

CLIMATE ACTION STRATEGY





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Abbreviations

ABBG	American Bus Benchmarking Group
APTA	American Public Transportation Association
DART	Des Moines Area Regional Transit Authority
FTA	Federal Transit Authority
GHG	Greenhouse Gas

Definitions

<u>ABBG</u> – The American Bus Benchmarking Group, a North American association of mid-sized bus agencies that benchmark performance.

<u>APTA</u> – The American Public Transportation Association, a nonprofit association in North America representing public transportation.

Des Moines Area Metropolitan Planning Organization – The regional transportation planning organization for the Des Moines urbanized area.

FTA - The Federal Transit Administration, and operating administration within the United States Department of Transportation.

<u>Greenhouse Gas</u> – Greenhouse gasses include water vapor, carbon dioxide, methane, nitrous oxide, and ozone and have the effect of trapping radiation from the sun and warms the planet's surface.

<u>Mobilizing Tomorrow</u> - The Metropolitan Transportation Plan of the Des Moines Area MPO, is a federally required plan as part of the transportation planning process. The current plan was adopted on November 21, 2019.

<u>State</u> - A State of the United States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, Guam, American Samoa, and the Virgin Islands.

<u>Transit Agency</u> - An operator of a public transportation system.





Executive Summary

Transportation is a major source of greenhouse gas (GHG) emissions in the United States, accounting for 29 percent of 2019 GHG emissions. Public transportation plays an important role in reducing a community's transportation GHG emissions through transportation and land use efficiencies.

DART has developed a strategy for reducing greenhouse gas emissions by consolidating emission reduction initiatives already underway into a single document, and by identifying opportunities to study additional potential GHG reducing investments and practices. Four key goal areas outlined in this strategy are:

- ► Identify opportunities to reduce greenhouse gas emissions from DART vehicles
- Identify opportunities to reduce greenhouse gas emissions from DART buildings
- ▶ Increase mode share of transit by 1 percent
- Coordinate planning practices with State and regional partners, member communities, and alternative mobility provides

DART's Climate Action Strategy lays the groundwork for further GHG reduction in a cost-effective manner by studying and improving on existing GHG reduction practices and highlighting areas for further study and collaboration. This Climate Action Strategy is not intended as a commitment to specific investments, but rather as a roadmap for how DART staff should organize and prioritize various potential GHG reduction strategies in a manner that aligns with DART's budget constraints and its mission of enriching lives, connecting communities, and expanding opportunities.





1. Introduction

The purpose of this plan is to develop climate action strategies with measurable goals in pursuit of reaching greenhouse gas (GHG) emission targets. Transportation is a major source of GHG emissions in the United States and accounts for 29 percent of 2019 GHG emissions¹. Public transit agencies across the United States play a role in reduction GHG emissions through the services provided and agency fleet and process improvements.

The Climate Action Strategy will identify the existing and potential future initiatives which would reduce DART and regional greenhouse gas emissions. The plan will identify the GHG impact of DART, existing initiatives to reduce the greenhouse gas emissions from the transportation sector, identify goals for reduction, and identify strategies for meeting the goals.

The action strategy was developed by DART staff using existing data from DART and with available data and tools from local, State and Federal partners. It provides a baseline for evaluating the impact DART provides on reducing greenhouse gas emissions in the region. The plan also provides coordination strategies to collaborate in regional planning processes to and work towards meeting regional targets.

The action strategy does is not a fiscally constrained plan nor is it a capital investment plan and does not create any new required investments or expenditures.

¹ U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 https://www.epa.gov/sites/default/files/2021-04/documents/us-ghg-inventory-2021-maintext.pdf?VersionId=yu89kg1O2qP754CdR8Qmyn4RRWc5iodZ





2. Agency Overview

DART is the public transportation resource for the Greater Des Moines region, offering the largest network of buses in the State of Iowa as well as resources for those who vanpool, walk or bike. The Greater Des Moines region has changed dramatically in recent decades with a growing reputation and vision for competing on a national level. A significant part of our community's ability to compete is tied to our workforce, infrastructure, and economic vitality.

Transportation is a critical component of a region's competitiveness - vibrant, growing communities have strong public transit systems at the heart of their infrastructure to connect citizens with jobs, education, shopping and more. The DART Commission and staff have worked diligently to improve the regional transit system since it was formed in 2006. In October 2017, DART's governance structure was reconstituted to establish a Board of Commissioners with one representative for each of its member governments.

DART's current member governments include Altoona, Ankeny, Bondurant, Clive, Des Moines, Grimes, Johnston, Pleasant Hill, unincorporated Polk County, Urbandale, West Des Moines, and Windsor Heights.

Approximately 4.5 million rides in 2019 were provided on DART's fixed route, paratransit, and vanpool services. DART has a fleet of 150 fixed route, on-call, and paratransit vehicles and 112 rideshare vans. DART provides its services from one transit hub, one operations and maintenance facility, 1,780 bus stops, more than 20 Park and Ride locations, and 33 bus stop shelters.

DART's administrative offices and transit hub are located at 620 Cherry St, Des Moines, Iowa 50309, and its operations and maintenance facility is located at 1100 Dart Way, Des Moines, Iowa 50309.

DART is funded by a combination of local property taxes, public-private partnerships, fares, and a variety of state and federal funds, including FTA 5307, 5310, 5311, and 5339 grant programs.





3. Emissions Inventory

A greenhouse gas inventory can be split into three different categories: produced, displaced as well as carbon offsets and sinks.

- ▶ Produced: Emissions from transit.
- > Displaced: Emission reductions as provided by transit.
- ▶ Offsets and Sinks: Purchase or sale of offsets. Development of sinks.

The initial inventory includes the primary source of emissions produced, which includes the operations of public transit buses. Based on the fuel consumption and vehicle miles traveled in the 2020 calendar year, the operation of the DART bus fleet emitted an estimated at 8,131 metric tons CO₂e. Details on this emissions inventory can be found in Appendix A.



Future efforts can calculate and monitor emissions from non-service-related activities such as non-revenue vehicle operations, building operations, solid waste, upstream electricity production, commuting and supply chain.





4. Sustainability Initiatives

DART has engaged in sustainable practice through various initiatives and projects. Designing for efficient operations is fundamentally sound business practice to reduce waste while also having ecological benefits. The following include past and current initiatives of DART which improve sustainability of the agency and impact on the community.

Existing efforts

The following major initiatives demonstrate how DART already contributes to its emission reductions goals. This is not an exhaustive inventory of efforts which contribute to the reduction of greenhouse gas emissions.

DART Central Station LEED Certification

DART Central Station has been certified LEED Platinum, the highest certification of the LEED (Leadership in Energy and Environmental Design) Rating System of the U.S. Green Building Council. DART Central Station achieved LEED Platinum through sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

Highlights include:

- ▶ 24 percent of construction materials were recycled
- ▶ 28 percent of the materials were manufactured regionally
- ▶ 70 geothermal wells help with heating and cooling
- 23,100 kilowatt hours of energy have been generated since opening by rooftop photovoltaic panels, a savings of 39,274 pounds of carbon dioxide
- 1.2 million gallons of rainwater have been captured, cleaned, and reused in place of potable water since opening for tasks such as washing bus platforms – 63 percent of total water used
- ▶ 60 percent total energy cost savings.

The station opened in November 2012 at 620 Cherry Street in downtown Des Moines, replacing the former Walnut Street Transit Mall as DART's primary transfer location. The station features many amenities including climate-controlled waiting areas, covered loading platforms, and a bicycle storage room.

Bus Electrification

In November 2020 DART unveiled the first electric bus in the state of Iowa. DART began a pilot program to test seven electric buses by adding them into service on the Route 60, which is the Ingersoll/University Avenue loop in Des Moines. The pilot project was made possible thanks to a public-private partnership with MidAmerican Energy who signed on to provide the local match for DART's Low- or No-Emission grant application with the Federal Transit Administration (FTA), resulting in DART receiving a \$1.45 million grant.

The Proterra battery-electric buses purchased by DART are expected to save approximately 115 tons of greenhouse emissions annually when replacing a diesel bus. The electric buses are also





expected to reduced noise pollution and lower operating costs compared to combustion engine vehicles. The pilot program has enabled DART to assess the vehicles overall performance and lifecycle costs. In 2021, the first full year of operations, the electric fleet saved an estimated 386.9 tons of carbon dioxide emissions.

Operations and Maintenance Facility

DART's operations and maintenance facility at 1100 DART Way was built in the 1970s and is beyond its useful life. While some electric bus charging infrastructure was installed to support a pilot fleet of electric buses, the garage is undersized for electric buses, is located within a flood plain, and is landlocked amidst rapidly growing residential development.

As DART considers options for investing in repairs or upgrades to its existing operations and maintenance facility or planning a new facility, the capacity to support electric and other zero emissions vehicles should be a key consideration. For example, investment in electric buses is severely constrained in the existing facility due to the size of the storage bay doors and overall height of the storage building as well as undersized electrical service.

Mode Shift

Public transit improves efficiency of transportation by allowing multiple people to travel together with the effect of reducing the cumulative impact of low occupancies vehicles, resulting in reduced overall vehicle emissions and pollutants. Transit also reduces the scale of roadway capacity needs and parking infrastructure by facilitating compact development and decreasing the demand for vehicle trips.

DART provides fixed-route service, demand response, microtransit, and On Call services, paratransit, and RideShare. DART served approximately 15,000 riders on an average weekday and 4.4 million annually in 2019. DART's strongest ridership occurs along high-density corridors, at park and ride locations, at schools, and at major transit hubs (DART Central Station, Merle Hay Mall, Valley West Mall, and Southridge Mall)





The Des Moines Area Metropolitan Planning Organization (Des Moines Area MPO) metropolitan transportation plan, known as Mobilizing Tomorrow, cites the region having a 1% mode share of transit trips (Page 41, Figure 2.16). 88 % of trips are completed using private automobiles in combination of driving alone and carpooling. The data suggests that there is significant opportunity to shift single occupant trips to shared rides in the region, which would reduce GHG emissions.



Figure 1 Current Mode Share (Mobilizing Tomorrow, DMAMPO)





Other GHG reduction goals that may impact DART

In addition to the work of DART, local and regional governments are including emission reduction and sustainability goals in planning activities. The following goals have been adopted by the respective jurisdiction. Understanding regional goals within the DART service area provides additional context for DART to evaluate opportunities to collaborate and partner service in reaching goals.

Polk County adopted the following resolution outlining policies and goals on September 14, 2021

- ► Commits to:
 - Engaging an experience and qualified energy consulting firm to conduct a formal audit of the County's energy consumption and greenhouse gas emissions at all county properties and vehicle fleet; and
 - Include in the energy audit Scope of Work for the firm to provide recommendations of new practices and policies for reducing energy consumption and greenhouse gas emissions; and
 - Establish measurable greenhouse gas emissions reduction and renewable energy targets for Polk County with formal recommendations for implementation in fiscal year 22/23; and
 - Address the concerns of the underrepresented and vulnerable communities during the climate action planning process, and
 - Develop a Climate Action Plan to meet the greenhouse gas reduction and renewable energy targets; and
 - Implement the plan and ensure measurements are being properly reported and communicated to the community; and
 - > Continuously monitor and report progress of the Climate Action Plan; and
- Invite and encourage the Polk County community to actively participate in this process of developing and implementing a Climate Action Plan to advocate for their priorities; and
- Use a collaborative approach to develop and implement plans to contribute to the successful achievement of County greenhouse reduction and renewable energy targets; and
- ► For the County Administrator's Office to provide administrative oversight for this effort and to establish a cross-department Climate Action Team. The Team will work with and support the energy consulting firm on the energy audit and new practice and policies recommendations; make recommendations to the Board for implementation plans; track and regularly report measurements, lead the implementation of the Climate Action Plan, prepare an annual report on the status of the Climate Action Plan, and other duties as assigned; and
- Board to provide strategic direction to the Team, shall approve the greenhouse gas reduction targets and implementation plan, shall provide the necessary staff with appropriate experience and financial resources to achieve the goals of the implementation plan, shall eliminate barriers to implementation, shall set interval for reporting the emissions inventory; and





- That the Team shall consist of designees from County departments, shall convene within three months of the signing of this Resolution, shall meet monthly to maintain actions to implement the Climate Action Plan, shall recommend reduction targets and department progress reporting deadlines to the Board, shall develop guidelines and necessary policies to support departments in meeting the County targets, shall facilitate cross-department coordination and shall seek the participation as appropriate of internal and external stakeholder groups; and
- ► That the Climate Action Plan will be integrated into key County processes and planning such as general plans, strategic plans, capital planning, budgeting, and training when possible and appropriate; and
- Polk County commits to a goal of reducing greenhouse gas emissions from county operations by 90% of current levels by the year 2040; and
- Global warming will be an on-going focus of Polk County including sharing urgent concerns and key learning with business, the public and other governmental agencies.

City of Des Moines adopted the following goals on January 11, 2021 (Roll Call Number 21-0040)

- ▶ Update greenhouse-gas emission goals to align with IPCC recommendations and commits to developing partnerships that advance a 45% reduction of greenhouse gas emission from 2010 levels by 2030 to reach net-zero greenhouse gas emissions by 2050.
- ► Community-wide goal of achieving 100% 24x7 electricity from carbon-free sources by 2035
- ► Work with utility partners, businesses, residents, and community stakeholders to identify a collaborative approach to achieve the emissions targets and energy goals with meaningful benchmarks and milestones between now and the target years referenced.





5. Emission Reduction Goals

The following goals provide a framework for identifying and prioritizing opportunities for reducing DART and the region's GHG emissions:

- 1. Identify opportunities to reduce greenhouse gas emissions from DART vehicles
- 2. Identify opportunities to reduce greenhouse gas emissions from DART buildings
- 3. Increase mode share of transit by 1%
- 4. Coordinate planning practices with State and regional partners, member communities, and alternative mobility providers





6. Strategies and Actions

This Climate Action Strategy identifies specific goals which have been selected because they are timely, actionable, and contribute to the reduction of greenhouse gas emissions. The following outlines specific strategies for DART to pursue and make progress on the goals. Each strategy includes a specific action, metrics used to track progress, on-going, near- and long-term timeframes, and DART departments responsible for leading the tactic.

6.1. Goal #1: Identify opportunities to reduce GHG emissions from DART vehicles

Understand the state of the industry in low and no-emission vehicle technology and the opportunities and challenges associated.

Strategy	Actions	Actions Metric to track progress Timeframe		Responsible Office
Continue to monitor electric bus pilot	Maintain dashboard of relevant metrics	Vehicle range, Lifecycle costs	On-Going	Business Intelligence
Investigate fleet propulsion technologies with	Review case studies	Number of technologies considered	Near term	Fleet
greenhouse gas emissions	Participate in peer sharing committees such as APTA and ABBG	Number of meetings attended	Near term	Fleet
Identify infrastructure capacity and needs to accommodate	Identify scalability of low/no emission fleet at DART facilities	Report	Near term	Facilities
technologies	Identify opportunities to increase capacity of low/no emission fleet	Report	Near term	Facilities
Plan bus garages and facilities for convertibility to accommodate future zero-emission technologies	Incorporate technologies for zero-emission vehicles in design of bus garage and facility projects	Number of vehicles which could be accommodated in garage	Long Term	Facilities





6.2. Goal #2: Identify opportunities to reduce GHG emission from DART buildings

Define the current Infrastructure capacity of DART to operate low and no-emission vehicles and identify facility requirements to accommodate various fleet strategies.

Strategy	Actions	Metric to track progress	Timeframe	Responsible Office
Review DART Central Station energy production system technologies and identify cost effective updates	Review energy production system	Number of cost- effective technologies identified	Near term	Facilities
Work with local utility provider to optimize building energy use and pricing	Review electricity contracts	Total energy use, GHG emissions from building energy use	Near term	Facilities
Evaluate new green building and infrastructure certifications where appropriate	Review projects as they are developed	Number of certifications	Long Term	Facilities

6.3. Goal #3: Increase mode share of transit by 1%

Increase ridership on existing DART services through implementation of design principles in the Transit Optimization Study to provide effective service using the most appropriate means.

Strategy	Actions	Metric to track progress Timeframe		Responsible Office
Maximize service utilization	Update routes based on performance	Service productivity metrics	On-Going	Planning
Implement effective	Identify markets with high propensity for transit use	Ridership data	On-Going	Planning
updates	Implement services in accordance with TOS principles	Alignment with TOS recommendations	On-Going	Planning





Strategy	Actions	Metric to track progress	Timeframe	Responsible Office
Coordinate capital and service	Coordinate amenity locations	Number of stops with amenities	On-Going	Planning and Facilities
and service optimizations with area planning efforts	Participate in Des Moines ICM	Number of meetings attended	On-Going	Planning

6.4. Goal #4: Coordinate planning practices with State and regional partners, member communities, and alternative mobility providers

Work with local partners to understand GHG reduction goals, collaborate on shared objectives, and stay abreast of the state of the practice and regional efforts.

Strategy	Actions	Metric to track progress	Timeframe	Responsible Department
Provide technical	Share Transit Optimization Study and Climate Action Strategy recommendations	Number of meetings with member communities	Near term	Planning
support to member communities and partner planning	Technical input on local land use and roadway planning	Number of On-Goir requests		Planning
organizations	Participate in regional transportation planning	Participation in MPO committees and other relevant opportunities	On-Going	Planning
Collaborate on local and regional climate	Participate with DMA MPO Environmental Subcommittee	Number of meetings attended	Near term	Planning
initiatives	Seek new opportunities as they become available	Number of associations	On-Going	Planning





7. Implementation and Monitoring

Implementing these climate action strategies requires a concerted effort, partnerships and an understanding of the challenges ahead. The following processes will be used to track implementation of the strategies and monitor progress towards meeting DART's GHG emission reduction goals.

7.1. Tracking progress

The strategies and actions identified will be integrated into the appropriate agency activities, demonstrating progress in the following ways:

- DART business plan will include identified strategies and identify owners of appropriate activities.
- Data and analytics will be tracked and reported in internal systems on appropriate dashboards and reports.
- Annual updates to the commission will be made to demonstrate activities achieved, in progress and where additional opportunities exist.

7.2. Emerging Challenges

Recognizing challenges in progressing with the outlined goals is important to understand and plan for. Anticipating the future requires DART to adapt to new challenges, shifts in technology, and align with partner stakeholders over time. Understanding what challenges may emerge will benefit all participants during implementation.

- ► Evolving technologies Research into new technologies can quickly be outdated upon advancements. DART will need to understand potential future capabilities when evaluating existing technologies, and to plan for iteration over time in accommodating change.
- ► **Fuels** External pressures on fuels, such as price, availability, blends and local, State, or Federal mandates can have a major impact on the viability of different strategies. Anticipating the variability and potential outcomes will be key.

7.3. Looking Ahead

To meeting the evolving needs of our growing region, DART strives to provide seamless mobility options that support economic prosperity for all by:

- Connecting people to jobs, education, and essential services
- Leveraging data, technology, and collaborative partnerships
- Ensuring innovative and regional mobility solutions are in the right place at the right time

These objectives are demonstrated in the planning and programming of DART resources and services. This Climate Action Strategy is the first document specifically prepared to outline the impact DART services has contributed to greenhouse gas emission reduction. This document consolidates these initiatives and was prepared to focus on these efforts in a comprehensive way. As such, progress made on the outline goals and strategies, and changing conditions of technology, research, and local planning, will require updates to this plan over time.



Appendix A – Greenhouse Gas Emissions Inventory Methodology

Emission Sources Associated with DART Service and Operations

	Transit Service Delivery		Scope
Mobile combustion	Emissions sources associated with combustion of fuels for transit vehicles	1	Purchased fuel
Electricity for traction power	Emission sources attributable to the electricity purchased or produced to power transit vehicles	2	Purchased electricity
Trip diversionsEmissions reductions associated with the reduction of automobile trips when riders use transit		3	
Land Use	Emission reductions associated with more compact development, more bike and walk trips, trip chaining, lower car ownership and other land-use effects associated with transit service	3	
Capital works	Indirect emissions (upstream) from materials associated with new capital works	3	Purchased goods and services capital
Construction EquipmentDirect emissions from on- and off-road vehicles and equipment		3	Services
Trans	it Maintenance and Operations		Scope
Agency fleet	Direct emissions associated with agency fleet	1	Purchased fuel
Facilities	Electricity and fuel use at facilities, maintenance yards, offices, and other stationary sources	2	Purchased electricity Purchased heating and cooling





Emission Inventory Calculation Methodology for Fleet (Scope 1 production)

	Year	Diesel Bus MY 2007-2018		el Bus MY 2007-2018 Gasoline Bus	
		gallons	VMT	gallons	VMT
Fleet Energy Usage	2020	783,922	4,313,792	8,473	278,553

Mileage Based Emission Factors	Diesel Bus MY07-18	Gasoline Bus (MY18)
	g/mi	g/mi
Methane (CH4)	0.0095	0.0326
Nitrous oxide (N20)	0.0431	0.0082

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

Annual Emissions		
	Diesel Bus	Gasoline
	MY07-18	Bus
		(MY18)*
CH4 Emissions (grams)	40,981	9,081
N20 Emissions (grams)	185,924	9,081
CO2 (grams)	8,003,843,620	74,390,921

	Diesel Bus MY07-18	Gasoline Bus (MY18)*	Fleet Total
CH4 Emissions (grams) to MTCO2e	1.15	0	
N20 Emissions (grams) to MTCO2e	49.27	2	
CO2 (grams) to MTCO2e	8,003.84	74	
Annual MTCO2e	8,054.26	77	8,131
Annual MTCO2e per VMT	0.001867095	0.000276614	0.001770623

Emission calculations utilize emission factors from the 2021 Default Emissions from the Climate Registry (source: https://www.theclimateregistry.org/wp-content/uploads/2021/05/2021-Default-Emission-Factor-Document.pdf)