



Small Transit Agency Innovates to Reduce GHG Emissions

The Champaign-Urbana Mass Transit District (MTD), a small transit agency in central Illinois, is addressing greenhouse gas (GHG) emissions from its operations through strategic fleet transition and onsite energy generation. MTD leadership strongly supports GHG emissions reductions through its own actions and supporting partners to increase modal options across the regional system.

Agency Environmental Policies and Systems

MTD adopted a Quality and Environmental Policy, which drives the agency's primary commitment to "increase customer satisfaction and reduce MTD's environmental impact." MTD follows MTD2071, which is a combination of its three International Organization for Standardization (ISO) systems to meet these commitments. MTD was the sixth transit provider in the country to achieve ISO 14001 Certification for the implementation of an [Environment and Sustainability Management System](#) (ESMS), which ensures that the agency incorporates environmentally sustainable principles into its activities.

Fleet Transition

Transitioning fleets to low or zero-emission vehicles is a key strategy for public transit agencies to reduce their own emissions. In 2009, the MTD board of directors pledged to no longer approve purchases of diesel buses, and that all future vehicle purchases were to be low or zero-emission vehicles. The transition implementation approach is documented in MTD's Zero-Emission Transition Plan, developed to support applications to the Federal Transit Administration's (FTA's) Low or No Emission Vehicle Program and other grant programs as applicable.

Vehicle Technology

MTD developed a phased transition plan for fleet replacement, focusing first on hydrogen fuel cell electric buses, which reduce emissions while maintaining the operation range needed to meet customer satisfaction and maintain existing routes. The agency plans to move to battery electric buses in later years, anticipating technology improvements.

Onsite Energy Generation

In order to ensure that the fuel cell electric buses produced zero emissions, MTD established an onsite generation process, which included solar panels and a hydrogen fuel production station (using energy from the solar panels) to turn water into hydrogen. This hydrogen supplies the electric power used by the fuel cell electric buses. MTD is the first transit agency in the United States to operate a hydrogen fleet entirely fueled by its own 100% renewable energy source. MTD worked closely with local utility companies, the regional water district, and the regional sanitary district to ensure the agency's hydrogen station met safety standards and other regional requirements and needs.

Highlights

- Internal priorities to reduce GHG emissions
- Innovation with onsite energy generation
- Strategic fleet transition plan
- Partnerships to support multimodal travel

Context

The Champaign-Urbana Mass Transit District (MTD) is a small public transit provider in central Illinois, serving a population of approximately 135,000 across Champaign, Urbana, and Savoy. MTD operates 25 fixed routes with over 100 vehicles, as well as on-demand transit services.





Climate Action Plan

MTD published its Climate Action Plan in 2022, as part of the Federal Transit Administration's (FTA) Climate Change Initiative, which describes the agency's approach to reducing GHG emissions. This plan was awarded "Most Innovative" by FTA for its use of creative solutions to implement the climate action strategy. The Climate Action Plan builds on frameworks from MTD2071 to achieve service quality and environmental objectives. MTD uses vehicle miles traveled (VMT) as a proxy for GHG emissions, demonstrating the change in emissions from 2009 to 2018 based on changes to the agency's fleet, shown in **Table 1**. The Climate Action Plan included a target of 100% of fleet as low or zero-emission vehicles by 2023 (which has been met), a target of 20% of the fleet as zero-emission by 2030, and a target to decrease annual GHG emissions from the fleet by 25% by 2030 from 2009 levels.

Table 1. Emissions Inventory for MTD Climate Action Plan. Source: MTD

Indicator	Normalization Factor	2009 Baseline (Amount)	2009 Baseline (Normalized)	2018 Follow Up (Amount)	2018 Follow Up (Normalized)	% Change from Baseline (Normalized)
GHG emissions in metric tons of carbon dioxide equivalent	VMT	8,281 metric tons of CO ₂ e	0.0026884	7,798 metric tons of CO ₂ e	0.0022841	-15%
Vehicle energy use in gallons of fuel	VMT	821,273 gallons	0.2666221	720,804 gallons	0.1988169	-25%
Low emission fleet	Total Fleet	9 hybrid buses	9%	92 hybrid buses	83%	+74%

Partnerships

MTD has close partnerships with local and regional agencies, which has helped the agency meet its own goals, as well as support the goals of their partner agencies.

MTD's fleet transition and GHG reduction goals are aligned with the City of Urbana's Climate Action Plan, which includes a goal for 80% reduction in GHG emissions by 2050 and calls for a reduction of non-renewable energy sources and an increase in wind and solar power.

MTD partnered with the City of Champaign, the City of Urbana, and the University of Illinois at Urbana-Champaign to develop a winning Transportation Investment Generating Economic Recovery (TIGER VI) grant to implement complete streets designs and expand multimodal transportation options through the cities' downtown districts and university campus. MTD also led an initiative, supported by these same partners to bring carshare and bike share to these areas to reduce emissions and increase modal options.

MTD has also established an apprenticeship program with the local community college to support training for electric vehicle maintenance.

The Champaign County Regional Planning Commission includes MTD's vehicle transition goals in its long-range plan annual report card, which communicates progress towards meeting regional transportation goals, shown in **Figure 1**.

Rating	Performance Measure: Percentage of low and zero-emission transit vehicles in MTD's Fleet.
2021 	In 2021, 96% of transit vehicles in the CUMTD's fleet were low and zero emission vehicles. The fleet consists of 4 diesel, 108 hybrid, and 2 hydrogen fuel cell vehicles. The proportion increased by 4 percentage points from the 2020 baseline. <i>Positive Rating.</i>
2022 	In 2022, 96% of transit vehicles in the CUMTD's fleet were low and zero emission vehicles. The fleet consists of 4 diesel, 108 hybrid, and 2 hydrogen fuel cell vehicles. The proportion is 4 percentage points from the 2020 baseline. <i>Positive Rating.</i>
2023 	In 2023, 100% of transit vehicles in the CUMTD's fleet were low and zero emission vehicles. The fleet consists of 116 hybrid and 2 hydrogen fuel cell vehicles, which is 8 percentage points higher than the 2020 baseline. <i>Positive Rating.</i>

Figure 1. Champaign County Regional Planning Commissions Long-Range Transportation Plan Annual Report Card, adapted for legibility. Source: CCRPC

Key Takeaways

- **Internal culture focused on reducing GHG emissions.** Maintaining an internal cultural attitude towards reducing environmental harm helps to align staff with a shared mission of reducing GHG emissions. MTD's board of directors and internal operation procedures instilled a cultural philosophy to focus on twin goals of customer satisfaction and environmental harm reduction.
- **Strategic selection of vehicle technology.** Selecting vehicle and technology types for a fleet transition plan should be carefully planned to consider agency goals and future forces. MTD's transition plan includes a thoughtful approach to vehicle selection and phasing of types of vehicles to ensure maintenance of customer satisfaction and allow for future advances in vehicle technology.
- **Onsite energy generation.** Onsite generation of energy allows the agency to control the upstream emissions from energy production to ensure GHGs are not emitted during fuel creation.
- **Partnerships.** While transit agencies can reduce GHG emissions from their own operations, they also have the opportunity to work with partners to increase opportunities to use transit or reduce single occupancy vehicle driving through support on complete streets implementation or first-mile/last mile solutions, such as bikeshare systems.

Resources

- MTD Climate Action Plan. <https://mtd.org/media/3851/mtd-climate-action-plan-2022.pdf>
- MTD Zero Emissions Plan. <https://mtd.org/media/4004/zero-emission-transition-plan-2023-update-20230322.pdf>
- MTD2071. <https://mtd.org/inside/mtd2071/>
- Champaign County Regional Planning Commission Long Range Transportation Plan Annual Report Card. <https://data.ccrpc.org/pages/lrt-2045-report-card>