



METRO

SUSTAINABILITY REPORT

2015

Washington Metropolitan Area
Transit Authority

Office of Planning
Sustainability

www.wmata.com/sustainability



477 MILLION

METROBUS AND
METRORAIL RIDERS IN
CY2014

41 MILLION

GALLONS OF FUEL
SAVED BY METRO
RIDERS ANNUALLY

22 TONS

LESS PARTICULATE
MATTER RELEASED
INTO THE AIR DUE TO
METRO RIDERS

***“RESOURCE-EFFICIENT
TRANSIT THAT SUPPORTS
A SUSTAINABLE REGION”***

SUSTAIN



SUSTAINABLE METRO

By choosing to ride Metro trains and buses Metro riders help fight climate change 1.2 million times every day. This means the region avoids the emission of 400,000 tons of carbon and saves 41 million gallons of fuel annually. Our riders' commitment to Metro promotes sustainability for the entire region.

Metro's Sustainability Agenda was launched one year ago to recognize and strengthen Metro's role in supporting regional sustainability. The agenda sets concrete, ambitious targets that guide the Authority and the region on the path to becoming the most sustainable in the nation.

2014 also marked the launch of Metro's Sustainability Lab, dedicated to piloting cost-saving technology across the Authority. This year, the Lab implemented projects related to the use of energy and water, as well as waste disposal, that are expected to save the Authority \$550,000 in operating costs over the next five years.

METRO'S SUSTAINABILITY INITIATIVE

SUSTAINABILITY PROGRESS

Metro is ramping up efforts to increase the efficiency of existing operations. Projects planned for 2015 include:

- Modernize path and parking lot lighting to reduce energy costs and increase reliability
- Seek a long-term, fixed-price renewable energy contract for 30% of Metro's electricity usage
- Initiate a program to install approximately 10MW of on-site solar power
- Create substantial cost savings by capturing braking energy from Metrorail trains
- Install electric vehicle chargers at three Metrorail stations

26%

INCREASE IN THE
REGION'S POPULATION
EXPECTED OVER THE
NEXT 25 YEARS

1% REDUCTION
IN METRO'S OVERALL
ENERGY BILL WOULD
SAVE \$13 MILLION
OVER THE NEXT 10
YEARS



The Metropolitan Washington Council of Governments estimates the region will add 1.7 million people and 1.4 million new jobs by 2040. About half the employment growth and three-fourths of the population growth is expected to be within WMATA's Compact Zone. Metro is a crucial component of accommodating this growth as articulated in Region Forward, the region's adopted strategic plan.

Metro's Sustainability Agenda commits the Authority to 10 core sustainability targets:

PERFORMANCE TARGETS

REGIONAL

25% Increase in Ridership by 2025



Increase Transit, Bike and Walk Mode Share



Connect Communities

10% Increase in Greenhouse Gas Displacement by 2025

INTERNAL

15% Reduction in Energy Use Per Vehicle Mile by 2025

50% Reduction in Greenhouse Gas Emissions Per Vehicle Mile by 2025

30% Use of Renewable Electricity by 2025 (as financially feasible)

20% Reduction in Water Use per Vehicle Mile by 2025

100% On-Site Stormwater Management for Stations and Facilities

100% Waste Diversion Rate

RIDERSHIP & CONNECTIONS

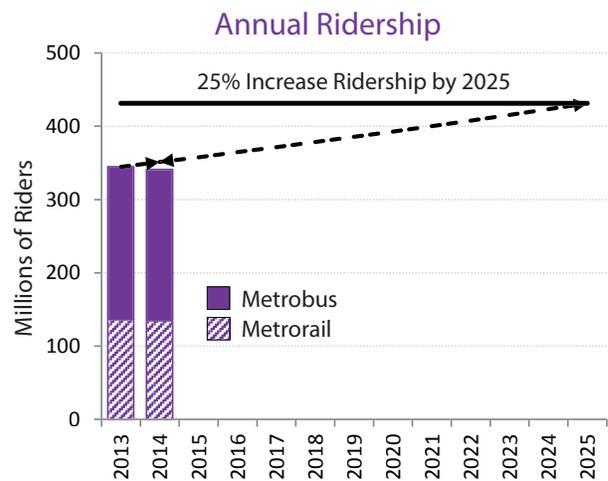
While Metrobus ridership was up in 2014, a decline in Metrorail ridership led to an overall decline of 1% compared to 2013. Service disruptions and changes to the federal transit rider subsidy are a significant factor behind this decline. The long haul Metrorail rider has been particularly hard hit by the reduced transit subsidy - with the average *SmartBenefits* customer paying an extra \$0.84 per trip – the equivalent of a 20% fare hike. Without the reduction in transit benefits, rail ridership might have gone up year-over-year.

This year Metro has improved service by:

- Launching Metroway, the region’s first dedicated right-of-way Metrobus service
- Opening Silver Line Phase 1 increasing the number of Metrorail stations in the region by 6%
- Installing new bike parking, sidewalks, and pedestrian lights at Greenbelt and Huntington stations
- Introducing Capital Bikeshare stations at six Metrorail stations
- Releasing six solicitations for transit oriented development at Metrorail stations. Leadership in Energy and Environmental Design (LEED) Silver, or equivalent are now standard requirements for developers

Despite this year’s slight decline in ridership, the region remains well positioned to build transit ridership. Meanwhile, the region continues to grow and has bet on transit-oriented development. Currently, 105 million square feet of new development are either under construction or proposed within a half-mile of a Metrorail station. That means significant new ridership - soon.

The region relies on Metro to get around. Capacity building projects such as those contained in Momentum’s Metro 2025 – Eight Car Trains, Core Station Improvements, and the Metrobus Priority Corridor Network – are absolutely critical to get underway so the region can continue to grow and prosper.





SILVER LINE PHASE 1

15,000
SILVER LINE PASSENGERS PER WEEKDAY

1,240
CARS REMOVED FROM THE DULLES TOLL ROAD DURING THE AM RUSH

5 NEW STATIONS
MCLEAN, TYSONS CORNER, GREENSBORO, SPRING HILL, AND WIEHLE-RESTON EAST

6%
MORE METRO STATIONS AND NEW DIRECT RAIL SERVICE CONNECTING THE REGION TO TWO OF ITS LARGEST EMPLOYMENT HUBS (TYSONS CORNER AND THE RESTON-HERNDON AREA)



CLIMATE CHANGE

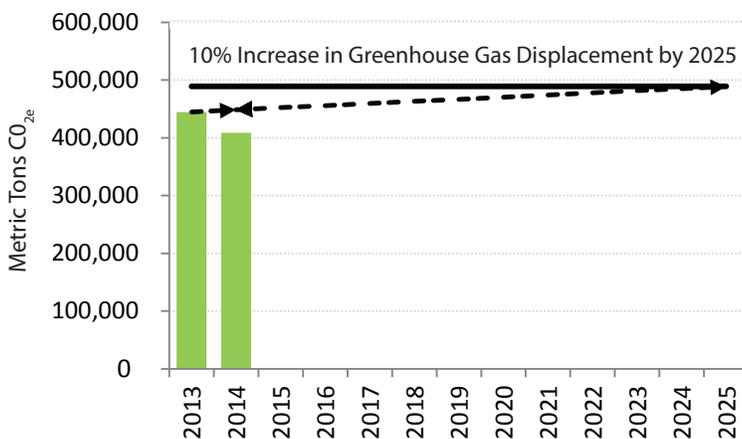
Metro's greenhouse gas displacement declined 7% this year. This decline was as a result of service increases such as the Silver Line that will provide a foundation for future ridership. As ridership grows on new services, the overall greenhouse gas displacement rate of the Authority will increase.

This year Metro has addressed climate change by:

- Increasing service to provide long term gains in transit ridership
- Launching a re-visioning of Metrobus and Metrorail service to best match long range regional growth patterns
- Evaluating all 935 roofs in the Metro system for their viability for cost-neutral on-site renewable power
- Launching a concentrated effort to make energy efficiency part of rebuilding the organization and its infrastructure - changing specifications and launching new initiatives
- Taking a leadership role in the Metropolitan Washington Council of Governments regional greenhouse gas reduction efforts

The Authority has established a foundation for reducing resource consumption and Metro's emissions profile in the coming years. The combination of green operations and increased ridership will deliver substantial environmental benefits to the region through 2025 and beyond.

Annual Greenhouse Gas Displacement



67 KG

OF CO_{2e} IS SAVED PER
WEEK BY THE AVERAGE
METRORAIL COMMUTER

Transit reduces vehicle-based greenhouse gas (GHG) emissions in two ways:

1. Shifting People From Cars to Transit

Metro takes cars off the road, avoiding emissions from cars idling in traffic jams. For example, through new parking facilities at the Wiehle-Reston East station an estimated 1,240 cars will be removed from the Dulles Toll Road during the AM rush. Based on the region's average commute, every commute that Metro takes off the roads saves an average of 67kg of carbon dioxide (CO_{2e}) per week.

Transit moves people with fewer GHG emissions than most automobiles. The average Metrorail ride cuts a typical car commuter's emissions by half and an average bus ride gets nearly 40 miles/gallon.

2. Sustainable Land Use Patterns

Metro has helped the region grow in ways that are pedestrian and bike-friendly and has allowed people to travel less – one can live, work, shop, and enjoy recreation opportunities in places closer to each other.

**GHG
BENEFITS
TO THE
REGION**

2014 REGIONAL
BENEFITS OF METRO

411,033
METRIC TONS OF CO_{2e}

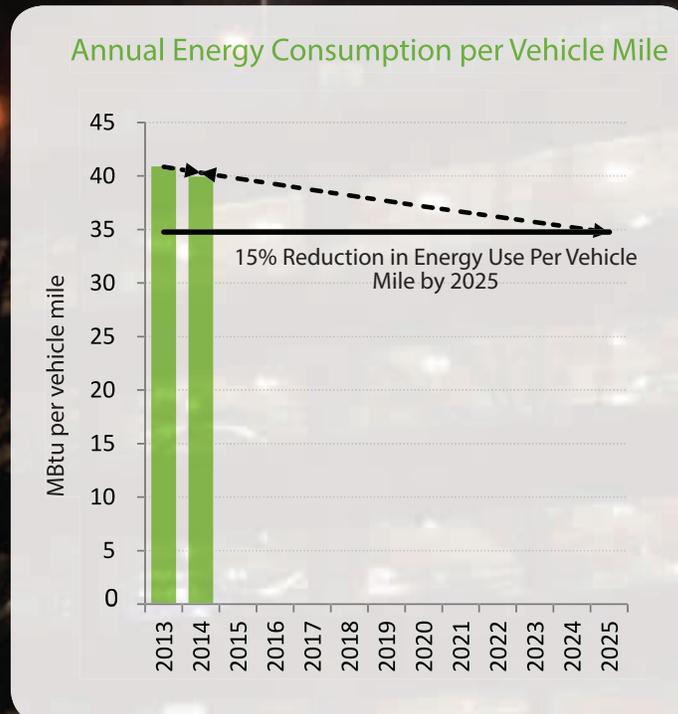
ENERGY CONSUMPTION

In 2014, Metro's energy consumption per vehicle mile decreased by 2%. Metro is already well on the way to achieving its 2025 target. Major drivers of this increase in efficiency include a greater percentage of rail service as a proportion of service provided, continued year-over-year increases in bus fleet efficiency - driven by the bus replacement program, and efficiency improvements to equipment across Metro facilities. The following projects will build on these improvements:

Metrorail - Completed an FTA funded pilot to capture and reuse power generated when trains brake at stations. Following the successful test, the Authority is now pursuing a strategic system wide deployment of regenerative braking technology in support of resilient operations and to vastly reduce energy consumption.

Metrobus - Continued to deliver gains in fuel efficiency with average fuel operating costs per mile stabilizing at \$1.75 per mile and overall fuel economy increasing to 3.42 miles/gallon. Since 2005, the overall fuel economy of the Metrobus fleet has risen by 15%.

Metro Facilities - Completed construction of Metro's Transit Police Department (MTPD) II Police Station and Range Training Facility in Franconia-Springfield, the Authority's sixth and seventh facilities constructed to LEED requirements delivering a 30% energy and water savings. Metro's specifications are being updated to be LEED compatible, and the cool roof technology used on these projects has become standard across Metro - making up 425,000 gross square feet of Metro's roof space.



GARAGE LIGHTING UPGRADES

15 MILLION

KWH IN ENERGY SAVINGS PER YEAR FROM GARAGE LIGHTING UPGRADES

13,500

LIGHT FIXTURES REPLACED WITH A HIGH-EFFICIENCY LIGHT-EMITTING DIODE (LED) SYSTEM

\$1.5 MILLION

IN ENERGY SAVINGS RE-INVESTED IN INFRASTRUCTURE RENEWAL ANNUALLY AT NO ADDITIONAL COST TO METRO

Metro achieved a major success in 2014 with the initiation of the garage lighting efficiency contract. Use of a self-funding contracting mechanism - with installation and maintenance of new equipment funded through guaranteed energy savings - demonstrates that Metro can successfully use the energy savings to finance infrastructure investments that radically improve the customer experience.

25

PARKING FACILITIES WILL BENEFIT FROM LIGHTING UPGRADES IN THE NEXT YEAR RESULTING IN A 68% REDUCTION IN ENERGY CONSUMPTION

A scenic view of a train crossing a bridge over water, with cherry blossoms in the foreground. The train is silver and black, moving from left to right across a concrete bridge. The bridge is supported by several dark, rectangular piers in the water. In the foreground, there are branches of cherry blossoms in full bloom, with white and light pink flowers. The sky is a clear, bright blue. The overall scene is peaceful and scenic.

295

NEW METROBUSES WILL
ALL UTILIZE CLEAN
FUEL DIESEL HYBRID
ELECTRIC TECHNOLOGY

10,000

KW OF MARKET
READY ON-SITE SOLAR
CAPACITY IDENTIFIED
AT METRO PROPERTY
THROUGHOUT THE
REGION

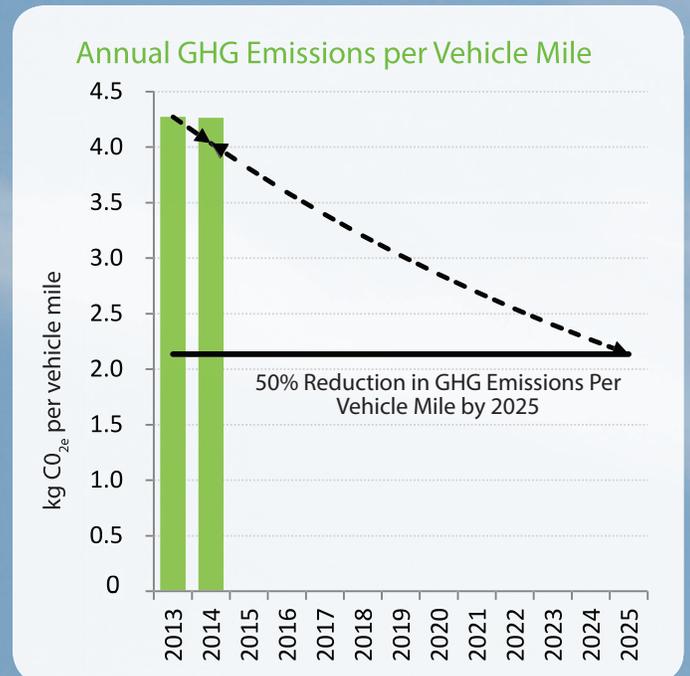
GREENHOUSE GAS EMISSIONS

In 2014, Metro's greenhouse gas (GHG) emissions per vehicle mile remained static when compared with 2013. This reflects relatively moderate overall energy savings in the first year of the Metro's sustainability commitment combined with a slightly more GHG-intensive regional power sourcing. However, Metro has taken significant steps this year that will shift both power sourcing and efficiency to meet the aggressive target of a 50% reduction in GHG emissions by 2025.

This year Metro has reduced greenhouse gas emissions by:

- Initiating an evaluation of all potential solar assets (including all 935 roofs) for cost-neutral on-site renewable power viability with study completion anticipated in Spring 2015
- Replacing diesel buses with 105 new Hybrid Electric buses - part of a sustained bus replacement program which will continue for the next 5 years
- Identifying routes and technology needs for electric bus operation in anticipation of a pilot
- Successfully designing, building, and opening Metro's first net-zero, or energy neutral, operation - an innovative Largo water treatment facility
- Launching a new mobile communications and tracking program to improve non-revenue vehicle fleet efficiency and reduce fuel consumption

This coming year Metro will advance solar power purchasing initiatives for both on- and off-site generation and is expecting to continue with further efficiency gains by reducing energy consumption per vehicle mile.



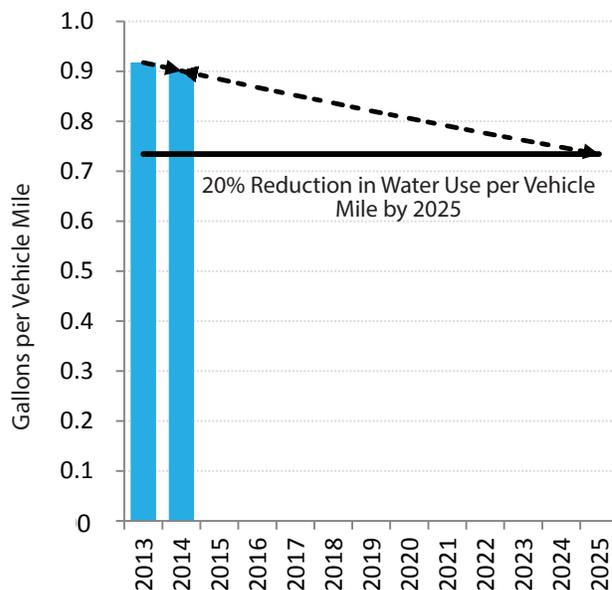
WATER & STORMWATER

In 2014, Metro's water consumption increased slightly to 120 million gallons, but declined per vehicle mile by 2% as a result of increased track miles. This year Metro has continued to enhance water and stormwater management within the Authority by:

- Upgrading water treatment systems at seven station chiller plants. Approximately three million gallons of water and \$30,000 in savings are expected from this Sustainability Lab pilot. If the pilot performs as expected, a full system roll out would produce nearly \$700,000 in water savings each year
- Meeting stricter discharge requirements with a new net zero water treatment facility
- Installing Low Impact Development (LID) stormwater management systems at two new facilities - a parking lot at the Carmen Turner Facility and the District II Police Station and Range Training Facility site

Metro will continue to install low-flow water fixtures Authority wide, investigate opportunities for rainwater harvesting, and complete a study that identifies cost effective stormwater retention opportunities for facilities and stations.

Annual Water Consumption per Vehicle Mile



LARGO WATER TREATMENT FACILITY

1.4 MILLION
GALLONS OF WATER
TREATED PER DAY
SYSTEMWIDE

3 TONS OF
CARBON EMISSIONS
PREVENTED ANNUALLY

15
OLYMPIC-SIZED
SWIMMING POOLS
OF WATER TREATED
SYSTEMWIDE EACH
WEEK

Stricter regulatory requirements from the Maryland Department of the Environment, as part of the Chesapeake Bay Restoration Act, triggered the need for Metro to construct a new water treatment building at the Largo pumping station. Metro's new state-of-the-art facility employs a combination of design elements that help Metro meet regulatory requirements, achieve its sustainability targets, and reduce operating costs.

To minimize energy use the facility uses gravity-fed treatment tanks and a high-efficiency system that uses bubbles of compressed air to "circulate" water for treatment. On the roof, solar panels supply extra electricity back to grid during the day while a green roof reduces stormwater runoff.

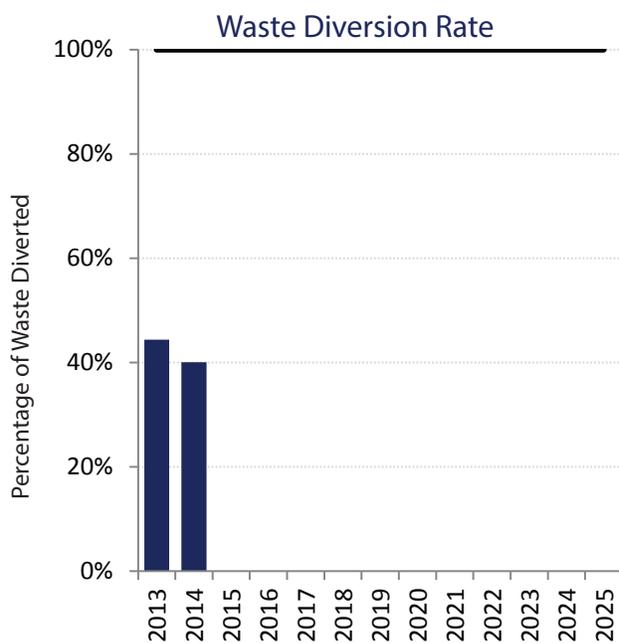
20,000
KWH OF ELECTRICITY
ANTICIPATED FROM
ROOFTOP SOLAR PANELS
ANNUALLY

WASTE & SUPPLY CHAIN MANAGEMENT

In 2014, Metro's overall waste diversion rate declined by 4% due to an increase in solid waste from renovation and rehabilitation projects. However, overall station recycling performance remained strong with a slight increase in overall station recycling tonnage when compared with 2013. This year Metro has targeted waste and supply chain management by:

- Converting 80% of Metrobus fleet headlights to LED – saving over \$35,000 annually in equipment and disposal costs
- Obtaining a new tub grinder that will remove 4,000 cubic yards of compostable waste from Metro's waste stream
- Reducing bus battery waste by 65% by converting to more efficient battery technology
- Issuing a request for proposals for a new waste and recycling contract that will support Metro's waste management efforts

Metro's long range goal is zero waste - or 100% diversion. Over the next several years, Metro will explore new opportunities to track and reduce waste, expand recycling to new waste streams, and engage with a range of Metro's suppliers to reduce packaging waste at its source.



REDUCE, COMPOST, RECYCLE

40%

OF WASTE DIVERTED
FROM LANDFILL IN
2014

3,851

TONS OF NEWSPAPER
RECYCLED FROM
METRORAIL STATIONS
IN 2014

A new tub grinder, funded by the Sustainability Lab, is expected to save approximately \$50,000 annually. This project will divert approximately 4,000 cubic yards of compostable waste from Metro's waste stream and will recoup the initial investment in equipment within three to four years.



DELIVERING RESULTS

To drive significant and long lasting service improvements for the region and achieve the Authority's sustainability targets, Metro will fully leverage Metro's Sustainability Lab to identify and accelerate implementation of cost saving investments for Authority-wide rollout. Metro is also aggressively developing innovative, self-financing performance contracts to upgrade key infrastructure throughout the system. In the next year, Metro will pursue the following potential self-financing opportunities:

- Station exterior lighting upgrades, including pathways and parking lots to lower energy costs and improve customer experience
- Cost-effective renewable power contracts to lower energy costs and reduce exposure to energy price volatility
- System-wide rollout of equipment that captures and reuses train braking energy to increase power reliability and safety



15%

INCREASE IN ENERGY
EFFICIENCY COULD
SAVE METRO NEARLY
\$19 MILLION PER YEAR
BY 2025

EFFICIENCY THROUGH INNOVATION

\$550,000

OF SAVINGS
ANTICIPATED FROM
2014 SUSTAINABILITY
LAB PROJECTS OVER THE
NEXT FIVE YEARS

SELF-FUNDING INFRASTRUCTURE INVESTMENT

Metro is investing in new infrastructure today by capitalizing on energy savings and revenue opportunities associated with innovative solutions.



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