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### Application Snapshot

Project Title: Breathing Easy, Riding Green: Powering BEBs for a More Equitable and Sustainable Future  
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# 1 Overall Project Summary and Approach

## 1.a Description of GHG Reduction Measures

Research Triangle Regional Public Transportation Authority (“GoTriangle”) is a regional public transportation provider, serving the Triangle region with an extensive network of public bus transit services. With 78 buses operating across 16 regional routes spanning Durham, Orange, and Wake counties, GoTriangle facilitated 1.6 million annual trips in 2023. GoTriangle stands as a pivotal player in emissions reduction efforts across North Carolina; the Priority Climate Action Plans (PCAP) of both the North Carolina Department of Environmental Quality (NCDEQ) and the Raleigh-Cary and Durham-Chapel Hill Metropolitan Statistical Areas (“Central Pines”) prioritize transportation as the top measure for reducing greenhouse gas (GHG) emissions. While GoTriangle has already avoided 24 million passenger vehicle miles through our public transportation services, we are seeking to further reduce emissions in the Triangle region by transitioning our fleet from diesel buses to battery-electric buses (BEBs). GoTriangle’s focus on affordable and accessible regional transit guides the organization’s vision to ensure that clean transportation options are available to all riders, particularly those residing in low-income and disadvantaged communities.

Recognizing the critical role public transit plays in achieving a sustainable future for our region, GoTriangle has committed to a substantial 20% funding match towards this grant application. GoTriangle is requesting additional support from the EPA Climate Pollution Reduction Grants (CPRG) Program to achieve the following for its fleet stationed at the Nelson Road Bus Operations and Maintenance Facility (BOMF):

1. 10 battery electric buses (BEBs) with 5 plug-in chargers and 2 pantograph chargers; and
2. 59,000 square feet (SF) of solar photovoltaic canopies to generate renewable energy on-site.

Servicing GoTriangle’s entire regional fleet of buses and paratransit vehicles, the BOMF is vital in connecting riders in Durham, Wake, and Orange counties to existing multimodal transportation options within the region. Located at 5201 Nelson Road in Cary, North Carolina, the BOMF has provided essential service to surrounding communities since its construction in 1996. The BOMF services 78 of its 35-ft and 40-ft buses and currently has 10 maintenance bays, one service lane, and storage for up to 91 vehicles.

Award of this funding will enable GoTriangle to advance our ongoing Zero-Emission Transition Plan. Our commitment to improved services and stewardship of riders is reflected through our ongoing transition from diesel to zero emission buses:

- 2 BEBs were brought into service in January 2020; 2 depot chargers were installed at the BOMF to support the transition.
- 5 additional BEBs were ordered and will be operational in 2025.
- In 2022, a joint specification for BEBs and diesel-electric hybrids was developed by GoTriangle and local public transit providers to standardize bus procurements and achieve lower unit costs through larger orders.
- The BOMF modernization project is underway, which will upgrade the facility’s electrical capacity and ensure our infrastructure can support a growing fleet of BEBs. This includes a robust network of charge management infrastructure, which will optimize the energy use of our BEBs.

Electrification of GoTriangle’s fleet will also move North Carolina’s adoption of zero emission vehicles and emissions reduction goals forward; Durham County has a commitment to achieve a 50% reduction in greenhouse gas emissions from 2005 levels by 2035 (including fuel-efficient, electric, or hybrid transit vehicles), and Wake County has a commitment to achieve 100% clean energy by 2050 (including the County’s fleet).

### 1.a.i CPRG Reduction Measure 1: Battery-Electric Buses with Charging Infrastructure

#### Project Features and Major Tasks

This application requests funds to replace ten of our diesel-powered buses with ten 40-foot BEBs, and to implement five 180kW plug-in electric vehicle chargers as well as two pantograph chargers. To date, GoTriangle has undertaken extensive planning efforts towards a comprehensive zero emission transition, allowing the scopes of work and associated budgets to be responsibly developed. Our first Zero Emission Transition Plan represents a holistic analysis of our fleet and infrastructure as of 2023, serving as a data-driven roadmap for effective and efficient conversions from diesel to BEBs. A key milestone within our plan was the completion of a preliminary BEB blocking analysis, which assessed the feasibility of electrifying buses along our existing routes without requiring additional on-route charging. By proactively investing in planning efforts, GoTriangle is working to maximize environmental benefits while minimizing disruptions to our riders.

Through the completed Zero Emission Transition Plan, the associated infrastructure for a holistic fleet conversion was also assessed. By performing preliminary calculations and advanced analyses, GoTriangle was able to plan for energy efficiency strategies that would reduce power consumption to charge the BEBs. The use of a charge management system will support GoTriangle with controlled charging of the fleet over an extended overnight charging period, which will effectively reduce the overall power consumption of GoTriangle's future 100% fleet conversion by roughly half. With the planning and preparation processes well-developed, GoTriangle is requesting support for 10 proposed BEBs, 5 plug-in chargers, and 2 pantograph chargers to further progress our transition plan.

Milestones for implementation of this measure are outlined below in *Table 1: Project Timeline*.

#### Project Assumptions and Risks

While extensive progress has been made towards implementing our Zero Emission Transition Plan, the risk of delayed BOMF upgrades could stall BEB implementation efforts and delay the projected emissions reductions as calculated in the separate GHG Emission Reduction Calculations Spreadsheet. By adequately preparing in advance, GoTriangle is already preparing for BOMF electrical upgrades, with preliminary design efforts underway and scheduled for completion by early 2025. With the final design scheduled for early 2025, construction efforts are anticipated to begin in early 2026. In order to mitigate risks of schedule delays for this CPRG application, the emissions calculations reflect the latest anticipated deployment date of early 2028 to account for potential delays, while understanding that the best-case scenario would allow GoTriangle to receive the zero emissions systems by 2026. Additionally, with a projected 18- to 24-month industry procurement timeline for BEBs, the schedule and emissions calculations assume a conservative 24 months for procurement, thus minimizing this risk.

Transitioning from diesel to BEBs will inherently increase the energy load on the grid, which runs the risk of electrical outages that could prevent buses from being charged. GoTriangle has been developing strategies for preventing outages and contingency options in this case, along with energy efficiency strategies such as the charge management system or controlled charging over an extended overnight charging period. These strategic energy planning efforts will effectively reduce the overall power consumption and prioritize charging during off-peak hours to reduce grid strain. Additionally, our existing partnership and collaborative efforts with Duke Energy will continue to ensure that adequate service and redundancy is available for GoTriangle to serve customers in the event of unexpected power outages. The proposed solar photovoltaic canopies will generate energy throughout the day, which will reduce the demand on the grid and support daily BOMF operations. While battery energy storage systems (BESS) were considered for this application, the comparison of projected costs versus emissions reduced was not advantageous towards the CPRG funding stream and therefore will be evaluated through separate funding opportunities.

While diesel bus fleets have historically been the industry standard, the risk of untrained personnel could prevent timely maintenance and repair efforts for BEBs. With 2 BEBs already operating under a pilot project, GoTriangle is strengthening and preparing our workforce by increasing relevant experience. We are developing a comprehensive workforce transition plan and coordinating with manufacturers and vendors to develop technical models and in-house training curriculum for all current and future maintenance, service, and BOMF personnel. With the current manufacturer warranty support active for our 2 BEBs in operation, our staff is prepared with guided exposure to hands-on maintenance and repair efforts.

#### Alignment with CPRG Program & PCAPs

Electrifying GoTriangle's fleet is in alignment with the North Carolina Department of Environment Quality's (NCDEQ) Priority Climate Action Plan (PCAP) under *PCAP Measure 3, Transportation: Increase the number of zero emission and electric vehicles in state and local government fleets*.<sup>1</sup> This priority measure is also echoed by the Central Pines Regional Council's PCAP for the Raleigh-Cary and Durham-Chapel Hill Metropolitan Statistical Areas. North Carolina recognizes that regional transit authorities require support with emissions reduction efforts across one of the largest emitting sectors of transportation; as a regional transportation service provider, GoTriangle has been actively working to progress decarbonization efforts accordingly. The BEBs and chargers proposed through this application will support North Carolina's efforts of significantly reducing transportation sector emissions, leading to cleaner air and a healthier environment.

NCDEQ has listed two example metrics for tracking progress towards North Carolina's pollution reduction efforts: number of zero emission buses procured, and number of public/school fleets with zero emission vehicles. The 10 proposed BEBs contribute significantly towards both metrics, and GoTriangle is committed to working with the EPA to provide robust data for reporting purposes. As calculated through Section 2 herein, deploying 10 BEBs in lieu of 10 diesel buses will prevent the release of 872.87 metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e) site emissions annually.

#### 1.a.ii CPRG Reduction Measure 2: Generating Renewable Energy On-Site

##### Project Features & Major Tasks

This application proposes a second GHG Reduction Measure of solar energy generation through photovoltaic panel canopies. GoTriangle is requesting funding for the purchase and installation of solar photovoltaic canopies at the BOMF, providing an anticipated 3.01 MWh/day of clean, renewable energy to support the BOMF's critical operations. The solar canopy will be located over the BOMF's exterior site bus parking lot, located on the west side. Structural steel canopies will support the photovoltaic panels, which will be strategically installed over the buses. To ensure a stable foundation for the panels, the parking lot will undergo necessary upgrades.

The on-site solar energy generation system will contribute to a reduction in the urban heat island effect and provide additional protection for the buses themselves. Furthermore, by generating clean energy onsite, the BOMF will be able to offset its reliance on traditional grid power, resulting in reduced source emissions.

Milestones for implementation of this measure are outlined below in *Table 1: Project Timeline*.

#### Alignment with CPRG Program & PCAPs

Integrating 3.01 MWh/day of solar photovoltaic generation at the BOMF site is directly aligned with NCDEQ's PCAP under *PCAP Measure 6, Electricity: Increase the amount of electricity generated by low and no carbon energy*

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<sup>1</sup> North Carolina Department of Environmental Quality. "North Carolina Priority Climate Action Plan," 42.  
<https://www.epa.gov/system/files/documents/2024-03/final-ncdeq-pcap-report.pdf>.

*resources in NC.*<sup>2</sup> NCDEQ recognizes that low- and no-carbon distributed energy resources, such as smaller scale solar, can support the holistic goal of reducing pollution across North Carolina. This initiative is also aligned with local county commitments to clean energy; Orange County published a commitment to achieve 100% renewable energy by 2050.

The metrics listed by NCDEQ to track progress towards North Carolina's pollution reduction efforts include: number of solar installations completed, and capacity of solar installations. The solar photovoltaic canopies contribute towards both, and GoTriangle is committed to working with the EPA to provide robust data for reporting purposes. As calculated through Section 2 herein, installing 59,000 SF of solar photovoltaic panels to support BOMF operations will prevent the release of 656.26 MT CO<sub>2</sub>e source emissions annually.

### Project Timeline and Milestones

Figure 2 outlines the project timeline and key milestones, incorporating potential delays due to material procurement, construction, or permitting. The "x" marks represent ideal scenarios, while the yellow highlights represent the anticipated completion dates with buffers factored in. Project milestones, marked by circles, signify the delivery and installation of corresponding systems. Anticipated dates (yellow highlights, Table 1) are outlined below, along with details on how the schedule ensures the success of our emissions reduction measures:

- **Project Award & Contract Negotiations (October 2024 - Q1 2025):** Following the project award in October 2024, we anticipate finalized contract negotiations by the first quarter of 2025. This initial phase allows for swift project initiation to expedite the implementation of emissions reduction measures.
- **BOMF Modernization Design & BEB Procurement (Q1 2025 - February 2028):** Procurement of the 10 BEBs, along with the completed BOMF modernization design, is anticipated to occur in Q1 2026. With a 24-month anticipated lead time for BEB delivery to the site by February 2028, commissioning and closeout activities will be finalized by March 2028, ensuring the operational efficiency of the systems.
- **BEB Charging Infrastructure (Q2 2026 - September 2027):** Design of the BEB charging infrastructure will commence in Q2 2026. Following design completion, procurement will occur in Q4 2026 with an expected lead time of 6 months. Delivery and installation of the charging infrastructure is anticipated by September 2027.
- **Photovoltaic Canopies (Q1 2026 - Q1 2028):** The design of the photovoltaic canopies will be finalized by Q1 2026, in alignment with the BOMF modernization final design. Procurement will follow in Q1 2027. While structural steel and photovoltaics are procured, site civil work will be ongoing from Q2 to Q3 of 2027. This civil work includes excavation for underground utilities, foundation installation for the canopy structure, electrical wiring for the photovoltaics, and backfilling and repaving. Delivery and installation of the canopy system will be completed by Q1 2028, aligning with the construction efforts of the separate BOMF modernization team.

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<sup>2</sup> North Carolina Department of Environmental Quality. "North Carolina Priority Climate Action Plan," 54.  
<https://www.epa.gov/system/files/documents/2024-03/final-ncdeq-pcap-report.pdf>.

Table 1: Project Timeline

GHG Reduction Measures	Reduction Milestone	Date Completed	Expected Date	2024				2025				2026				2027				2028			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Fleets and Facilities Assessments																							
Zero-Emission Transition Plan		Apr 2023																					
BEB Block Analysis		Apr 2023																					
Regional Fleet, Facilities, & Grid Capacity Study		Feb 2024																					
BOMF Facility Infrastructure																							
Site Assessment		Feb 2024																					
Utility Coordination with Duke Energy			Ongoing																				
Climate Pollution Reduction Grant																							
Grant Notification of Funding Selection			Jul 2024																				
Grant Award			Oct 2024																				
Grant Negotiations			Jan 2025																				
BEB Procurement/Delivery																							
Procure 10 BEBs			Jan 2026					X															
Lead Time (24mo)								X	X	X	X	X	X	X	X	X							
Deliver 10 BEBs	#1		Feb 2028														X						
Commissioning/Closeout for Operational (1mo)			Mar 2028														X						
BEB Charging Procurement/Delivery																							
Design BEB Charging Infrastructure								X	X	X													
Procure Charging Infrastructure										X													
Lead Time (6mo)												X	X										
Deliver/Install Charging Infrastructure	#1		Sep 2027											X									
Canopy System Procurement/Delivery																							
Preliminary Design for BOMF Modernization			Ongoing																				
Final Design for BOMF Modernization																							
Construction for BOMF Modernization																							
Civil/Utility Construction for Canopy System													X	X									
Procure Canopy System												X											
Lead Time (12mo)													X	X									
Deliver/Install Canopy System	#2		Feb 2028												X	X							

KEY:

Yellow highlights = Anticipated Dates

• = milestones

X = Best Case Scenarios

## 1.b Demonstration of Funding Need

Recognizing that the transportation sector significantly contributes to global greenhouse gas emissions, GoTriangle has been making strides to transition from a diesel-powered fleet to a fleet with zero tailpipe emissions since 2018. That year, our organization embarked on this transition with the purchase of 2 overhead pantograph bus charger kits and 2 charging cabinet assemblies for our Raleigh Union Station Bus Facility using USDOT's BUILD discretionary grant program. In January 2020, GoTriangle brought two BEBs into service and installed two depot chargers at the BOMF using the awarded FTA funding.

In April 2023, our organization created a Zero-Emission Transition Plan to outline our path towards the incremental deployment of zero emission vehicles (ZEVs) and charging infrastructure, developing long-range service plans and a long-term fleet composition plan to ensure reliable service with as many ZEVs as practicable. A preliminary BEB blocking analysis was conducted based on existing GoTriangle service plans, assessing high-level Diesel-to-BEB replacement needs within the context of existing operating characteristics and fleet capacities of the GoTriangle transit system. This assessment determined that a 100% BEB conversion of the current 78 vehicle fleet would require a BEB fleet size of 87 vehicles without on-route charging. However, GoTriangle is piloting shared-opportunity charging infrastructure to support on-route charging for GoTriangle and local public transit providers



that will maximize up-time of battery-electric vehicles. The assessment also estimated a minimum number of 50 charging cabinets<sup>3</sup>, with additional cabinets recommended for redundancy.

Continuing the organization's focused efforts towards a timely transition, GoTriangle received a FY23 Low-No Grant, which will support the installation of additional depot electric charging stations at the BOMF. To support the continued reliability of our service, GoTriangle also requested and received a \$1 million federal grant through the FY23 Congressional Community Project Funding Request to purchase battery-electric non-revenue vehicles and supporting charging infrastructure. This project was included in the subcommittee draft of the FY23 Transportation Housing and Urban Development Appropriations Bill.

To date, GoTriangle has been awarded \$5,352,000 in funding the procurement of BEBs and charging infrastructure at the BOMF, advancing our organization's fleet to 7 purchased BEBs out of a needed 87. To build upon our momentum in reducing our tailpipe emissions and generating clean onsite energy, GoTriangle is seeking funding from the CPRG Implementation Grant to procure an additional 10 BEBs, 7 chargers, and solar photovoltaic canopies. The following *Table 2: Demonstration of Funding Need* summarizes GoTriangle's secured and requested funding needed to achieve these transformative GHG reductions.

*Table 2: Demonstration of Funding Need*

Year	Funding Type	Agency/ Entity	Funding Stream	GHG Reduction Measures within Project Scope	Total Value	Value Allocated to GHG Measures
Secured 2018	Federal Grant	USDOT/FTA	BUILD	3 BEBs	\$20,000,000	\$1,661,000
Secured 2020	Federal Grant	FTA	Multi-source Urbanized Area Formula Grant	2 BEBs	\$10,478,052	\$943,000
Secured 2023	Federal Funding	House Appropriations Committee	Community Project Funding	2 BEBs	\$2,000,000	\$2,000,000
Secured 2023	Federal Grant	FTA	Low-No Emission Grant	3 plug-in charging stations plus facility rehabilitations to accommodate charging equipment at the BOMF	\$1,672,000	\$748,000
<b>Total Secured for GHG Measures at the BOMF (Prior Awards)</b>				<b>7 BEBs 3 charging stations</b>		<b>\$5,352,000</b>
<b>Requesting 2024</b>	<b>Federal Grant</b>	<b>EPA</b>	<b>Climate Pollution Reduction Program</b>	<b>GHG Reduction Measures</b> 10 BEBs 5 BEB chargers 2 BEB pantograph chargers 59,000 SF solar photovoltaic canopy systems	<b>\$19,874,320 requested</b>	

### 1.c Transformative Impact

Replacing 10 diesel buses with 10 BEBs has the ability to reduce GHG emissions by approximately 872.87 MT CO<sub>2</sub>e annually, and the proposed PV canopies can offset approximately 656.26 MT CO<sub>2</sub>e annually. While about 22% of global carbon emissions come from the transportation sector<sup>4</sup>, only ~2% of buses in the United States are currently

<sup>3</sup> Assuming a 150 kW charging cabinet with a one (1) dedicated dispenser, the maximum number of vehicles in a charge state on a typical weekday would reach 50 vehicles.

<sup>4</sup> Architecture 2030. "Why the Built Environment," <https://www.architecture2030.org/why-the-built-environment/>.



zero-emission or battery-powered.<sup>5</sup> By introducing BEBs into our fleet, GoTriangle can significantly reduce emissions in a hard-to-abate sector where GHG reduction measures are not yet widely adopted.

Our BEB fleet infrastructure allows for scale-up as we replace more of our diesel buses with BEBs, expanding further reducing GHG emissions. BEBs are more fuel efficient than their diesel counterpart and are composed of fewer moving parts, potentially leading to decreased fuel and maintenance costs. Additionally, having fewer moving parts allows the BEB to operate more quietly and produce less noise pollution.

The PV canopies provide significant transformative impacts as well. The structures will be strategically installed over bus parking areas, creating canopies that provide shade and cooler temperatures. This not only reduces the urban heat island effect, but also protects BEBs from the sun and potentially lowers their air conditioning needs, leading to additional energy savings. By installing PVs, the energy consumed by the BOMF will be offset with clean energy, thus reducing the reliance on the grid during daily peak time frames and helping to support the region’s clean energy transition.

2 Impact of GHG Reduction Measures

Diesel-fueled internal combustion engine (ICE) buses emit a range of greenhouse gases (GHGs), including CO<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, CO, CH<sub>4</sub>, NO<sub>x</sub>, and SO<sub>2</sub>, as well as particulate matter. The transportation sector is responsible for nearly a fifth of global GHG emissions; these gases trap heat in the atmosphere and place Earth at risk of irreversible global temperature shifts that are harmful to humans, other species, and our interconnected ecological systems. Key to improving public and planetary health, the following emissions reduction measures align with the goals of the EPA’s CPRG program, as well as the PCAP Priority Measures identified by North Carolina DEQ and Central Pines Regional Council. This project is essential to the execution of GoTriangle’s larger Zero Emission Bus (ZEB) Transition Plan to convert to an all-electric fleet. These pollution reduction efforts embody GoTriangle’s mission to improve quality of life in the Triangle region.

Estimated GHG emission reductions are provided for the following GHG emissions, as relevant to this application: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (NO<sub>x</sub>). These associated emissions are confirmed by the EPA’s 2024 Emissions Factors for Greenhouse Gas Inventories.<sup>6</sup>

Table 3: Impacts of GHG Reduction Measures from 2025-2030 and 2025-2050

Reduction Measure	2025-2030 Reductions	2025-2050 Reductions
Measure #1: BEBs	2,544.48 MT CO <sub>2</sub> e	10,481.65 MT CO <sub>2</sub> e
Measure #2: PVs	1,913.05 MT CO <sub>2</sub> e	15,047.30 MT CO <sub>2</sub> e
Total	4,457.53 MT CO <sub>2</sub> e	25,528.95 MT CO <sub>2</sub> e

2.a Magnitude of GHG Reductions from 2025 through 2030

2.a.i Reduction Measure 1: BEBs and electric charging infrastructure

We anticipate that replacing 10 diesel buses with 10 battery electric buses (BEBs) will prevent 872.87 MT CO<sub>2</sub>e of GHG emissions annually. When accounting for their anticipated delivery date of February 2028, the total reduction

<sup>5</sup> Wilson, Kea. “US DOT Will Double the Nation’s Electric Bus Fleet,” (2022). <https://usa.streetsblog.org/2022/08/16/us-dot-seeks-to-double-the-nations-electric-bus-fleet-which-is-currently-tiny-and-will-still-be>.  
<sup>6</sup> EPA. “Emission Factors for Greenhouse Gas Inventories”, 2-3 (13 February 2024). <https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf>.

of cumulative emissions between 2025-2030 amounts to 2,544.48 MT CO<sub>2</sub>e. Due to the project schedule for BOMF modernization efforts, procurement is anticipated no later than Q1 2026 with deployment in Q1 2028.

#### 2.a.ii Reduction Measure 2: Photovoltaic panels

Installing 3,278 solar photovoltaic panels at the BOMF is expected to generate at least 1,100,000 kWh of solar power annually, which will offset a portion of the BOMF's energy consumption. Solar generation will eliminate 656.26 MT CO<sub>2</sub>e of GHG emissions each year; with an anticipated delivery date of February 2028, this clean energy generation is calculated to prevent 1,913.05 MT CO<sub>2</sub>e source emissions from 2025-2030. In coordination with the BOMF modernization efforts, the procurement and installation of the structural steel canopies and solar photovoltaic systems are anticipated in February 2028. Aligned with the 30- to 35-year average lifespan of PV panels, an average of 33 years extends these emissions reductions beyond 2030 to 2061, providing GoTriangle with reliable renewable energy at the BOMF site.

#### 2.a.iii Total 2025-2030 GHG reductions

With 2,544.48 MT CO<sub>2</sub>e emissions eliminated with the BEBs and 1,913.05 MT CO<sub>2</sub>e emissions eliminated with the solar photovoltaic canopies, a total of 4,457.53 MT CO<sub>2</sub>e reduced emissions are anticipated from both measures through 2030.

### 2.b Magnitude of GHG Reductions from 2025 through 2050

#### 2.b.i Reduction Measure 1: BEBs and electric charging infrastructure

As discussed in the previous section, replacing 10 diesel buses with 10 BEBs will prevent 872.87 MT CO<sub>2</sub>e of GHG emissions annually. Reductions are anticipated to take effect in 2028, upon BEB delivery and implementation. Aligned with the average 12-year lifespan of BEBs<sup>7</sup>, a total reduction of 10,481.65 MT CO<sub>2</sub>e cumulative source emissions are calculated through 2040. With proper maintenance and/or replacement efforts, an additional 9,532.25 MT CO<sub>2</sub>e could be avoided through 2050, for a total reduction of 20,013.90 MT CO<sub>2</sub>e source emissions reduced through 2050. Both calculations are reflected within the GHG Emissions Calculations spreadsheet.

#### 2.b.ii Reduction Measure 2: Photovoltaic panels

Solar generation will eliminate 656.26 MT CO<sub>2</sub>e of GHG emissions each year; with an anticipated delivery date of February 2028, this clean energy generation is calculated to prevent 15,047.30 MT CO<sub>2</sub>e source emissions from 2025-2050. In coordination with the BOMF modernization efforts, the procurement and installation of the structural steel canopies and solar photovoltaic systems are anticipated in February 2028. Aligned with the 30- to 35-year average lifespan of PV panels, an average of 33 years extends these emissions reductions beyond 2050 to 2061, providing GoTriangle with reliable renewable energy at the BOMF site.

#### 2.b.iii Sum total of 2025-2050 GHG reductions.

With 10,481.65 MT CO<sub>2</sub>e emissions eliminated with the BEBs and 15,047.30 MT CO<sub>2</sub>e emissions eliminated with the solar photovoltaic canopies, a total of 25,528.95 MT CO<sub>2</sub>e reduced emissions are anticipated from both measures through 2050.

### 2.c Cost Effectiveness of GHG Reductions

To finance the procurement and deployment of 10 BEBs, 7 BEB chargers, and 59,000 SF of photovoltaic canopies, this project is estimated to cost \$19,874,320. With GoTriangle proposing a 20% match valued at \$3,974,864, the

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<sup>7</sup> NREL. "Financial analysis of battery electric transit buses", (June 2020)  
[https://afdc.energy.gov/files/u/publication/financial\\_analysis\\_be\\_transit\\_buses.pdf](https://afdc.energy.gov/files/u/publication/financial_analysis_be_transit_buses.pdf).

CPRG Funding Request reduces to \$15,899,456. The cost effectiveness of these GHG reductions for the 2025-2030 was calculated at \$3,566.87/MT CO<sub>2</sub>e reduced. This was calculated as follows:

*Table 4: Cost Effectiveness of Proposed GHG Reductions*

Reduction Measure	2025-2030 MT CO <sub>2</sub> e Emissions Avoided	2025-2050 MT CO <sub>2</sub> e Emissions Avoided	Estimated Costs
Measure #1: BEBs	2,544.48	10,481.65	\$ 13,215,200
Measure #2: PVs	1,913.05	15,047.30	\$ 6,659,120
<b>Totals</b>	<b>4,457.54</b>	<b>25,528.95</b>	<b>\$ 19,874,320</b>
<b>Less 20% Applicant Match</b>			\$ 3,974,864
<b>CPRG Request</b>			<b>\$ 15,899,456</b>
<b>Cost Effectiveness (\$/MT CO<sub>2</sub>e)</b>	<b>\$ 3,566.87</b>	<b>\$ 622.80</b>	

***Cost Effectiveness = requested CPRG funding ÷ Sum of 2025-2030 GHG reductions***

$$\$3,566.87/\text{MT CO}_2\text{e} = \$15,899,456 \div 4,457.54 \text{ MT CO}_2\text{e}$$

Both reduction measures are anticipated for delivery and installation by February 2028. The remaining period (approximately 2 years and 11 months) allows for a thorough cost effectiveness analysis through 2030. Currently, the estimated cost effectiveness is \$3,566.87/MT CO<sub>2</sub>e reduced.

The project team is actively progressing with BOMF upgrades for a complete fleet conversion. Depending on the pace of design and construction efforts, the systems could potentially be delivered, installed, and operational by February 2027. This earlier operational date presents a compelling opportunity: an additional 1,529.13 MT CO<sub>2</sub>e could be reduced annually, leading to a more favorable cost effectiveness ratio of \$2,655.81/MT CO<sub>2</sub>e. However, while acknowledging the possibility of delays with BOMF upgrades, a conservative operational date of February 2028 has been used for cost effectiveness calculations, therefore mitigating this delay risk. This approach ensures a realistic assessment of financial benefits while remaining optimistic about achieving an earlier launch. This potential scenario was calculated as follows:

**Calculations for Best-Case February 2027 Operational Date:**

$$\begin{aligned} &872.87 \text{ MT CO}_2\text{e/year (BEBs)} + 656.26 \text{ MT CO}_2\text{e/year (PVs)} = 1,529.13 \text{ MT CO}_2\text{e/year (both)} \\ &4,457.54 \text{ MT CO}_2\text{e (current 2025-2030 estimate)} + 1,529.13 \text{ MT CO}_2\text{e/year} = 5,986.67 \text{ MT CO}_2\text{e} \\ &\$15,899,456 \div 5,986.67 \text{ MT CO}_2\text{e} = \$2,655.81/\text{MT CO}_2\text{e} \end{aligned}$$

## 2.d Documentation of GHG Reduction Assumptions

The Technical Appendix ("Techappx\_GoTriangle.docx") outlines the methodology and assumptions used to develop the GHG emission reduction estimates associated with the proposed project measures.

### 3 Environmental Results – Outputs, Outcomes, and Performance Measures

#### 3.a Reduction Measure 1

##### 3.a.i Expected Outputs and Outcomes

The key *outputs* expected to result from this measure include:

- 10 battery electric buses (BEBs);
- 5 BEB plug-in chargers;
- 2 BEB pantograph chargers;
- Progress reports and a final report.
- Increased employment opportunities and trainings for workforce development (see *Section 5: Job Quality*).

GoTriangle recognizes that it will be required to track and report progress towards expected *outcomes*. Key anticipated outcomes are:

- **Avoided GHG emissions:** The proposed measure is anticipated to result in an estimated reduction of 2,544.48 cumulative metric tons CO<sub>2</sub>e of GHG emissions from 2025 through calendar year 2030. It will result in an estimated reduction of 10,481.65 cumulative metric tons CO<sub>2</sub>e of GHG emissions from 2025 through calendar year 2050, including pollutants such as nitrous oxides (NO<sub>x</sub>) and particulate matter (PM), which can help reduce respiratory illnesses and smog formation.
- **Avoided criteria air pollutants (CAPs) – Particulate Matter:** Beyond primary pollutants, the proposed measure is anticipated to lead to a reduction in CAPs emitted by diesel combustion, namely particulate matter (PM) emissions. With the swapping of 10 diesel-fueled buses for 10 BEBs, these pollutant reductions are anticipated to occur across our routes, including within low-income and disadvantaged communities. This transition is expected to reduce riders' and residents' exposure to harmful air pollutants and unhealthy ambient air quality.

The agency can report estimated GHG emissions reductions and PM reductions associated with the deployment of the 10 proposed BEBs, as described further in *Performance Measures and Plan*. GoTriangle recognizes that HAPs are also a byproduct of diesel combustion but are more complex to quantify, given their variability depending on factors such as oil source, refining processes, and fuel blends. If required, GoTriangle can work with the EPA to establish estimated HAPs associated with the gallons of diesel avoided by using BEBs in lieu of diesel buses.

##### 3.a.ii Performance Measures and Plan

The following performance measures will be utilized as mechanisms to track, measure, and report progress towards achieving the expected outcomes of avoided GHG and PM emissions:

- Quantity of buses procured and deployed;
- Date of deployment;
- Vehicle mileage;
- Avoided diesel consumption (gallons);
- Days traveled over each semi-annual reporting span.

Avoided GHG and PM emissions will be reported on a semi-annual timeline, as requested by the EPA. Bus mileage and fuel consumption will be cumulatively tracked by GoTriangle's systems for 6-month spans. GHG emissions avoided will be calculated for GoTriangle's entire service area. Avoided particulate matter will be calculated for GoTriangle's entire service area. GoTriangle's approach to quantify and disclose GHG emissions reductions and associated PM emission reductions may include the following method:

$$\text{Emissions Avoided} = (\text{BEB Miles Traveled}) * (\text{Gallons of Diesel Avoided Over Reporting Time Span}) * (\text{Emissions Factor Per Gallon})$$

GoTriangle will utilize our established data collection and reporting systems to meet the EPA's reporting requirements. This data can be specifically tailored to track emissions reductions achieved across the project's life span. GoTriangle is committed to actively engaging with the EPA to ensure we provide the appropriate reported data. We are prepared to strengthen our internal reporting structure if necessary and ensure we are in alignment with the EPA's expectations.

### 3.b Reduction Measure 2

#### 3.b.i Expected Outputs and Outcomes

The primary expected *output* of this measure is the installation of 59,000 SF of photovoltaic panels, or approximately 3,278 panels. Just as with Reduction Measure 1, GoTriangle recognizes that it will be required to track and report progress towards expected *outcomes* for Reduction Measure 2. Key anticipated outcomes are:

- **GHG emissions reductions:** The proposed measure is anticipated to avoid an estimated 1,913.05 cumulative metric tons CO<sub>2</sub>e of GHG emissions from 2025 through calendar year 2030. An estimated 15,047.30 cumulative metric tons CO<sub>2</sub>e of GHG emissions will be avoided from 2025 through calendar year 2050.
- **Reduced grid energy demand and consumption:** The proposed measure is anticipated to result in an estimated 3.01 MWh generated per day, for a total estimate of 1,100 MWh generated annually.

#### 3.b.ii Performance Measures and Plan

Avoided GHG emissions and reduced grid energy consumption will be reported on a semi-annual timeline, as requested by the EPA. Energy generation via the photovoltaic panels will be cumulatively tracked by GoTriangle's systems for 6-month spans through utilities data. The energy generated by the photovoltaic canopy will offset daily energy consumed by the BOMF, therefore allowing GoTriangle to calculate source emissions generated by the grid. GoTriangle's approach to quantify and disclose GHG emissions reductions may include the following method:

$$\text{Emissions Avoided} = (\text{PV Energy Generated Over Reporting Time Span}) * (\text{Source Emissions Factor})$$

As with Reduction Measure 1, GoTriangle will utilize our established data collection and reporting systems to meet the EPA's requirements for Reduction Measure 2. This data can be specifically tailored to track emissions reductions achieved across the project's life span. GoTriangle is committed to actively engaging with the EPA to ensure we provide the appropriate reported data. We are prepared to strengthen our internal reporting structure if necessary and ensure we are in alignment with the EPA's expectations.

### 3.c Authorities, Implementation Timeline, and Milestones

#### 3.c.i Authorized Parties

Recognizing that the transition from diesel to BEBs and the installation of solar PVs can be a complex undertaking, GoTriangle's prior experience proves our capability.

The Project Manager acts as the key point of contact to coordinate efforts across several key players; they will work closely with the design and construction teams to ensure the BOMF is adequately equipped to receive BEBs and solar PV systems onsite. The Project Manager will have the authority to direct these teams on specific requirements and ensure their work aligns with the overall zero emission transition. In collaboration with the design team, the Project Manager will collaborate with bus and solar PV manufacturers to verify models, negotiate

pricing and delivery schedules, and finalize purchase agreements. The Project Manager's authority extends to procuring both systems, ensuring they adhere to established specifications. In alignment with GoTriangle's existing relationship with Duke Energy, the Project Manager can also collaborate with the utility company to effectively support our clean energy transition. Fellow collaborators may also include a dedicated grants team who will navigate funding applications under their direction.

Beyond our Project Manager, the successful expansion of our BEB fleet relies on our Operations team that will integrate BEBs into existing routes, schedule charge times, and train drivers to operate and maintain the new BEBs. Clear communication with the public is also key; our community engagement teams will work with the project manager to develop information that informs the community of the environmental benefits and potential service adjustments, if any.

Some key GoTriangle team members include:

- Jay Heikes – Project Manager and Senior Transit Planner
- Bryan Hammond – Senior Project Architect
- Richard Major – Director of Capital Development
- Jimmy Price – Director of Safety and Security
- Brian W Andrews – Assistant Director of Transit Operations
- Gary Tober – Real Estate Director

The successful implementation of both BEBs and PVs hinges on collaboration between a diverse group of stakeholders. While GoTriangle plays a central role in leading project planning and funding allocation, the successful implementation includes the expertise of external stakeholders. Duke Energy is a crucial partner to ensure that adequate electrical service and redundancy is available for the BOMF. Skilled contractors are responsible for preparing the site for the physical installation of both the BEB charging infrastructure and the solar canopies. Additionally, designers play a critical role, ensuring the technical feasibility and optimal efficiency of the systems. Finally, the success of the project relies on manufacturers building the BEBs, chargers, structural steel, and PVs.

### 3.c.ii Implementation Timeline and Milestones

A robust project management approach will be maintained, emphasizing quality assurance and transparency. Our dedicated project team will establish clear communication channels with stakeholders throughout the implementation process. Semi-annual progress reports will detail project milestones achieved, budget utilization, and any unforeseen challenges. A comprehensive final report will summarize project outcomes, environmental benefits, and cost effectiveness analyses. The following timelines detail key milestones, estimated dates, and reporting requirements to ensure efficient use of allocated funding throughout the 5-year grant duration (2025-2030):

Table 5: Implementation Timeline and Milestones

2025	Complete grant contract negotiations.
	Finalize BOMF modernization design for larger fleet conversion.
	Initiate bidding for BEBs and charging infrastructure.
2026	Procure BEBs and charging infrastructure.
	Initiate bidding for PVs.
	BOMF modernization construction to begin for larger fleet conversion.
2027	Procure PVs and structural steel canopies.
	Deliver and install BEB charging infrastructure.
	Initiate and complete construction required to install structural steel canopies and PVs (excavation, foundation system, backfill and repave).
	Train bus operators for BEBs and ensure preparation.
2028	Deliver and commission BEBs to be operational.
	Deliver and install structural steel canopies and PVs.
	Semi-annual reporting of GHG emission reduction measures.
2029	Semi-annual reporting of GHG emission reduction measures.
2030	Semi-annual reporting of GHG emission reduction measures.
	Final project report submission of GHG emission reduction measures.

## 4 Low-Income and Disadvantaged Communities

### 4.a Community Benefits

#### 4.a.i Impacted Disadvantaged Communities

The proposed GHG reduction measures are expected to result in both direct and indirect benefits to low-income and disadvantaged communities within GoTriangle’s transit service area. To determine which communities are affected by improvements to GoTriangle’s services, our team performed a geospatial analysis identifying where GoTriangle’s service routes overlap with disadvantaged communities, as identified by the EPA’s provided definition of disadvantaged for this application. The following methodology was performed:

1. A shapefile containing GoTriangle’s service routes was uploaded to the EJScreen mapping tool.
2. IDs were extracted for CEJST disadvantaged census tracts and disadvantaged census block groups (at or above the 90<sup>th</sup> percentile for EJScreen when compared to the state of North Carolina) that overlapped with GoTriangle routes.
3. Geospatial data containing GoTriangle’s bus routes, US census tracts, and US census block groups were re-mapped using ArcGIS mapping software. Census tracts and census block groups were filtered down to only show disadvantaged areas overlapping GoTriangle routes.
4. Total number of service area route miles was calculated through the calculate geometry function.
5. Number of route miles intersecting disadvantaged census tracts and disadvantaged census block groups was calculated using the calculate geometry function.

Through this analysis, the team determined that 23% of GoTriangle’s service routes travel through disadvantaged communities—spanning approximately 229 miles out of the agency’s 989-mile network. A complete list of CEJST Census tract IDs, EPA EJScreen Census block group IDs, and relevant jurisdictions is included in the attachment *Areas\_GoTriangle.xlsx*.



For these communities that have been disproportionately impacted by vehicular pollution, electrification of GoTriangle's fleet offers a cleaner future where negative health impacts of air pollution and noise are mitigated. (Further details of this analysis are detailed below in Potential Disbenefits and Mitigation Measures). This application's proposed emissions reduction measures are anticipated to have the following direct and indirect benefits:

- Improved air and noise quality in GoTriangle's service area and immediate surrounding region by transitioning from diesel to zero-emissions buses, eliminating tailpipe diesel emissions and noise pollution from 10 GoTriangle buses.
- Through the anticipated reduction of 10,481.65 MT CO<sub>2</sub>e (over 12 years) of heat-trapping emissions—CO<sub>2</sub>, CH<sub>4</sub>, and NO<sub>x</sub>—indirect mitigation of increased local and global surface temperatures.
- Anticipated reduction of harmful particulate matter in disadvantaged communities within GoTriangle's service area.
- Transit investments improve social mobility and inherently benefit transit dependent and historically marginalized communities that have been disconnected from employment opportunities and social services.
- GoTriangle is also working to ensure the creation and maintaining of high-quality jobs and new workforce training opportunities in low-income and disadvantaged communities, with an emphasis on expanding opportunities for individuals that face barriers to employment. We invest in its future workforce by offering paid internships, partnering with community colleges for industry-recognized credentials, and developing comprehensive training programs. This creates a pipeline of qualified talent, provides valuable work experience, and ensures a skilled workforce to keep our transit system running smoothly. More details can be found in *Section 5: Job Quality*.
- The project would also have indirect, dispersed benefits to the broader region by reducing GoTriangle's contributions to climate change. Reductions in climate impacts can be expected in proportion to the project's GHG reduction.

#### 4.a.ii Demographics of Impacted Riders

In addition to the EPA's geospatial definition of disadvantaged communities, as demonstrated by CJEST and EPA Supplemental Index criteria, GoTriangle recognizes that its services largely support riders from historically disinvested and underserved communities. GoTriangle's 2023 Onboard Customer Survey highlights that 32% of riders earn less than \$15,000 annually, and 47% earn less than \$25,000 a year. 70% of riders identify as Black, Indigenous, Hispanic, Asian, or otherwise as a person of color. 60% of riders are transit-dependent, meaning they do not have a vehicle available for use. As our agency continues to pursue electrification of the GoTriangle fleet, battery electric buses will provide improved ride quality for these riders, reduce noise pollution, and decrease pollutant exposure to emissions at bus stops.

#### 4.a.iii Potential Disbenefits and Mitigation Measures

The regional transportation that GoTriangle provides is essential. While an average of 15% of regional riders are work commuters, GoTriangle serves 46.6% of regional riders that are work commuters—nearly 3 times greater. However, GoTriangle recognizes that disadvantaged communities often face higher pollution levels, including pollutants from vehicle emissions. When considering any anticipated negative impacts to disadvantaged communities, one risk of this proposed GHG reduction measure is that the proposed BEBs may not effectively reduce emissions or noise levels specifically within disadvantaged communities. However, the geospatial analysis described above enabled our team to:

1. Determine that all current GoTriangle service routes travel through disadvantaged communities.
2. Identify priority routes for BEB deployment, based on the highest percentages of route miles traveling

through disadvantaged communities for each distinct route.

One known challenge is that the distance between the BOMF and certain disadvantaged communities extends further than a BEB battery can accommodate without on-route charging, route changes, and additional block analyses. Recognizing this, GoTriangle will prioritize BEB services through more substantially served disadvantaged communities, but along routes that do not require route changes or further block analyses, allowing a more rapid and equitable implementation of BEBs.

#### 4.a.iv Plan and Process for Reporting Benefits and Avoided Disbenefits

GoTriangle's current systems enable the agency to assign each bus a specific number and route, and track each bus's daily mileage. In order to assess, quantify, and report on expected benefits and avoided disbenefits to low-income and disadvantaged communities, GoTriangle can perform the following:

$$\text{Emissions Avoided} = (\text{BEB Miles Traveled}) * (\text{Estimated Percentage of Miles Traveled through Disadvantaged Communities}) * (\text{Gallons of Diesel Avoided Over Reporting Time Span}) * (\text{Emissions Factor Per Gallon})$$

#### 4.b Community Benefits

This application is a component of GoTriangle's larger strategic vision to ensure continued reliable and safe public transit is provided for the next 40 years. Alongside the organization's fleet electrification efforts, GoTriangle is engaged in simultaneous construction efforts for the following projects:

- Expansion and renovation of the BOMF; electric charging infrastructure requested in this application will be installed at this facility.
- Construction of a new Raleigh Union Station Bus Facility (RUS Bus), in Raleigh, NC.
- Efforts to relocate GoTriangle's Regional Transit Center (RTC) to provide enhanced safety and functionality, access and connectivity, and bus service reliability.

Extensive community engagement has been performed for each of these projects. Within these engagement efforts, input on GoTriangle's transition to BEBs has been continuously gathered from the community and incorporated to inform strategic procurement efforts. GoTriangle maintains a robust public engagement program to determine any disproportionate or adverse impacts to EJ populations and ensure meaningful engagement with minority and low-income populations in compliance with Title VI. Title VI compliance efforts to involve minority and Limited English Proficiency (LEP) populations in public participation activities can include both comprehensive measures, such as placing public notices at all transit stations and vehicles, as well as targeted measures to address linguistic, institutional, cultural, economic, historical, or other barriers that may prevent minority and LEP persons from effectively participating in the decision-making process.

Outreach efforts are conducted with a broad array of stakeholders to align the Project with the needs of the community, with an increased focus on the following populations:

- GoTriangle staff that work at the current BOMF.
- Populations that have historically been marginalized and excluded from transportation planning decisions, including low-income populations and communities of color.
- Existing GoTriangle riders.
- Vulnerable users of the transportation network and community members that lack reliable access to a private automobile.

GoTriangle is committed to working closely with stakeholders to ensure the project's impacts are fully aligned with community needs. By engaging those most directly affected by the project in meaningful ways, the agency aims to

proactively identify and mitigate risks at an early stage. This approach will facilitate consensus-building and collaborative planning activities with all stakeholders from the outset of project development. The goal is to avoid potential design changes and cost overruns later by ensuring community input is thoughtfully considered and integrated throughout the project development process. Although GoTriangle will be the lead agency responsible for delivering this project, this effort is the result of a long-standing collaborative partnership between multiple agencies and organizations that consistently work closely together to solve regional public transit challenges and implement successful projects.

## 5 Job Quality

The transition to clean energy solutions for regional transit services establishes more than positive environmental benefits; this is also an opportunity to create high-quality jobs with a diverse and highly skilled workforce. In alignment with the Good Jobs Principles and Good Jobs Toolkit, GoTriangle is working diligently to promote a future with economic growth and a thriving workforce.

### 5.a Good Jobs Principles

#### 5.a.i Recruiting and Hiring

GoTriangle continuously develops a pipeline for recruitment and hiring, especially for those from disadvantaged communities. In partnership with Wake Technical Community College, GoTriangle implemented new curriculum in the college's Workforce Continuing Education Propel Program to train new bus operators and mechanics, while also operating a mechanic internship program for students. The interns perform preventative maintenance services and repairs on agency vehicles under the direction of a mechanic to supplement the formal learning obtained as part of the curriculum of a local technical/trade school. GoTriangle is continuing its internship program to provide opportunities for interns to gain hands-on experience with zero emissions technology. GoTriangle is also developing training curriculums with other local community colleges, including historically black colleges and universities (HBCUs). As a support for current and future maintenance, service, and BOMF personnel, GoTriangle is coordinating with bus manufacturers and powertrain vendors to develop technical training modules and an in-house training curriculum.

Furthermore, GoTriangle is currently developing a comprehensive workforce development plan to ensure equitable job access is available for disadvantaged communities. This comprehensive workforce transition plan will identify goals, opportunities, and activities to advance opportunities for persons of Black, Hispanic, Asian American, Native Hawaiian and Pacific Islander, Native American descent, and for other groups facing systemic barriers to employment. GoTriangle currently offers paid in-house trainings for operators, such as Commercial Driver License training and safety trainings. GoTriangle has committed to developing a Zero Emissions Training Program with partnering organizations to provide employment opportunities and support the transition to zero-emission fleet and facilities.

#### 5.a.ii Benefits

GoTriangle demonstrates a strong commitment to its workforce by offering family-sustaining benefits packages. The comprehensive health insurance plan, including medical, dental, and vision coverage, provides employees with financial security and access to quality healthcare, a core aspect of economic security. Additionally, 401k retirement savings plans empower employees to plan for their future. Paid time off (PTO) and holiday pay contribute to employees' work-life balance, a key element of respecting employees' dignity. Well-rounded benefits packages help to foster a stable, secure workforce.

#### 5.a.iii Diversity, Equity, Inclusion, and Accessibility (DEIA)

GoTriangle seeks to champion Diversity, Equity, Inclusion, and Accessibility through our hiring and workplace practices. In addition to working to remove barriers to entry for members of disadvantaged communities through GoTriangle's strategic hiring and recruitment efforts, GoTriangle implements standardized hiring practices to advance equal employment opportunities. Our agency seeks to provide inclusive and accessible accommodations by offering flexible work arrangements, and ensuring communications are accessible in multiple formats and languages.

#### 5.a.iv Empowerment and Representation

GoTriangle aim to empower its staff's voices into decision-making processes by seeking employee feedback and incorporating it into operational strategies. Our agency seeks to ensure that decisions are informed by the lived experiences of those who keep the system running.

#### 5.a.v Job Security and Working Conditions

The well-being of GoTriangle employees is our top priority; we have a robust safety program that exceeds federal regulations. This includes an employee safety committee that actively works to minimize workplace injuries. Since 2013, our partnership with the NC Department of Labor's (DOL's) Carolina Star Program supports our effectiveness at reducing hazards and employee injuries within our organization. Over a 3-day period with employee interviews, DOL assessed our safety program and ensured GoTriangle's safety efforts go above and beyond the requirements. Our Health and Safety plans are developed in conjunction with employees, including anti-harassment training for workers and management, OSHA training to minimize workplace hazards, and supplemental health and safety training to address evolving needs.

#### 5.a.vi Organizational Culture

The perspectives of our workers are crucial for continuous improvement. By providing open communication channels, employees feel comfortable sharing ideas and concerns. Employee feedback at every level is sought and leveraged to directly shapes our policies, procedures, and safety protocols.

#### 5.a.vii Pay

Our competitive pay attracts and retains top talent. BEB maintenance requires a unique blend of traditional mechanical skills and new software expertise. Technicians need to diagnose and repair complex electrical systems alongside utilizing computer programs for data analysis and system monitoring. This dynamic job profile positions us well in the competitive job market, naturally attracting a diverse pool of qualified candidates seeking careers that challenge them to leverage both technical and digital skillsets. By offering competitive salaries, we ensure we can build a strong and inclusive team prepared to keep our BEBs running smoothly.

#### 5.a.viii Skills and Career Advancement

GoTriangle's current bus and facility maintenance personnel are enrolled in BEB and facility electrical power systems training courses with the BEB manufacturer, ensuring that our workforce has the tools and resources necessary to support their daily practice. Additionally, GoTriangle is coordinating with bus manufacturers and powertrain vendors to develop in-house training curriculums, allowing our teams to have more convenient access to necessary resources on a daily basis.

#### 5.a.ix Workforce Development and Training Opportunities

As discussed, GoTriangle is proactively developing a workforce transition plan focused on equitable career pathway and advancement for individuals in low-income and disadvantaged communities. GoTriangle has already established partnership and initiatives including:

- **Community College Partnerships:** The agency has partnered with Wake Technical Community College, including historically Black colleges and universities (HBCUs), to offer CDL training, mechanics training, and workplace preparedness program, leading to industry recognized credentials.
- **In-house training:** We currently offer paid ongoing training for operators, including CDL and training programs. All maintenance and facility personnel receive BEB and facility electrical system training from the manufacturer. Our extensive training programs are being further developed to eliminate the potential for displacing workers as the fleet composition gradually transitions toward zero-emissions.
- **Internships:** The agency’s mechanic internship program provides hands-on experience for students, preparing them for careers in electric bus maintenance.

## 6 Programmatic Capability and Past Performance

### 6.a Past Performance and Reporting Requirements

GoTriangle has a proven track record of successfully managing and delivering the expected outcomes of assistance agreements. As demonstrated in the following table, GoTriangle is currently managing multiple assistance agreements of awarded federal funding.

In past and ongoing assistance agreements, GoTriangle has consistently demonstrated successful agreement completion and management. This track record is evidenced by our high-quality interim and final reports submitted in accordance with reporting requirements. On every project, our team works to carefully detail our progress towards achieving agreed-upon outputs and outcomes, ensuring alignment with project goals and providing transparency for project partners and stakeholders. GoTriangle’s Senior Manager of Administration ensures timely submission of reports in accordance with project milestones to facilitate effective project management and to keep partnering agencies and stakeholders informed. The Senior Manager of Administration also coordinates with funding agency staff as needed and reports invoices paid on a quarterly basis.

The following *Table 6: Programmatic Capability and Past Performance of GoTriangle* demonstrates our track record in further detail:

Table 6: Programmatic Capability and Past Performance of GoTriangle

Project Title	Funding stream	Assistance Agreement No. (if applicable)	Latest year active	Agency & Assistance Listing No. (formerly CFDA) (if applicable)	Assistance Agreement Description	Funding Organization Contact	Dollar Value
Raleigh Union Station Bus Project	2018 BUILD Grant	NC-2020-037	2024 (Active)	USDOT / FTA; 20.933	Funding construction of a new bus facility and structured parking to create a multimodal transit center in downtown Raleigh. The project includes an off-street bus transfer facility, pedestrian bridge, BRT platform and other BRT infrastructure, on-street pedestrian improvements and wayfinding, traffic signal prioritization, new rolling stock, and three new battery electric buses.	Guanying Lei	\$20,000,000
GoTriangle Zero Emissions Vehicle Charging Equipment and Facility Rehabilitations	FY 2023 Low or No Emission Grant Program	N/A	2024 (Active)	FTA; 20.526 -- Buses and Bus Facilities Formula, Competitive, and Low or No Emissions Programs	Enabling GoTriangle to purchase zero emissions charging equipment and rehabilitate facilities to accommodate charging at two of its facilities—the Raleigh Union Station Bus Facility (RUS Bus) in Raleigh, NC, and the Nelson Road Bus Operations and Maintenance Facility (BOMF) in Morrisville, North Carolina. The new infrastructure will support efficient transit operations and services, enabling buses to remain in service for longer and minimize operational delays due to charging.	In development; no contact information at this time.	\$1,672,000
Multi-sourced FFY18 and FFY19 UAF, CMAQ for Ops and Electric Buses	Multi-source Urbanized Area Formula Grant	N/A	2024 (Active)	FTA; 20.507, 20.526	Funding the purchase of (2) battery electric buses.	No contact information at this time.	\$10,478,052
FY 2023 Community Project Funding		N/A	2024 (Active)	House Appropriations Committee	Funding the purchase of (2) battery electric buses.	No contact information at this time.	\$1,000,000

## 6.b Staff Expertise

Success of this project will hinge on our proven expertise and resources to achieve our proposed GHG reduction measures. Possessing extensive experience in design, construction management, and project controls, GoTriangle’s core staff are capable and motivated to deliver high-quality transit improvements on-time, within scope, and on-budget. Our team also includes legal, procurement, and real estate experts with in-depth knowledge of property acquisition and federal contracting to ensure compliance with the Uniform Act, relevant EPA guidance, and applicable state laws. Beyond our core expertise, GoTriangle strategically expands its team with highly qualified design professionals for each project. For this initiative, GoTriangle has assembled deep technical expertise in zero-emissions vehicles and fleet electrification; renewable energy; climate adaptation and mitigation; structural engineering, civil, MEP, and architecture; and cost estimating. Furthermore, the team’s experienced management consultants are equipped to manage project risks and ensure timely completion of projects in accordance with local and federal funding award deadlines. GoTriangle will leverage this deep bench of knowledge to successfully achieve our proposed measures and outcomes. This combined expertise will translate into successful GHG emissions reductions and cleaner, safer bus services for the region’s most transit-dependent populations. Key staff and personnel are referenced further in *Section 3.c.i: Authorized Parties*.