

METRO SUSTAINABILITY 2017

Washington Metropolitan
Area Transit Authority



sustainability



SafeTrack - Sustainability 2016

8,220 Wooden crossties recycled

\$2,631 Annual energy savings from new LED signals

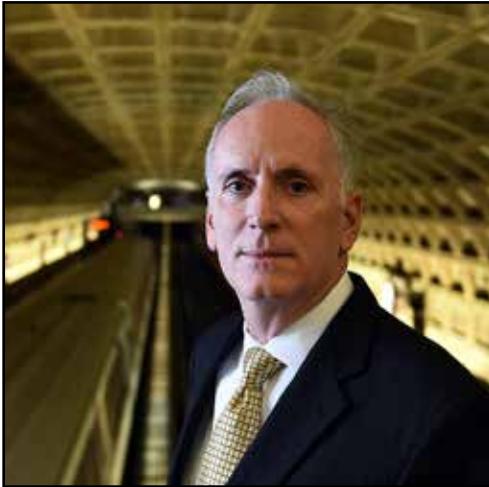
1,000+ Tons of metal recycled

BACK2GOOD - SafeTrack

Three years of maintenance in a little more than one year - SafeTrack promotes sustainability by extending the life of Metro's track assets and replacing or repairing assets that have reached the end of their useful life. To achieve these goals, the program expands maintenance time on weeknights, weekends and midday hours and includes 16 "Safety Surges" for major projects in key parts of the system.

**SAFETY, SERVICE RELIABILITY,
AND FISCAL RESPONSIBILITY**

General Manager/CEO Message



“Sustainable projects facilitate long-term cost savings”

In 2017, Metro continues to improve the overall safety of the system, while placing a much greater emphasis on the customer experience. By investing in our infrastructure, we are working to get “Back2Good.” We hope that customers will see tangible improvements once unscheduled delays due to track problems are reduced and the reliability of our train fleet improves.

The “Back2Good” plan also focuses on improving Metro’s financial management and stability. As we rebuild the system, it’s critical that we invest smartly and demonstrate responsible stewardship of the region’s dollars. My leadership team and I recognize that sustainable projects facilitate long-term cost savings.

That’s why Metro has initiated an Authority-wide energy audit to recommend smart, sustainable investments. The audit will identify programs that can help us meet ambitious energy reduction targets while also reducing costs. The report will provide concrete recommendations, including integration into capital programming, asset management, as well as how we rebuild and operate the system.

In addition, Metro is launching an Enterprise Energy Management system that will allow internal transparency, accountability and asset management of Metro’s \$107 million energy budget. By incorporating the management of energy use across the Authority, WMATA will be able to reach its ambitious energy reduction targets and achieve associated cost savings.

Since its adoption in 2014, Metro’s Sustainability projects have included efficient passenger garage lighting, rail yard switch heaters, and building automation systems at key facilities. These projects have saved approximately \$2.5 million annually across the agency while reducing use of utilities, upgrading equipment and reducing labor requirements.

The Sustainability program will continue to help Metro provide a sustainable transit network around which our region can prosper.

A handwritten signature in black ink that reads "Paul J. Wiedefeld". The signature is written in a cursive, flowing style.

Paul J. Wiedefeld
General Manager/CEO
Washington Metropolitan Area Transit Authority

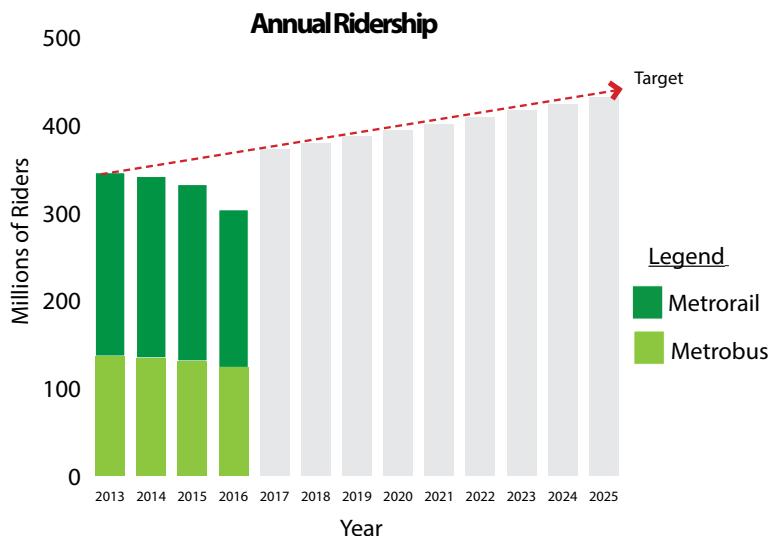
Ridership & Mode Share

In 2016, Ridership on Metrorail and Metrobus declined by a total of 9%. At the same time, the regional transit mode share increased between 2013 and 2015, to 20% of commutes using transit. To improve safety and reliability and prevent continued ridership decline, Metro's SafeTrack program is aggressively tackling deferred maintenance.

As rail safety issues were being completed under SafeTrack, Metro also targeted improvements in reliability and customer service:

- Launched BusETA and MyTripTime to assist riders with bus location and Metrorail trip reliability information
- Provided real-time train location data to third-party software developers, who are creating improved ways for customers to interact with Metro
- Improved station signage and lighting
- Improved pedestrian and bus facilities at Franconia-Springfield Metro station
- Launched the NH2 Metrobus service between Alexandria and National Harbor

With the SafeTrack program scheduled to be completed in mid-2017, a new preventative maintenance program of track and power systems will take effect to continue the focus of restoring reliable service. In 2017, Metro will also address systemic railcar failures by accelerating the retirement of the oldest and most unreliable cars, commissioning a total of 30 new trains, and implementing the Railcar Get Well Plan to reduce passenger offloads and cut delays due to train car issues by 25%.



Regional Mobility and Access

20%

of the Washington DC Metro region commutes by transit, up from 17% in 2013.

2015 Metropolitan Washington Council of Governments State of the Commute Survey

BACK 2 GOOD - Beyond SafeTrack

In 2017, Metro's Railcar Get Well Plan aims to reduce delays and offloads from railcar failures by 25%.

Metro will be running new, more reliable, 7000 Series car trains and retiring many of the oldest and least reliable cars, which are responsible for a third of all train delays.

The Get Well Plan will also target delays due to train offloads through legacy fleet component fixes to the HVAC, propulsion system, and pneumatic brakes.

Connect Communities

Metro and its regional partners work together to develop and implement projects that improve connectivity and strengthen ridership. These projects include developing Metro-owned land adjacent to stations, identifying and prioritizing regional pedestrian projects within station areas, and making stations more pedestrian and bike friendly. Metro also provides regional partners with key performance indicators that measure how effectively they are taking advantage of transit infrastructure investments. The two metrics are:

- Concentration of development near transit stations - as of 2015, 47% of Metrorail station areas are meeting job and household density targets (measured every 5 years)
- Path and road access to transit - as of 2016, 48% of Metrorail station areas are meeting the high-performing walkshed target (63.7% coverage ratio)

In 2016, Metro improved access and connections to rail stations and bus services:

- Initiated construction of new secure Bike & Rides for 204 bikes in Vienna and East Falls Church Stations. Completion anticipated in 2017
- Increased bike locker usage at Metrorail stations by 19% due to “I’m a Bike Locker” poster campaign
- Developed a Metrorail Station Investment Strategy with a priority list of regional pedestrian and bicycle projects that would improve station accessibility
- Finalized joint development at Dunn Loring Station with 628 residential units
- Advanced multi-year joint development efforts on Metro-owned land at Navy Yard, Capitol Heights, College Park-U of Md, Grosvenor-Strathmore, and New Carrollton Stations

In 2017, Metro will support access and connectivity through a number of new projects: construction of secure Bike-and-Rides at West Hyattsville and Franconia-Springfield Stations; installation of bike fix-it stands at 20 stations; installation of bike share stations at 7 Metrorail stations (College Park, Shady Grove, Tysons Corner, Wheaton, White Flint, Twinbrook, and Virginia Square-GMU); and construction will commence in summer of 2017 for phase one of the New Carrollton joint development project.

Development and Accessibility

6.8%

greater value for residential
properties - Metrorail boosts tax
revenue and property values
located within 0.5 miles of a
station

BACK2GOOD - Customer Service

In 2017, stations will receive a makeover to improve visibility and cleanliness. Metro is launching an annual station cleaning routine to improve the station look and feel for customers. Each station is being assigned a "champion" among senior managers to work with station personnel to ensure internal coordination of timely repairs to equipment and systems.

Greenhouse Gas Emissions

Authority Emissions

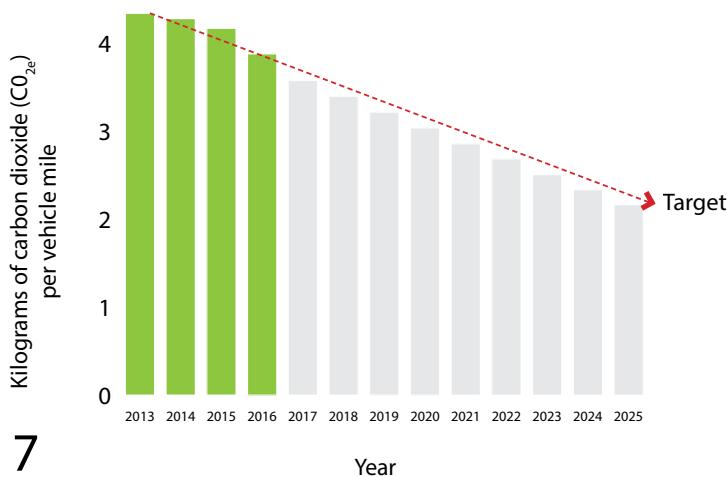
In 2016, Metro's greenhouse gas (GHG) emissions per vehicle mile declined by 7%. This decrease was due to a reduction in the carbon intensity of regional electrical supply, increased energy efficiency at facilities due to investments in efficient equipment, and reduction in railcar miles due to SafeTrack.

In 2016, Metro continued to take steps to reduce emissions:

- Received first zero emission, battery-powered bus for testing
- Purchased new maintenance-of-way equipment that meets the Tier 4 emissions standards to minimize particulate matter (PM) and Nitrogen Oxides (NOx) emissions by 95%
- Invested in energy efficient equipment and practices

In 2017, Metro will continue to invest in efficiency and clean power sourcing. For example, install remote monitoring of maintenance-of-way fleet, which is expected to generate a 5-10% reduction in diesel consumption; initiate use of solar-powered temporary lighting to replace diesel powered units; and begin an effort to integrate clean solar power into facilities.

Annual GHG Consumption per Vehicle Mile



75%
of the region's transit passenger miles were on Metro in 2015



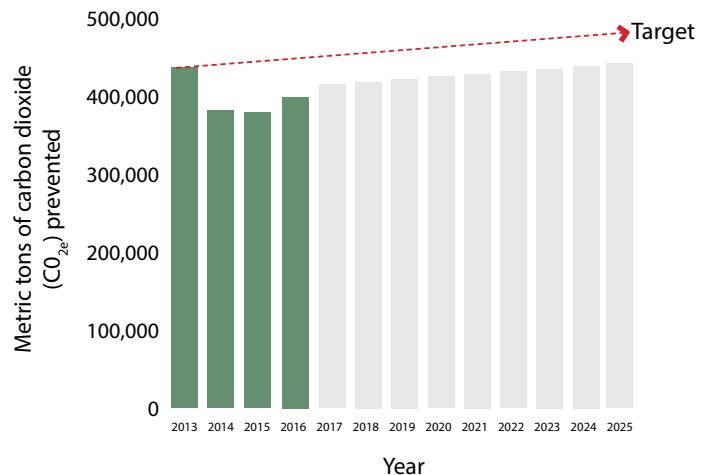
Regional Emissions Impact

Metro plays a key role in reducing regional greenhouse gas emissions. The impact on the region is measured by the amount of greenhouse gas our customers avoided using transit, and nets out Metro's annual tailpipe emissions. This is called "greenhouse gas displacement."

In 2016, Metro displaced, or avoided, nearly 400,000 metric tons of greenhouse gas emissions from the region. This is a 5% increase over the prior year.

In 2017, Metro will focus on enhancing the efficiency of service delivery. As riders return, it is anticipated that the net value of greenhouse gas savings from transit will continue to grow.

Metro Regional GHG Displacement



Energy Consumption

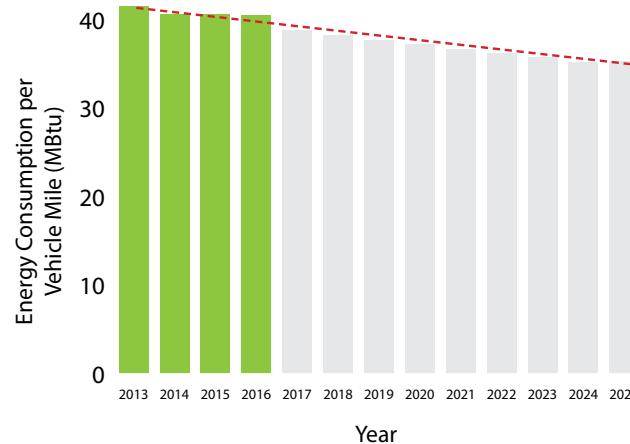
In 2016, Metro continued to reduce energy consumption per vehicle mile. Absolute energy consumption was reduced by 187 Million Mbtu, or a one-percent reduction per vehicle mile.

In 2016, Metro continued to reduce energy consumption through a number of innovative projects:

- Upgraded train signals with energy efficient LED bulbs, which also improved safety and visibility to train operators
- Retired data center physical servers through virtualization
- Implemented efficient lighting, mechanical and power systems upgrades at facilities
- Outfitted new escalators with energy saving variable frequency drive systems
- Continued to install building automation systems, bringing a total of 19 support facilities online for remote energy monitoring and management

In 2017, the Authority will take a major step forward in controlling energy costs. Metro will complete and begin implementing recommendations from an Authority-wide energy audit and prioritized action plan, and stand up an energy monitoring program to manage performance.

Annual Energy Consumption per Vehicle Mile





Station Lighting Upgrades

\$2.1 million
potential program energy
savings from conversion of track
and pylon lights to LED

BACK2GOOD - Lighting

In 2017, Metro will begin replacing existing lighting with new LED technology as the standard for station lighting. These enhancements, which provide better visibility and improve accessibility, are underway throughout the system. To date, 55 station mezzanines have been upgraded and the final six mezzanines are beginning construction in April 2017. Construction will commence on interior station platform lighting upgrades in early 2018, resulting in an 80% reduction in energy use.

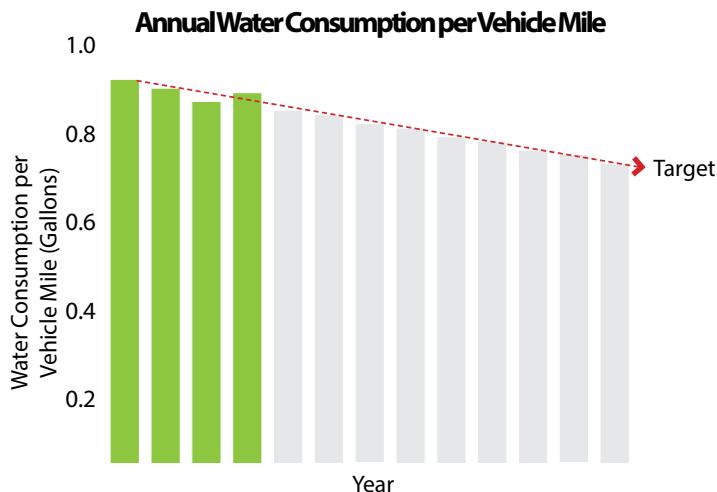
Water and Stormwater

Metro uses water to cool stations and facilities, clean the exterior of buses and trains, and in its office buildings. In 2016, Metro's water use per vehicle mile increased by 2%, primarily due to water usage at chiller plants during particularly warm summer and falls seasons.

In 2016, Metro continued to take steps to reduce water consumption and increase sustainable stormwater management:

- Installed new efficient chillers, including water treatment systems, at Metro Center, Potomac Avenue, and Crystal City Stations
- Installed low-flow and flush fixtures (31% water usage savings), storm filters, and bioretention facilities at the new LEED Silver Greenbelt Commissioning Facility
- Trained 28 Environmental Compliance Officers and 55 Deputy Environmental Compliance Officers charged with ensuring compliance with federal, state, and local environmental regulations
- Added drain medallions to storm drains at 22 rail stations in Maryland as a Best Management Practice for stormwater education and outreach

In 2017, the Authority plans to reduce consumption by completing construction on its first rainwater harvesting system at the Landover bus garage and initiating a pilot project to clear wrap railcars to reduce the reliance on acid based cleaners at railcar washes. To improve stormwater management, it will expand drain medallion placement to an additional 25 rail stations and conduct a stormwater infrastructure assessment to prioritize future green infrastructure investments.



A Commitment to the Bay

BACK2GOOD - Facility Upgrades

In 2017, Metro will continue to retrofit bathroom and breakroom facilities. Improved facilities will be fitted with low-flow fixtures. This will help Metro reduce its annual water consumption per vehicle mile, and reduce the wastewater load to the region's sewage plants.

Pollution prevention at stations and facilities

Helping the Bay

Urban and suburban stormwater runoff from parking lots, roofs and other hard surfaces account for 15% of nitrogen pollution in the Chesapeake Bay. Smart growth patterns and public transportation investments help preserve permeable surfaces like open fields, woods or parklands that play a key role in preserving the health of the Chesapeake Bay.

Models comparing proposed regional development patterns show that a more transit-oriented future, the region could save 6,000 acres of permeable area that it would otherwise lose between now and 2040 – an area 18 times the size of the National Mall, or nearly eight times the size of Reagan National Airport. This would prevent an average of 6.5 billion gallons of particulate-laden rainwater and snow-melt from flowing into the Chesapeake Bay every year.



**2016
Metro
Recycled**

9,727

Rail Ties

83,299

Gallons of Oil

4,336,946

**Pounds of
scrap metal**

8,334

Bus Tires

2,937

**Gallons of
Antifreeze**

Waste and Supply Chain

Overall, Metro produced 10% less waste in 2016, showing a decline for the 4th consecutive year.

This year, Metro continued to reduce waste and improve supply chain operations:

- \$1.5 million in asset recovery revenue from end-of-life equipment and materials
- 8,334 Metrobus tires cradle-to-grave recycling and disposal
- Recycled 4,336,946 lbs of steel, copper and aluminum
- Continued commitment to universal waste recycling of hazardous wastes such as batteries and mercury-containing lamps
- Recycled all used toner cartridges and continued a program to reduce paper consumption and printing costs
- Recycled all decommissioned escalator steps and gear boxes through refurbishment and resale as salvage
- Successfully implemented construction waste management for all new LEED certified buildings to recycle and/or salvage approximately 90% of nonhazardous construction and demolition debris

In 2017, the Authority plans to focus on station and facility recycling, materials reuse in track and construction projects, and to pilot more durable escalator handrails that are suitable for recycling.



1000 Series Railcars Retire

136

1000 series railcars were
retired in 2016 - 10,545,516 lbs
of metal recycled

BACK2GOOD - Railcars

As part of Metro's Back2Good program in 2017, all remaining 1000 Series cars will be retired and recycled. The retirement of least reliable (4000 Series) cars will also be accelerated. To replace these the Authority will commission a total of 50 new 7000 series trains. This will reduce passenger offloads and cut delays due to train car issues by 25% in 2017.

Scrapped railcars are shredded and then melted down to create new steel products. Railcar bodies can be turned into car parts, skins for appliances and piping and duct work. The heavier gauge railcar trucks are melted down and reused as plate and structural steel in industries such as construction.



sustainability

wmata.com/initiatives/sustainability

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