

Energy Action Plan

FY20 Annual Progress Report

Background

Metro's Energy Action Plan defines the path to a greener, safer, more reliable transit system for the National Capital Region. By following this plan, Metro is achieving environmental goals through increased energy efficiency and is generating long-term cost savings to ensure responsible stewardship of the region's dedicated funding.

FY20 Summary — Metro is advancing strategic investments in energy efficiency

Starting in FY20, the Covid-19 pandemic brought unprecedented changes to how we work, travel, and engage with our communities. Throughout the pandemic, Metro's essential transit workers kept the region moving for healthcare providers, first responders and other frontline workers. As the region adjusted to this new normal, Metro continued planning for a future where we support energy and environmental goals in the National Capital Region.

In Fiscal Year 2020, from July 2019 through June 2020, Metro advanced programs that increase energy efficiency, mitigate risk, and promote fiscal responsibility.

Highlights from this past year:



Completed platform-level light-emitting diode (**LED**) **lighting upgrades at 48 underground stations** including track beds, pylons and parapets—one year ahead of schedule



Negotiated and signed an innovative [lease agreement](#) to **install solar carports at four Metro sites**—nearly 10MW of community solar, estimated to produce enough energy each year to power ~1,100 single family homes



Awarded a **competitive three-year natural gas contract** in coordination with General Services Administration (GSA) Energy Division, saving Metro approx. \$750,000 annually



LED lighting upgrades mean stations are up to 10 times brighter - improving the customer experience and safety, while reducing energy consumption and costs (Pictured: Pentagon City)

Measuring Annual Progress:

Metro calculates the “energy use per vehicle mile” to measure its overall progress on energy efficiency.

In FY20, Metro’s energy use per vehicle mile increased slightly by 1.5% compared to the previous year. This is partially due to significantly reduced transit vehicle miles in response to COVID-19 and continued operation of essential support assets.

As Metro continues to increase transit service, it is anticipated that Metro will be within range of its energy efficiency target by 2025 through continued implementation of the Energy Action Plan.

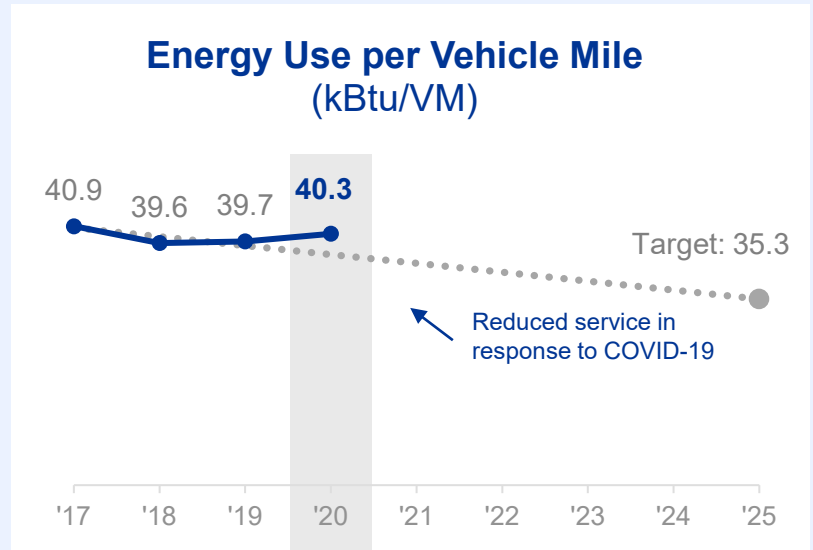


Figure 1: In 2014, Metro established the target of a 15% reduction in energy use per vehicle mile by 2025.

In This Report

This report communicates Metro’s progress and achievements in FY21. It focuses on the three key pillars in the Energy Action Plan, including:

1. Implement Energy Audit Identified Investments

2. Modernize Design, Construction, and Operations

3. Engage Dynamically in the Energy Market

1. Implement Energy Audit Identified Investments

In FY20, Metro continued implementing, tracking and reporting the delivery of energy efficiency investments embedded within its Capital Improvement Program. Metro will continue implementation of projects that improve energy efficiency and help reduce operating costs.

SCORECARD

FY19–20 Project Accomplishments and FY21 Priorities

Project Category		Action	19	20	21
Lighting	Station lighting systems (trackbeds, pylons, and parapets)	Upgrades at 25 underground stations (FY19), complete all 48 underground stations (FY20) (project 100% complete)	✓	✓	
	Non-revenue facilities	Upgrades at 11 facilities for Phase 1 (FY19), 9 facilities for part of Phase 2 (FY21)*	✓	+	□
		Upgrades at 14 facilities for Phase 2 (FY22)*			□
	Tunnel lighting	Systemwide upgrades 20% segments (FY19), 58% (FY20), 63% (FY21)*	✓	✓	□
		Systemwide upgrades to 77% of segments (approx. 17,000 total fixtures) (FY22)*			□
	Station backrooms	Upgrades at 25 stations for Phase 1 (FY20), 56 stations for Phase 2 (FY21)		✓	□
Traction Power	8000-series railcar procurement	Include efficiency incentives and penalties in solicitation (FY19), select vendor (FY21)*	✓		□
	Maintenance of way vehicle tracking	Installation (FY20–21), measurement and verification of tracking devices (FY22)*		✓	□
	Braking energy recovery	Design (FY20) and install two energy recovery units for test and evaluation (FY22)*		✓	□
		Update specifications to require modern technology in traction power upgrades*		→	□
		Develop designs/specifications for two battery storage systems and initiate procurement*		→	□

*Action impacted by COVID-19 Pandemic

Scorecard Key

- ✓ Action completed
- +
- Action moved to next fiscal year
- Planned action

Project Category		Action	19	20	21
Facilities	Investments in efficient facilities	Andrews Federal Bus Garage built and operating to LEED® Silver Standards (FY19), certified (FY20); est. 30% energy savings from ASHRAE 90.1-2007	✓	✓	
		Cinder Bed Road Bus Garage built, certified, and operating to LEED® Gold Standards; est. 20% energy savings from ASHRAE 90.1-2007	✓		
	Manage to Energy Action Plan recommendations	Establish ownership for management of facilities		✓	
Stations	Chiller plant upgrades (incl. frictionless bearings and variable frequency drives (VFDs))	Upgrades at 8 sites (FY19), 5 sites (FY20) (systemwide approx. 90% complete)	✓	✓	
	Manage to Energy Action Plan recommendations	Establish ownership for management of stations		✓	
	Variable Frequency Drive (VFD) test and evaluation	Install VFDs on four air conditioning units and four drainage pumping stations			☐
Bus	Zero-emission fleet strategy	Conduct electric bus strategy research (FY19), release Zero-Emission Bus Update (FY20)	✓	✓	
		Secure Metro’s Board adoption of zero-emission bus goals (FY21)			☐
		Initiate electric bus test and evaluation phase (FY20), secure FTA Low-No Grant for two buses and charging equipment (FY21)		✓	☐
	Bus priority measures	Conduct analysis of transit signal priority (TSP) (FY19), install TSP devices on Metrobus fleet (FY21)	✓		☐
		Partner with jurisdictions to implement dedicated bus lanes and other bus improvements, such as queue jumps and TSP (FY20-21)		✓	☐
	Cashless fare payment pilot	Conduct a 12-month cashless fare payment pilot on the 79-bus route	✓		
	Bus eco-driving	Install and evaluate efficient transmissions with FuelSense software on 7% of fleet (FY19), 14% of fleet (FY20), 21% of fleet (FY21)	✓	✓	☐
	Bus Transformation Project	Engage with jurisdictions and the public to develop draft strategy	✓		
Release final strategy and action plan			✓		

*Action impacted by COVID-19 Pandemic

Scorecard Key

- ✓ Action completed
- Action moved to next fiscal year
- ☐ Planned action

2. Modernize Design, Construction, and Operations

In FY20, Metro continued to incorporate energy efficient design standards in major facilities under development, including the Heavy Rail Overhaul facility, Potomac Yard Station, Northern and Bladensburg Bus Garages, Grosvenor-Strathmore Parking Garage and three new Metro headquarters buildings. Metro will continue to standardize and adopt best practices, including energy efficient building standards, design guidelines and standard operating procedures at Metro facilities.

SCORECARD

FY19–21 Project Accomplishments and FY22 Priorities

Project Category		Action	19	20	21	
Design, Construction & Operations	Design criteria & specifications update	Update Design Criteria and Standards (DC&S) Manual and contract language to support energy efficiency		+	☐	
	Energy efficient operating procedures	Update policies and procedures affecting energy efficiency and purchasing		+	☐	
	Capital Improvement Program prioritization	Include utilities operating cost impact in project initiation review		✓		
		Integrate energy efficiency best practices into DC&S, contract language, lifecycle costing, etc.			+	☐
		Train staff in LEED® and Envision® standards				☐
	Lifecycle costing and energy efficient building standards included in major capital investment contracts	Release RFPs (FY19) and design Northern and Bladensburg Bus Garages and the Heavy Repair & Overhaul facility using LEED® criteria		✓	+	☐
		Evaluate design of Metro’s new headquarter facilities using 30-year return on investment (ROI) threshold and LEED® criteria		✓		
		Incorporate ‘electric-bus-ready’ design in new bus garages currently under development (Northern and Bladensburg)			✓	☐
	Project support for major capital projects	Design/build Potomac Yard Station to meet LEED® for Transit standards (FY20–21)			+	☐
		Design/build Grosvenor-Strathmore Garage expansion to meet Parksmart® standards (FY21)				☐
	Best practice consultation with peer agencies and industries	Actively participate in APTA Sustainability Committee, CoMET/NOVA and UITP research and benchmarking efforts		✓	✓	☐

Scorecard Key

- ✓ Action completed
- + Action underway, partially completed
- ☐ Planned action

Metro leads innovation in green building design and construction

Metro is incorporating energy efficiency and sustainability into the design of the new Potomac Yard-VT Metrorail station. Metro is on track to be one of the first transit agencies in the U.S. to certify a station project under the LEED for Transit® pilot rating system.

Metro is actively engaging with the U.S. Green Building Council’s “LEED for Transit” pilot program to test new criteria for green building design and construction of transit stations. Metro’s project team is providing important feedback to adapt LEED® standards to rail station design and construction and leverage the framework as a tool help advance climate and sustainability goals for transit agencies.



New infill station on the Blue Line
(Pictured: Rendering of Potomac Yard Metrorail)

3. Engage Dynamically in the Energy Market

In FY20, Metro continued to engage with major regional energy policy groups and awarded a cost-effective natural gas supply contract in coordination with the GSA Energy Division. In addition, engagement in the renewable energy market resulted in an innovative lease agreement to host nearly 10MW of solar carports at four Metro stations in District of Columbia and Maryland (Anacostia, Cheverly, Naylor Road, and Southern Avenue). Metro will continue to explore energy market engagement opportunities, including renewable energy.

SCORECARD

FY19–20 Project Accomplishments and FY21 Priorities

Project Category		Action	19	20	21
Energy Market Engagement	Strategic energy purchasing	Establish cross-departmental group to support strategic energy purchases	✓		
		Secure new natural gas supply contract in coordination with GSA		✓	
		Engage technical resources to prepare for new electricity supply contracts		✓	
		Evaluate renewable natural gas opportunity		✓	
		Explore and implement renewable energy purchasing; award District of Columbia electric supply contract in coordination with GSA Energy Division and include high renewables requirement			☐

Scorecard Key

- ✓ Action completed
- ☐ Planned action

Project Category		Action	19	20	21
Energy Market Engagement	Enterprise Energy Monitoring Software (EEMS)	Issue RFP and select vendor for EEMS 2.0 (enhanced analysis and visibility into operations)	✓		
		Launch EEMS 2.0 and train interdepartmental staff to leverage tool capacity		✓	
	Solar program	Develop business case (FY19), issue RFP and select vendor for third party design and operation at four Metro sites (Southern Ave, Cheverly, Naylor Rd, and Anacostia) (FY20), initiate design review and permitting approval for solar carports (FY21)	✓	✓	☐
		Phase 2—Other Metro facilities: Evaluate and advance designs for solar at additional facilities			☐
	Utility rebates	Apply for/receive utility energy efficiency rebates: \$430K (FY19), \$245K (FY20), est. \$300K (FY21)	✓	✓	☐
	Active engagement with regional stakeholders and working groups	Continue collaboration and advocacy with stakeholders (e.g., DC Power Path, Connected DMV, Washington Advanced Energy Group, and local Public Utility Commissions)	✓	✓	☐
Continue to work with utilities for fleet electrification (incl. garage and on-route charging) and EV charging opportunities at parking facilities			✓	☐	

Scorecard Key

- ✓ Action completed
- ☐ Planned action



Metro is Engaging in Zero-Emission Bus Planning

Metro is engaging in zero-emission fleet planning to support a transition to a 100% zero-emission bus fleet by 2045. This will enable cleaner and more sustainable transit service and support a more livable and prosperous region.

Zero-emission buses have the potential to reduce local air pollution; provide a quieter, smoother ride; and support a more livable and equitable region.

In FY20, Metro released its [Zero Emission Bus Update](#), detailing regional benefits and opportunities, outlining actions Metro has undertaken, and delineating market, infrastructure and policy prerequisites for success.



Metrobus in front of electric utility substation (Pictured: Bus parked at Four Mile Run Bus Garage)