

Wichita Transit Climate Action Plan

2022-2040



March 15, 2022

Executive Summary

Wichita Transit is in the process of converting our fossil fuel fleet to battery-electric buses with a complete adoption timeline of 2040. Currently, 11 of our 50 fixed-route buses are battery-powered buses. Wichita Transit has deployed these battery-electric buses on routes which are central to the downtown core and serve the most economically fragile areas of the city. Our fossil fuel fleet is within the useful service life, and the agency has not been successful with recent grant applications to replace vehicles.

Wichita Transit is a department within the city that provides public transit services. Service includes 18 fixed routes operating six days a week from 5:30 am to 7:00 pm and paratransit services. In addition to these services, Wichita Transit operates an electrified downtown circulator, and a veteran’s program in partnership with Wichita Veterans Affairs and United Way of the Plains, allowing veterans to ride free. Wichita Transit also has partnerships with Wichita Public Schools providing over 12,000 monthly trips to students and an electrified Wichita State University circulator providing nearly 13,000 trips to students per month. Wichita Transit is the largest transit system in the State of Kansas and serves as a designated recipient for FTA funding within the Wichita Metropolitan Planning Area.

Wichita At a Glance

- Population of Urbanized Area: 484, 715
- 214.7 square miles
- 2,257.7 people per square mile
- Median age 35.3
- Median Household Income: \$58, 031
- Persons below the poverty line: 12.7%
- Drive to Work: 86%
- Use Public Transit to Commute: 1%

Citation: U.S. Census Bureau (2019). *American Community Survey 1-year estimates*. Retrieved from *Census Reporter Profile page for Wichita, KS Urbanized Area* <<http://censusreporter.org/profiles/40000US95077-wichita-ks-urbanized-area/>>

I. Introduction

Wichita Transit has committed to the FTA's Sustainable Transit for a Healthy Planet Challenge to take actions and make investments to cut GHG emissions.

This document is a planning framework for the future.

3. Emissions Inventory

In 2019, Wichita Transit’s fleet used only fossil fuels. The transition to electric buses began in 2020 with the purchase of 4 Proterra buses, followed by the purchase of another 7 CCW vehicles in August of 2020. The summaries that follow show emissions reductions over the past 3 years.

Emissions per VMT	2019	2020	2021
Diesel VMT	1,818,711	1,464,238	1,385,552
Gas VMT	787,316	677,788	811,064
Electric Bus VMT	0	92,571	165,046
Total VMT	2,606,027	2,234,597	2,361,662
Annual MTCO_{2e}	4457	3361	3502
Annual MTCO_{2e} per total VMT	0.00171	0.00150	0.00148

Wichita Transit may achieve zero emissions by the year 2040, if expansion of the battery-electric fleet continues at the pace set in 2020.

Emission Tables which follow exclude battery-electric buses.

2019 Wichita Fleet Data

Year		Diesel Bus MY1960-2006		Diesel Bus MY 2007-2018		Gasoline Bus	
		gallons	VMT	gallons	VMT	gallons	VMT
Fleet Energy Usage	2019	64,530	264,575	285,617	1,554,136	97,439	787,316

Mileage Based Emission Factors	Diesel Bus MY1960-2006	Diesel Bus MY07-18	Gasoline Bus (MY18)*
	g/mi	g/mi	g/mi
Methane (CH4)	0.0051	0.0095	0.0326
Nitrous oxide (N2O)	0.0048	0.0431	0.0082

*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	Gasoline Bus (MY18)*
	g/gallon	g/gallon	g/gallon
Carbon dioxide (CO2)	10,210	10,210	8,780

*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	Gasoline Bus (MY18)*
CH4 Emissions (grams)	1,349	14,764	25,667
N2O Emissions (grams)	1,270	66,983	25,667
CO2 (grams)	658,851,300	2,916,149,570	855,514,420

	Diesel Bus MY1960-2006	Diesel Bus MY07-18	Gasoline Bus (MY18)*	Fleet Total
CH4 Emissions (grams) to MTCO2e	0	0.41	1	
N2O Emissions (grams) to MTCO2e	0	17.75	7	
CO2 (grams) to MTCO2e	659	2,916.15	856	
Annual MTCO2e			863	
	659	2,934.31		4,457
Annual MTCO2e per VMT		0.00189	000110	0.00171
	0			

2020 Wichita Fleet Data

	Year	Diesel Bus MY 2007-2018		Gasoline Bus	
		gallons	VMT	gallons	VMT
Fleet Energy Usage	2020	254,650	1,464,238	83,692	677,788

Mileage Based Emission Factors	Diesel Bus MY07-18	Gasoline Bus (MY18)*
	g/mi	g/mi
Methane (CH4)	0.0095	0.0326
Nitrous oxide (N2O)	0.0431	0.0082

*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 MY07-18	Gasoline Bus (MY18)*
	g/gallon	g/gallon
Carbon dioxide (CO2)	10,210	8,780

*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 MY07-18	Gasoline Bus (MY18)*
CH4 Emissions (grams)	13,910	22,096
N2O Emissions (grams)	63,109	22,096
CO2 (grams)	2,599,976,500	737,186,360

	Diesel Bus MY07-18	Gasoline Bus (MY18)*	Fleet Total
CH4 Emissions (grams) to MTCO2e	0.39	1	
N2O Emissions (grams) to MTCO2e	16.81	6	
CO2 (grams) to MTCO2e	2,617.09	737	
Annual MTCO2e	2,617.09	741	3,361
Annual MTCO2e per VMT	0.00179	0.00110	0.00157

2021 Wichita Fleet Data

Year		Diesel Bus MY 2007-2018		Gasoline Bus	
		gallons	VMT	gallons	VMT
Fleet Energy Usage	2021	253,018	1,385,552	101,877	811,064

Mileage Based Emission Factors	Diesel Bus MY07-18	Gasoline Bus (MY18)*
	g/mi	g/mi
Methane (CH4)	0.0095	0.0326
Nitrous oxide (N2O)	0.0431	0.0082

*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 MY07-18	Gasoline Bus (MY18)*
	g/gallon	g/gallon
Carbon dioxide (CO2)	10,210	8,780

*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 MY07-18	Gasoline Bus (MY18)*
CH4 Emissions (grams)	13,163	26,441
N2O Emissions (grams)	59,717	26,441
CO2 (grams)	2,583,313,780	894,480,060

	Diesel Bus MY07-18	Gasoline Bus (MY18)*	Fleet Total
CH4 Emissions (grams) to MTCO2e	0.37	1	
N2O Emissions (grams) to MTCO2e	15.83	7	
CO2 (grams) to MTCO2e	2,583.31	894	
Annual MTCO2e	2,599.51	902	3,502
Annual MTCO2e per VMT	0.00188	0.00111	0.00159

4. Past and Current Initiatives

Improving Cost-Effectiveness

Adoption of the electric bus has yielded a 35% savings in operating costs over diesel operations. Wichita’s regional electric provider, Evergy, is a strong partner in the quest to electrify the fleet by providing a significantly reduced non-peak hour charging rate (50% below standard rates) as an in-kind local match. With this reduced rate, each grant awarded has a multi-fold return not seen in most other communities. Currently, Wichita Transit has two Proterra 150KW in depot plug-in charging stations, and two CCW Electrics Charging stations. Each bus takes approximately 2 hours to recharge. The electrical infrastructure at the Wichita Transit Facility can accommodate up to 5 additional charging stations without significant infrastructure upgrades.



Supporting Other City Sustainability Efforts

The City of Wichita is committed to creating a more sustainable future for our community. In 2021 the City Council formed a Sustainability Integration Board. The purpose of this Board is to advise the City Council and City Staff on sustainability matters affecting the City’s long-term livability and economic vitality. The Board will collaborate with residents, schools, businesses, and other partners to advance the City’s environmental goals, including:

1. Economic opportunities and energy use practices that optimize financial, health, and environmental benefits, including demand reduction, energy efficiency, building, and vehicle efficiency, emissions reduction, energy transition, public and active transportation, and renewable energy expansion.

2. Climate resiliency planning includes resource conservation, air, and water quality, transportation, land management, education, food systems, and quality of life. Waste and material management practices that optimize financial health and environmental benefits, including waste reduction, recycling, composting, and procurement policy.
3. Community outreach initiatives that help to educate residents and businesses on sustainability initiatives that enhance the quality of life in Wichita.
4. Affordability and resiliency of all services vital to the quality of life.

Demonstrating Leadership

The city has been certified in Leadership in Energy and Environmental Design (LEED) since November 2015. The city is one of just 120 LEED-certified cities globally

Wichita participates in the Carbon Disclosure Project (CDP), reporting climate and environmental data through the CDP-ICLEI Unified Reporting System

Wichita participates in the American Council for an Energy Efficient Economy (ACEEE) benchmarking survey

Wichita Transit has committed to the FTA’s Sustainable Transit for a Healthy Planet Challenge to take bold actions and investments to cut GHG emissions.

5. Emission reduction Goals and Targets

Evaluation Category	Indicators
Operations	<ul style="list-style-type: none"> • Increase in ridership • Reduction in auto/non-transit VMTs • Reduced need for off-street parking • Conversion of on-street parking to transit, bicycle, and pedestrian uses
Vehicles	<ul style="list-style-type: none"> • Reduce transit fleet vehicle emissions (zero emissions by 2040)
Facilities	<ul style="list-style-type: none"> • Increase in energy efficiency and renewable energy • Provision of infrastructure to support transit and non-transit electric vehicles

6. Preparing for the Future

Establishing a Baseline Condition

Air Quality/ GHG Emissions

The US EPA has three air quality monitoring stations in Wichita. They measure ozone, Particulate Matter PM 10 & PM 2.5, and other known pollutants. Through monitoring, The US EPA designates certain areas which exceed National Ambient Air Quality Standards (NAAQS) as non-attainment areas. Fortunately, Wichita does not have any non-attainment areas for air quality within the MPO Planning Area. To protect this status and prevent the city from becoming a non-attainment area, Wichita Transit is proactively converting the fleet to zero-emissions vehicles.

The State of Kansas 2019 Ambient Air Monitoring Network plan and data is located here: [State of Kansas \(epa.gov\)](https://www.epa.gov/state-of-kansas)

Next Steps:

- **Identify Potential Strategies**
- **Screen Strategies**
- **Recommend Strategies for Implementation**
- **Define milestones**
- **Document and Share the Action Plan**
 - Partnerships
 - External partners – Universities, Schools, Businesses, etc.
 - Stakeholders
 - Agency staff – internal working group
- **Create necessary policies**
- **Fill resource needs**
- **Conduct outreach and training**
- **Implement data gathering**
- **Ongoing stakeholder engagement**
- **Continued Monitoring**
- **Management and calibration**
- **Monitoring**