



Climate Action Plan – The roadmap to a Sustainable Future



April 15, 2022

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Letter from our CEO

The Rapid has been and will continue to be a leader in sustainability efforts and alternative fuel programs. While many agencies are now developing climate action plans to address emerging and future needs, The Rapid began this journey in 2004 with the construction of the first LEED Certified Public Transit Center in the United States, Rapid Central Station. This effort was followed by our second LEED Certified building, the Rapid Operation Center in 2012 (LEED Gold). This exercise impacted future building projects, creating an emphasis on sustainability efforts across the board like decreased water and energy use, and durable material selection. The Rapid has also been a leader in adding cleaner emission vehicles to the fleet as early as 2007.

We have taken additional steps to maintain a healthy indoor environment at our facilities and for our employees. During facility renovations, inefficient lighting systems have been replaced with light-emitting diode (LED) lighting in our buildings. In addition to solar lighting at bus shelters, the future potential of onsite solar power will be considered along with the exploration of hydrogen fueling for a zero-emission bus fleet. We will put systems to the test, and we will continue to be a good steward in our region by reducing greenhouse gas emissions whether from construction materials, facilities, or the vehicles we operate.

As you will see in the plan outlined here, Hybrid, Propane, CNG, Renewable CNG (RNG), Hydrogen and Electric propulsion either are, or will be deployed. While many agencies' Climate Action Plans will outline how they intend to improve, ours will outline how we intend to continue our commitment for the future. We must build our future upon a foundational responsibility to adopt and continue sustainable practices and to reduce our own carbon footprint wherever possible.

Deborah Prato
Chief Executive Officer

I. Introduction

Like many areas around the world, West Michigan and the Grand Rapids Metro area is challenged to maintain and strengthen its economic resilience. To meet this challenge, the region needs to remain environmentally, economically, and socially sustainable. The Rapid is a key component of sustainability. Having a safe, reliable, and well-utilized transit system impacts the reduction greenhouse gas emissions, spurs economic development and improve mobility for residents, employees, and visitors. An integral part of the region is a public transit system that helps make Grand Rapids one of the most sustainable regions in the country.

The Rapid has a history of being a leader in sustainability in our region. We are excited to continue this commitment with this Climate Action Plan and Fleet Transition Plan to a zero emissions future.

ENVIRONMENTAL IMPACT

Transit in the region saves more than 650,000 gallons of gasoline each year, keeping more than 5,700 metric tons of greenhouse gases from being released into the atmosphere. By removing over one million cars from the road every weekday, transit reduces gasoline and diesel consumption and reduces the amount of toxic pollutants being emitted into the air.

SOCIAL IMPACT

The Rapid allows residents and visitors to travel to jobs, schools, doctor appointments, shopping, and recreational activities. Quality public transit promote improved physical health, as transit riders generally take part in higher levels of physical activity than non-riders and obesity rates tend to be lower in regions with high transit market share. Transit is also linked to improved mental health, as transit commuters have been found to have lower stress levels than commuters who drive to work.

ECONOMIC IMPACT

Transit can save households in the Grand Rapid area up to \$8,700 annually. The Rapid attracts businesses and jobs to the region, as more corporations consider access to quality transit when determining where to locate new offices, expand, and recruit new talent. Additionally, land near our 2 BRT systems enjoy significant land-value premiums and the area in general outperforms competitive residential markets.



2. Agency Overview

The Rapid has a reputable history of recognized achievement. In 2004 and 2013, The Rapid was awarded “Outstanding Public Transportation System of the Year” for mid-sized systems by the American Public Transportation Association. In 2014, The Rapid launched Michigan’s first Bus Rapid Transit service, the Silver Line. Currently, the Silver Line maintains its place as the system’s highest ridership route. In August 2020, The Rapid, in partnership with Grand Valley State University and the Michigan Department of Transportation, launched a second Bus Rapid Transit line called the Laker Line in 2020.

From a facility standpoint, The Rapid has been dedicated to being a sustainable partner in the community. Public transit by design has significant advantage over single vehicle modes. In 2004, The Rapid opened the first **LEED Gold Certified Transit Center in the US. In 2012, we achieved LEED Gold Certification at our Operations and Maintenance Facility.**

From a vehicle perspective, The Rapid was an early adopter and tester of alternative fueling options. In 2007, we purchased five Hybrid buses. They were evaluated in a partnership study with a local university engineering department. This was critically important to understand the customer and environmental impacts. This led to making decisions about how we moved forward in our alternative fueling plans. In 2015, we launched an alternative fueling plan for our paratransit fleet to propane Autogas. In July of 2017, we opened our CNG fueling site after receiving our first two CNG buses. The Board of Directors approved the recommended plan to transition the fleet over the 12-year life cycle of the bus. In 2021, the City of Grand Rapids constructed a bio-digester in which The Rapid will be the primary consumer of Renewable Compressed Natural Gas for our entire fleet of CNG Linehaul buses and LL BRT buses.

3. Emissions Inventory

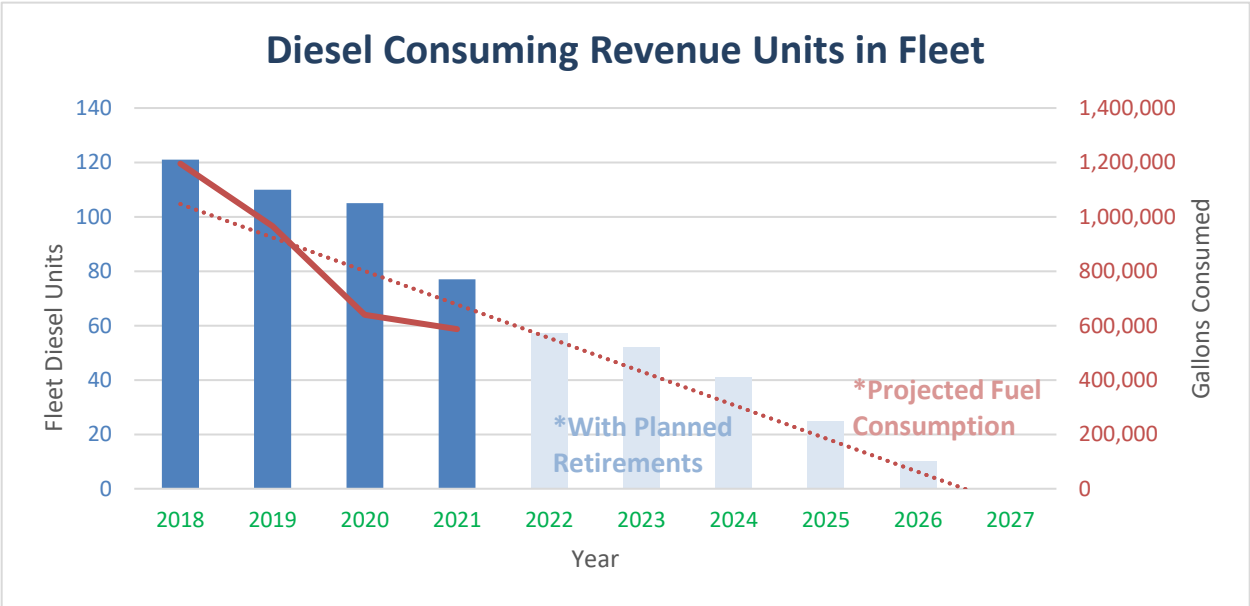
Emissions will be reported as Scope 1, 2 or 3, and units converted to metric tons of carbon dioxide equivalent (MTCO_{2e}). The Climate Registry recommends Facility-level emissions reporting; The Rapid will detail the total emissions for each group: Commercial buildings, Stations & Right of Ways, and Mobile sources (disaggregated by NTD categories).

Fleet Summary

For fiscal year 2021, The Rapid’s fleet included:

- 98 CNG Buses
- 72 Diesel Buses; 19 retired during Fiscal Year 2021
- 10 Diesel/Electric Hybrid Buses
- 8 Diesel Non-revenue support vehicles/equipment
- 34 Gasoline Non-revenue support vehicles
- 64 Propane Paratransit/Demand Response
- 8 Gasoline Paratransit/Demand Response

GASOLINE	DIESEL	CNG
27,198	612,898	759,077
Gallons	Gallons	DGE
<i>Fiscal Year 2020-2021</i>		



All diesel fueled buses were model year 2009 and newer. The amount of fuel consumed by all fleet vehicles and equipment in 2021 was 1,326,183 gallons or equivalent of various fossil fuels.

Fleet emissions:

In FY2021 The Rapid operated 9 properties with a total of 12 Buildings or structures, consuming 242,351 CCF of natural gas, which equates to 1,328 metric tons of CO₂ (MTCO₂e).

From an audit performed by DTE energy it was estimated that The Rapid's facilities had an annual average natural gas usage of 35,000 MCF. This equates to approximately 1,855 metric tons of CO₂ produced each year (MTCO₂e).

Fleet emissions equated to a total of 14,266 MTCO₂e for all vehicles.

	Diesel Bus MY07-18	Gasoline Bus (MY18)*	CNG ICE Bus	LPG Bus	Fleet Total
CH4 Emissions (grams) to MTCO ₂ e	0.82	1	887	1	
N ₂ O Emissions (grams) to MTCO ₂ e	35.03	7	1	7	
CO ₂ (grams) to MTCO ₂ e	6,216.24	398	5,479	1,233	
Annual MTCO₂e	6,252	407	6,367	1,241	14,266
Annual MTCO₂e per VMT	0.002038284	0.00024005	0.0004765	0.002010764	0.000859407

Conversion & measurement factors: Natural Gas/CNG usage measured in CCF units (100 cubic feet by volume at standard pressure). Diesel gallon equivalent (DGE) calculation: 139.3 cubic feet per DGE (https://afdc.energy.gov/fuels/equivalency_methodology.html)

Facilities emissions -

The Rapid operates 8 properties with electrical service which consumed 4,377,376 Kilowatt-hours (KWH) of electricity in FY21. The Rapid also owns and operates 50 BRT stations along two routes which consumed 1,231,997 KWH, resulting in a total usage of 5,609,373 KWH in fiscal year 2021. This equates to 3,975 MTCO₂e. This has the equivalent emissions to consuming 390,497 gallons of diesel fuel.

Metrics

Total emissions for The Rapid in fiscal year 2021 equate to 18,088 MTCO₂e. This includes facilities scope 1 emissions of 1,328 MTCO₂e, fleet emissions of 12,785 MTCO₂e, and scope 2 emissions from facility electrical usage of 3,975 MTCO₂e. Scope 1 emissions amount to 16,760 MTCO₂e.

From reports submitted to NTD for FY 2021 it was determined that The Rapid provided 14,818,237 passenger miles traveled (PMT). Using reports S-10 and MR-20, the following data was also collected:

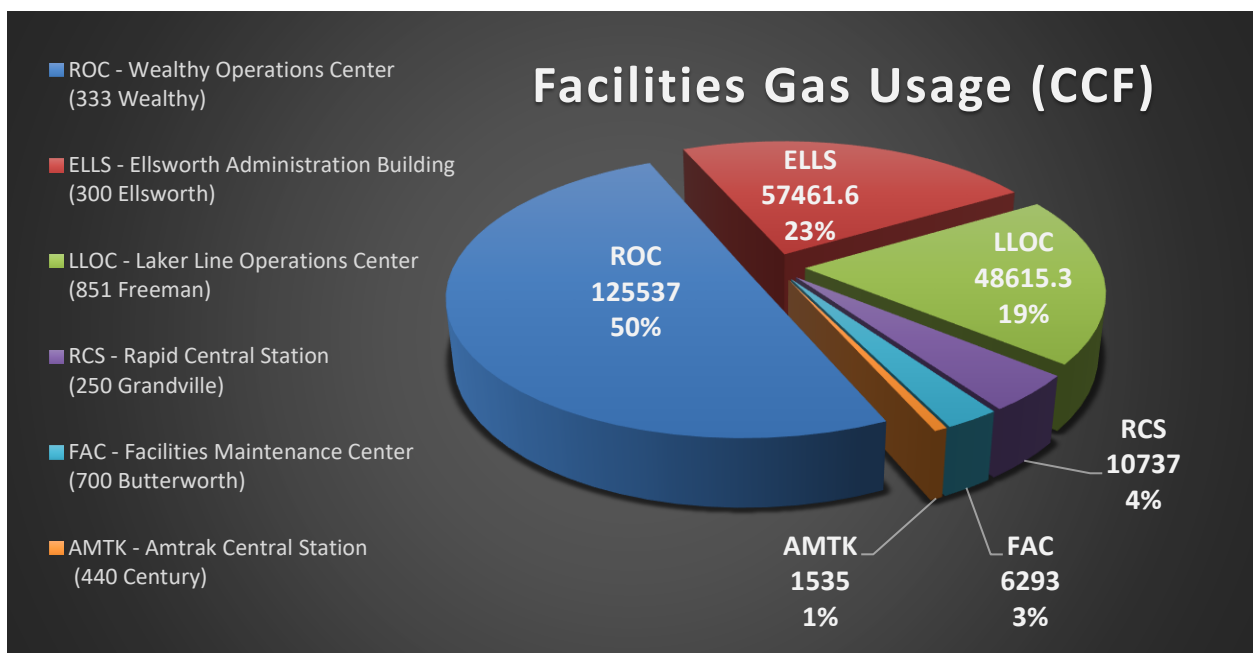
	RB DO	DR PT	MB DO	VP DO	TOTAL
UPT	367,484	200,526	3,553,108	7,690	4,128,808
VRM	327,927	1,475,687	4,967,690	104,402	6,875,706
VRH	26,584	107,902	374,984	2,689	512,159
VOMS	6	62	105	6	179

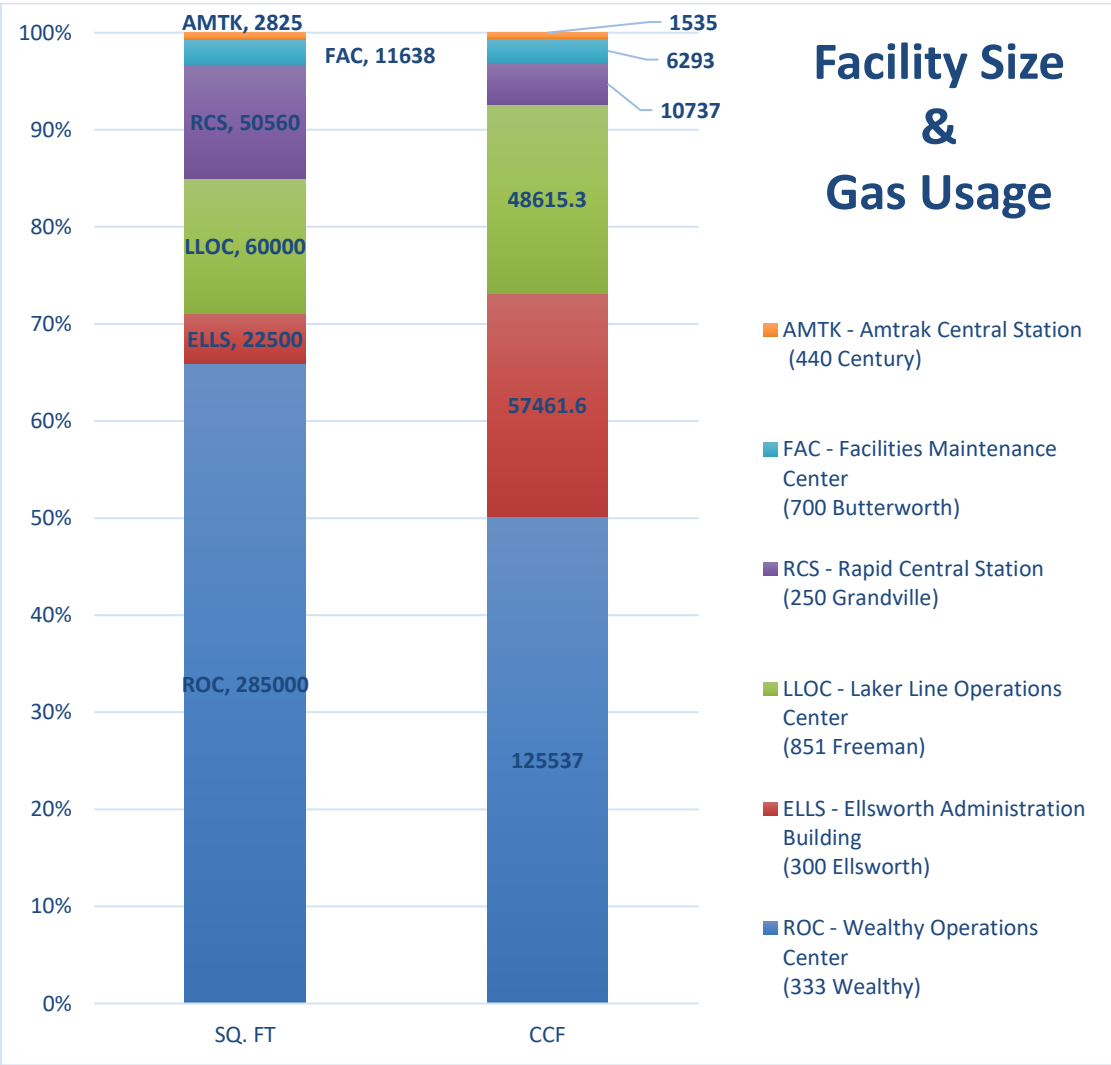
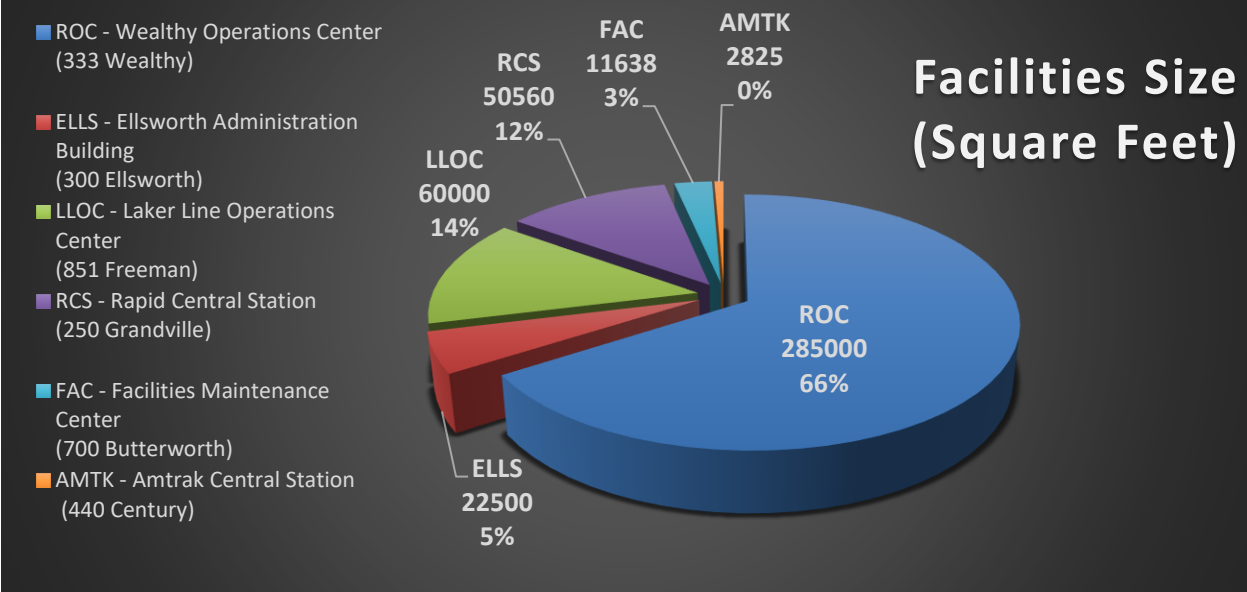
RAPID BUS - DIRECTLY OPERATED	RB DO
DEMAND RESPONSE - PURCHASED TRANSPORTATION	DR PT
MOTOR BUS - DIRECTLY OPERATED	MB DO
VANPOOL - DIRECTLY OPERATED	VP DO
UNLINKED PASSENGER TRIPS	UPT
VEHICLE REVENUE MILES	VRM
VEHICLE REVENUE HOURS	VRH
VEHICLES OPERATED IN MAX SERVICE	VOMS

According to an FTA estimate in 2010 from 'Public Transportation's Role in Responding to Climate Change': the average transit system emits 0.45 lbs CO2 per passenger mile traveled (PMT), while the average car emits 0.96 lbs CO2 / PMT.

Using the data from FY 2021

Facilities Gas Use and Sq Ft. Comparison





Focused Attention-*Ellsworth Facility*

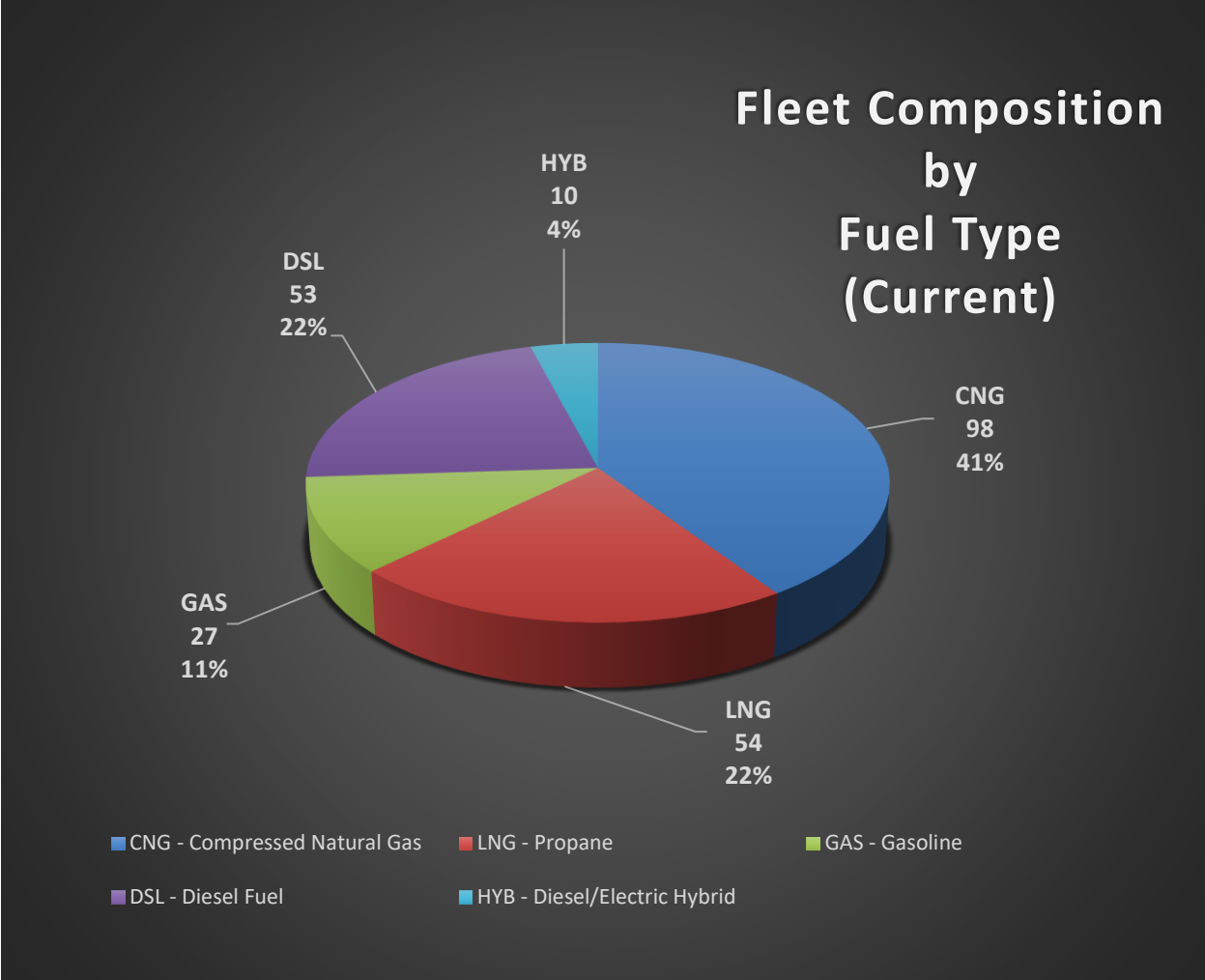
While looking at the 3 charts above, it is clear that the Ellsworth facility is the least efficient in terms of energy use per sq. ft.

The Rapid has determined that a renovation of that facility is a priority as listed in our Facilities Master Plan. The renovation will include better space utilization as well as improvements to the energy used to operate the building. HVAC and insulation materials included. The building is the oldest in our portfolio.

4. Past and Current Initiatives

THE RAPID's Alternative Fuel efforts began as early as **2007**, with the commitment to purchase vehicles that of alternate fuel sources. The continue exploration of alternative fueled buses in following years began after receiving five (5) battery electric/hybrid buses and completing an exhaustive study. Pursuant to this vision, The Rapid began to successfully transition the bus fleet from all-diesel, to one consisting of CNG and Propane. We continue to commit to innovative technologies and strategies to further reduce our carbon footprint by introducing Renewable Natural Gas (RNG) in the summer of 2022 and Battery Electric (BEB) with the recent award of funding for BEB and infrastructure.

The conversion to Zero Emission Bus's (ZEB) is the next step in our future and it will further improve the air quality in the Grand Rapids region for residents and visitors for the future. The transition to a ZEB fleet is a primary goal of the authority and one we are committed to achieve. The first phase is the development of this plan to evaluate the current fleet, routes, blocks, and facilities; and map out the best strategy and anticipated cost to convert the fleet to a ZEB operation. Following this, the 30-year master planning process, launching in the fall of 2022, will consider ZEB as well. Future considerations are primarily focused on the implementation of a hydrogen fuel cell linehaul bus fleet.



As you can see from the chart above, just 33% of the current fleet is diesel of gasoline fueled. That means 67% has already been move to an alternative fueling strategy.

From a facility standpoint, The Rapid has been dedicated to being a sustainable partner in the community. Public transit by design has significant advantage over single vehicle modes. As noted previously, The Rapid open the first **LEED Gold Certified Transit Center in the US**. **In 2012, we achieved LEED Gold Certification at our Operations and Maintenance Facility.**

In 2007, we purchased five Hybrid buses. They were evaluated in a partnership study with a local university engineering department. This was critically important to understand the customer and environmental impacts. This led to making decisions about how we moved forward in our alternative fueling plans. In 2015, we launched an alternative fueling plan for our paratransit fleet to propane Autogas. In July of 2017, we opened our CNG fueling site after receiving our first two CNG buses. The Board of Directors approved the recommended plan to transition the fleet over the 12-year life cycle of the bus. In 2021, the City of Grand Rapids constructed a bio-digester in which The Rapid will be the primary consumer of Renewable Compressed Natural Gas for our entire fleet of CNG Linehaul buses and LL BRT buses.

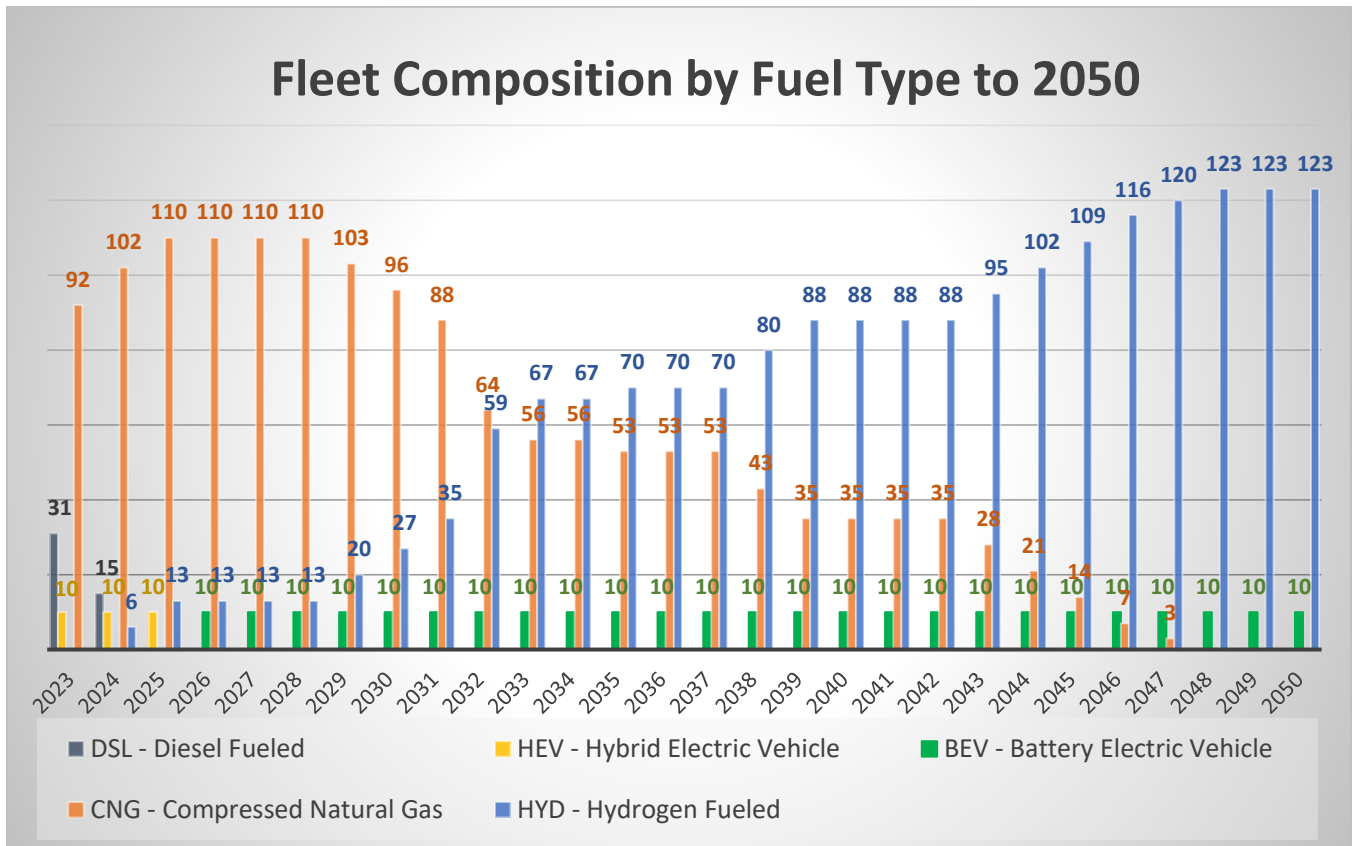
5. Emission Reduction Goals and Targets

Goal #1: By 2030, use 100% renewable natural gas for Operations and Transit Center facilities

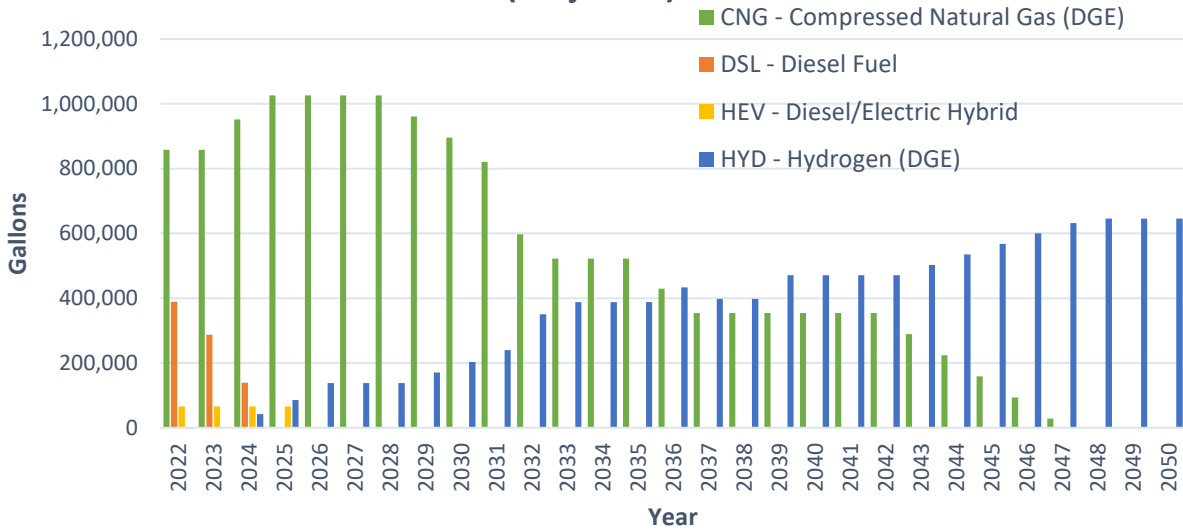
Goal #2: Decrease total GHG emissions from transit fleet by 25% by 2030

Goal #3: Plan new facilities to accommodate zero-emission technologies

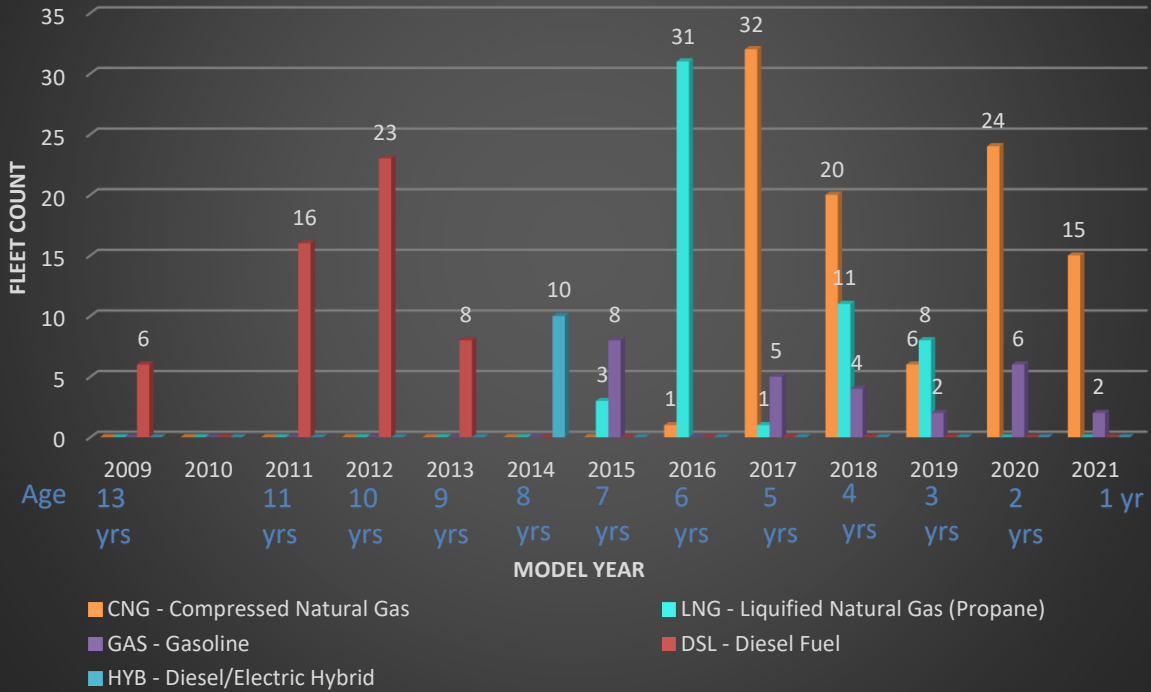
How we are trending today. Note Diesel fueled vehicle already have a sunset of 2026.



Fleet Estimated Fuel Usage per Year in Gallons or Equivalent (Projected)



Current Fleet Age & Composition by Model Year & Fuel Type



6. Strategies and Actions

The Rapid has the following goals as part of its Climate Action Plan:

Goal #1: *By 2030, use 100% renewable natural gas for Operations and Transit Center facilities.*

Goal #2: *Decrease total GHG emissions from transit fleet by 25% by 2030.*

Goal #3: *Plan new facilities to accommodate zero-emission technologies.*

To achieve these goals, The Rapid will use the follow emission reduction strategies:

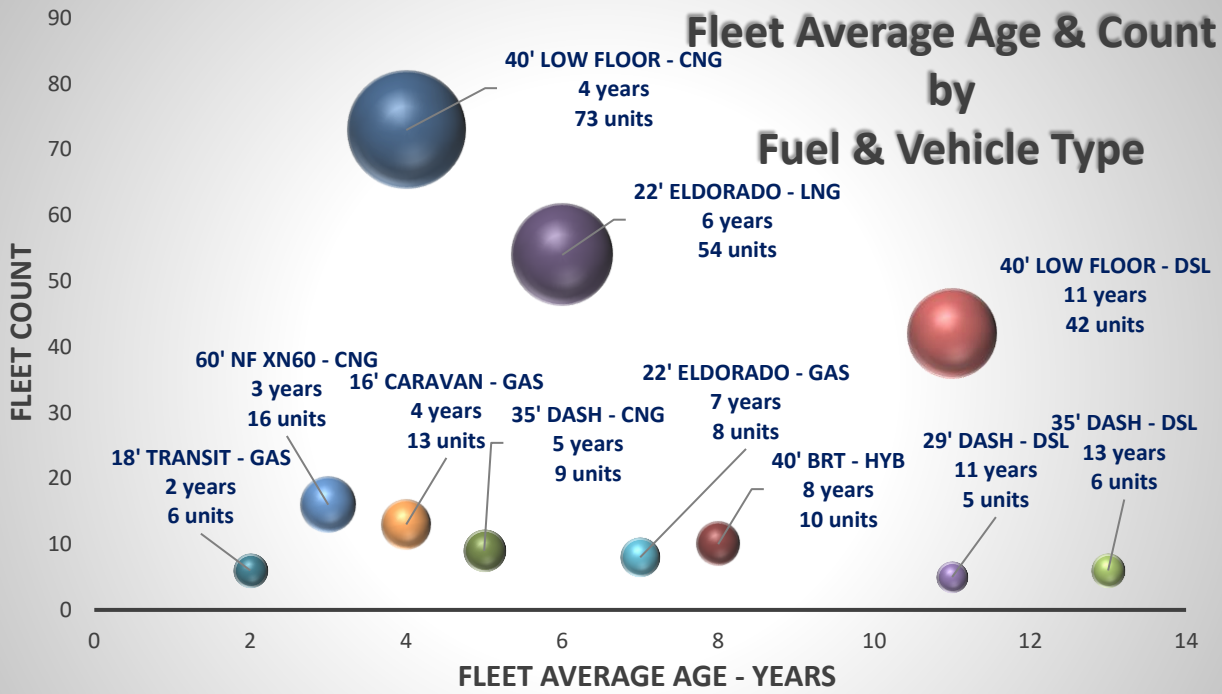
- *Expanding transit service and increasing ridership—ON DEMAND, TMP*
- *Clean and renewable energy and alternative fuel sources—RNG, Electric Bus, Hydrogen, Solar*
- *Energy efficiency and supply strategies—LED Lighting upgrades*
- *Employee travel and trip reduction strategies—reduced already*
- *Transportation and land use strategies—Division United Investments*
- *System efficiency and capacity improvements—Completed COA*
- *Waste reduction strategies—Lean employment strategy, improved record keeping, recycle plan, Bronze APTA sustainable agency*

7. Implementation and Monitoring

Implementation strategies may include information on the following topics:

- *Ongoing efforts to keep the plan on track—some done, other to be planned and executed (ops and capital environment)*
- *Funding—Capital Funding opportunities, Earmarks*
- *Emerging Challenges—alternative fuel and battery technology improvements*
- *Implementation Principles—Focused on achieving ZEB plan in 2050*
- *Partnerships-RNG (city/agency), Electric bus (Hoekstra)*
- *Looking Ahead—Emerging Technologies*
- *Establish Dash Boards (Fleet Analyst)*

Fleet Average Age & Count by Fuel & Vehicle Type



- 60' New Flyer XN60 Articulated CNG
- 40' Gillig Low Floor Diesel
- 35' Gillig Low Floor Dash Diesel
- 29' Gillig Low Floor Dash Diesel
- 22' Eldorado Paratransit Gasoline
- 16' Grand Caravan Gasoline

Some ideas for initiatives:

- Solar panels for BRT stations
 - See Grand Rapids' plan for Solar Panels on Butterworth
- Landscaping/planting at Bus stops (carbon sinks)
- Increase employee usage of transit/vanpool/carpooling to work
 - Incentives, awareness, new programs?
- Decrease energy use at facilities, more recycling, water conservation, etc.
- EPA Energy Star certifications for facility buildings
- RNG Commitment

NREL Solar Assessment for facilities – see city of GR studies

City of GR initiative for 'green' streets – work with city in plan for more planting/landscaping along city streets for handling excess rainwater.

State of Michigan plans for increased investment in electrical vehicles and infrastructure

Attachments:

- *Zero Emission Bus Plan*
- *City of Grand Rapids Strategic Plan*
- *Grand Rapids Climate Resiliency Report*
- *Energy Performance Update – Grand Rapids' future initiatives*
- *State of Michigan Healthy Climate Plan*