Zero-Emissions Fleet Transition Case Study

Zero-emissions bus charging

Transitioning to a zero-emissions bus fleet

In 2018, the MTA announced a commitment to transition the entire bus fleet to zero-emissions by 2040. This ambitious initiative is a core component of the MTA's goal to reduce agency-wide greenhouse gas emissions 85% by 2040. When completed, the transition will eliminate more than 500,000 metric tons of emissions annually.

Fossil-fueled vehicles have supported MTA bus operations since the mid-20th century. Until recently, MTA capital investments, operations, and workforce skills were oriented around fossil-fuel-based technologies. Converting to alternative technologies requires unprecedented investments in new types of vehicles, in workforce training, and, most consequentially, in new electric vehicle charging equipment to replace fossil fuel infrastructure.

The MTA's bus fleet transition is complicated by the fact that it is orders-of-magnitude larger than any other transit agency across the country. The transition will entail major challenges, including funding constraints, limited availability of suitable products, and uncertainties associated with rapidly emerging new technologies.

Committed to sustainability

MTA is ready to rise to the challenge and is committed to slashing the emissions of its bus fleets for the health of our customers, our workforce, and our planet. This commitment is bolstered by MTA's yearslong leadership in the use of low emissions fuels and technologies for its fleets, including renewable natural gas.

New bus fleet. New bus depots. A workforce with expanded skills.

The Zero-Emissions Bus Transition Plan will be guided by criteria such as equity and environmental justice, distribution across boroughs, construction feasibility, schedule feasibility, depot modifications and power supply availability. In consideration of these criteria, the transformation will be implemented across three areas:

Fleets: The MTA is transitioning its fleet of almost 6,000 buses to zero-emissions buses in four stages, closely aligned with the capital planning process.

- **Stage 1** (2015-2019 & 2020-2024) deploys 560 battery-electric buses to test infrastructure and operational feasibility.
- **Stage 2** (2025-2029) deploys over 100 buses at multiple depots while converting Jamaica Depot to 100% zero-emissions. All new bus orders become zero-emissions after 2029.
- **Stage 3** (2030-2034) converts about a third of the fleet to zero-emissions with a mixture of propulsion types that include battery-electric and some hydrogen fuel cell buses.
- **Stage 4** (2035-2039) will round out the transition to 100% zero-emissions bus service and retire all remaining non-zero-emissions buses.

Depots: The MTA will focus on in-depot charging, using high-capacity chargers with multiple dispensers and dedicated positions for each bus. This transition will require approximately 262 MW of new power supply across 28 bus depots. We are also exploring options like on-site battery storage and solar generation to reduce grid power demands. Many depots will need significant upgrades to accommodate zero-emissions buses, and some may even require expansion or acquisition of new facilities.

Workforce: Over the course of the transition, the MTA will develop workforce skills in four areas: safety, bus maintenance, facilities maintenance, and operations. Safety will require baseline awareness for all staff and more extensive training for those working with high voltage systems. Bus maintenance staff will need new skills for battery and electric propulsion systems. Facilities maintenance will involve troubleshooting and fixing charging equipment. Operations will require adapting to charging requirements and range limitations. The MTA is developing training programs and leveraging existing experience to prepare its workforce for these changes.