Climate Action Plan | April 2022

METRO

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Executive Summary

METRO is excited to present its Climate Action Plan, not only as a goal-setting mechanism for moving forward but also as a way to reflect on accomplishments over the past decade. Since 2010, METRO made significant investments in various projects that set the stage for future sustainable operations. The centerpiece of these projects is the Robert K. Pfaff Transit Center, located in downtown Akron, a Gold LEED facility serves as the heart of METRO service and a transfer point for other agencies to better connect the region. In addition, METRO engaged with multiple vendors to move both its demand response and fixed-route fleets to Compressed Natural Gas, building the necessary infrastructure for fueling on-site, and 2500 solar panels to off-set energy consumption . METRO is now in a unique position, to find additional alternative fuel options to replace its remaining diesel buses and begin replacing the original CNG vehicles that have reached the end of their useful lives.

In 2021, METRO implemented a Strategic Plan, which outlines goals, recommends strategies, and presents an action plan to guide METRO into the next 10 years. Sustainability is a common theme in this plan, specifically highlighted for the need to invest in sustainable fleet and facility improvements. The Strategic Plan has provided the framework for METRO to continue its investments in sustainable operations. METRO recently welcomed two (2) fully electric 40 ft. buses into the fleet, replacing two (2) diesel buses. METRO will welcome two (2) additional Battery Electric Buses (BEB) into the fleet in early 2023, while continuing to replace remaining diesel buses with CNG buses. These buses utilize METRO's aforementioned solar array to offset energy consumption.

Most excitingly, METRO is in the design development phase of a LEED Platinum Maintenance and Operations Facility that will allow the agency to better serve the community with Safe, Reliable and Sustainable service.

METRO embraces its responsibility to bring clean, sustainable mobility options to our service area.

1. Introduction/Purpose

In 2021, METRO implemented a Strategic Plan. The Strategic Plan outlines six (6) key supporting strategies to guide METRO on future investments and realignment of services, highlighted in figure 1.1 below. These include strategies to align various aspects of the agency's operations and organization to a more expansive vision of mobility, and to address gaps and needs identified in the plan that are not directly related to the agency's operations.

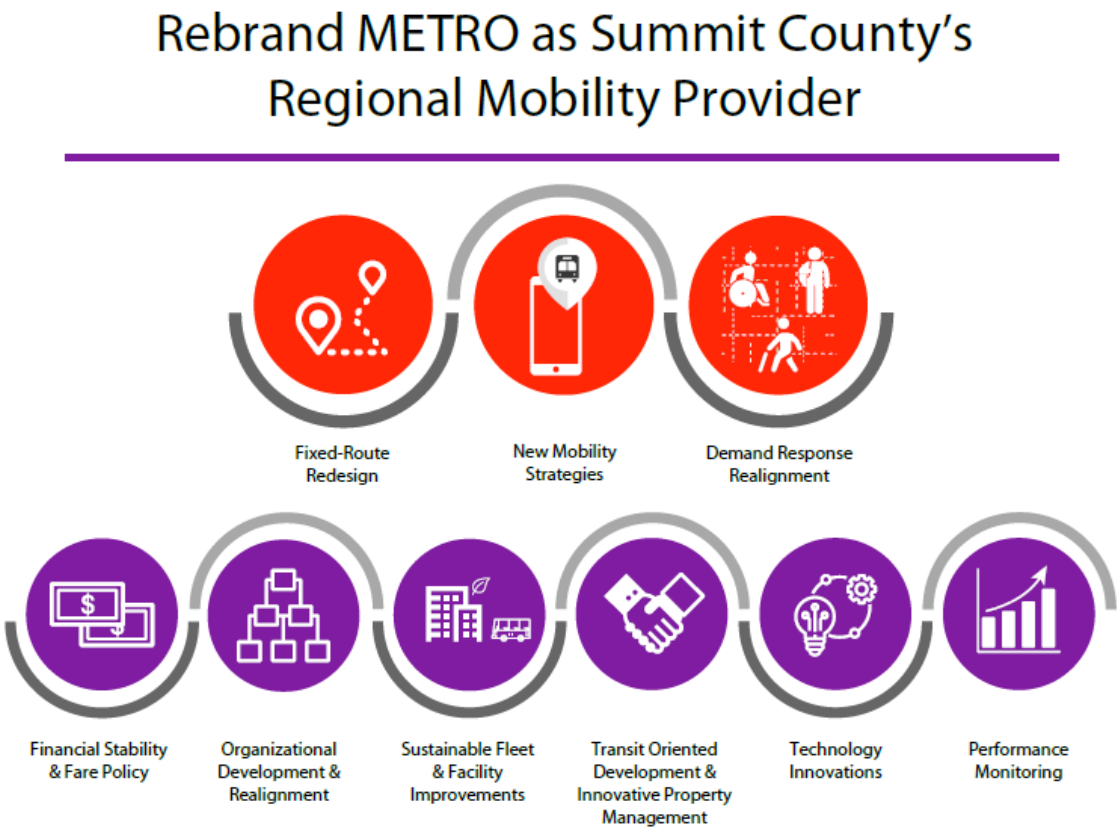


Figure 1.1 – Strategic Plan Recommendations

One of the strategies identified was the need for **Sustainable Fleet and Facility Improvements.** Some of METRO's existing operating (bus storage and maintenance, administrative office) and passenger (transfer facilities, park-and-ride lots) facilities are inadequate to meet existing needs and are nearing, or past, the point of requiring renovation or replacement. The process of meeting METRO's facility needs begins with updating its recent facility and needs assessment to account for existing needs and support implementation of alternative fuel fueling facilities. METRO also must regularly update this assessment to account for future needs as they are defined by future detailed planning. The planning and priority of these facilities also must consider the potential of each new or replaced facility for attracting joint development with public or private partners, or their use to leverage and facilitate transit oriented development.

METRO's existing fleet plan outlines a replacement schedule to update its existing fleet over the next several years. However, METRO's fleet size and composition will be greatly influenced by the transition of METRO's role to regional mobility management, and more specifically by the outcomes of the network redesign and network redesign projects and the integration of New Mobility into METRO's palette of services. The outcomes of these plans development of new services could greatly change the number and types of vehicles required for both fixed-route and demand response services.

METRO's current fleet management plans include limited use of battery electric buses alongside its existing CNG fleet. METRO should continue to monitor the market for battery electric and other alternative fuel and zero-emission vehicles and set goals and benchmarks for transitioning the fleet to one or more alternatives as they reach operating range and life cycle cost parity with Clean Diesel and CNG options. Battery electric and other low-or no-emission vehicles have higher life-cycle costs than Clean Diesel or CNG buses due to higher initial costs and initial capital costs of charging/fueling stations and associated equipment and connections. Battery electric vehicles also have range limitations which can increase operating expenses. However, this could rapidly change over the next several years as the technology continues to be developed, driven by increasing regulation, environmental concerns, and potential changes in the relative costs of electricity and other fuel types. In addition, regulation at the Federal or state level ultimately could require transition to a low-or no-emission fleet, making it imperative that METRO be prepared to make this transition, which could take 15 years or more to complete, when it is opportune or required.

METRO's decision regarding its future administrative office location is the most prominent example, though not the only one, of how METRO must carefully consider its opportunities and constraints in making facility decisions. METRO's existing office facilities at 416 Kenmore Boulevard, like the bus storage and maintenance facility, are in need of short term upgrades or replacement. METRO could pursue several options in regard to its facility: replace the administrative facility adjacent to the new maintenance and storage facility on Kenmore Boulevard; build a stand-alone office facility adjacent to RKP Transit Center, or use its potential occupancy of office space to leverage a larger transit oriented development, at RKP or elsewhere in and around downtown Akron.

Co-location within the maintenance and storage facility has advantages related to employee-relations and organizational cohesion. Almost the entire team is housed in one place and interacts daily. However, location in or near downtown Akron brings the advantage of placing the Chief Executive Officer and administrative team members in close proximity to the heart of the operation, as well as many stakeholders and decision makers who work in downtown Akron. Transit agencies usually disengage their office space from their maintenance facility at some point in their organizational growth, with smaller agencies mostly co-locating offices with their maintenance facilities, and larger ones locating offices in the downtown core. This often occurs at the point when an agency requires a second operating division--or when it develops a new downtown transit hub.

These recommendations outline METRO's needs moving forward for fleet and facility development. Pairing these needs with its Capital Budgeting Process as well as its Transit Asset Management plan will position METRO to meet its sustainability goals.

1.1 Scope/Process/Implementation

The Strategic Plan outlines five (5) specific tasks to aid in the implementation of Sustainable Fleet and Facility Improvements as represented in figure 1.2.

Figure 1.2 – Strategic Plan Task List

ID	Task Name	Quick Win	Start	Finish	Predecessor ID	Goals	Gaps and Opportunities	Public Input and Preference	Departments
5	**Implement sustainable fleet and facility improvements**		Dec. 2021	Jan. 2025	2.b		State of the System 2, 9	Stakeholder Outreach 7 Employee Inreach 1-7	MAIN
5.1	Update recent facility needs assessment to account for future needs (passenger, operations, maintenance, administration, TOD integration)		Dec. 2021	Aug. 2022	2.b, 7.2				MAIN, OPS, PSD FIN, S&"
5.2	Identify partners for potential joint use or joint development where potential mutual benefit of new facilities exists		Dec. 2021	Dec. 2022	7.2				PSD
5.3	Build new maintenance facility to meet current and future needs - including supporting expanded alternative-fuel vehicles		Jan. 2021	Jan. 2025	3.2,3.3				MAIN, FIN, OPS
5.4	Set Goals for Alternative Fuel Balance		Jan. 2022	Dec. 2022					MAIN, OPS, CEO
5.5	Develop fleet and facility plan based on fleet replacement needs and future plans as indicated in the COA (network redesign-BRT-new mobility, demand response changes, alternative fuel goals)		Jan. 2022	Aug. 2022	5.5				MAIN, OPS, PSD FIN

These tasks list a start-end date, related items within the Strategic Plan, as well as the departments responsible for executing the tasks. These tasks create a broad scope of projects related to sustainability, most notably tasks 5.4 and 5.5.

2. Agency Overview

METRO enhances the quality of life for our community by providing innovative transportation that is safe, dependable, cost-effective and customer-focused ... now and into the future.

METRO is the premier public transportation provider serving residents and visitors of Summit County through its current and future mobility options, including fixed-route, demand response, and express routes to and from Cleveland.

Fixed-route service consists of buses traveling along predetermined routes on a set schedule, including:

- 36 local routes
- Express route to downtown Cleveland, making limited stops in order to help passengersĔreach their destinations in the shortest reasonable time
- A single-ride pass on METRO fixed-routes is $1.25 for adults and children age six and over. The fare is $.50 for passengers age 62 or older, or with a disability, within the Akron-Summit County area. To be eligible for the $.50 fare, a passenger must show the operator proof of age, a Medicare card, SCAT I.D. or Disability and Senior (D&S) card.

Also available:

$2.50 / 1-Day general fare pass
$15.00 / 7-Day general fare pass
$50.00 / 31-Day general fare pass
$30.00 / 31-Day D&S pass
$5.00 / Express one-ride fare
$40.00 / Express 10-ride ticket

METRO SCAT is an origin-to-destination, shared ride service designed for older adults and persons with disabilities. METRO SCAT transports individuals to and from medical appointments and work throughout Summit County during designated hours of operation.

The service is broken down into two categories: SCAT Temporary and SCAT Senior.

SCAT Temporary Service is designed for eligible Summit County residents who cannot utilize fixed-route service and may not be able to utilize ADA service due to unavailability of fixed-routes for ADA routing purposes.

SCAT Senior Service is available for eligible Summit County residents who are age 62 and older. SCAT senior is available for one round trip per day. Grocery trips within a six mile radius from the passenger's home and nursing home visits are offered.

METRO SCAT operates Monday through Friday and hours vary based on location. SCAT fare is $2.00 per ride. A companion may accompany the primary SCAT passenger for an additional $2.00 per ride Americans with Disabilities Act (ADA) Complementary Paratransit is transportation for qualified persons

with disabilities, complementing regular fixed-route service. ADA Complementary Paratransit service is available during the hours METRO's fixed- routes operate, and when the origin and destination of all ADA trips are within ¾ mile of an active fixed-route bus stop.

The fare for ADA Complementary Paratransit is $2.50 each way and a personal care attendant may also ride along at no extra charge. There are no limits on a passenger's daily trips, but travel must be scheduled at least one to three days in advance. ADA service is dependent upon completion of an application and a functional assessment to determine the applicant's ability to ride fixed-routes. This service ensures persons with disabilities have equal access to public transportation. All METRO revenue vehicles are fully accessible in accordance with ADA law.

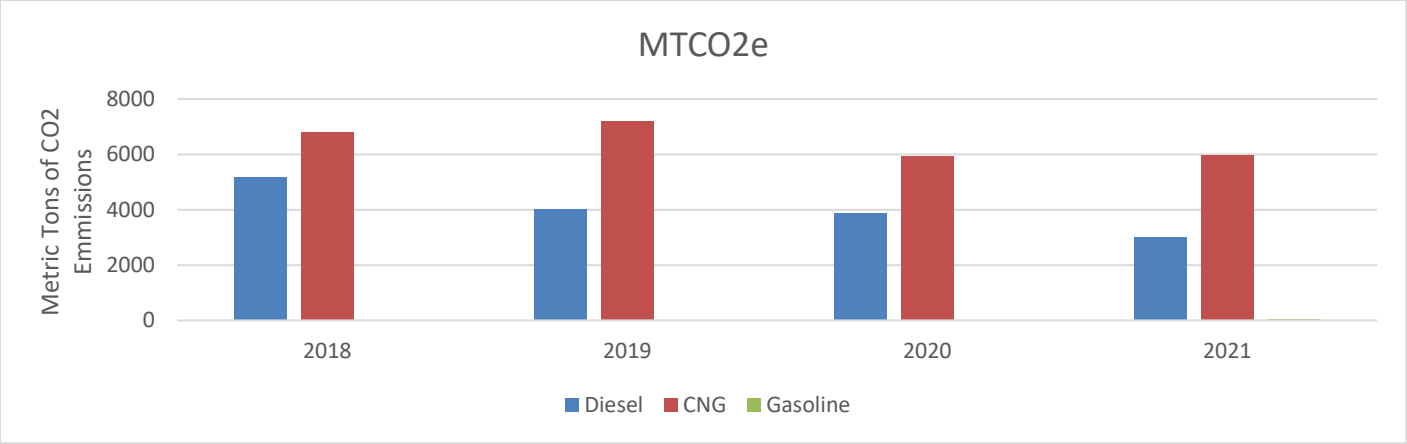
METRO's 2021 total expenses were $62.4 million and total revenues were $90.4 million. Labor accounted for 37.3% of total operating expenses. Other expenses included fringe benefits at 27%, materials and supplies were 6.2%, purchased transportation was 2.2%, and casualty and liability insurance was 1.5%.

METRO's total 2021 income included 23.4% from federal revenue, an increase attributed to American Rescue Plan Act funding due to COVID-19; state revenue was 1.2%, and fare box and ticket sales amounted to 2%. Sales tax generated $63.7 million, or 70.4% of total revenue

3. Emissions Inventory

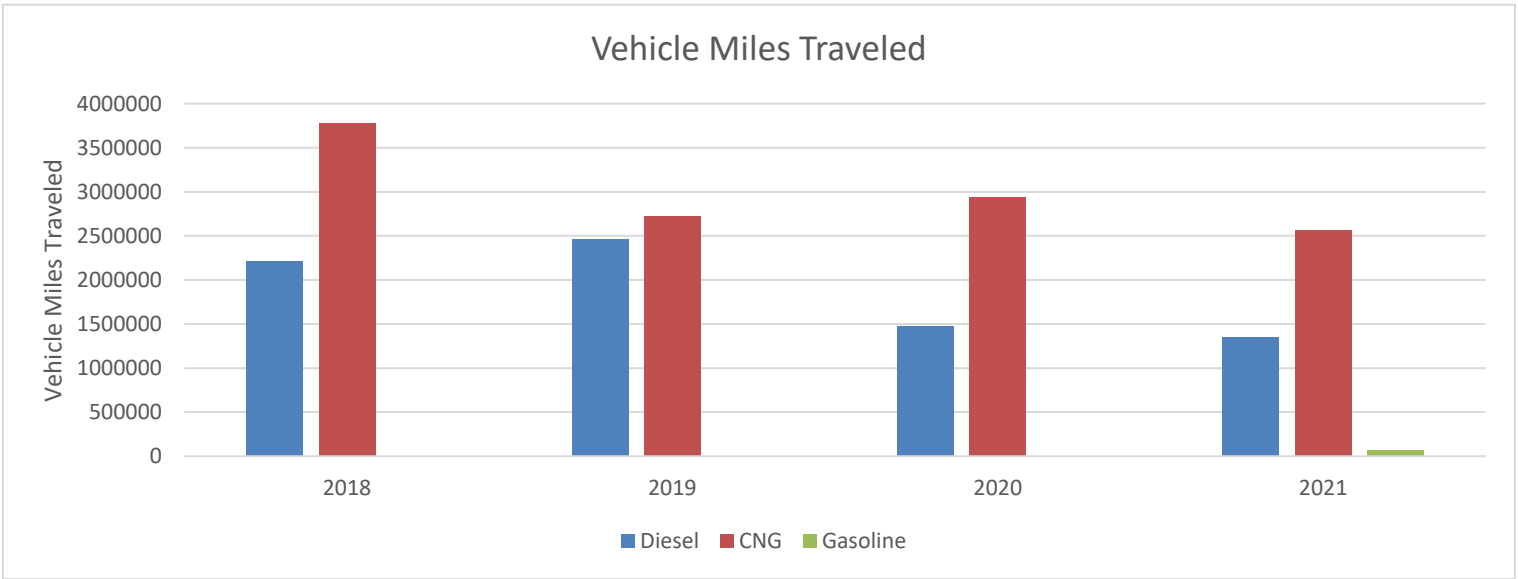
MTCO2e			
	Diesel	CNG	Gasoline
2018	5161	6820	0
2019	4010	7212	0
2020	3881	5941	0
2021	3027	5978	58

Based on a bus traveling 30,000 miles yearly, an electric bus will produce approximately 7 MTCO2e compared to a diesel at 70 MTCO2e.



VEHICLE MILES TRAVELED			
	Diesel	CNG	Gasoline
2018	2207000	3780000	0
2019	2460000	2722000	0
2020	1470747	2932829	0
2021	1348000	2564000	71000

FLEET INVENTORY					
	Diesel	Hybrid Diesel	CNG	Gasoline	Electric
2018	102	4	125	0	0
2019	102	4	125	0	0
2020	93	4	134	0	0
2021	82	4	107	38	0
2022	26	4	117	82	2
2023 Projected	14	4	127	82	4
2024 Projected	0	4	139	82	6



4. Past and Current Initiatives

METRO introduced two (2) GILLIG 40ft. electric buses to its fleet in 2022. METRO has secured funding for two (2) buses in 2023 and intends to add two (2) in 2024. Expected fuel cost savings will be $500 per week per bus, with an expected savings of $312,000 per bus over its useful life. METRO has two ChargePoint 125KWH in depot plug-in charging stations. Each bus takes approximately 2 hours to recharge. The electrical infrastructure at METRO's facility can accommodate up to 15 additional charging stations without significant infrastructure upgrades. Based on a bus traveling 30,000 miles annualy an electric bus will produce approximately 7 MTCO2e compared to a diesel at 70 MTCO2e. These buses are equipped to enable live metric monitoring for items such as battery performance and GHG reduction.

Emission statistics of today

PRODUCED EMISSIONS BY THE GRID	
CO2 production	6.97 lb
NOx production	0.04 oz
Particles production	0.00 oz
SAVED EMISSIONS BY DRIVING ELECTRIC	
CO2 savings	10.88 lb
NOx savings	0.29 oz
Particles savings	0.01 oz
NET RESULT	
CO2 net result	-3.91 lb
NOx net result	-0.25 oz
Particles net result	-0.01 oz

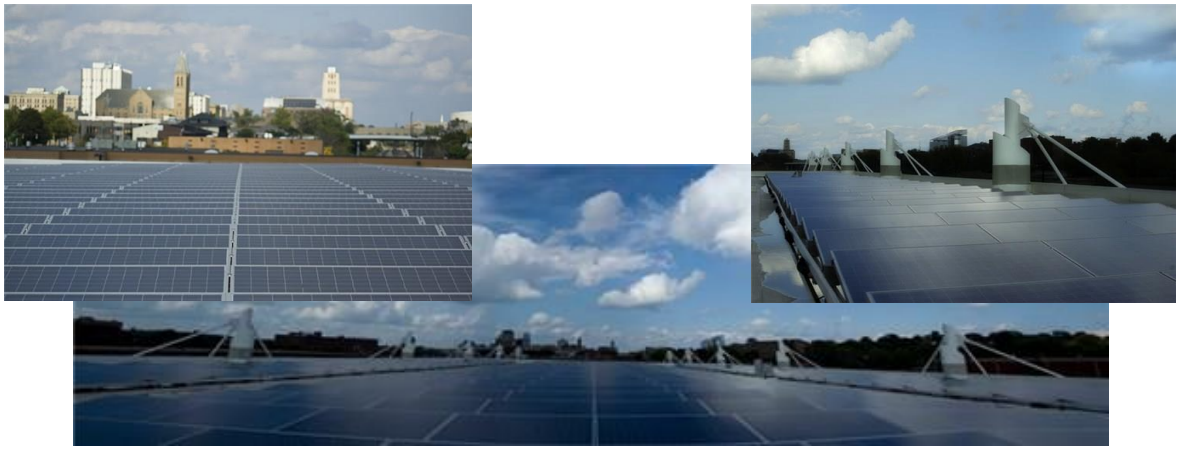
Emission calculations

METRO has over 2500 solar panel that produce 244,000 kWh yearly. The power produced by the solar panels helps to supplement the electric bus chargers.

The solar panels at Robert K. Pfaff Transit Center, which is a Gold LEED building, provides 20% of the power consumed. The 19,800-square-foot facility has canopies extending over the front 15 feet of each bus berth. The pull-in layout for the berths improves pedestrian safety.

The building was designed to include alternative energy, heating, and cooling systems. One of the initial goals was to be an example of environmentally-friendly design and sustainable building practices. This includes collecting rain water in 20,000-gallon underground containers for use in toilets and landscaping.

Among other green elements of the facility are one of the largest single arrays of solar panels in Ohio and 45 geothermal wells (each more than 300 feet deep) for heating and cooling. This is one of the largest geothermal fields in Summit County. Recycled materials were used wherever possible in constructing the building, particularly recycled concrete. Approximately 75% of the construction scrap material was recycled.



METRO is expected to break ground on a Platinum LEED maintenance and operations building in 2022.

RENDERING - NORTHEAST VIEW

Bowen

AKRON METRO - NEW MAINTENANCE FACILITY

03.10.2022

METRO

In April 2021, METRO implemented a cashless MASABI fare system to reduce the amount of paper tickets printed. The cashless system allows the customer to purchase passes through the mobile fare app EZFare or at the customer care window. The future of cashless fare collection will include the ability to purchase reloadable passes at local retailers and ticket vending machines.

As part of a renovation in 2014, METRO installed bus wash lanes that utilize rain water collectors to aid in final rinse and undercarriage spraying for washing our fleet.

5. Emission Reduction Goals and Targets

Operations	• Ridership Growth • Reduction in auto/non-transit VMTs	1. Tracked and Set through Strategic Plan - System Redesign and Comprehensive Operational Analysis
Vehicles	• Reduce transit fleet vehicle emissions	1. Reduce Diesel Vehicle Inventory to 0 by 2025 2. Determine Alternative Fuel Balance for CNG Replacements
Facilities	• Increase in energy efficiency and renewable energy • Provision of infrastructure to support transit and non-transit electric vehicles	

6. Strategies and Actions

Strategy	Actions	Metric	Timeframe	Responsible Office
Determine Scalable Capacity for Electric Buses/Electric Non-Revenue Vehicles	Complete Current Energy Capacity Analysis	Complete/Not Complete	4th QTR 2022	MAINTENANCE
	Re-Evaluate Fleet Plan for Addition of Electric Non-Revenue Vehicles/Revenue Vehicles	Complete/Not Complete	2nd QTR 2023	MAINT/FINANCE/PLANNING
	Develop RFP for Charging Infrastructure to Maximize Capacity	Complete/Not Complete	3rd QTR 2023	MAINT/FINANCE
	Amend TIP for Vehicle Changes	Complete/Not Complete	2023	PLANNING
	Procure Additional Electric Vehicles	Complete/Not Complete	2023-TBD	MAINT/FINANCE
Collaborate with Local Utility to Optimize Building Energy Use	Contract/Pricing Review – Explore RNG	GHG Use by Facility/Pricing Models	2022-TBD	MAINT-FACILITIES
Coordinate with Local Efforts for Climate Action	Outreach for Collaboration/Coordination of Sustainability Efforts Locally	TBD	2023	MAINT/PLANNING
Internal Team Member Buy-In for Climate Goals	Champion internal “Green-Team” that seeks out initiatives to undertake and work through processes to help METRO achieve sustainability goals	TBD	2022	ALL

7. METHODOLOGY TABLE

	Year	Diesel Bus MY1960-2006		Diesel Bus MY 2007-2018		Biodiesel (100%) Bus		Gasoline Bus		CNG Bus			Liquefied Petroleum Gas Bus	
		gallons	VMT	gallons	VMT	gallons	VMT	gallons	VMT	GGE	Cubic Feet	VMT	GGE	VMT
Fleet Energy Usage	2021	5,000	21,000	290,000	1,327,000	0	0	6,632	71,000	840,000	96,574,982	2,564,000	0	0

Mileage Based Emission Factors	Diesel Bus MY1960-2006	Diesel Bus MY07-18	Biodiesel (100%) Bus	Gasoline Bus (MY18) *	CNG ICE Bus	LPG Bus
	g/mi	g/mi	g/mi	g/mi	g/mi	g/mi
Methane (CH4)	0.0051	0.0095	0.009	0.0326	10	0.034
Nitrous oxide (N20)	0.0048	0.0431	0.043	0.0082	0.001	0.017

**The emission rates for gasoline buses vary each model year. See the Climate Registry default emissions source (url listed below) for emission rates for earlier model years*

Volume Based Emission Factors	Diesel Bus MY1960-2006	Diesel Bus MY07-18	Biodiesel (100%) Bus	Gasoline Bus (MY18) *	CNG ICE Bus	LPG Bus
	g/gallon	g/gallon	g/gallon	g/gallon	g/standard ft	g/gallon
Carbon dioxide (CO2)	10,210	10,210	9,450	8,780	54.444	5,680

**The emission rates for gasoline buses vary each model year. See the Climate Registry default emissions source (url listed below) for emission rates for earlier model years*

Annual Emissions

	Diesel Bus MY1960-2006	Diesel Bus MY07-18	Biodiesel (100%) Bus	Gasoline Bus (MY18) *	CNG ICE Bus	LPG Bus

CH4 Emissions (grams)	107	12,607	-	2,315	25,640,000	-
N20 Emissions (grams)	101	57,194	-	2,315	2,564	-
CO2 (grams)	51,050,000	2,960,900,000	-	58,228,960	5,257,928,320	-

	Diesel Bus MY1960-2006	Diesel Bus MY07-18	Biodiesel (100%) Bus	Gasoline Bus (MY18) *	CNG ICE Bus	LPG Bus	**Fleet Total**
CH4 Emissions (grams) to MTCO2e	0	0.35	-	0	718	-	
N20 Emissions (grams) to MTCO2e	0	15.16	-	1	1	-	
CO2 (grams) to MTCO2e	51	2,960.90	-	58	5,258	-	
Annual MTCO2e	51	2,976.41	-	59	5,977	-	**9,063**
Annual MTCO2e per VMT	0	0.002242961	#DIV/0!	0.0008297	0.002330939	#DIV/0!	**0.00227540 1**

Conversions

139.3	standard cubic feet/diesel gallon equivalent (source: https://afdc.energy.gov/fuels/equivalency_methodology.html)
28	Methane GWP (IPCC Fifth Assessment Report (2013) (AR5)
265	N20 GWP (IPCC Fifth Assessment Report (2013) (AR5)

Source notes:

Source of all emission factors, including GWP factors, is the May 2021 Climate Registry default emission factors: https://www.theclimateregistry.org/wp-content/uploads/2021/05/2021-Default-Emission-Factor-Document.pdf
Source of standard cubic feet to diesel gallon equivalent is:
https://afdc.energy.gov/fuels/equivalency_methodology.html