



Air Handling Unit

Mechanical & Electrical Upgrades

HVAC Systems

- Systems are designed for comfort control, safety operation, and are constructed and controlled to be safe for use in a facility with natural gas storage.
- The original two boiler heating hot water system has been replaced with an eight boiler system to allow for high efficiency operation throughout the heating season. To improve efficiency during the shoulder months, two condensing boilers are included in the system allowing for up to very high efficient operation.

Gas Detection Monitoring

- A new gas detection monitoring system has been provided to allow for the ventilation requirements to be adjusted for energy savings while providing detection necessary to ventilate and exhaust should there be a natural gas release inside the building.
- System includes approximately 360 sensors located throughout the garage and maintenance facility.
- Sensors are an infrared technology.

Building Automation System

- A building automation system has been provided to allow for complete control and monitoring of all equipment.
- System utilizes an open (BACNet) protocol allowing for flexibility and interoperability in the future.



Lighting Upgrade

Electrical and Lighting

- Light Levels:
 - Original Light Levels 10-15FC in the bus storage area and 10-30FC in the bus maintenance area.
 - New Light Levels 25 FC in the bus storage area and 50FC in the bus maintenance areas.
- Electrical Load: Approximately 10.4 W/SF for the Garage and Maintenance facility.
- Roughly 1,200 light fixtures, Roughly 30 miles of conduit, and Roughly 170 miles of wiring

Featured LEED Credits

- Sustainable Sites: Credit 4.3 Alternative Transportation-Low-Emitting and Fuel-Efficient Vehicles
- Energy and Atmosphere : Credit 1 Optimize Energy Performance
- Materials: Credit 1.1 Building Reuse-Maintain 50% of Interior Non-Structural Elements
- Materials: Credit 2 Construction Waste Management
- Materials: Credit 5 Regional Materials
- Indoor Environmental Quality: Credit 7.1 Thermal Comfort -Design

Designing to Meet USGBC LEED Silver Requirements



McKinley Avenue CNG Project

Renovation and Compressed Natural Gas (CNG) Fueling Project



Site Plan

■ COTA CNG FUELING
 ■ PROPOSED NON-COTA CNG FUELING
 ■ EXISTING LANDSCAPING
 ■ PROPOSED LANDSCAPING
 ■ EXISTING STRUCTURES
 ■ PROPOSED PHASE 3 CONSTRUCTION

General Description of Facility

COTA's McKinley Avenue facility is a 400,000 square foot fixed-route bus operation, storage and maintenance facility and has indoor storage capacity for 240 large 40' buses. In addition, the facility houses Radio room operations, the Customer Service call center, IT data center, and administrative offices for Security, Safety, Vehicle Maintenance and Facility Maintenance support staff. The building was constructed in 1980 and is in need of significant upgrade and renovation to bring the facility into a state of good repair.

Two years ago, COTA committed to converting its fleet to compressed natural gas (CNG) vehicles. This commitment, based on both environmental and economic factors, will result in air quality improvement and substantial reduction in operating fuel costs. To advance this decision, COTA will construct a CNG fueling station. The McKinley Avenue facility will be the site of COTA's initial CNG fueling station. In addition to constructing the CNG station COTA will be required to renovate the interior of the McKinley Avenue facility to accommodate these vehicles.

Ultimately, the facility will be renovated to "like new" condition with CNG compliance and anticipated Leadership in Energy and Environmental Design (LEED) Silver certification. LEED design and construction will result in lower long-term operating costs and an environmentally friendly building.

In April 2013, COTA took delivery of its first CNG coaches. As part of a new five-year contract with Gillig Corporation, COTA will purchase up to 30 CNG buses a year. The average service lifespan of a transit bus is 12 years and it is anticipated that COTA's entire fleet will be CNG buses by 2025.

In view of the projected cost of nearly \$75 million associated with a complete renovation of the McKinley facility and the need to secure funding, COTA has decided to approach this project in phases. In Phase I, COTA focused mainly on improvements of safety elements which included replacement of all (32) bus lifts and critical support equipment in heavy maintenance. Phase II of the renovation project



began in 2012 and is scheduled for completion in April 2013. The total projected cost for this phase of the project is \$31,500,000.

Phase II renovations consist of providing a Compressed Natural Gas (CNG) Fueling Station for the eventual fleet conversion to CNG-fueled buses and non-revenue vehicles. The renovation elements can be divided into two specific categories, (1) interior renovations to upgrade the facility to receive CNG vehicles and (2) CNG fueling system.

The McKinley Avenue Renovation included the following:

- Addition of the exterior fueling islands that includes four fueling lanes and one bypass lane.
- Addition of a new CNG building for lineup office room, future cash room, utility room, storage room, rest room and Mechanical/Electrical rooms.
- Addition of a new CNG compressor plant.
- Addition of a new Generator.
- Re-configured parking area.
- Upgraded mechanical systems as required by NFPA.
- Upgraded maintenance and bus storage areas to meet Class I Division II as required in the NFPA 30A Chapter 12 and Chapter 8.
- Re-configured bus route and added/replaced all overhead doors.
- Cleaned and painted the roof of the maintenance and bus storage areas.
- Replaced all lighting in the maintenance and bus storage areas.

CNG Fueling Station

- Bypass Lane for cash drop and tire pressure check
- 4 fueling lanes – of which lane 4 will ultimately have both CNG and diesel
- Each of the 4 fueling lanes also has vehicle fluids (engine oil, transmission oil, coolant, windshield fluid) for topping off during fueling
- Canopy has infrared heaters for the winter months
- Canopy area has in-slab hot water heating system to eliminate ice and snow during winter months
- CNG building has an office for the hostlers, a restroom, storage rooms, a lube room and mechanical spaces



CNG Fueling

Natural Gas Line Upgrade

- Service was upgraded from a 6" to a 8" main. Medium pressure service has an average pressure of 25psi. Columbia gas guarantees 10psi.

CNG Compressor Plant

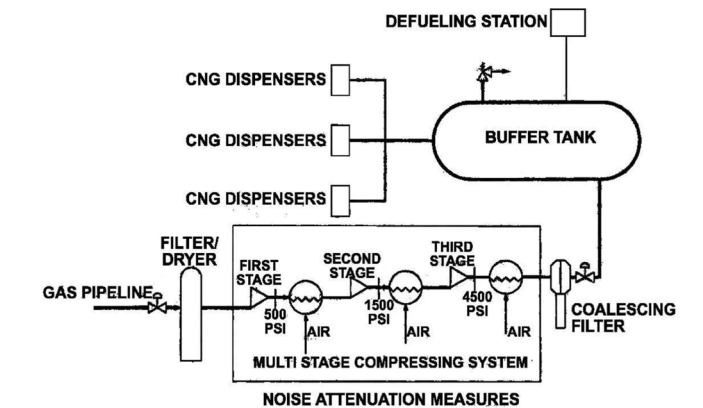
- Largest CNG station currently in use in Ohio.
- Designed for a mature fleet of up to 250 buses.
- Buses will fuel in 5 to 6 minutes on average.

Main station components:

1. One twin tower manually regenerated desiccant CNG dryer—manufactured by PSB in Pennsylvania.
2. Four 400 Hp 5 stage reciprocating compressors. One of the four compressors is provided to ensure redundancy in the event of a breakdown on one compressor. Compressors operate with a 20 psig suction pressure and a maximum discharge pressure of 4500 psig. Compressor blocks are manufactured by Ariel Corporation of Mount Vernon, OH and packages fabricated by ANGI Energy in Wisconsin.
3. Twelve 5500 psig ASME storage spheres containing a total volume of approximately 140,000 standard cubic feet of CNG. Storage manufactured by JW in Texas.
4. Three high flow CNG dispensers with light and heavy vehicle hoses. These dispensers work with 4 valve panels (one at each compressor) and one storage mounted panel to direct the flow of gas to optimize fill speed. Dispenser system manufactured by ANGI Energy in Wisconsin.
5. Programmable Logic Controller (PLC) based control system and all motor control gear is housed in a prefabricated control room. This system manufactured by ANGI Energy in Wisconsin.
6. Standby generator and Automatic Transfer Switch to provide sufficient power to power two compressors during an outage.



CNG Storage Vessels



Schematic - CNG Compressing/Fueling Station



Compressor Plant