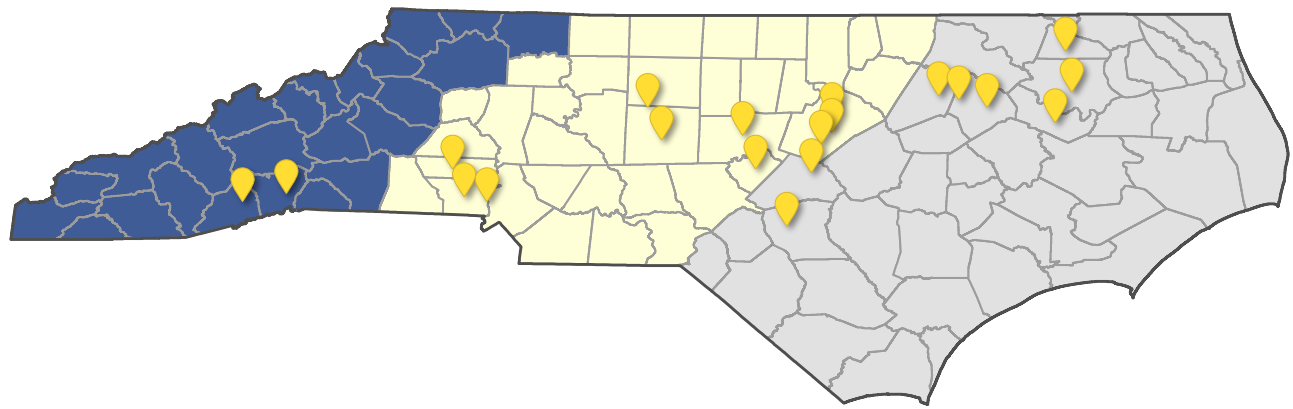
EVIDENCE-BASED CLIMATE RESILIENCE

In addition to mitigating climate change through GHG emission reductions, the Project incorporates evidence-based climate resilience measures to mitigate flood risk and maximize the lifespan of this Federal investment. The [State of North Carolina Hazard Mitigation Plan](#) found that North Carolina is facing the following climate hazards:

- Flooding
- Hurricanes and coastal hazards
- Severe winter weather
- Excessive heats
- Earthquakes
- Droughts
- Tornadoes
- Thunderstorms
- Geological failures

These hazards create risks leading to vulnerability of the Project's EV charging stations, especially with regard to flooding





	MOUNTAINS	PIEDMONT	COASTAL PLAIN
Flooding	Dark Blue	Yellow	Light Gray
Hurricanes & Coastal Hazards	Dark Blue	Yellow	Light Gray
Severe Winter Weather	Dark Blue	Yellow	Light Gray
Excessive Heat	Light Gray	Yellow	Light Gray
Earthquakes	Dark Blue	Yellow	Light Gray
Drought	Dark Blue	Light Gray	Light Gray
Tornadoes	Light Gray	Yellow	Light Gray
Thunderstorms	Dark Blue	Yellow	Light Gray
Geological Failures	Dark Blue	Light Gray	Light Gray

and standing water. The Project mitigates these risks in accordance with the Federal Flood Risk Mitigation Standard (FFRMS), as updated by Executive Order (EO) 13690 by incorporating the following features:

- Siting will avoid areas prone to flooding and inundation using North Carolina’s [Resilience Analysis Framework for Transportation \(RAFT\) tools](#).
- New EV charging stations will be elevated above the Design Flood Elevation (DFE).
- Wet and dry flood proofing measures, like watertight covers on exposed outlets or plugs, will minimize flood damage.
- Resilient landscaping will prevent erosion and support stormwater management.
- Siting will avoid areas prone to rockslides using NCDOT’s [Geotechnical Asset Management Database](#).

Moreover, as site context and budget allow,

the Project will explore the incorporation of backup power systems and climate-adaptive materials at highly vulnerable sites. This will further bolster the Project’s ability to withstand hazards intensified by climate change.

Lastly, the Project will install up to five EV charging stations along the State’s coastal evacuation routes to support the needs of coastal EV users during hurricanes and emergency weather events whose frequency and intensity is increasing due to climate change. Nash CC (Main Campus), Edgecombe CC (Rocky Mount and Tarboro campuses), and Martin CC (Martin and Bertie campuses) are all within approximately one mile of North Carolina’s Coastal Evacuation Routes (see **Supplemental Materials**).

By reducing GHG emissions, considering climate change, and incorporating resilience and EJ in project planning and delivery,



powerNC will create health benefits and address the disproportionate negative impacts of climate change and air pollution on disadvantaged communities at each participating CC.

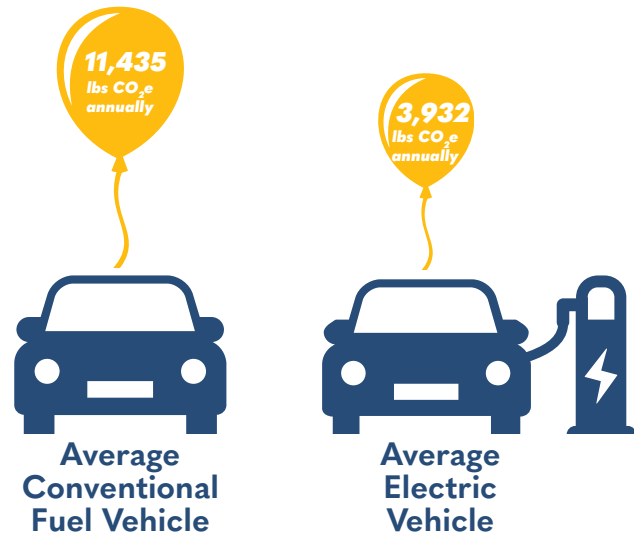
The Project’s reductions in GHG emissions will address the primary factor driving global climate change and subsequent increase in the frequency and intensity of natural disasters in North Carolina. This Project recognizes the disproportionate harm these events cause in the disadvantaged, underserved, and overburdened communities surrounding each participating CC due to lack of resources and limited access to healthcare and transportation options, particularly for older adults, children, low-income earners, and communities of color.

PowerNC will incorporate siting and design elements to protect the environment as follows:

Air Quality: The Project’s new EV charging stations will accelerate the adoption of EVs, thereby reducing pollution from tailpipe emissions and improving air quality. The Project will also contribute to reductions in particulate matter from brake dust due to friction braking, as EVs primarily use regenerative braking during operation.

PowerNC will reduce air pollution from the project, including nitrogen oxide (NO_x) particulate matter (PM₁₀ and PM_{2.5}), volatile organic compounds (VOC), and sulfur oxides (SO_x) according to data from the [AFLEET Tool](#). The Project directs these benefits towards disadvantaged, underserved, and overburdened communities across the State, with consideration to the unique transportation challenges faced in rural areas (see **Equity, Community Engagement, and Justice40** and **CFI Program Vision**).

Carbon emissions for conventional fuel vehicles versus EVs



Not to scale. CO₂e: Carbon dioxide equivalent. Via USDOE Alternative Fuels Data Center

Water Quality: By supporting a transition from conventional vehicle ownership to EVs, the incidence non-point source surface water pollution from leaks and accidental spillage of gasoline and oil will be reduced in North Carolina communities. Moreover, powerNC will seek to minimize the amount of new impervious surface created by the Project by placing new EV charging stations in existing parking lots and exploring the use of permeable pavers where budget and site conditions allow. The Project will follow erosion and sediment controls during construction to avoid adverse water quality impacts.

Wetlands and Endangered Species: The Project’s site and utility improvements will be designed to completely avoid impacts to streams, wetlands, or endangered species habitat.

powerNC Annual Air Quality and GHG Emissions Improvements (AFLEET)

AFV Fueling Infrastructure	GHGs (short tons)	CO (lb)	NO _x (lb) ^x	PM ₁₀ (lb)	PM _{2.5} (lb)	VOC (lb)	SO _x (lb) ^x	Fuel Dispensed (fuel unit)	Fuel Unit
Level 2 EVSE	91.1	941.8	22.8	2.3	2.1	92.2	0.4	120,000	kWh





EQUITY, COMMUNITY ENGAGEMENT, AND JUSTICE40

PowerNC supports North Carolina’s EV Infrastructure Deployment Plan by expanding access to convenient, reliable, affordable, and equitable EV charging.

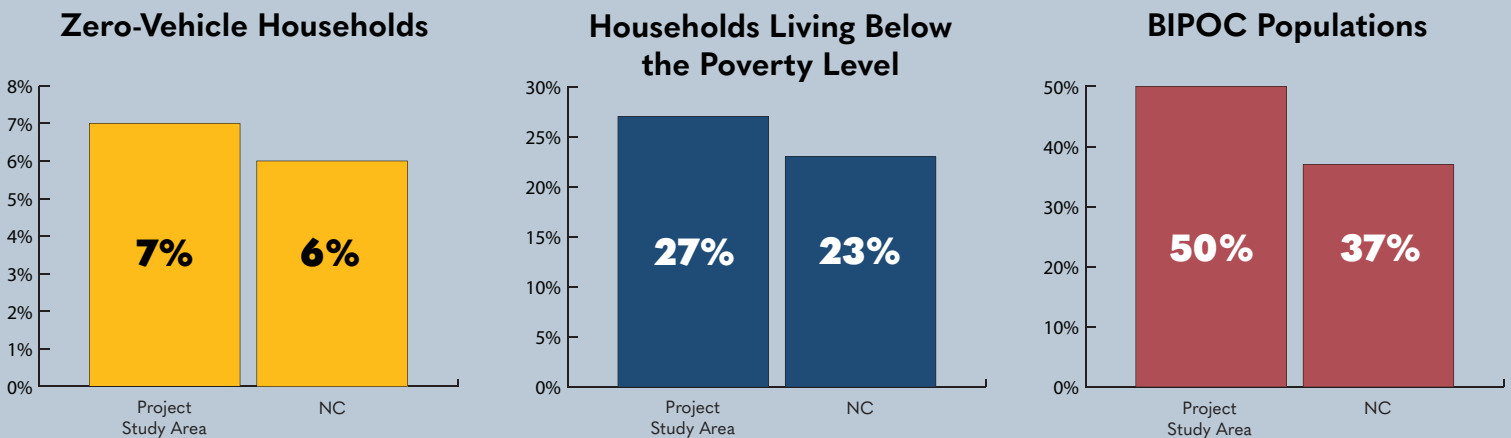
In alignment with this plan, powerNC will adopt an integrated approach to EV charging station deployment that expands community-based infrastructure and fills gaps in access in locations accessible to students, teachers, and the community at-large. Equity and the goals of the Justice40 initiative were major considerations in the identification of participating CCs and campuses. Six of the 10 participating CCs are located in Tier 1 economically distressed counties according to the North Carolina Department of Commerce (NCDOC), while 8 participating CCs will deploy new EV charging stations in Disadvantaged Communities (DACs) according to the EV Charging Justice40 map. There are 153 Justice40 DACs and 140 Historically Disadvantaged Communities (HDCs) within 5 miles of the participating CCs (see **Project Location**). The Title VI EJ program officer from NCDOT’s Office of Civil Rights (OCR) will be engaged with this planning and delivery of essential components of this Project.

NCDOT’s Transportation Disadvantage Index (TDI) tool found concentrations of zero-vehicle and impoverished households, and Black, Indigenous, or Persons of Color (BIPOC) populations within 5 miles of the participating CCs that exceed State averages, as shown in the below bar charts.

[USDOT’s Equitable Transportation Community \(ETC\) Explorer](#) identified several indicators of disadvantage in the counties served by the participating CCs (see table on following page). Nine out of the Project’s 15 counties are experiencing disadvantage for multiple indicators. Edgecombe CC and Martin CC (Main Campus) are experiencing the highest measures of disadvantage compared to the rest of the participating

CCs, particularly for Health Vulnerability, Social Vulnerability, and Transportation Insecurity. By equitably expanding the deployment of public EV charging infrastructure, powerNC will improve daily life in these disadvantaged communities and create a more equitable transportation system by improving traffic safety (see **Safety**), mitigating climate change and creating environmental benefits (see **Climate Change, Resilience, and Sustainability**), and increasing workforce development opportunities (see **Workforce Development, Job Quality, and Wealth Creation**) in these communities while also improving mobility, increasing affordable transportation options, and addressing unique rural challenges.

NCDOT’s TDI Populations for the Project



powerNC Disadvantage Indicators (USDOT ETC Explorer)

CC Name	Campus	Climate & Disaster Risk Burden	Environmental Burden	Health Vulnerability	Social Vulnerability	Transportation Insecurity
Blue Ridge CC	Henderson	47%	46%	58%	44%	46%
	Transylvania	19%	18%	29%	50%	63%
	Lee Main	41%	51%	50%	64%	62%
Central Carolina CC	Chatham Main	26%	38%	35%	41%	64%
	Harnett Main	46%	29%	60%	58%	71%
Edgecombe CC	Tarboro					
	Rocky Mount	49%	35%	69%	79%	68%
Fayetteville Technical CC	Main	57%	49%	52%	64%	51%
Gaston College	Dallas					
	Kimbrell	43%	65%	48%	49%	44%
	Lincoln	56%	50%	67%	43%	65%
Martin CC	Martin	58%	13%	75%	78%	75%
	Bertie	35%	5%	44%	87%	95%
Nash CC	Main	41%	45%	45%	63%	67%
Randolph CC	Asheboro					
	Archdale Center	35%	48%	44%	61%	59%
Roanoke-Chowan CC	Main	39%	14%	47%	71%	90%
Wake Technical CC	Beltline					
	Public Safety	63%	65%	44%	27%	25%
	Northern Wake					

Note: Table cells highlighted in red identify indicators for which the county qualifies as disadvantaged (score of 65 percent or higher).



MEANINGFUL PUBLIC ENGAGEMENT

PowerNC will engage the public throughout the Project to solicit input on community charging needs, and the related features of the deployed EV charging stations, while building interest in and support for its workforce development activities. NCDOT and Successful Training and Effective Partnerships for Growing Regional Opportunities in the Workforce To Harness the NC Clean Energy Alliance (STEPS4GROWTH) will perform robust community outreach in the counties served by the participating CCs, with the goal of engaging K-12 students, adults, and Disadvantaged Business Enterprise (DBEs), and building trust with communities that have not been historically involved in the clean energy sector. Through this outreach, powerNC will build a pipeline of workers to pursue hi-tech and well-paying careers in the clean vehicle sector. Community engagement will include a combination of in-person and virtual community activities and will build partnerships with local non-profits, advocacy groups, economic development agencies, and community leaders. More specifically, it will include career days for K-12 students, pop-up engagements, informational booths at community events, and Summer Career Accelerator Program to introduce high school students to careers in the clean vehicle sector. All community engagement activities will be located at sites that are accessible to local community members, including those with limited mobility.

The Project's community engagement activities will follow the [Statewide Public Involvement Plan](#) to comply with best practices and ensure that all communities are engaged and heard during outreach and engagement activities associated with the Project. By continuously engaging the public in a meaningful and inclusive way, powerNC will ensure the Project equitably serves all communities and provides benefits to those with the greatest transportation needs and challenges.

INCREASING AFFORDABLE TRANSPORTATION OPTIONS

PowerNC will increase affordable transportation options by supporting the adoption of EVs and active mobility options that are cheaper to operate and maintain than conventional vehicles. While EVs often have a higher average purchase price than similar conventional fuel vehicles, they have substantially lower maintenance and fuel costs. EVs are more energy efficient than conventional vehicles, and electricity prices are lower and more stable than gasoline, making EVs cheaper and more financially predictable to operate and maintain than similarly-sized conventional vehicles. A [Consumer Reports study](#) found that EVs have a lower total cost of ownership, while a [2021 study by plug-in NC](#) found that EV drivers in North Carolina were paying the equivalent of \$1.10 per gallon of gasoline at the end of 2020. Moreover, the upfront costs of EVs are projected to continue decreasing, [reaching parity with the purchase price](#) of conventional vehicles during the development and operational phases of the Project. By deploying new EV charging stations in communities across North Carolina, powerNC will improve the quality of life for communities by equitably expanding community-based EV charging solutions that will help reduce transportation cost burdens, while also implementing high-quality workforce development programs that will create a pipeline of workers to pursue hi-tech and well-paying careers in the clean vehicle sector. The Project also improves safety, connects North Carolinians to well-paying jobs, and fights climate change by supporting the transition to clean transportation (see **Safety, Workforce Development, Job Quality, and Wealth Creation, and Climate Change, Resilience, and Sustainability**, respectively).

The North Carolina Business Committee for Education's (NCBCE's) Work-Based Learning [Navigator](#) platform will allow information sharing and work-based learning opportunities at powerNC's participating CCs.



IMPROVING MOBILITY

PowerNC will support the mobility of students, teachers, and the public. The Project will help transform existing parking lots on campus into multimodal facilities that support a range of travel modes, including EV carshare, ride share, e-bikes, and paratransit and microtransit vehicles. This is particularly important for low-income and carless households in proximity to the participating CCs, which exceeds the statewide average as shown in the introduction to this merit criterion. The Project will help these underserved communities gain access to more affordable transportation options, including EVs and active mobility options, thereby removing barriers to higher education and vocational training opportunities, while also supporting local transit agencies' transition to EVs and supporting nearby transit-oriented development (TOD) (see **CFI Program Vision**). Additionally, the Project will site each EV charging station to maximize the ability for users to safely access nearby on- and off-campus essential services, amenities, parks and recreational facilities, and campus resources without a vehicle. The Project will protect the safety of these users through several design elements (see **Safety**). By increasing access to affordable transportation options and incorporating multimodal considerations into the siting and design of the Project's EV charging stations, powerNC will enable students, faculty, and the public to reach their desired destinations in a more safe, convenient, and affordable way.



E-bike charging at EV charging station, courtesy of EBR forum

ADDRESSING UNIQUE RURAL CHALLENGES

Rural communities face unique challenges related to mobility and economic development, including traffic safety, isolation, and transportation cost burdens. [USDOT's Charging Forward Toolkit](#) finds that rural residents travel longer distances to access employment, education, essential services, and medical care compared to urban area; spend more on fuel and vehicle maintenance than their urban counterparts; and usually have fewer alternatives to driving to meet their transportation needs (see **Supplemental Materials**). While the adoption of EVs in rural communities can address these challenges, the rate of EV adoption in rural areas is roughly 40 percent lower than in urban areas, and EV charging infrastructure expansion has primarily been concentrated in cities and along major highways. Lower rural EV adoption rates are partly due to a lack of convenient and accessible EV charging infrastructure. One hundred percent of the area within 5 miles of Blue Ridge CC (Transylvania Campus), Central Carolina CC, Edgecombe CC (Tarboro Campus), Gaston College (Lincoln Campus), Martin CC, Randolph CC (Asheboro Campus), and Roanoke Chowan CC are rural according to CFI definitions, while all participating CCs have rural areas within 5 miles. By targeting electrification benefits to these rural communities, the Project will reduce transportation cost burdens, improve traffic safety (see **Safety**), create economic development, mobility, health, and environmental benefits (see **Climate Change, Resilience, and Sustainability**), and create new workforce development opportunities (see **Workforce Development, Job Quality, and Wealth Creation**) in rural areas of the State.

Mobility: PowerNC supports rural mobility by installing new EV charging stations that support affordable and convenient alternatives to conventional vehicle ownership, including EVs and active mobility options like e-bikes and e-scooters. These rural charging solutions are especially important to rural renters, residents of multifamily housing, visitors, individuals



without personal vehicles, and EV drivers without access to chargers at home. The Project also incorporates design elements and siting considerations that will maximize EV charging station users' ability to safely access nearby on- and off-campus essential services, amenities, parks, and campus resources without a vehicle.

Isolation: According to the [*University of Minnesota Rural Health Research Center*](#), improvements in transportation, technology, collaboration, education, and awareness are primary strategies to support socially isolated individuals in rural areas. PowerNC supports these strategies by improving mobility alongside workforce development programs to connect students with careers in the clean vehicle sector and robust community and stakeholder engagement to increase collaboration and build awareness of the Project.

Transportation Cost Burden: Rural households in the US are highly burdened by both total transportation costs and transportation energy costs ([*ACEEE*](#)). The Project addresses this challenge by supporting the adoption of EV and active mobility options in North Carolina that are cheaper to operate and maintain than conventional vehicles (see **Increasing Affordable Transportation Options** for more information). By using EVs and the electric alternatives to car ownership discussed above, rural residents will be less burdened by the relatively high costs associated with operating and maintaining conventional vehicles.

Economic Development: According to the [*US Congress Joint Economic Committee*](#), "Limited employment opportunities, and lack of public investment pose significant challenges to the economic vitality of rural communities." PowerNC will address both challenges through the deployment of new EV charging stations alongside robust workforce development programming (see **Workforce Development, Job Quality, and Wealth Creation**) to support rural employment. The Project's workforce development elements will train highly skilled and certified workers to support the State's growing clean energy sector and will create new synergies with major economic development projects in the

State, including the Triangle Innovation Point Megawatt, Greensboro-Randolph Megawatt, and Chatham Advanced Manufacturing Megawatt (see **Project Overview**).

INTEGRATED LAND USE, ECONOMIC DEVELOPMENT AND TRANSPORTATION PLANNING

PowerNC supports integrated land use, economic development, and transportation planning to improve the movement of people and goods and facilitate greater public and private investments and strategies in land-use productivity. By locating new EV charging stations on CC campuses, with intentional planning and design principals, the Project strategically boosts land use productivity by improving public access to the unique land uses that make up each campus, including community and educational facilities, essential services, and commercial amenities. The Project's ability to attract more people to CC campuses for EV charging and workforce development programs will support private investment and economic development projects in the clean vehicle sector for surrounding communities (see **Workforce Development, Job Quality, and Wealth Creation**). PowerNC supports cleaner transportation modes for the benefit of all students, teachers, and residents, including carless households, making the movement of people between land use elements more convenient, efficient, and sustainable (see **CFI Program Vision**).



Existing EV charging stations at Blue Ridge CC





WORKFORCE DEVELOPMENT, JOB QUALITY, AND WEALTH CREATION

PowerNC presents a unique opportunity for North Carolina to prepare its workforce for continued growth of the clean vehicle sector by strategically pairing the deployment of Level 2 charging stations at 10 participating CCs with workforce development and job training by NCDOT's OCR and STEPs4GROWTH. The CC setting provides valuable opportunities to link infrastructure investments with classes, apprenticeships, and other on-the-job (OJT) training programs that are integral to the development of a skilled and well-paid workforce. The partnership between NCDOT and STEPs4GROWTH, a novel clean energy workforce development project funded by the federal government and led by the Center for Energy Research & Technology at NC A&T State University, will build relationships between employers, students, and educational institutions and build awareness of job opportunities to develop a pipeline of future workers.

PowerNC includes several workforce development benefits that will help increase job quality and create wealth in North Carolina, with a focus on women, people of color, and other populations that are underrepresented in infrastructure jobs. PowerNC builds on the current success of North Carolina's strong workforce and education systems to create well-paying jobs with free and fair choice to join a union, promote investments in high-quality workforce development programs, promote the entry and retention of underrepresented populations, and promote inclusive economic development and entrepreneurship through partnerships with DBEs, Minority Business Enterprises (MBEs), Women's Business Enterprises (WBEs), Small Business Enterprises (SBE), and Small Professional Service Firms (SPSF).

JOB CREATION

While North Carolina has a large clean economy workforce and is meeting current workforce needs due to its strong education systems and workforce development programs, North Carolina can do more to prepare for the growth of the clean economy. To support powerNC, NCDOT and STEPs4GROWTH will partner with major employers throughout the State to obtain commitments to hire students that have completed vocational training in the clean vehicle sector at the participating CCs. The partnership between NCDOT OCR and STEPs4GROWTH offers a unique opportunity to synergize job creation activities to the benefit of future workers in this sector

throughout the State and build off of the ongoing work that NCDOT's OCR contributes to job creation through their OJT, DBE engagement, and Business Opportunity & Workforce Development (BOWD) programs.

These job placements in clean vehicle and clean energy occupations will largely meet or exceed North Carolina's 2020 median income of \$30,016, according to the US Census. NCDOT's [2019 Clean Energy and Clean Transportation Assessment](#) found that median annual wages in both the clean energy and clean transportation sectors range from approximately \$30,000 annually for occupations like construction laborers to over \$100,000 for engineers and managers. Several top ranked occupations in these sectors, based on wages, projected growth rate, and projected job openings, have median annual wages that well exceed North Carolina's 2020 individual median income, as shown in the following table.

This same study found that wage progression steadily increased over time for graduates from the North Carolina Community College System (NCCCS) in clean energy-related program areas. The average annual wages of these graduates increased between \$7,000 and \$17,000 five years after graduation.

North Carolina Annual Wages for Clean Energy Jobs

Occupation	2017-2026 Growth Rate	2018 Median Wage
Construction Managers	11.8%	\$97,290
Cost Estimators	10.0%	\$59,750
Electrical Engineers	11.2%	\$91,680
Electrical Power-Line Installers & Repairers	14.5%	\$59,690
First-Line Supervisors of Construction Trades & Extraction Workers	12.4%	\$59,040
First-Line Supervisors of Mechanics, Installers, & Repairers	8.9%	\$63,620
General and Operations Managers	10.6%	\$108,750

Source: NCDOC, Clean Energy & Clean Transportation in NC: A Workforce Assessment (2019)

WORKFORCE DEVELOPMENT PROGRAMMING

PowerNC's job creation benefits are driven by the high-quality workforce development programming and supportive services that will be implemented by NCDOT OCR and STEPs4GROWTH. The Project will implement a suite of services and resources, with a focus on equity and reaching a diverse group of students. This program will support underrepresented populations through multi-level training programs to build the required skills and capabilities for clean energy jobs. The program also collaborates with industry partners to provide job opportunities, including apprenticeships for those graduating from the program.

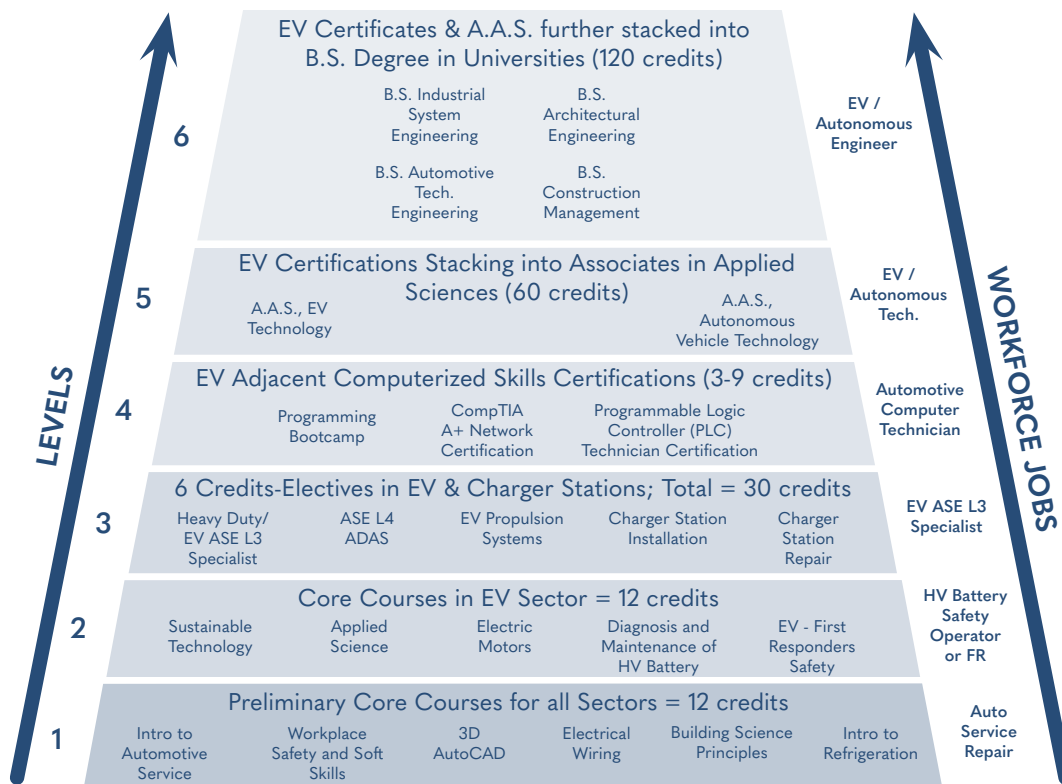
The framework for delivering powerNC's workforce development and vocational training encompasses supportive wraparound services for students, recruiting, job-placement, core curriculum development (where employers will help craft the curriculum), hands-on training, experience with innovative technology, and OJT programs to support North Carolina's growing clean energy sector. STEPs4GROWTH will also develop pre-apprenticeship and registered apprenticeship pathways in EV charging installation at the participating CCs, creating a path from entry level job to careers that support family-sustaining wages.

STEPS4GROWTH is leading the nation in setting a national workforce development model that will create a diverse talent pipeline to support North Carolina's clean energy economy.

The Project will implement STEPs4GROWTH's Clean Energy EV & Charger Education Pyramid Model for students to follow at the participating CCs. The model contains a series of stackable credentials with multiple pathways for students with "on-ramps" to all education levels, including certificates and degrees, as well as "off-ramps" to all workforce job levels. Through this framework, the Project will provide OJT and facilitate internships, pre-apprenticeships (summers), and apprenticeships; and assist with placement for part-time and full-time skilled and well-paying clean vehicle sector jobs at the participating CCs. Employers who partner with STEPs4GROWTH will receive reimbursements for a portion of USDOT's OJT program wages and Inflation Reduction Act (IRA) tax credits.



STEPS4GROWTH Pyramid Education Model



Associate in Applied Sciences degree (A.A.S.)
Advanced Driver Assist Systems (ADAS)
Automotive Service Excellence (ASE)
Bachelor of Science degree (B.S.)

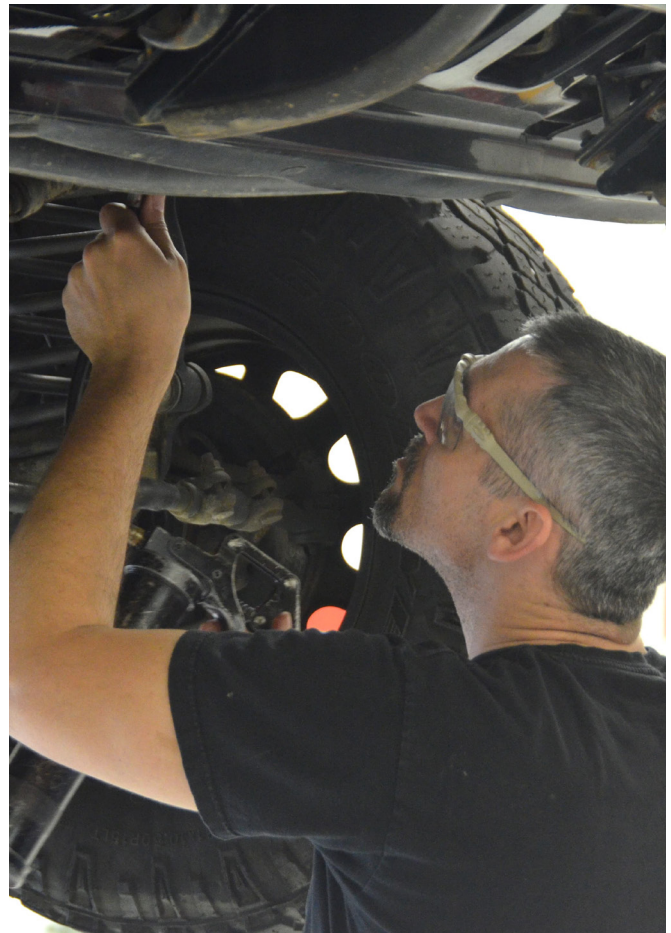
Acronyms:

Electric Vehicle (EV)
First Responders (FR)
Hybrid Vehicle (HV)
Traffic Impact Analysis (TIA)

PowerNC will partner STEPs4GROWTH's workforce development elements with NCDOT OCR's robust workforce development programs in the counties served by the participating CCs to create a more diverse, competent, retained, and well-paid clean vehicle workforce. The Project will leverage NCDOT OCR's Highway Construction Trade Academies

(HCTAs) and innovative, accelerated boot camp versions called Pop-Up Academies to partner with NCWorks Career Centers (Workforce Innovation and Opportunity Act (WIOA) system), non-profits and advocacy organizations in these counties to promote the training and hiring of women, minorities, and other underrepresented groups in the clean vehicle sector.

NCDOT OCR's innovative workforce development programs have been nationally recognized for their innovation and commitment to equity. Its HCTA program was included in the Federal Highway Administration (FHWA)/NCDOT Every Day Counts (EDC) 6 and 7 initiatives under Strategic Workforce Development innovation and led to the selection of NCDOT to host the second FHWA national multi-state peer exchange and learning workshop, a recommendation from FHWA to the US House of Representatives that the NCDOT OJT/SS Program be highlighted during testimony before the House Subcommittee on Highways and Transit, and inclusion of NCDOT OCR in two national webinars on innovative uses of 504(e) funding for workforce development with a diversity, equity, inclusion, and accessibility (DEIA) focus and related supportive services.



Fayetteville Technical CC students gaining hands-on experience in automotive technologies

PowerNC will also provide opportunities for future clean vehicle professionals at the participating CCs to observe, learn about, and participate in activities over the life cycle of the Project. Specific programming may include lessons in procurement, contracting, siting, design, environmental review, installation, and operations and maintenance (where appropriate and under the supervision of certified professionals). PowerNC will help generate coursework over two semesters that will be incorporated into the clean vehicle educational and training programs at the participating CCs. Moreover, Wake Technical and Blue Ridge CCs currently operate EV charging stations that are close to the end of their lifecycle. PowerNC will replace the old EV charging stations with new ones at these CCs. To comply with National Electric Vehicle Infrastructure (NEVI) requirements, decommissioned charging stations will be used for classroom instruction and to gain hands-on experience with charging stations.

“PowerNC would be an inclusive value-addition to EV Charger Workforce development efforts in Clean Energy, in parallel to STEPs4GROWTH and would essentially serve 100 Good Job Placements from DAC counties.”

**-Balakrishna (Balu) Gokaraju, Ph.D,
STEPS4GROWTH Principal
Investigator**



ENTRY AND RETENTION OF UNDERREPRESENTED POPULATIONS

Increasing the participation of underrepresented populations in North Carolina's clean vehicle sector is one of the Project's primary goals. To promote more diversity in clean vehicle sector jobs, powerNC includes a series of community engagement activities led by NCDOT OCR, whose mission is to serve the State's disadvantaged and underserved communities. NCDOT OCR will join with STEPs4GROWTH, NCCCS, community partners, and stakeholders to deploy targeted program resources in the counties served by the participating CCs, to help minorities, women, veterans, and disadvantaged individuals enter the workforce and train for skilled positions. These activities will promote youth engagement and awareness of the clean vehicle sector and opportunities at the participating CCs.

The following events will provide outreach, recruitment, career awareness, and exposure to students in support of the Project that will enable them to make a difference in their community:

Career Days: Trade show with booths to showcase technology and equipment and provide information on future clean vehicle sector career paths for middle and high school students.

Career Engagement: NCDOT OCR will lead outreach, information sessions, and career fairs for anyone 18 years or older to promote educational and training opportunities in the clean vehicle sector at the participating CCs.

Highway Construction Trades Academies (HCTA): NCDOT OJT will offer training HCTA for adult learners to introduce them to the highway construction industry, earn Occupational Safety and Health Administration (OSHA) and Flagger certifications, and credential related to EV career pathways. Participants are also provided with case management, training allowances, access to hiring fairs, and prime contractors.

These activities will benefit underserved populations while also addressing one of

North Carolina's most common and pressing challenges to develop a pipeline of future workers in clean energy and clean vehicles. NCDOT's 2019 Clean Energy & Clean Transportation in NC Workforce Assessment found that skilled trades and manufacturing tend to have a larger percentage of older workers headed for retirement and a limited number of younger workers to fill these vacancies. To address this "interest gap", the report recommends educating young people about opportunities in these fields, wages paid, and the importance of technical skills while addressing potential misperceptions.

PROMOTING LOCAL INCLUSIVE ECONOMIC DEVELOPMENT AND ENTREPRENEURSHIP

The Project will implement measures to promote local inclusive economic development and entrepreneurship through the utilization of DBE, MBE, WBE, SBE, SPSF firms. NCDOT routinely contracts DBEs for transportation projects and conducts quarterly DBE outreach to highlight future projects and to encourage participation. NCDOT OCR's BOWD Unit provides supportive services to certified DBE firms through training, education, one-on-one technical assistance, and other services. NCDOT OCR will lead efforts to collaborate with a diverse group of community partners to recruit DBE, MBE, WBE, and employer partners to which students, apprentices, and graduates can be matched for OJT as well as part- and full-time jobs. PowerNC will continue this focus on inclusive economic development and entrepreneurship by developing partnerships with local DBE firms as part of its workforce development program while also maximizing the participation of DBEs in the delivery of the Project's EV charging stations. The alternative contract delivery methods NCDOT is considering using to implement the Project will promote DBE utilization by allowing NCDOT to score respondents on their DBE participation plan and work to maximize participation from design through construction. The proposed alternative contract delivery method is a means to help NCDOT achieve the 3-year aspirational DBE goal of 13 percent.



CFI PROGRAM VISION

PowerNC fulfills the CFI Program vision by deploying 20 Level 2 charging stations across 10 participating CCs to equitably expand the deployment of public EV charging infrastructure in publicly accessible locations on CC campuses in both rural and urban settings, while supporting the development of multimodal hubs and the needs of electric fleet vehicles. As shown in the below table, there is a mix of urban and rural communities within 5 miles of the participating CCs, all of which serve multiple DACs and other disadvantaged and underserved populations.

Participating CC Snapshots

CC	Campus	Percent Urban	Percent Rural	Urban DACs within 5 miles	Rural DACs within 5 miles	Total DACs within 5 miles
Blue Ridge	Henderson	63.3%	36.7%	2	0	4
	Transylvania	0.0%	100.0%	0	2	
Central Carolina	Chatham	0.0%	100.0%	0	1	20
	Harnett	0.0%	100.0%	0	9	
	Lee	0.0%	100.0%	0	10	
Edgecombe	Rocky Mount	42.9%	57.1%	12	0	18
	Tarboro	0.0%	100.0%	3	6	
Fayetteville Technical	Fayetteville	92.6%	7.4%	24	0	24
Gaston	Dallas	42.4%	57.6%	20	1	36
	Kimbrell	81.4%	18.6%	11	0	
	Lincoln	0.0%	100.0%	0	7	
Martin	Bertie	0.0%	100.0%	0	4	9
	Martin	0.0%	100.0%	0	6	
Nash	Main	26.1%	73.9%	2	6	8
Randolph	Archdale	27.2%	72.8%	10	0	18
	Asheboro	0.0%	100.0%	0	8	
Roanoke-Chowan	Main	0.0%	100.0%	0	4	4
Wake Technical	Beltline	98.5%	1.5%	15	0	17
	Public Safety	88.1%	11.9%	12	0	
	Scott Northern	76.6%	23.4%	6	0	

North Carolina's CCs often serve as local community hubs due to their multifaceted roles within the community. They have become activity hubs by offering education and training, supporting workforce development, hosting cultural events, providing community services, fostering economic development, and serving as centers for lifelong learning and engagement. Their activities and partnerships contribute to the social, cultural, and economic fabric of the community. The Project will significantly increase the availability of convenient, reliable, affordable, and secure EV charging infrastructure at these essential institutions, thereby supporting North Carolina's efforts to reduce GHG emissions while also developing the workforce needed to support North Carolina's clean vehicle sector. By deploying new EV charging stations, workforce development programs, and community engagement activities at the participating CCs, the Project will strengthen local communities and address transportation-related disparities.

MULTIMODAL HUBS

PowerNC will support the development of multimodal hubs at the participating CCs by increasing access to EV charging stations that support alternatives to conventional vehicle ownership. This will help to transform existing, vehicle-dominated parking lots on campus into multimodal facilities that support a range of travel modes. This is particularly important for the underserved communities encompassed by the Project and will help students who lack access to a car use more affordable active mobility options to seek higher education and vocational training opportunities. The new EV charging stations will be integrated into the multimodal network on CC campuses, which will create new opportunities for charging multiple electrified active mobility and shared mobility modes, appropriate for Level 2 charging and each site's context. The modes accommodated could include e-bikes, e-scooters, electric rental vehicles and ride-shares, ride-hails, CC fleet vehicles, and even paratransit and shuttle vehicles operated by transit agencies serving each location. Racks for active mobility options will be included where feasible at each site to support the needs of students, teachers, and visitors. In addition to these



Mobility hubs are crucial to making transportation more sustainable for communities.

Credit: CoMo UK

active transportation modes, the placement of EV charging stations will consider planned TOD and transit needs, as follows:

- ***S-Line TOD***: Wake Technical's Beltline Campus is within Raleigh's Atlantic Avenue Station area for new S-Line passenger rail service, which is a missing link within the larger vision for passenger rail service in the southeast. The Project will align with this TOD plan and provide new electric charging options to support station area growth and development.
- ***Wake Bus Rapid Transit (BRT)***: Wake Technical's Public Safety Campus is in proximity to two potential stops along Wake BRT's southern corridor. The Project will create additional mobility options along this corridor and include siting and design features that consider the needs of users for the anticipated development activities along the corridor.
- **GoRaleigh Transit Service**: GoRaleigh will coordinate with Wake Technical CC to explore using the Project's new EV charging stations to support its electrification efforts for microtransit and paratransit vehicles that operate in the vicinity of the identified campuses.

By considering the needs of various electric transportation modes in siting and design decisions, powerNC's comprehensive approach will create more equitable mobility outcomes and support each community's transition to cleaner transportation alternatives.

RURAL CHARGING SOLUTIONS

Rural areas that have low EV adoption compared to their metropolitan counterparts, and the lack of EV charging infrastructure in rural areas is a significant barrier to adoption (*EESI*). By providing convenient and accessible places for EV users to recharge their vehicles at CC campuses in rural areas, the Project will accelerate rural EV adoption. PowerNC will add up to 11 EV charging stations at CC campuses in rural areas. In doing so, the Project will create new multipurpose charging solutions in rural areas, including single occupancy vehicles, fleet vehicles, shared vehicles, taxis, as well as active mobility options like e-bikes. By targeting

electrification benefits to North Carolina's rural communities, the Project will address the unique mobility, isolation, transportation cost burden, and economic development challenges faced by rural communities in the state (see **Equity, Community Engagement, and Justice40** for more information).

URBAN/SUBURBAN CHARGING SOLUTIONS

NCDOT's Electric Vehicle Deployment Plan reports that EV ownership in the State has increased by 230 percent since 2018, and this demand is more concentrated in populated areas. This same study found that urban vehicle-miles traveled (VMT) grew by 3.4 percent per year, outpacing rural VMT growth in the State and the national average for urban VMT (1.9 percent). The higher amount of EV trips in suburban and urban areas are generally for shorter distances/durations, and urban and suburban residents can face additional barriers to EV adoption related to lack of space or access to EV charging stations at home, particularly for multi-unit dwellings and homes without driveways or garages. These factors speak to the need for more widespread public charging solutions to support the travel patterns and access constraints of citizens in urban and suburban areas.

To address these considerations, the Project will add up to nine charging stations at CC campuses in urban or suburban areas that will expand public access to convenient, equitable, accessible, and affordable electric charging. These campuses are centrally located in cities and counties across the State, and the new EV charging stations will improve convenience and address the higher number of short trips taken by EV users in urban settings. The Project's new EV charging stations will be sited and designed to integrate seamlessly with the surrounding multimodal transportation network, giving users, including students, faculty, and the public accessible and affordable electric charging solutions for EVs, e-bikes, e-scooters, and other electric alternatives to conventional vehicle ownership. This multimodal integration will also provide safe access to nearby activity centers, recreational areas, and amenities for users while their vehicle is charging.



*power*NC

IN PARTNERSHIP WITH
STEPS4GROWTH & NC COMMUNITY COLLEGE SYSTEM

**USDOT Charging and Fueling
Infrastructure Grant
APPLICATION
JUNE 2023**

