

Stark Area Transit and Waste / Wastewater System Decarbonization and Equity-Focused Resiliency Project



Applicant organization: Stark Area Regional Transit Authority (SARTA)

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Type of Application: coalition application

Coalition Members: SARTA (lead), City of Canton, Enbridge Gas Ohio

Funding Requested: \$56,684,037

Application Title: Stark Area Transit and Waste / Wastewater System Decarbonization and Equity-Focused Resiliency Project

Brief Description of GHG Measures: Measure 1: Diversion of Wastewater Sludge and Food Waste to RNG Production and Use for Transit Operation; Measure 2: Coordinated Operational Center to Improve Paratransit Routing and Increase Regional Transit System Efficiency; Measure 3: SARTA / Community Renewable and Resilient District Microgrid Deployment.

Sector(s): transportation (primary); commercial and residential buildings; and waste and materials management

Expected Total Cumulative GHG Emission Reductions: Cumulative 2025 to 2030: 77,018 MT CO₂e.
Cumulative 2025 to 2050: 1,136,859 MT CO₂e.

Location(s): Canton, OH (primary); also Stark County, Wayne County, Medina County, Mahoning County, and Columbiana County, Ohio.

Applicable PCAP Reference(s): All activities are applicable under the Ohio EPA's PCAP, the Ohio EPA Priority Resiliency Plan, available at <https://epa.ohio.gov/static/Portals/33/documents/OhioPRP-3-2024.pdf>. GHG reduction measures named therein include 1) Light Duty Zero Emission Vehicles (ZEV) and Modernization, 2) Medium and Heavy Duty Zero Emission Vehicles (ZEV) and Modernization, 3) Transportation Efficiencies, 4) Renewable Electricity Generation, 5) Building Energy Efficiency, 6) Clean Heating, 7) Composting, 8) Clean Waste-To-Energy (WTE) (see pp 4-6 of the PCAP for a summary). GHG reduction measures 2, 3, 4, 5, 6, and 8 are applicable to the project.

Stark Regional Transit and Waste / Wastewater System Decarbonization and Equity-Focused Resiliency Project

1. OVERALL PROJECT SUMMARY AND APPROACH

1.1 Description of GHG Reduction Measures

1.1.1 Project Description and Proposed Measures

The Stark Area Regional Transit Authority (SARTA), in collaboration with the City of Canton, Enbridge Gas Ohio (Enbridge), and the Canton City School District, proposes to design, engineer, deploy, and operate three critical need infrastructure, operations, and community support measures that will greatly reduce greenhouse gas (GHG) emissions while improving transit access and reliability within SARTA's service area. It will also increase reliability and reduce GHG emissions from coordinated transit operations across four Ohio counties, harness wastewater sludge and food waste to generate 100% renewable energy and serve as a model for improved resiliency and low GHG operation at nearby Patrick Elementary School within the Canton City School District and low income / community housing at the Stark Metropolitan Housing Authority. It will also provide key community benefits including education, workforce development support, and improved transit for underserved communities. Proposed GHG emissions reduction measures will include the following:

Measure 1. Diversion of Wastewater Sludge and Food Waste to RNG Production and Use for Transit Operation

In collaboration with the City of Canton, SARTA will deploy a new wastewater + food waste digester system that will transform wastewater sludge and food waste biomass collected from the City into 100% renewable natural gas (RNG). The project team will then transport the RNG via Enbridge pipeline to SARTA and surrounding community buildings for use by CNG buses and building heating (Figure 1).

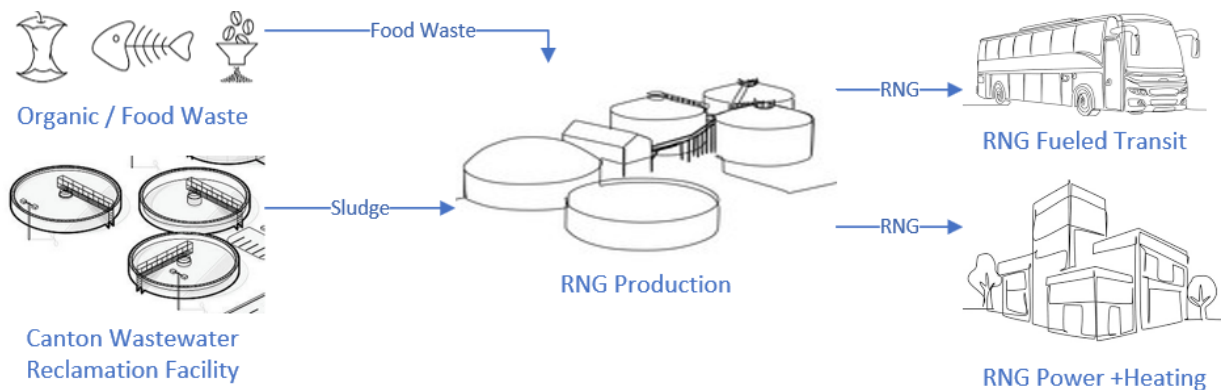


Figure 1. Measure 1 includes the collection of food waste from municipal and industrial sources in and surrounding the City of Canton, plus diversion of wastewater sludge from the landfill, from the landfill to a proposed anaerobic digester (AD). The digester will generate 100% renewable RNG, which will replace compressed natural gas for SARTA's transit system, provide power via a microgrid (see Measure 3), and reduce natural gas use for heating for SARTA and adjacent underserved community buildings. SARTA will also deploy a pyrolyzer system that will convert a portion of the RNG to hydrogen, to support additional hydrogen based fueling of SARTA's existing hydrogen buses.

The City of Canton's existing Wastewater Reclamation Facility (Canton WRF) is a tertiary treatment system supporting an average daily flow of 39 million gallons per day (mgd) of design wastewater treatment capacity—sufficient to serve the City of Canton, OH. The existing Canton WRF operates as an advanced, membrane supported system. The Canton WRF operates as an advanced, membrane-supported system,

the largest of its kind in North America. The process includes that includes the following stages: raw wastewater pumping, grit and grease removal, mechanical fine screening, flow equalization, membrane bioreactor systems (largest of its kind in North America), and post aeration. At present, the system typically operates at approximately 66% capacity (approximately 26 mgd average daily flows), with key relevant operational parameters summarized in Table 1.

Presently, wastewater sludge from the existing system is collected and dewatered on site via centrifuge. Dewatered sludge is collected and transported via diesel truck to the landfill, at about 13.9 dry tons per day. Under existing conditions, this residual wastewater sludge degrades in the landfill, contributing carbon dioxide and methane emissions to the landfill's existing operations.

Meanwhile, within the City of Canton, food waste from industrial food handlers and producers, along with institutional producers such as schools, and commercial producers including restaurants, grocery stores, and others, produce an estimated 90,000+ tons/yr of food waste. The City of Canton provides municipal waste collection services within its service area, including for food waste. All food waste is currently landfilled and decomposes. Here, it contributes significant volumes of methane and carbon dioxide emissions during degradation within the landfill and ultimately the atmosphere.

| Wastewater Parameter | Value |
|---|-------------------------------|
| System capacity (average daily flow) | 39 mgd |
| Actual average daily flow | 25.9 mgd |
| Total solids (TS) | 1.2 to 1.5% |
| Existing dewatering units | 3 |
| Dewatering mechanism | Centrifuges |
| Sludge cake production | 13.9 dry tons per day |
| Total solids, sludge cake | 19 to 22% |
| Service operating period | 24h per day / 7 days per week |
| Polymer usage | 776 lbs/yr |
| Sludge offtake | Hauled via diesel truck |
| Sludge disposal | Landfill |
| On site electricity consumption | 2.3 GWh/month |
| Table 1. Canton WRF Existing Operational Parameters. | |

To address these existing issues, SARTA and the project team propose to design, engineer, deploy, and operate a bolt-on anaerobic digester system located adjacent to the existing Canton WRF. In lieu of drying, transporting, and landfilling the Canton WRF's existing stream of waste sludge, the sludge would instead be transferred into a

specially designed, high-solids anaerobic digestion system, at a rate consistent with the sludge production rate of the existing WRF (Table 1). This process would be sufficient to produce up to approximately 120,000 million British thermal units per year (MMBtu/yr), equivalent to 1,052,631 gasoline gallon equivalents per year (GGE/yr) of biogas. The Canton WRF will also require key electrical system upgrades to the dewatering and sludge handling systems, to support integration of the proposed AD facility. These elements will also be included in the project.

To supplement sludge-produced RNG, the project team will design the proposed digester system to accept additional food / organic waste. This food waste will be collected from existing producers in and around the City of Canton, including schools, institutions, restaurants, grocery stores, commercial food facilities, and other sources. Based on a preliminary evaluation of food waste resources within the Canton area, and typical / likely collection rates, this element of the project will generate an additional 180,000 MMBtu/yr (1,578,946 GGE/yr) of RNG, for a **total annual RNG production rate of 300,000 MMBtu/yr (2,631,578 GGE/yr)**, sufficient to offset that same amount of existing natural gas / CNG consumption, while also alleviating GHG emissions from the decomposition of food waste and sludge in the landfill. Additionally, SARTA will use a portion of the produced RNG to convert to 100% renewable hydrogen via a

pyrolysis process. Produced hydrogen will then be used by SARTA to fuel its existing hydrogen transit buses. Working with Enbridge and other partners, SARTA will sell the resulting carbon black to other industries and processes for uses such as asphalt production, so support long-term sequestration.

Once produced, the total biogas generated by wastewater sludge + food waste would be upgraded—using proposed membrane based upgrading equipment. The RNG will then be injected into Enbridge’s existing on-site pipeline, located at the Canton WRF, and wheeled to SARTA, where it will be used to refuel SARTA’s existing CNG-operated buses, plus RNG-based power production and heating at the proposed microgrid (see Measure 3). For additional information on the specific equipment to be deployed, potential specifications, and other details, refer to the Technical Appendix.

Measure 2. Coordinated Operational Center to Improve Paratransit Routing and Increase Regional Transit System Efficiency

Under Measure 2, SARTA will upgrade the 2nd floor of its existing operations building, located at SARTA’s main facility campus at 1600 Gateway Blvd SE, Canton, Ohio 44707. The proposed upgrade will house a new dispatch and control center to improve coordinated operations within SARTA’s service area and in cooperation with other regional transit agencies (Figure 2).

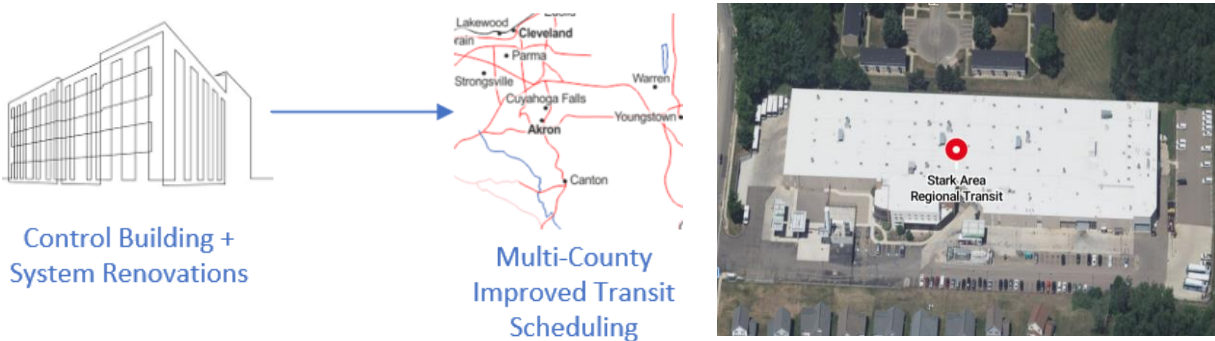


Figure 2. Measure 2 will upgrade SARTA’s existing control building and deploy key operational system / dispatch upgrades to enable improved internal coordination of SARTA’s service vehicles for disabled and senior citizens. Moreover, through inter-system cooperation, the new facility and its operation will coordinate paratransit operations with four other regional transit providers, reducing redundancy, improving service, and streamlining operations (left). The proposed upgrades will be at SARTA’s existing main headquarters, the second floor of which will be upgraded (right). The increased number of passengers transported per vehicles will consolidate trips. This will reduce additional vehicles miles resulting in avoid GHG emissions.

Currently, SARTA operates 36 CNG-fueled paratransit vehicles, five H2 paratransit vehicles, and seven diesel paratransit vehicles (contingency use only) throughout its service area. SARTA’s paratransit operations are in high demand—particularly among underserved seniors and the disabled—through two key programs, SARTA’s Proline and ADA Paratransit, as well as Medline, Passport, and Medicaid transit. Every year, over 170,000 people with disabilities use the Proline service to travel to work, school, medical appointments, shopping, senior centers, libraries, parks, and a wide range of other destinations in and around Stark County. Meanwhile, Medline provides on demand service to people with disabilities who hold Level One Medicaid waivers. The system provides free, non-medical transportation on specially equipped SARTA vehicles, with specially trained staff. SARTA also operates these systems in a manner that is, at present, very loosely coordinated with other regional transit authorities such as Wayne County Transit.

Demand for these services is high. In 2023 alone, SARTA transit vehicles provided 1.1 million miles of paratransit services to its users. Despite operating almost entirely on CNG, this travel nonetheless generates CO₂ emissions during typical operations (refer to Section 2 for details). Moreover, demand is expected to increase in coming years as the regional population grows. A preliminary analysis also indicates high demand for similar services among neighboring transit agencies, including Western Reserve Transit Authority (WRTA), Wayne County Transit (WCT), Medina County Public Transit (MCPT), and Columbiana County transportation providers. Collectively, these service providers provide transit services to Wayne County, Medina County, Mahoning County, and Columbiana County, supporting an additional approximately one million miles per year of similar paratransit services, collectively. Transport vehicles used by these agencies, however, are diesel fueled, and have a higher emissions rate (see Section 2 for emissions specifics).

Because these services are provided on-demand, rather than as fixed routes, their scheduling and management presents multiple challenges, with many opportunities for improved efficiencies. For example, rides between urban areas often overlap among the service areas of the five transit agencies, but are at present only minimally coordinated, resulting in overlapping / duplicate ride services, low ridership, and idle / waiting buses, all of which lead to inefficiencies both in terms of GHG emissions and transit level of service. Moreover, within each transit agency, effectively scheduling based on rider needs while also optimizing system operations and efficiency can be very difficult, presenting multiple challenges.

To address these issues, SARTA seeks to renovate the second floor of its existing operational building, located on its main campus (Figure 2). The proposed renovation—totaling 15,000 square feet—will include key modernization features needed to enable centralized and coordinated tracking and management of paratransit and related vehicles throughout the region, from a single center. The proposed renovation will include needed office and control room spaces to house a new centralized control center that will coordinate these transit operations. Additional specific upgrades will include installation of a central dispatch system, phone system upgrades, software and computing system upgrades, along with the physical space and renovation needed to prepare the area for use. The proposed control / dispatch system will be consistent with NEORide EZ Connect,¹ a statewide initiative promulgated by the Ohio Department of Transportation (ODOT) that helps transit agencies to develop coordinated policies, use a common phone system, integrate needed software, and operate with a mobile app based ticketing platform. Deployment of NEORide under the project will enable greatly improved transit coordination among SARTA and its partner agencies.

When operational, the new coordinated operational center will coordinate services to save GHG emissions and improve transit experience for riders by implementing a unified scheduling and routing system to optimize service frequency, coverage, and connections among the different providers. This effort will reduce unnecessary duplication of routes, increase the ridership potential, and minimize the waiting and transfer times for passengers. The unified scheduling and routing system will also enable real-time information sharing and communication among the providers and customers, thereby enhancing the reliability and convenience of paratransit services across the five counties. By improving the efficiency and attractiveness of transit, the coordinated system will also help to reduce the dependency on private vehicles, increase transit ridership, and lower the GHG emissions from transportation in the target region.

Measure 3. SARTA / Community Renewable and Resilient District Microgrid Deployment

¹ Refer to <https://www.neoride.org/home>

Under Measure 3, SARTA will deploy an islanding-capable microgrid system capable of supplying up to approximately 3 MW worth of power. The system will include needed lines, a microgrid controller and switch system capable of islanding, a 1 MW rooftop solar array, and a phosphoric acid fuel cell (PAFC) plus microturbines collectively capable of producing up to 1 MW of renewable electricity, produced from RNG sourced from Measure 3.

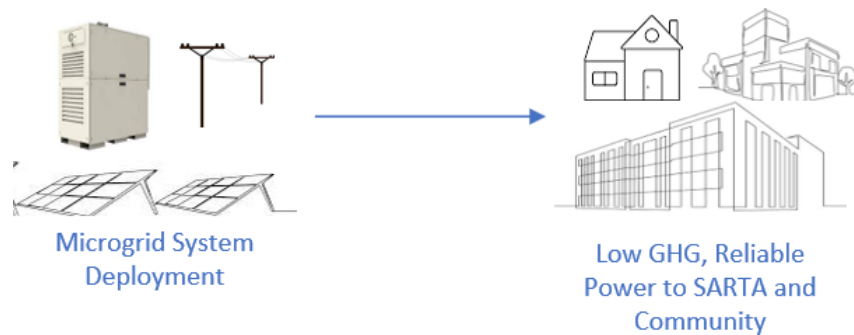


Figure 4. Measure 3 includes the installation of a 1 MW rooftop solar array on top of SARTA’s existing main facility, plus a 250 kW phosphoric acid fuel cell and 500 kW of microturbines, all capable of directly converting RNG (e.g., methane) to electricity. RNG will be derived from Measure 1. To the extent available, excess RNG produced under Measure 1 will also be available to provide heating at SARTA’s facility and within the microgrid service area. Once microgrid connections are deployed, Measure 3 will provide resilient, renewable power to SARTA’s internal operations as well as the adjacent elementary school and low income housing (see text).

SARTA’s current operations, existing control center, mechanic shops, and vehicle refueling—and the proposed Measure 2 coordinated operations center—are all housed at or adjacent to the organization’s headquarters, located at 1600 Gateway Blvd SE, Canton, Ohio 44707. These existing, critical need transit facilities are all currently grid tied without sufficient backup power. In the event of a grid down power outage, these facilities are also subject to outages, resulting in widespread transit outages and / or deficiencies in the event of an outage. In light of the strengthening effects of climate change, potential for utility outages is increasing, wherein an outage at these facilities would effectively shut down transit operations for the duration of that outage. Moreover, the facilities are currently fed by grid power, wherein Ohio’s grid power carries a carbon intensity of 1,162 lbs CO₂/MWh.² SARTA’s operations consume approximately 2 MW of power.

In addition to SARTA’s facility, the adjacent Stark Metropolitan Housing Authority manages low income housing, seeking to provide quality affordable housing, located in safe and community friendly neighborhoods, including public housing located at 1315 Gonder Ave SE., Canton, OH, 44707, as well as a community center (hosting the Stark County Urban League) located at 1400 Sherrick Rd. SE, Canton OH, 44707. Finally, the Patrick Elementary School, located at 1326 Sherrick Rd SE, Canton, OH 44707, is also located adjacent to SARTA’s existing facility. All of these existing facilities suffer from inadequate electric service backup and rely directly on grid power. Collectively, these facilities consume typical loads of approximately 1 MW, resulting in a total load of approximately 3 MW between the SARTA campus and adjacent facilities.

² Refer to <https://www.eia.gov/electricity/state/ohio/>

To alleviate these issues, SARTA proposes to develop and deploy a local microgrid that will provide resilient, low-carbon electricity to support its internal operations and maintain transit operability even during a grid down event, while also providing resiliency and renewable energy to the elementary school and low income housing. Herein, the project will deploy a coordinated microgrid sufficient to serve these loads.

During operations, a proposed microgrid controller system will assume that dispensing equipment loads, SARTA servers, and SARTA's garage maintenance/air handlers are critical, uninterruptible loads. The rest of the facility includes critical, yet interruptible loads. Core microgrid equipment will be installed on SARTA's campus, while power lines serving the other facilities will extend to those facilities. The microgrid will include a bidirectional connection to the utility grid. In the event of a grid outage or failure, the microgrid will island and will continue to serve the facilities. It will be designed to operate in islanded mode for at least 24 hours, relying on a combination of solar power and energy provided using the proposed microturbines and PFAC fuel cell—all of which will operate on RNG sourced from Measure 1. Generation capacity will be sufficient to serve critical uninterruptible loads at SARTA's facility and emergency loads at other covered facilities. During normal operational periods, the microgrid will provide RNG-derived PFAC plus microturbine based power generation to supplement grid power.

1.1.2 Tasks, Milestones, and Risks

SARTA and the Coalition (see Section 1.1.3) will execute the project through the following tasks and milestones; relevant project risks and associated mitigation measures are also discussed.

Task 1. Project Administration and Management. SARTA will complete all project administration and oversight, for the duration of the project, including the following elements: initial contracting and subcontracting; negotiation and completion / signing of the required MOA in accordance with EPA deadlines; budget oversight, invoicing, and tracking; day to day project management and tracking, milestone performance and tracking; QA/QC of all deliverables and outcomes; coordination with EPA management team.

Task 1 Milestones. 1.1: MOA negotiation and signing by all relevant parties in accordance with EPA timelines; 1.2: SARTA/EPA contract negotiation and signing; 1.3: Subcontract negotiation and signing for Coalition members and for other contractors; 1.4: Quarterly invoicing with to-date progress reporting; 1.5: QA/QC of all deliverables, consistent with Tasks 2 to 5 deliverables scheduling.

Task 1 Risks and Mitigation. Potential risks include: 1) potential for loss of a coalition member during the MOA negotiation and signing process. Mitigation: all commitments have already been reviewed by the project team; SARTA will work with coalition members following application completion and before award to complete the MOA negotiation and signing process per EPA schedule requirements. 2) Schedule, budget, or milestone performance could be compromised due to multiple concurrent elements and project complexity. Mitigation: SARTA's highly experienced grant administrators and project manager will apply standard, proven management and tracking processes to ensure budget, milestone, and schedule performance tracks proposed performance.

Task 2. Feasibility, Engineering / Design, and Permitting. SARTA, with support from Coalition members, will complete the following:

- ***Wastewater sludge + food waste to RNG feasibility evaluation (Measure 1).*** This element is required in accordance with City of Canton's internal project development requirements. Briefly,

the project team will retain an external engineering consultant to complete a streamlined feasibility study to confirm viability of the proposed AD wastewater sludge + food waste to RNG system.

- **AD + RNG facility design, engineering, and permitting (Measure 1).** Design and engineer all aspects of the proposed wastewater sludge and food waste to RNG facility, including grading and foundation requirements, process design, all equipment and appurtenances, and all electrical systems, mechanical components, structural components of the proposed facility. Complete all federal / state environmental and City permitting requirements.
- **Coordinated Transit Operational Center design, engineering, and permitting (Measure 2).** Design and engineer all elements of the proposed Coordinated Transit Operational Center, including grading and foundation requirements, structural components, equipment and system interconnections, and all building utility connections and integration, and relevant appurtenances. Complete all federal / state environmental and City permitting requirements.
- **Microgrid design, engineering, and permitting (Measure 3).** Design and engineer all aspects of the proposed microgrid system, including structure, electrical, and logical / operational elements of the proposed microgrid system. Complete engineering needed to support installation and construction, including electrical and structural components, and all appurtenances. Complete all federal / state environmental and City permitting requirements.

Task 2 Milestones. 2.1: Complete wastewater sludge + food waste to RNG feasibility study; 2.2: Written Notification of Completion of Engineering Plans, one for each Measure; 2.3: Summary of lessons learned during the design phase; 2.4: Approval from applicable agencies, as needed to initiate construction, for each Measure; 2.5: Construction and Equipment List that will be used to develop bid packages to be sent to vendors, for each Measure.

Task 2 Risks and Mitigation. The primary risk under Task 2 is the potential risk that Milestone 2.1 could show that the project is infeasible or not sufficiently beneficial to justify execution. However, based on preliminary design and evaluation completed to date, the project team has incorporated key measures to help ensure AD system feasibility. These include consideration of high solids digestion processes that significantly reduce system construction costs, a preliminary feasibility evaluation based on the last two years of Canton WRF operations, and the incorporation of food waste to enhance RNG output. Other system related risks would be minimized through the proposed comprehensive engineering and design process. Permitting is generally expected to be straightforward, wherein only modifications of existing permits would be required for the AD facility, and RNG pipeline interconnection risks are minimized through Enbridge's participation in the project. Permitting for other facilities would follow standard procedures.

Task 3. Procurement and Construction. The project team will complete the following for each of the three proposed measures, based on the design and engineering completed under Task 1:

- Prepare a Procurement Plan for each Measure, detailing procurement of equipment, materials, and services, in accordance with EPA contracting requirements. It will include: a description of the bid packages to be assembled and a methodology for receiving and evaluating responses, in compliance with EPA requirements.
- Execute the Procurement Plan, for each Measure
- Prepare and provide a Procurement Report, for each Measure, including: list of respondents to bid packages; review of rationale for the selected service providers

- Prepare and provide a Construction Plan for each Measure to outline the budget and schedule for the completion of all construction and installation activities, including milestones, schedule, best management practices, risk management, and QA/QC.
- Implement the Construction Plan for each Measure including all construction and installation related activities.
- Prepare and provide a Major Project Change List for each Measure, to identify any major project changes that occur during implementation of the Construction Plan. The Major Project Change List will be updated on an as-needed basis
- Prepare and provide a Construction Report for each Measure, to evaluate the actual construction activities compared to the Construction Plan.
- Prepare and provide Written Notification of Completion of Construction and Installation for each Measure. This memorandum will notify EPA that construction and installation activities have been completed.
- Prepare a Testing and Commissioning Plan for each Measure that details the processes, deliverables, and milestones needed to complete testing and commissioning of the facility.
- Prepare and provide a Testing and Commissioning Report for each Measure that describes all commissioning or testing / validation completed for each facility, verifying that each Measure is ready for operation.

Task 3 Milestones. 3.1: Procurement Plan (one per Measure); 3.2: Procurement Report (one per Measure); 3.3: Construction Plan (one per Measure); 3.4: Major Project Change List (one per Measure); 3.5: Construction Report (one per Measure); 3.6: Written Notification of Completion of Construction and Installation (one per Measure); 3.7: Testing and Commissioning Plan (one per Measure); 3.8: Testing and Commissioning Report (one per Measure).

Task 3 Risks and Mitigation. Risks are associated with typical construction risks. All proposed equipment will be fully commercial and available, thereby avoiding technical risk. Construction and commissioning risk will be minimized through the design and engineering process, and through the proposed carefully managed, stepwise procurement, construction, and commissioning process. Moreover, the project team will carefully oversee and manage the construction process, including through careful oversight of construction contractors, weekly progress check ins, and an active progress reporting process.

Task 4. Operation and Validation. The project team will verify and validate system operation for each of the three proposed measures as follows, including operational data collection for a period of at least one year:

- Measure 1. SARTA and the City will track AD facility key operational parameters including sludge and food waste inputs, biogas produced, RNG upgraded and pipeline injected, residual post-digestion biosolids and their disposal, RNG end use, net GHG emissions reduction, and other key parameters.
- Measure 2. SARTA will hire staff and operate the proposed transit routing system, track and quantify transit routing changes, quantify service improvements, and evaluate net GHG emissions savings.
- Measure 3. SARTA and Canton City Schools will track microgrid performance including renewable energy provided / delivered, energy stored, resiliency improvements, transit service improvements, and net GHG emissions reduction.
- Measure 4. Rely on commercially available products and systems to complete this (and all) project elements.

SARTA will provide quarterly updates regarding progress completed on the operation and validation process, and will provide a final report that summarizes outcomes for each Measure.

Task 4 Milestones. 4.1: Quarterly operation and validation data reports; 4.2: Final operation and validation reports, one for each Measure.

Task 4 Risks and Mitigation. Operational risks include potential challenges associated with the operation of each Measure. For Measure 1, key challenges will include collection of food waste, which will be minimized by using existing City hauling equipment and by completing dedicated, food-only pickup runs to key food waste generators. For Measure 2, key challenges will focus on interoperability among the targeted transit authorities. This risk will be minimized through project system design, which will integrate and as needed develop information sharing protocols and processes during the engineering and design phase (Task 2). Once commissioned, Measure 3 risks are limited, and could include the potential lack of a real world grid down event during the operational test period. If a grid down event does not occur during this period, SARTA would work with the utility to create an artificial / scheduled demonstration grid down event, which would be used to test microgrid resilience and grid down operability.

Task 5. Community Benefits. The project team will administer and deploy a comprehensive community benefits and outreach plan that will integrate the specific items summarized in Section 4.1 and 4.2 of this document, relating to community benefits and community outreach. Specifically, the project team will complete the following: 1) Develop and deploy a food waste capture public outreach program designed to raise awareness of existing food waste relevant to the City of Canton's waste collection area. The program will target both commercial and residential sources of food waste, which will be collected to generate RNG under the project. 2) Transit ridership outreach, including public noticing and advertising of new proposed transit scheduling streamlining, and of the use of RNG and renewable hydrogen to support reduced emission operation. 3) Job postings targeting local underserved communities first and foremost, with initial postings and outreach targeted first to underserved and low income communities. 4) Workforce training to support internally proposed jobs, and development of a training program, in collaboration with Cleveland State University and/or local community colleges, to provide training to 50+ workers interested in gaining job skills in the clean economy. 5) Outreach to schools including site tours and educational materials developed to support k-12 outreach, and including site tours (4+ per year) of SARTA's facilities, for k-12 as well as college students and apprentices. 6) Community outreach and education events including open houses, webinars, and social media campaigns to inform community members about the project and its specific benefits. 7) Educational opportunities for CSU students and/or researchers interested in developing or pursuing careers in the clean energy sector, including collaborations to provide internship and mentoring opportunities. 8) incorporation of a suite of job quality related benefits including hiring that targets local, underserved communities, and providing for quality jobs including full benefits with above-median wages (see Section 5).

Task 5 Milestones. 5.1: Develop the community benefits plan according to the requirements above and those referenced in Sections 4 and 5 of this document. 5.2: Initiate community benefits plan execution. 5.3: Complete quarterly progress reporting to EPA on all metrics identified for this task.

Task 5 Risks and Mitigation. Key risks include typical challenges surrounding accomplishment of effective outreach to underserved communities, wherein common challenges include low or limited participation, difficulty in reaching targeted populations, relevance of outreach to the targeted communities, and limited opportunities to close feedback loops. These risks will be mitigated as follows: 1) SARTA and the project team will leverage existing and successful models of public outreach, including those identified in

Task 5, using community-appropriate and sensitive language. Outreach will also be completed directly within the targeted communities, and on the buses that serve many of the targeted communities. 2) Mitigation relating to the relevance of the proposed outreach and benefits has already been pre-mitigated through project design, which explicitly targets known needs of the target communities, as discussed in Section 4.0. 3) Quarterly reporting will help to ensure that community benefits related metrics are achieved according to planned schedule and outcomes, and will describe how feedback received from community members has been integrated into the project to date.

1.1.3 Coalition Structure and Project Partners

SARTA has assembled a coalition team that will develop and deploy the proposed project. Coalition participants and roles will include the following:

SARTA has been a regional and national leader in the development and deployment of alternative fueled transit systems for 15+ years. As an early adopter of CNG, diesel hybrid, and hydrogen fueled buses plus associated refueling infrastructure, SARTA currently operates a suite of 36 CNG transit buses. Moreover, the agency received its first hydrogen-fueled buses in 2016. Since that time, the organization has expanded its hydrogen operations and influence, supporting a total of 20 hydrogen vehicles along with multiple regional collaborations on GHG emissions reduction through the adoption of hydrogen and other low carbon transportation fuels for transit and other services. Leveraging extensive grant funding, SARTA has built up its fleet of alternate fueled vehicles, and currently operates the third largest hydrogen refueling station in the nation. Also leveraging grant funding, SARTA built and operates the country's first hydrogen fueled five paratransit vehicles.

SARTA has developed an exceptionally strong commitment to making renewable low carbon fuels available to its own fleet and publicly / to other fleets in the region. Separately, for example, in a parallel effort with the ARCHII Hydrogen Hub, SARTA and Enbridge have funded the construction of an electrolyzer to replace current H2 deliveries. This additional source of hydrogen, and SARTA's investment in its development, underscore the project team's commitment to renewable transit development within its service area. Additionally, SARTA operates a CNG station that is open to the public. This station serves SARTA vehicles and also operates as a backup fuel provider to Kimble Refuse, that services most of the of Stark County outside of Canton. Additionally, Hometown Inc., Earth and Wood (mulch makers), and Ace Taxi all locally use SARTA's CNG station, while trucks for McDonalds, UPS, and Pepsi Co have also used SARTA's station for backup service.

Project Role: SARTA will serve as the coalition leader and will organize and ensure the successful execution of all elements of the project. SARTA will also directly host the proposed coordinated transit operational center (Measure 2) and the proposed microgrid (Measure 3), and will handle all project administration and oversight. Finally, SARTA will be the primary user of RNG generated by the proposed AD system (Measure 1), wherein RNG will be used as a transportation fuel to replace fossil CNG in SARTA's existing buses. SARTA will also explore the use of RNG to generate carbon negative hydrogen via pyrolysis as described above.

City of Canton. Canton is the county seat and largest municipality in Stark County, Ohio, with a population of about 71,000. The city operates and maintains the Canton WRF, which treats wastewater from Canton and surrounding communities . The city also provides municipal solid waste collection and disposal services for its residents and businesses. **Project Role:** The city will coordinate with SARTA to support the installation and operation of the proposed AD system, including for the digestion of wastewater sludge and regionally available food waste. The City's municipal solids waste managers will work with SARTA to

coordinate the pickup and delivery of food waste from its service area to the proposed AD system, to enhance AD gas production. The City will also oversee the completion of a feasibility study to provide an initial evaluation of the proposed system in greater detail, prior to execution.

Canton City School District. Canton City School District (CCSD) is the largest public school district in Stark County, Ohio, serving about 8,300 students from pre-kindergarten to 12th grade. The district's mission is to inspire confident, curious, and capable learners who thrive in a diverse and changing world. The district has a strong track record of administering federal grants, such as Title I, IDEA, ESSER, and CARES, to support its educational programs and operations. The district also collaborates with community partners, such as SARTA and the City of Canton, to enhance learning opportunities and outcomes for its students.

Project Role: CCSD will coordinate with SARTA to support deployment of the proposed microgrid at Patrick Elementary School, and will also coordinate with SARTA staff to support employment educational opportunities for students, as proposed under the project. This element of the project (see Task 5 and Section 4.0) is especially important, because the southeast portion of Canton has some of the most highly impoverished under-employed populations in the state. Also, this targeted area has one of the highest infant mortality rates in Ohio.

Enbridge Energy and parent company Dominion, is collectively one of the largest energy companies in the United States, with over 7 million customers in 16 states. Through its Net Zero Commitment, Dominion is establishing itself as a leader in developing and integrating RNG into its existing natural gas pipelines, which span more than 10,000 miles, and provide service to the City of Canton and other areas targeted in this project. To date, Dominion has partnered with dairy farms, landfills, and wastewater treatment plants to capture biogas from organic waste and convert it into RNG, which can then be injected into the pipeline network and delivered to customers as a low-carbon alternative to conventional natural gas. Dominion has also invested in RNG production facilities and vehicle fueling stations, to support the growth of the RNG market and to reduce greenhouse gas emissions from the transportation sector. **Project Role:** Enbridge will coordinate with SARTA and the City of Canton to facilitate the injection of RNG produced by the proposed AD system into its pipeline network, and will also provide technical assistance and quality assurance for the RNG upgrading process. Enbridge will also assist with the measurement and verification of RNG production and utilization, and will help secure the environmental attributes associated with the RNG, such as Renewable Identification Numbers (RINs) and/or related credits.

1.1.4 Project Relationship to PCAP

Each element of the project is directly related to a priority GHG reduction measure identified in Ohio's PCAP—which identifies eight priority reduction measures (PRM)—as follows:

- Measure 1. The proposed wastewater sludge and food waste to RNG system will directly support 1) **PRM 8, Clean Waste to Energy (WtE)**, by developing significant new organic WtE capacity within the City of Canton, capable of transforming the targeted organic waste sources into RNG to be used as a natural gas fuel replacement. 2) **PRM 2, Medium- and Heavy Duty ZEVs** and other modernization technologies, by supporting the transition of fossil CNG buses to RNG, and by supporting the potential future production of carbon negative hydrogen from RNG. 3) **PRM 3, Transportation Efficiencies** by providing a new source of environmentally friendly, sustainable RNG fuel for transit in Stark County. 4) **PRM 6, Clean Heating**, by providing excess RNG as a fuel to replace fossil natural gas heating within the microgrid service area.
- Measure 2. The proposed coordinated operational center will directly support **PRM 3, Transportation Efficiencies** by developing new infrastructure and operational + behavioral changes that will lead to improved coordinated transit system efficiency, and improved sustainability.

- Measure 3. The proposed microgrid system will support 1) **PRM 4, Renewable Electricity Generation** through the deployment of the proposed microgrid including 1 MW new solar capacity. 2) **RPM 5, Building Energy Efficiency** through the transition of targeted buildings to increased reliance on renewable electricity, while reducing grid based electricity consumption.

1.2 Demonstration of Funding Need

None of the three Elements of the project would not be possible without EPA funding. While SARTA maintains sufficient funds based on its ongoing operations and reserves to complete incremental upgrades to its existing facilities, these funds are insufficient to enable the deployment of any of the proposed facilities or outcomes. For example, regarding replacing CNG use with RNG, there is not currently sufficient or planned RNG capacity in or near SARTA, that could support the proposed RNG transition. Moreover, while the City is in the process of executing targeted Canton WRF facility upgrades to support improved operability, the cost benefit scenarios associated with RNG production are not financially viable without grant support. For Measure 2, SARTA is investing in an updated main office building. However, the proposed coordinated operational center will require notable additional physical resources and costly integrated planning efforts with other regional transit authorities. Execution of coordinated, inter-agency transit management efforts is significantly hampered by SARTA's and other transit agencies budget guidelines and restrictions, which limit funding spent on such efforts. Finally, without EPA support, SARTA would likely rely on a lower cost resiliency solution, such as diesel or CNG fired backup. Moreover, the targeted school district and low-income housing lack discretionary funds needed to participate in the proposed microgrid. Therefore, EPA's funding is entirely critical to their participation in the project including its targeted outcomes.

SARTA and the City have been exploring this project since 2010. However, there has not been a clear revenue stream to fund this project. Power Purchase Agreements, tax incentives, and other grants have been explored. Additionally, the City recently funded a major upgrade to its existing WRF, totaling \$80 million, and does not have additional funds to support more effective / lower emission sludge management. SARTA's annual budget is about \$30 million and could not fund this project alone, without federal support.

1.3 Transformative Impact

Refer to Section 1.1.4 and Section 2.0 for a summary of potential for transformative impacts from the project. Additionally, SARTA and the Coalition have designed the project to operate as a model of cooperation for other local transit and government agencies. Herein, the project team recognizes that through coordinated collaboration, transit and local government agencies can leverage existing infrastructure and waste related resources to support significant GHG emissions reductions, reduced landfilling, improved transit service, and direct benefits to schools and communities. Through the project, SARTA and the project team will demonstrate a viable, replicable, and multi-faceted decarbonization, resiliency, and community benefits strategy that can be replicated by other public sector partnerships across Ohio and the greater Midwest Region. The project will also install a proposed RNG to H2 pyrolysis system, which will be novel in Ohio. This first in-region installation will serve as a model for future deployment of such carbon sequestering technologies, supporting their increased application to transit and other outcomes, especially in light of regional Hydrogen Hub development.

2. IMPACT OF GHG REDUCTION MEASURES

When fully operational, the project will result in significant GHG emissions reduction as follows; the sections below summarize GHG emissions benefits associated with each of these measures:

- Avoidance of GHG emissions associated with the existing practice of landfilling 274,000 gallons/d of wastewater sludge
- Avoidance of GHG emissions from at least 50,040 tons/yr of food waste that is currently landfilled
- Offsetting of GHG emissions from compressed natural gas (CNG), which is currently used as a transportation fuel for 36 SARTA paratransit buses
- Partial replacement of grid based power used to supply SARTA facilities and Patrick Elementary School with solar and off-peak lower carbon electricity
- Improved transit system routing to increase transit operational efficiency

2.1 Magnitude of GHG Reductions from 2025 through 2030 and from 2025 through 2050

GHG emissions reduction potential was calculated based on the proposed project characteristics described above. Detailed assumptions and the calculation process employed to calculate these emissions are summarized in the attached Technical Appendix. Please refer to that volume for additional information.

The following table summarizes GHG emissions reduction benefits of the project:

| | MT CO2e offset (net reduction) | | | |
|----------------------|--------------------------------|-----------|-----------|-----------|
| | Measure 1 | Measure 2 | Measure 3 | Total |
| Per Year | 5,052 | 129 | 23,053 | 28,234 |
| 2025-2030 Cumulative | 15,156 | 387 | 46,106 | 61,649 |
| 2025-2050 Cumulative | 116,196 | 2,967 | 1,014,332 | 1,133,495 |

2.2 Cost Effectiveness of GHG Reductions

Cost effectiveness of the proposed GHG emissions reduction measures was calculated by dividing the total cost of the project by the MT CO2e reduction supported by the project, during the applicable window. Cost effectiveness calculations per year and per cumulative categories requested by EPA are shown in the table below. Important Note: While Measure 1 and Measure 3 emissions reductions are reported separately, Measure 3 GHG emissions reductions would not be possible without completion of Measure 1. Please refer to the Technical Appendix for details.

| Category | Measure 1 | | Measure 2 | | Measure 3 | | Total | |
|----------------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
| | MT CO2e Reduction | \$/MT CO2e | MT CO2e Reduction | \$/MT CO2e | MT CO2e Reduction | \$/MT CO2e | MT CO2e Reduction | \$/MT CO2e |
| Per Year | 5,052 | \$9,219 | 129 | \$42,826 | 23,053 | \$329 | 80,279 | \$743.47 |
| 2025-2030 Cumulative | 15156 | \$1,094 | 387 | \$14,275 | 46106 | \$165 | 77,018 | \$774.95 |
| 2025-2050 Cumulative | 116196 | \$1,502 | 2967 | \$1,862 | 1014332 | \$7 | 1,136,859 | \$52.50 |

2.3 Documentation of GHG Reduction Assumptions – Up to 10 additional pages as an appendix to the workplan (see Appendix C of the NOFO)

Please refer to the attached technical appendix.

3. ENVIRONMENTAL RESULTS – OUTPUTS, OUTCOMES, AND PERFORMANCE MEASURES

3.1 Expected Outputs and Outcomes

The project will result in the following outputs and outcomes, broken down by each of the three proposed Measures:

| Output or Outcome | Measure 1 (AD + RNG) | Measure 2 (Coordinated Transit Operations) | Measure 3 (Reliable Microgrid) |
|---|--|--|---|
| Number of Equipment / Technology Installations | 1 biodigester | 1 building + system to support coordinated transit operations | 1 renewables + resiliency focused microgrid |
| Policies and Procedures implementing GHG emissions reduction measures | Transition of all CNG fueled transit buses to RNG | Improved inter-agency coordination of transit operations | N/A |
| Staff hired to implement GHG reduction | 5 facility + food waste management operational staff | Minimum of 5 regional transit operation coordinators and manager | 1 microgrid operational and training staff member |
| GHG Emissions Reduction, 2025 to 2030 | 15,156 MT CO ₂ e | 387 MT CO ₂ e | 46,106 MT CO ₂ e |
| GHG Emissions Reduction, 2025 to 2050 | 116,196 MT CO ₂ e | 2,967 MT CO ₂ e | 1,014,332 MT CO ₂ e |
| Workforce development training | 5+ staff trained | 5+ staff trained | 1+ staff trained 50+ workforce development trainees |
| NOx Emissions reduction in 2030 | N/A | Total: 1,698 Low Income / Disadvantaged Communities: 96 kg | Not Quantified |
| PM2.5 Emissions Reduction | N/A | Total: 76 kg Low Income / Disadvantaged Communities: 13 kg | Not Quantified |
| Hazardous Air Pollutant reductions | None | Reduced HAPs and TACs via reduced diesel consumption / improved route efficiency | Reduced HAPs and TACs via reduced coal combustion for upstream electricity production |
| Table 2. Project outputs and outcomes, by GHG emissions reduction measure. | | | |

3.2 Performance Measures and Plan

Project performance will be measured for at least one year for each Measure, as discussed in Section 1.1.2 under Task 4. The following specific measures will be tracked:

| Performance Measure | Measure 1 (AD + RNG) | Measure 2 (Coordinated Transit Operations) | Measure 3 (Reliable Microgrid) |
|---------------------------------|----------------------------|--|--------------------------------|
| GHG emissions reduction, annual | 5,052 CO ₂ e/yr | 129 MT CO ₂ e/yr | 23,053 CO ₂ e/yr |

| | | | |
|--|------------------|----------------------------------|------------------|
| NOx emissions reduction, annual | N/A | 566 kg/yr | Not Quantified |
| PM2.5 emissions reduction, annual | N/A | 25 kg/yr | Not Quantified |
| RNG generated per year | 300,000 MMBtu/yr | N/A | N/A |
| Renewable electricity produced | N/A | N/A | 7446 MWh/yr |
| Renewable electricity consumed for project uses | N/A | N/A | 7446 MWh/yr |
| RNG consumed per year | N/A | N/A | 300,000 MMBtu/yr |
| Transit miles saved | N/A | 315,000 | N/A |
| Natural Gas Consumption Avoided | 62,685 MMBtu/yr | N/A (quantified under Measure 1) | 237315 MMBtu/yr |
| Diesel Consumption Avoided | N/A | 12,692 DGE | N/A |
| Workers trained for project operations | 5+ | 5+ | 1+ |
| Workforce trainee program workers trained | 0 | 0 | 50+ |
| School tours | 0 | 0 | 16 |
| Table 3. Performance measures tracked during the evaluation period. | | | |

3.3 Authorities, Implementation Timeline, and Milestones

3.3.1 Parties, Roles, and Implementation Responsibilities

Roles and responsibilities for implementing each GHG reduction Measure are as follows:

Measure 1 (AD + RNG): City of Canton will be responsible for completing a City-required feasibility study, then overseeing engineering, design, installation, and operation of the proposed AD facility, and routing of wastewater sludge and food waste—which is already being collected and landfilled—to the digester. Enbridge will be responsible for receiving RNG from the AD facility in its existing pipeline, then for providing RNG to SARTA. SARTA will be responsible for receiving RNG from Enbridge’s pipeline, then using that RNG for vehicle refueling, renewable power production (Measure 3) and, to the extent available, support renewable space heating (Measure 3).

Measure 2 (Coordinated Transit Operations): SARTA will be responsible for overseeing engineering, design, construction, and operation of the proposed facility, and for coordinating with other transit providers to support inter-agency coordination.

Measure 3 (Reliable Microgrid): SARTA will be responsible for overseeing engineering, design, construction, and operation of the proposed microgrid system, including its integration and installation at the targeted low-income housing, community center, and at Patrick Elementary School. CCSD will be responsible for approving microgrid deployment at that school, and the City will be responsible for approving microgrid deployment at the low-income housing and community center.

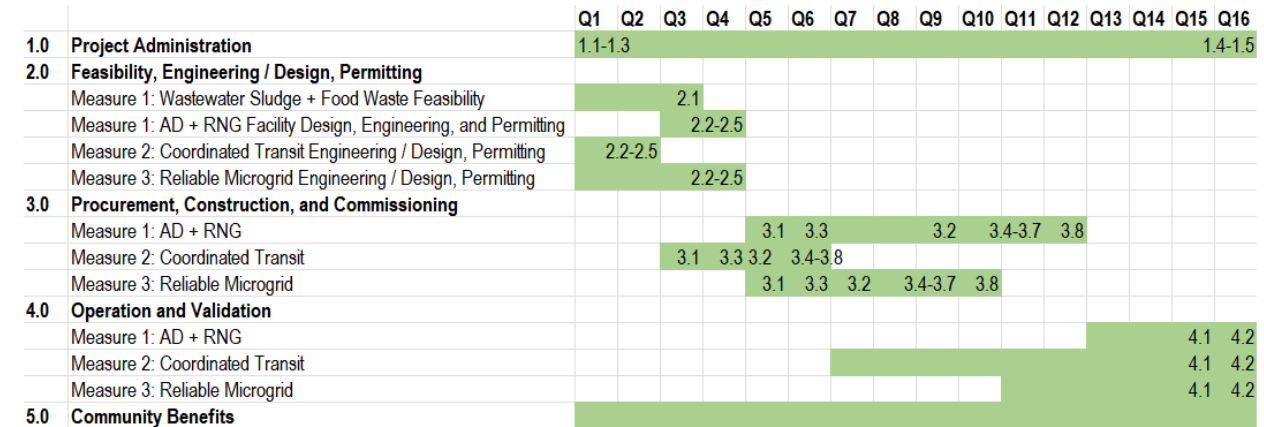
3.3.2 Implementing Entity Authority

For **Measure 1 (AD + RNG)**, the City has implementation authority over the proposed deployment of the AD system and over the transfer of sludge and food waste into the AD system during operation. Concurrently, Enbridge has implementation authority to receive RNG into its pipeline system and to

transport that RNG. SARTA has implementation authority over its site, including the proposed use of RNG for transportation fuel. For **Measure 2 (Coordinated Transit Operations)**, SARTA maintains full authority over its campus site for the construction of the proposed facility, and is already working with the other target agencies to support coordination of operations. For **Measure 3 (Reliable Microgrid)**, SARTA has implementation authority to deploy the proposed microgrid equipment at its existing site, CCSD has approving authority for the school, and the City has approving authority for other areas.

3.3.3 Project Timeline

SARTA and the project team will complete the project according to the Gantt chart shown below. Note that milestone numbers correspond to the milestones described in Section 1.1.2.



4. LOW-INCOME AND DISADVANTAGED COMMUNITIES

4.1 Community Benefits

The project will support multiple categories of community benefits, which will incur over a total of 63 low income or disadvantaged communities (see attached List of CJEST Communities Affected by at Least One Proposed Measure). The following discussion focuses on summarizes **direct and indirect benefits to low income and disadvantaged communities**, which the project will realize through the following key elements; refer to Sections 3.1 and 3.2 and the Technical Appendix for details regarding the amounts saved for the items below:

- Improved food waste management (Measure 1).
- Improved wastewater sludge management (Measure 1).
- Reduced landfilling (Measure 1).
- Improved transit access (Measures 2-3)
- Improved disabled and senior mobility (Measures 2-3)
- Improved transit service (Measures 1-3)
- Increased transit ridership (Measures 2-3)
- Reduced criteria air pollutant emissions (Measures 1-3)
- Reduced hazardous air pollutants (Measure 2)
- Reduced fossil fuel consumption (Measures 1-3)
- Benefits from reduced GHG emissions (Measures 1-3) reduced risk of wildfires, drought, extreme weather events, and/or sea level rise)
- Increased energy resilience to global warming induced extreme weather events (Measures 1-3).
- Creation of high-quality jobs (Measures 1-3)
- Workforce development support (Measure 3).

- Increased housing comfort and energy availability (Measure 3)

4.2 Community Engagement

SARTA and the project team understand the need for effective community engagement, to ensure realization of the proposed benefits targeted under the project, and to support community participation. To this end, SARTA has completed ongoing and wide-ranging outreach to its local communities over 15+ years of its recent and ongoing service delivery. This outreach process directly supports SARTA's daily operations, including through route improvements and feedback from riders and community members. Moreover, SARTA's day to day operations include immediate and close contact with transit riders—a large proportion of whom reside in underserved / disadvantaged or low-income communities. Additionally, through coordination with the City and other project team members—and with its location in a low income / underserved community directly adjacent to community housing and a community center—the project team is exceptionally well positioned to understand key needs of the communities that it serves. Herein, based on outreach completed over more than a decade of community participation, SARTA understands that its local community members have identified the following needs:

- Further improvements in transit service including to boost ridership
- Increased availability of quality, well-paying jobs
- Increased availability of worker training
- Education opportunities to improve understanding of new clean energy technologies and GHG emissions reduction measures
- Access to affordable, reliable renewable energy
- Reduced air pollution

To achieve these targets, SARTA and the project team will implement the following community engagement and community benefit activities:

- Integrate outreach—through emails, social media, website, and community notifications, to discuss and receive feedback on the development of key community supporting elements, as described above, including measures that will directly reduce CAP, HAP, and GHG emissions; improve energy reliability; improve waste management; and other measures discussed in Section 4.1.
- Conduct community education and outreach events, such as open houses, workshops, webinars, and social media campaigns, to inform the public about the project's objectives, impacts, and opportunities. SARTA will also solicit project-related feedback and community input to help improve understanding of community needs and ensure that the project meets their identified needs.
- Partner with local schools and educational institutions to provide school field trips to SARTA's site, where students can learn about the technology, operations, and environmental aspects of RNG fired buses, zero-emission buses, the use of hydrogen, and microgrid related benefits. SARTA will host four field trips per year, targeting a wide array of different grade levels and curricula. SARTA will also provide educational materials and resources for teachers to use in their classrooms.
- Collaborate with Cleveland State University (CSU) to leverage their expertise and facilities in hydrogen and fuel cell research and development. SARTA will invite CSU faculty and students to participate in the project's evaluation and validation activities, as well as provide internship and mentoring opportunities for CSU students interested in pursuing careers in the clean energy sector. SARTA will also host industry tours to help spread the word regarding feasibility and viability of the proposed solutions for transit and associated decarbonization efforts.

- Equity-focused outreach to low-income and disadvantaged communities, especially those that are disproportionately affected by air pollution and lack of transportation access. SARTA will engage with these communities through various channels, such as community-based organizations, faith-based groups, neighborhood associations, and social service agencies. SARTA will also ensure that the project's benefits, such as improved air quality, reduced greenhouse gas emissions, enhanced mobility options, and job creation, are equitably distributed among these communities.

5. JOB QUALITY

SARTA and the coalition are deeply committed to job quality commitments, as defined by EPA and in accordance with the US Department of Labor's Good Jobs Principles, Department of Commerce's Good Jobs Toolkit, and provisions of the Inflation Reduction Act of 2022. Commitments identified below will also be incorporated into the MOA, which will be signed by all coalition members; moreover, as relevant and applicable, SARTA will require that all subcontractors, as conditions of their written contracts, adhere to pass down job quality standards in accordance with those listed below. The following job quality standards will apply to all new jobs created under this project:

- All new jobs will incorporate pay scales that exceed the median area income for all workers
- All new full time jobs will include full benefits, including healthcare, vacation and sick time off, and retirement contributions
- All new eligible SARTA and City employees will be represented by a collective bargaining agreement through the American Federation of State, County, and Municipal Employees (AFSCME).
- Bids for subcontracts let to engineering, construction, and procurement firms will require or give strong preference to bidders whose employees are union members, have fair opportunity to join a union, or are otherwise represented by a collective bargaining agreement, thereby ensuring employee rights to freely and fairly join a union.
- Subcontractors, as a condition of their contract, will be required to commit at minimum to remaining neutral in union organizing and operations
- Preferential bid scoring will be provided to construction contractors who hire from adjacent / local low income and underserved communities to support project construction
- SARTA and the Coalition members already maintain health and safety plans to support workers, including anti-harassment training for workers and management, OSHA training to minimize workplace hazards (e.g., OSHA 10 and OSHA 30) where relevant, and supplemental health and safety training as needed; these practices will continue under the project.
- Where applicable, SARTA and Coalition members—and subcontractors through bid solicitation and contractual requirements—will seek to rely on the use of registered Apprenticeship labor to expand the pool of highly skilled workers. Subcontractor bids will receive preferential scoring for including a commitment to using qualified apprentices for at least 10% of the total labor hours on their portion of the project.
- SARTA and Coalition members will prioritize hiring of individuals from low income and disadvantaged communities, including by notifying these communities of job opportunities first through targeted outreach.

6. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

6.1 Past Performance

Over the course of the last 15 years, SARTA has looked toward grants in order to provide reliable transportation to the resident of Stark County. SARTA has even expanded its roll with being a member of NEORide, a Council of Government consisting of 25 transit agencies across 5 states. SARTA has applied for

EPA grants, Low-No Emissions Grants, and innovative technology grants in coordination with NEORide. These grants have allowed SARTA to expand its operations through building new hydrogen station, a CNG station and expansion of this station, becoming a leader in hydrogen fueling technology, and helping implement a central ticket purchasing system across several regional transit authorities. SARTA has also utilized its annual funding from the Federal Transit Administration (FTA) to help maintain its operations and help supplement other capital projects that tie into the green energy initiatives of SARTA. SARTA also works with the Stark County Area Transportation Study to provide local non-profits funding from the FTA with funding to help local agencies provide additional transit services to the residents of Stark County.

Massillon Project. The Massillon project will give SARTA a centralized transit center to offer its riders a place to wait for the bus along its fixed routes. This will offer riders places to stay and wait until their bus arrives during inclement weather. Construction started in December of 2022 and is set to be finalized and furnished this summer of 2024.

Admin Facility. SARTA started its construction of its new maintenance facility in 2022 with infrastructure upgrades in addition to a new training pad for drivers to train CDL drivers on site. The site allowed for the construction of a new administrative facility to allow larger conference rooms and meeting locations for trainings and other seminars for SARTA employees. Construction of the training pad and infrastructure concluded in December 2022 and the administrative facility is in the final stages of construction with employees set to move into the facility in April 2023.

CNG Expansion. In August 2022, SARTA began to upgrade its CNG facility. As a leader in clean energy, SARTA's fleet relies on CNG fuel to power most of its fleet. The project completed in early fall of 2023 to fulfill the increased need of CNG fuel to power SARTA's fleet and help SARTA continue to be a leader in providing low emission transportation. SARTA will continue to provide upgrades to the facility to ensure it runs efficiently to meet the needs of SARTA's riders.

H2 Station. In January 2016, SARTA broke ground on its hydrogen refueling station. This was the first step to bring hydrogen fueled vehicles to SARTA's fleet. With this station, SARTA has become a leading transit authority in using hydrogen fuel to power its fleet. With the hydrogen fleet continuing to expand, SARTA is looking to the future to continue to expand its hydrogen fueling station to allow for larger tank capacity. Also, they are adding the ability to fuel passenger cars at 10,000 psi in addition to fueling its buses at 5,000 psi. SARTA looks to build off this to work toward hydrogen fuel production.

H2 Paratransit Vehicles. In 2017, SARTA was awarded funds to purchase 5 hydrogen paratransit vehicles for its Proline services. These vehicles helped to expand its use of hydrogen fuel beyond its fixed route services. In addition, in 2022, SARTA was awarded grant funds (under EPA's DERA program) for two paratransit vehicles to continue to expand its use of zero or no emission vehicles.

6.2 Reporting Requirements

Refer to Section 6.1. Herein, SARTA has consistently met all reporting requirements for each of the projects discussed in Section 6.1. Specifically, the following summary applies to **each** of the projects listed in Section 6.1: 1) SARTA completed all interim and final reports on time. Content contained therein was wholly developed in accordance with applicable guidelines. SARTA did not receive any major revision requests, and at most with minor edits, submissions were deemed sufficient. 2) For the projects identified in Section 6.1, all project reporting was completed in a timely manner, in accordance with agreed upon deadlines. Progress reports received were deemed adequate pursuant to

6.3 Staff Expertise

SARTA and the project team have assembled a veteran team of project managers, administrators, and leaders with deep experience supporting transit and municipal decarbonization and facilities improvement projects, as follows; for additional details, please refer to the attached resumes:

Clayton Popik, Development and Special Projects (SARTA Project Manager and Outreach / Community Lead). Clayton came on board with SARTA in October 2021 after 17 years with PARTA where he began his transit career as a student Operator while attending Kent State University. Clayton completed his Master's degree in Urban Planning before taking on more managerial roles in the Operations and Planning Departments where he oversaw all aspects of route scheduling and design for both the Portage County community and Kent State University. Clayton's dedication and passion to public transit earned him the 2021 Ohio Public Transit Association's Four Under Forty Award. As Director of Development & Special projects, Clayton oversees the completion of capital projects for SARTA such as the new Massillon Transit Center and the facility expansion at the SARTA main campus. Clayton is responsible for coordinating the service SARTA provides in Wayne County through the Wayne County Transit and Community Action Wayne/Medina County.

Mark Finnicum, Chief Operations Officer (SARTA Operations and Verification Lead). Mark has been the Chief Operations Officer who oversees the daily operations of both the Maintenance and Transportation Departments for SARTA since 2014. He began his career at SARTA in 2005 as the Parts and Inventory Supervisor before becoming the Director of Maintenance in 2007. Mark has been involved with the building and expansion of SARTA's alternative fueling stations and oversee the deployment of both the CNG and hydrogen fuel cell fleet. Currently, Mark serves as a member of the National Renewable Energy Laboratory (NREL) Electric Transit User Group, the Vice-Chair of the OPTA Safety and Security Committee, Ohio Transit Risk Pool, and the Midwest Zero-Emission Bus Working Group. He also oversees day to day operation of SARTA's Transportation Department, which provides professional, safe, and reliable transportation to the citizens of Stark County—and SARTA's Maintenance Department, which maintains all transit centers, shelters, and stops ensuring they are safe, secure, and cleaned daily.

Carrie Domer, Director of Finance (SARTA Lead Project Administrator). Carrie has been an employee of SARTA since 2012. As the Director of Finance, she manages and safeguards the Agency's resources by implementing best practices and monitoring the budget and fiscal trends. The Finance department is responsible for maintaining all State and Federal regulations with a strict adherence to policies and procedures. She is also responsible for ensuring that timely, accurate, and complete financial reports are filed, while providing support to all SARTA's internal departments, the Board of Directors, and the community at large. Carrie Domer earned her bachelor's degree from Malone University. As the head of SARTA's Finance Department, Carrie and her team work to manage and safeguard the Agency's resources, implement and monitor the budget and analyze fiscal trends, while also providing timely, accurate, and complete information and support to all of SARTA's departments, the Board of Directors, and the community at large.

Kirt Conrad, Executive Director / CEO (SARTA Senior Project Advisor). Kirt is a senior executive in Public Transit with expertise in alternative energy and public policy. During his career, he has lead campaigns that have increased ridership over 30% and increased revenues by 20%, secured over \$50 million in competitive grants and managed construction programs from railroad rehabilitation to LEED certified building in the transportation industry. He also led the purchase of 50 miles of railroad right-of-way and use of transportation infrastructure as a multi-modal corridor for both freight and commuter service. Since 2009, Kirt has been the CEO of the Stark Area Regional Transit Authority (SARTA) in Canton, Ohio.

SARTA operates 100+ buses with 200+ employees. Last year nearly 2.6 million passenger trips were transported by over 30 fixed routes or demand response services throughout Stark County.

SARTA, under Conrad's leadership, has replaced much of its bus fleet, purchased buses that run on Compressed Natural Gas (CNG), opened Northern Ohio's first public-private CNG fueling facility, revamped many of its routes, built the Belden Village Transit Center and advanced the Mahoning Road corridor project. They are also deploying 11 fuel cell buses, which will be the largest fleet in the country outside of California. SARTA along with Ohio State University's Center for Automotive Research lunched the Midwest Fuel Cell Center of Excellence and the Renewable Hydrogen and Fuel Cell Collaborative in 2017. Prior to joining SARTA, Kirt was employed by METRO Regional Transit Authority (Akron, Ohio) as a Planner, Grants Manager and then Director of Planning. He received a Bachelor's in Political Science with a minor in business administration from Kent State and a Master's of Public Administration with a concentration in finance from the University of Akron. He also completed a graduate certificate in finance from the Grenoble Ecole de Management in Grenoble, France.

Kirt, as Metro's Director of Planning, had years of experience planning complex transit projects as the project manager for the construction of the downtown Akron transit center and system redesign. He also developed a deep understanding of the federal transit grant system and new transit technology. Currently, Kirt serves on the board of Ohio Transit Risk Pool (OTRP) and is on the board of The Ohio Fuel Cell Coalition as Chair and CALSTART's fuel cell infrastructure advisory board for public transit. Kirt is also involved with the Center for Transportation and the Environment/Federal Transit Administration's Procurement Risk Reduction for Zero Emission Vehicles Committee, is a member of American Public Transportation Association's Zero Emission Bus Specification Committee and is the past president of Ohio Public Transit Association (OPTA).

John T. Michaels, Procurement Administrator (SARTA Contracts and Procurement). John started his career with SARTA as a bus operator. He was promoted to transportation supervisor and demand response center administrator. During that time he completed his BA from Malone University in Canton, OH. Two years ago, he was promoted to his current position as procurement officer. In this position he has carried out the procurement of several multi-million dollar projects including the new Massillon Transit Center, administration building expansion, and CNG and Hydrogen stations expansion projects.

7. BUDGET (OPTIONAL BUDGET SPREADSHEET AND UP TO 10 ADDITIONAL PAGES MAY BE ADDED IF NEEDED AS AN APPENDIX TO THE WORKPLAN)

Please refer to the attached budget spreadsheet for additional budget detail.

7.1 Budget Detail

Stark Area Regional Transit Authority

| BUDGET BY YEAR | | | | | | | |
|----------------|-----------------------|-------------|--------------|--------------|-----------|--------|--------------|
| COST-TYPE | CATEGORY | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | TOTAL |
| Direct Costs | TOTAL PERSONNEL | \$236,000 | \$236,000 | \$236,000 | \$236,000 | \$0 | \$944,000 |
| | TOTAL FRINGE BENEFITS | \$118,000 | \$118,000 | \$118,000 | \$118,000 | \$0 | \$472,000 |
| | TOTAL TRAVEL | \$5,000 | \$0 | \$0 | \$0 | \$0 | \$5,000 |
| | TOTAL EQUIPMENT | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| | TOTAL SUPPLIES | \$900 | \$0 | \$0 | \$0 | \$0 | \$900 |
| | TOTAL CONTRACTUAL | \$5,927,432 | \$26,276,769 | \$25,503,737 | \$555,000 | \$0 | \$58,262,937 |
| | TOTAL OTHER | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| | TOTAL DIRECT | \$6,287,332 | \$26,630,769 | \$25,857,737 | \$909,000 | \$0 | \$59,684,837 |
| | | | | | | | |
| | TOTAL INDIRECT | \$0 | \$0 | \$0 | \$0 | \$0 | 0 |
| | | | | | | | |
| TOTAL FUNDING | | \$6,287,332 | \$26,630,769 | \$25,857,737 | \$909,000 | \$0 | \$59,684,837 |

| BUDGET BY PROJECT | | | |
|-------------------|--------------------|--------------|------------|
| Project Number | Project Name | Total Cost | % of Total |
| 1 | AD Sludge and Food | \$46,574,400 | 78% |
| 2 | Operations | \$5,524,537 | 9% |
| 3 | Microgrid | \$7,585,900 | 13% |
| 4 | N/A | \$0 | 0% |
| 5 | N/A | \$0 | 0% |
| | | | |
| Total | | \$59,684,837 | 100% |

7.1.1 Measure 1: Personnel, Fringe, Travel, and Contractual

| CATEGORY | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | TOTAL |
|---|-----------|-----------|-----------|-----------|--------|-----------|
| Personnel | | | | | | |
| Sen Proj Advisor (Kirt Conrad) | \$40,000 | \$40,000 | \$40,000 | \$40,000 | | \$160,000 |
| Project Manager (Clayton Popik) | \$95,000 | \$95,000 | \$95,000 | \$95,000 | | \$380,000 |
| Operations Manager (Mark Finnicum) | \$42,000 | \$42,000 | \$42,000 | \$42,000 | | \$168,000 |
| Procurement and Contracts (John Michaels) | \$24,000 | \$24,000 | \$24,000 | \$24,000 | | \$96,000 |
| Project Administrator (Carrie Domer) | \$35,000 | \$35,000 | \$35,000 | \$35,000 | | \$140,000 |
| | | | | | | \$0 |
| TOTAL PERSONNEL | \$236,000 | \$236,000 | \$236,000 | \$236,000 | \$0 | \$944,000 |

| | | | | | | |
|---|-----------|-----------|-----------|-----------|-----|-----------|
| TOTAL PERSONNEL | \$236,000 | \$236,000 | \$236,000 | \$236,000 | \$0 | \$944,000 |
| Fringe Benefits | | | | | | |
| Sen Proj Advisor (Kirt Conrad) | \$20,000 | \$20,000 | \$20,000 | \$20,000 | \$0 | \$80,000 |
| Project Manager (Clayton Popik) | \$47,500 | \$47,500 | \$47,500 | \$47,500 | \$0 | \$190,000 |
| Operations Manager (Mark Finnicum) | \$21,000 | \$21,000 | \$21,000 | \$21,000 | \$0 | |
| Procurement and Contracts (John Michaels) | \$12,000 | \$12,000 | \$12,000 | \$12,000 | \$0 | \$48,000 |
| Project Administrator (Carrie Domer) | \$17,500 | \$17,500 | \$17,500 | \$17,500 | \$0 | \$70,000 |
| TOTAL FRINGE BENEFITS | \$118,000 | \$118,000 | \$118,000 | \$118,000 | \$0 | \$388,000 |

Stark Area Regional Transit Authority

| CATEGORY | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | TOTAL |
|----------------------------------|----------------|------------|------------|------------|------------|----------------|
| Personnel | | | | | | |
| Travel | | | | | | |
| Observe operational AD facility: | | | | | | \$0 |
| Airfare for 4 | \$2,352 | | | | | \$2,352 |
| Hotel for 4, Los Angeles | \$1,464 | | | | | \$1,464 |
| Per Diem for 4, Los Angeles | \$1,184 | | | | | \$1,184 |
| | | | | | | \$0 |
| TOTAL TRAVEL | \$5,000 | \$0 | \$0 | \$0 | \$0 | \$5,000 |

| CATEGORY | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | TOTAL |
|---|--------------------|---------------------|---------------------|------------------|------------|---------------------|
| Personnel | | | | | | |
| Contractual | | | | | | |
| AD Feasibility Study Contractor | \$82,000 | | | | | \$82,000 |
| Project Design, Engineering, and Permitting--AD and Electrical Upgrades | \$355,000 | \$510,000 | | | | \$865,000 |
| Required Electrical Upgrades | \$4,947,400 | | | | | \$4,947,400 |
| Procurement and Construction--AD and Electrical Upgrades | | \$15,115,000 | \$15,115,000 | | | \$30,230,000 |
| Organic Waste Handling Equipment + Installation | | \$4,022,000 | \$4,022,000 | | | \$8,044,000 |
| City of Canton Project Support | \$185,000 | \$190,000 | \$190,000 | \$220,000 | | \$785,000 |
| Measurement & Verification | | | | \$200,000 | | |
| TOTAL CONTRACTUAL | \$5,569,400 | \$19,837,000 | \$19,327,000 | \$420,000 | \$0 | \$44,871,400 |

Other expense categories, including indirect, are not applicable to Measure 1.

7.1.2 Measure 2: Contractual

| CATEGORY | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | TOTAL |
|---|------------------|--------------------|--------------------|-----------------|------------|--------------------|
| Project Design, Engineering, and Permitting--Facilities | \$283,032 | \$283,032 | | | | \$566,063 |
| Procurement and Construction--Facilities | | \$2,431,737 | \$2,431,737 | | | \$4,863,474 |
| Measurement and Verification | | \$25,000 | \$35,000 | \$35,000 | | \$95,000 |
| | | | | | | \$0 |
| | | | | | | \$0 |
| TOTAL CONTRACTUAL | \$283,032 | \$2,739,769 | \$2,466,737 | \$35,000 | \$0 | \$5,524,537 |

Other expense categories, including indirect, are not applicable to Measure 2. Note all oversight and management costs are applied through Measure 1.

7.1.2 Measure 3: Supplies and Contractual

Stark Area Regional Transit Authority

| CATEGORY | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | TOTAL |
|---|----------|-------------|-------------|-----------|--------|-------------|
| Supplies | | | | | | |
| <i>Outreach and Community Involvement</i> | | | | | | |
| <i>Printing / flyers</i> | \$2,200 | | | | | \$2,200 |
| <i>Advertising / media</i> | \$2,000 | | | | | \$2,000 |
| <i>Site and AV rental</i> | \$900 | | | | | \$900 |
| | | | | | | \$0 |
| TOTAL SUPPLIES | \$900 | \$0 | \$0 | \$0 | \$0 | \$5,100 |
| Contractual | | | | | | |
| <i>Project Design, Engineering, and Permitting-- Microgrid</i> | \$75,000 | \$75,000 | | | | \$150,000 |
| <i>Procurement and Construction--Microgrid including microturbines and PAFC, and RNG to H2 Pyrolysis unit</i> | | \$3,625,000 | \$3,625,000 | | | \$7,250,000 |
| <i>Measurement and Verification</i> | | | \$85,000 | \$100,000 | | \$185,000 |
| | | | | | | \$0 |
| | | | | | | \$0 |
| TOTAL CONTRACTUAL | \$75,000 | \$3,700,000 | \$3,710,000 | \$100,000 | \$0 | \$7,585,000 |

Other expense categories, including indirect, are not applicable to Measure 3. Note all oversight and management costs are applied through Measure 1.

All costs including contractual costs are based on actual rates, quotes developed by engineers or through engineering studies, or based on current market costs, including applicable contingencies. Salary and fringe rates are actual rates paid by SARTA. Therefore, project costs are considered highly reasonable. Refer to Section 2 for the cost effectiveness of the project.

Stark Regional Transit and Waste / Wastewater System Decarbonization and Equity-Focused Resiliency Project

Technical Appendix

1. PROJECT OVERVIEW

The Stark Area Regional Transit Authority (SARTA), in collaboration with the City of Canton, Enbridge Gas Ohio (Enbridge), and the Canton City School District, proposes to design, engineer, deploy, and operate three critical need infrastructure, operations, and community support measures that will greatly reduce greenhouse gas (GHG) emissions while improving transit access and reliability within SARTA's service area. It will also increase reliability and reduce GHG emissions from coordinated transit operations across four Ohio counties, harness wastewater sludge and food waste to generate 100% renewable energy and serve as a model for improved resiliency and low GHG operation at nearby Patrick Elementary School within the Canton City School District and low income / community housing at the Stark Metropolitan Housing Authority. It will also provide key community benefits including education, workforce development support, and improved transit for underserved communities.

2. GHG REDUCTION ESTIMATE METHODS AND MODELS / TOOLS USED

SARTA and the project team assembled an engineer-built model to evaluate anticipated GHG emissions reductions associated with the project. Due to the very specific nature of the project and its unique elements, the primary model used was developed specifically for the project as a self-contained spreadsheet model. Information and data sources used to construct the model are discussed below. Specific assumptions including details about base case and with project scenarios are also described below.

3. MEASURE IMPLEMENTATION ASSUMPTIONS, CALCULATIONS, AND MEASURE SPECIFIC RESULTS.

The GHG emissions reduction measures are described fully in the attached grant application. Briefly, the following measures were evaluated:

Measure 1. Diversion of Wastewater Sludge and Food Waste to RNG Production and Use for Transit Operation

In collaboration with the City of Canton, SARTA will deploy a new wastewater + food waste digester system that will transform wastewater sludge and food waste biomass collected from the City into 100% renewable natural gas (RNG). The project team will then transport the RNG via Enbridge pipeline to SARTA for use by CNG buses. SARTA will also convert, via methane pyrolysis, a portion of the total RNG to renewable hydrogen. The remaining RNG will be used to support operation of RNG-powered microturbines (750 kW total) and an RNG-powered PAFC fuel cell.

Annual RNG production rates were determined based on anticipated available wastewater sludge and food waste, based on a preliminary review of municipal solid waste characteristics in and immediately surrounding Canton, OH. Wastewater sludge availability and properties were provided by the City of Canton. RNG production rates were estimated separately through a proprietary engineering analysis completed by Yaniv Scherson of Anaergia. Existing consumption rates for CNG by SARTA were based on recent historic usage, combined with additional loads anticipated starting in 2026 based on forward looking ridership, routes, and equipment data.

Key assumptions and calculations include the following, for the conversion of CNG to RNG as proposed:

- Base case scenario: SARTA relies on CNG for transportation fuel; existing sludge streams and food waste is landfilled.
- System operational lifetime: 2026 to 2050
- Wastewater sludge use: 274,000 gallons/d of wastewater sludge
- Wastewater sludge total solids: 1.2 to 1.5%
- Food waste input: 50,040 tons per year
- RNG produced from food waste: 180,000 MMBtu/yr
- RNG produced from sewage sludge: 120,000 MMBtu/yr
- Transport method for RNG: existing natural gas pipeline
- Existing CNG consumption per year, SARTA: approximately 470,000 GGE/yr
- Anticipated future CNG consumption per year, starting in 2025: 550,000 GGE/yr
- Carbon intensity score of RNG produced from sewage sludge via anaerobic digestion: -54.06 g CO₂e/MJ³
- Carbon intensity score of RNG produced from food waste via anaerobic digestion: 15.72 g CO₂e/MJ⁴
- Combined carbon intensity score of RNG produced by the project (weighted average based on production source per above): -26.15 g CO₂e/MJ
- Natural gas GHG emissions per therm: 0.0053 metric tons CO₂-/therm
- Based on the above, for every MMBtu of RNG combusted, a total of -0.0276 MT CO₂ is emitted
- Concurrently, for every MMBtu of natural gas combusted, a total of 0.0530 MT CO₂ is emitted
- Therefore for every MMBtu of natural gas replaced by RNG, a total of -0.0806 MT CO₂ is emitted, versus baseline conditions.
- SARTA will utilize 550,000 GGE/yr of RNG to replace CNG. This is equivalent to 62,684 MMBtu/yr of CNG replaced with RNG, or **5,052 MT CO₂/yr offset**

Emissions reduction associated with RNG consumption for other on site uses are discussed under Measure 3, below.

Measure 2. Coordinated Operational Center to Improve Paratransit Routing and Increase Regional Transit System Efficiency

Under Measure 2, SARTA will upgrade the 2nd floor of its existing operations building, located at SARTA's main facility campus at 1600 Gateway Blvd SE, Canton, Ohio 44707. The proposed upgrade will house a new dispatch and control center to improve coordinated operations within SARTA's service area and in cooperation with other regional transit agencies. Currently, SARTA operates 36 CNG-fueled paratransit vehicles, five H₂ paratransit vehicles, and seven diesel paratransit vehicles (contingency use only) throughout its service area. In 2023 alone, SARTA transit vehicles provided 1.1 million miles of paratransit services to its users. By optimizing routes and scheduling of these vehicles, in coordination with other regional transit agencies, the project will reduce CNG consumption by SARTA and also reduce diesel

³ Calculated by averaging the CI scores for all of the approved CA Air Resources Board RNG production pathways for food waste that is currently landfilled to RNG. Refer to <https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities> to download the database.

⁴ Calculated by averaging the CI scores for all of the approved CA Air Resources Board RNG production pathways for wastewater sludge that is currently landfilled to RNG. Refer to <https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities> to download the database.

consumption by other regional transit agencies. This effort will reduce unnecessary duplication of routes, increase the ridership potential, and minimize the waiting and transfer times for passengers.

While the project would offset both CNG emissions from SARTA and diesel emissions from other agencies, this analysis conservatively focuses only on the diesel related emissions reductions. Herein, the other transit agencies considered currently provide a total of approximately 1.1 million miles of paratransit services per year. Based on data compiled by SARTA and these other agencies, SARTA estimates that the proposed operational system will reduce total vehicle miles travelled by approximately 15%, or approximately 165,000 miles/yr reduced. The following additional calculations and assumptions are considered:

- Base case scenario: SARTA and other relevant agencies do not complete system operational efficiency improvements proposed under this measure
- Average mileage of 13 MPG for diesel paratransit vehicles
- 165,000 miles per year / 13 miles per gallon = 12,692 gal diesel/yr reduced
- Diesel emissions per gallon: 10.19 kg CO₂/gallon
- Total GHG emissions reduction per year: **129 MT CO₂/yr reduced**

Measure 3. SARTA / Community Renewable and Resilient District Microgrid Deployment

Under Measure 3, SARTA will deploy an islanding-capable microgrid system capable of supplying up to approximately 3 MW worth of power. The system will include needed lines, a microgrid controller and switch system capable of islanding, a 1 MW rooftop solar array, and a phosphoric acid fuel cell (PAFC) plus microturbines collectively capable of producing up to 1 MW of renewable electricity, produced from RNG sourced from Measure 3. The project will serve existing, critical need transit facilities and community facilities while also providing backup power.

We conservatively do not consider solar power production within the microgrid offset calculations, because the solar array would be purchased separately. Therefore this analysis focuses on RNG related emissions reduction. To evaluate the GHG emissions benefit associated with the offset of grid power by RNG generated power, the following assumptions and calculations are relevant:

- Base Case Scenario: the relevant facilities served by the microgrid continue to receive power from the grid
- RNG assumptions described above for Measure 1
- RNG required to generate 1 MWh of electricity: 11.52 MMBtu/MWh⁵
- Anticipated annual generation rate, assumes 85% capacity factor: 7,446 MWh/yr
- Total MMBtu/yr RNG consumed: 85,778 MMBtu RNG/yr
- Grid power emissions per MWh, CO₂: 1,162 lbs/MWh = 0.527 MT CO₂/MWh, or 3,925 MT CO₂e/yr based on MWh offset
- Net reduction in GHG emissions, calculated by subtracting RNG emissions from grid electricity emissions: **10,839 MT CO₂e/yr offset**

All remaining RNG produced by the project would offset winter time heating for SARTA and other end users within the microgrid service area. Note that any RNG that could not be used within the microgrid service area is assumed to be used for heating at other locations. Calculations and assumptions include the following:

- RNG and natural gas assumptions per the above

⁵ Refer to: <https://www.sciencedirect.com/science/article/pii/S2666955221000605>

- RNG used for heating: 151,537 MMBtu/yr
- Net reduction in GHG emissions, calculated by subtracting RNG emissions from conventional natural gas emissions for heating: **12,214 MT CO₂e/yr offset**

4. TOTAL PROJECT RESULTS.

The following table summarizes the GHG emissions benefits of the project, by year and by Measure, and also provides totals.

| | MT CO₂e offset (net reduction) | | | |
|-------------------------|--|------------------|------------------|------------------|
| | Measure 1 | Measure 2 | Measure 3 | Total |
| Per Year | 5,052 | 129 | 23,053 | 28,234 |
| 2025-2030 Cumulative | 15,156 | 387 | 46,106 | 61,649 |
| 2025-2050 Cumulative | 116,196 | 2,967 | 1,014,332 | 1,133,495 |