



2018

sustainability report





4.4 million
people in Atlanta Metro Area

500,000
bus & rail
passengers daily

service to
**world's
busiest**
airport

**specialized
paratransit**

MARTA's Contribution to Sustainability

The Metropolitan Atlanta Rapid Transit Authority (MARTA) provides essential transportation services for the Atlanta Metropolitan Region, home to over 4.4 million people.¹

MARTA provides bus and rail service to more than 500,000 passengers on a daily basis², including services to Hartsfield-Jackson Atlanta International Airport, the busiest airport in the world.³ In addition, MARTA provides specialized paratransit van services to residents needing assistance. MARTA's role in Metropolitan Atlanta is uniquely ours, providing a comprehensive and wide-reaching transit option that connects people to employment, entertainment, and recreation.

As a result of a growing Atlanta area population, and exciting expansion opportunities into more counties and new routes, increased ridership is projected to continue into future years. With increased routes and increased ridership, our role in the Atlanta region's discussions about transportation, connectivity and environment will only grow in years to come.



At MARTA, we have enjoyed the challenge and opportunity to define what sustainability means internally, and to increase how we contribute to the broader sustainability of the Atlanta Metropolitan Region. Sustainability is part of both our objectives and daily operations, as well as a goal in and of itself.

Our internal initiatives are viewed in terms of our attempts to realize the Triple Bottom Line:

1

Achieving cost-savings

2

Having a net-positive impact on the environment

3

Improving the communities in which we operate, work, and live

As a public transit agency whose mission is to provide safe and reliable alternative forms of transportation, we are as proud of our contributions to sustainability in the Atlanta Metropolitan Region as we are of our own internal sustainability accomplishments. As a result of operating our buses and trains, MARTA helps eliminate passenger vehicles from our roadways daily. By reducing vehicle miles travelled, MARTA is actively improving the region’s air quality, which has improved substantially over the last decade. MARTA currently helps to alleviate heavy traffic issues that lengthen commutes and contribute to air pollution.

Our recent Carbon Footprint Update for 2016 found that MARTA’s provision of alternative transportation (alternative options to using single occupancy passenger vehicles) to the Atlanta population prevents 638,624 metric tons of carbon dioxide equivalent⁴ from being released into the atmosphere due to mobility mode shift, congestion relief, and changing land use.



MARTA's commitment to sustainability was originally made several years ago, though our story has only just begun.

October 27 **2008**

The MARTA Board approved a **policy on sustainability**

which formally established our sustainability program.

MARTA committed to respecting our environment and to reducing our dependence on non-renewable energy and resources. At that time, the sustainability vision included several key points:

- Establish MARTA's environmental baseline and develop a comprehensive sustainability master plan
- Reduce MARTA's environmental footprint
- Increase MARTA's use of green products and services
- Increase the volume of recycled materials
- Increase savings and Return on Investment (ROI) through greening strategies

2009

Became a **founding signatory**

of the American Public Transportation Association's (APTA) Sustainability Commitment.

The APTA initiative provided additional guidance and a solid framework for MARTA's sustainability program. MARTA initially completed the signatory level of APTA's program by passing a Board action on sustainability, identifying a sustainability champion within the organization, establishing an outreach program on sustainability for all staff, and undertaking a sustainability inventory by establishing baseline measurements of greenhouse gas emissions (2008) and resource consumption Authority-wide (2012).

2011

MARTA introduced renewables into the agency's energy portfolio with the installation of **solar panels** at the Laredo Bus Facility.

2012

MARTA begins the **baseline year** for the majority of the sustainability data that MARTA monitors.



2015

MARTA's commitment and efforts to date were acknowledged with the award of

bronze level
recognition by APTA.⁵

2016

Below are some high level data points showing the

progress
we have made

in reducing our impacts on the environment.

2018

MARTA is now proud to have attained the

silver level of
recognition

in March 2018 for our sustainability efforts.



	2012	CHANGE	2016
EMISSIONS (CO2e per PMT)	0.643	-10%	0.580
WATER (gallons per PMT)	0.048	-27%	0.035
WASTE (lbs. per PMT)	0.0064	-13%	0.0056

All metrics are normalized by our ridership metric (passenger miles traveled or PMT); this makes our values more comparable to other transit agencies and accounts for our increasing service levels. Initiatives enacted to achieve these reductions are further described later in the report.

In our most recent application we highlighted a number of the programs in this report including our LEED (Leadership in Energy and Environmental Design) Silver buildings, energy efficiency upgrades, wash water recycling, and transit-oriented development efforts.

This recent accomplishment was announced publicly by APTA at their July 2018 Sustainability & Multimodal Planning Workshop.



MARTA has thrived in the self-imposed ambition of expanding our sustainability program to include challenging initiatives to address our internal and external operations. Historically, we have not been as proactive at telling the story of sustainability at MARTA; this report aims to address that. We are excited to highlight the accomplishments of our sustainability program since its inception.

This Report is constructed of four main sections, each of which tells a chapter of our story of sustainability:



Buildings



Community



Environment



Climate

Of course, we recognize that the comprehensive implementation of all these initiatives is ongoing. As we continue to learn, improve, and progress, MARTA will find further ways to integrate sustainability into our operations, as well as new opportunities to contribute to the sustainability of the Atlanta Metropolitan Region. Our Sustainability Report, therefore, concludes with our Vision Forward and what next steps we foresee for MARTA's sustainability program.

MARTA continues to take its role seriously, both in Atlanta Metropolitan Region's sustainability efforts and as an industry leader in sustainability. We believe that this report shares both sides of our sustainability story.





buildings

building a more sustainable MARTA



MARTA is comprised of two main office buildings, 38 rail stations, five bus and three rail maintenance facilities, and other small facilities critical to our day-to-day operations and mission of providing transit to the Atlanta Metropolitan Region. In short, with over six million square feet, we are a significant property manager. As such, we recognized early on that our sustainability program would need to integrate with our building management and operations.

From large one-time initiatives to changing the culture of how we operate facilities, MARTA has made major strides at increasing the sustainability of our built environment.

MARTA's approach to our buildings has three components:



Improve efficiency within existing buildings and infrastructure



Consider green design standards and best practices in new design



Incorporate renewable energy when and where feasible



efficiency
upgrades
motion-detecting
light switches
LED lights:
longer life span,
low energy consumption,
better quality light

Efficiency Upgrades

With an inventory of buildings of varying ages, ranging from the 1970s to 2016, much of our infrastructure was constructed during times when design and technology had not reached the efficiency levels or standards that we currently have available today. Therefore, MARTA has begun making the necessary adjustments and upgrades to improve efficiency in many of our existing buildings.

MARTA implemented a major program designed to replace standard light switches with motion-detecting sensor light switches in multipurpose rooms, such as conference, break, copy, and other similar rooms that have moderate to infrequent use. The sensors turn off the lights when the room is not in use, thus reducing energy use and saving dollars. These light switches will be implemented Authority-wide over the coming years. The ROI of this project is less than three months from the start of implementation. Talk about flipping a switch!

MARTA is also using more LED lights due to the longer life span, low energy consumption, and better quality of light output. The brighter light quality makes them better candidates for overall security camera resolution, and their long lifespan reduces long-term maintenance and replacement cost. Currently, MARTA has LED installations in all tunnels and many stations.



Green Design Standards

When resources allow, MARTA is strategically renovating existing facilities and building new ones to meet the growing demands of being a world-class regional transit provider. These renovations give us a great opportunity to consider and incorporate best practices and green design standards within our infrastructure. MARTA has applied Leadership in Energy and Environmental Design (LEED) standards in the design of new facilities, and implements similar sustainable design principles in the renovation of existing facilities. LEED is used as a standard to promote green buildings that are environmentally responsible and resource-efficient throughout each building's life cycle: from siting to design, construction, operation, maintenance, renovation, and deconstruction.



MARTA's commitment to incorporating green design considerations is also on display at the newly completed Integrated Operations Center (IOC), which will soon house the operational functions of MARTA's bus, rail, and paratransit departments. It also serves as an emergency operations center for MARTA's Police department. The IOC used sustainable design considerations, such as LED lighting, high efficiency heating, ventilation, and air conditioning (HVAC) and low volatile organic compound (VOC) materials.



LEED Certification Success Stories

On Atlanta's west side sits MARTA's **Brady Paratransit Facility**, home to MARTA's fleet of over 180 Paratransit buses. The Brady Facility was completely rebuilt and reopened in 2016. Soon after construction, the Brady Facility achieved LEED Silver Certification. The construction utilizes green practices such as the use of maintenance equipment designed for low water consumption, recycled and low-emitting building materials, and the use of green cleaning systems and supplies.

The **Pedestrian Bridge at Buckhead Rail Station's North Entrance** provides riders with easier access to one of MARTA's major stations in one of Atlanta's most popular economic and commercial centers along the Red Line. The project used best practices to achieve energy efficiency by maximizing daylighting and using LED light fixtures. Also, the materials used in the construction emphasized conservation and repurposed materials with a high percentage of recycled content.



strategically
renovating
 existing facilities and
building
 new ones



Renewable Energy

MARTA is always looking for opportunities to push the envelope on sustainability; if we can partner with local and federal agencies to reach new heights, all the better. In 2009, MARTA successfully secured that year's largest federal Transit Investments

for Greenhouse Gas and Energy Reduction (TIGGER) grant from the Federal Transit Administration (FTA). The \$10.8 million grant provided full funding for an array of 4,903 energy-efficient solar panels at MARTA's Laredo Bus Facility, which were installed in 2011.

energy savings in first
year of operation:

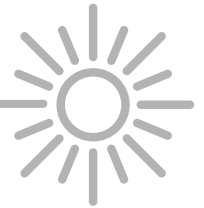
4,545m

British Thermal Units
(MMBtu), an amount of
energy that could power
118 homes for an entire year

annual savings on
electrical bills:

\$100k

based on the electricity
we use from the panels and
that which we sell back
to our electric utility



The project also significantly cuts our annual fuel consumption and greenhouse gas (GHG) emissions at Laredo, enhances our work environment, and has created additional jobs in the Atlanta metropolitan region (during construction phase).

In addition to generating clean, renewable energy, the steel structure provides shade for approximately 220 buses with a perforated canopy and LED lights to accommodate the 24/7 operations of the facility. The shade helps reduce the amount of air conditioning needed to cool the buses as they start up during the hot Atlanta summer months.



environment

conserving resources and being good stewards





As the 9th largest transit agency by ridership in the nation⁶, we are proud of our size and our ability to cover such a large geographic area. But that does not mean we need to have a large environmental footprint. In fact, MARTA has many ongoing initiatives to reduce our waste, limit our GHG emissions, and be more efficient with our water usage. MARTA is addressing environmental stewardship at all levels:



Providing our employees with informational materials and training to better recycle and reduce our waste



Implementing Authority-wide initiatives to eliminate single-use plastic water bottles



Improving each facility's overall environmental management program





Environmental Management System

An Environmental Management System (EMS) is a set of management policies, processes, and procedures that allow an organization to assess, control, and reduce the environmental impact of its activities, products, and services. An EMS helps an organization address its regulatory demands in a systematic and cost-effective manner. This is part of MARTA's proactive approach to reduce the risk of noncompliance and improve environmental practices that benefit both employees and the public.

MARTA implemented an EMS in 2011 for our Armour Yard Rail Car Maintenance Facility, which was

independently certified to the ISO 14001:2004 Standard in March 2014.⁷ The EMS was then expanded to the Laredo Bus Maintenance Facility and the Headquarters Print Shop, which were both certified to ISO 14001:2015, along with a re-certification for Armour Yard to the new standard in 2017. Following these successes, MARTA's EMS grew to add South Yard Rail Maintenance Facility and Brady Mobility Maintenance Facility. These facilities are now in the process of being certified to ISO 14001:2015. MARTA is currently planning to expand the scope of the EMS to Perry Bus Maintenance and the IOC.

MARTA is one of the first public transit agencies to be an ISO 14001:2015 registered multisite organization

As of late 2017, MARTA is officially an ISO 14001:2015 certified multi-site organization. With this certification, MARTA is one of the first among peer transit agencies to have implemented a 14001:2015 multi-site management system towards achieving high levels of environmental performance. This certification exemplifies MARTA's

commitment to its community, customers, and employees with an environmentally responsible and sustainable business model. MARTA accomplishes this commitment through our management system framework that drives continual improvement in operating efficiency and environmental performance.

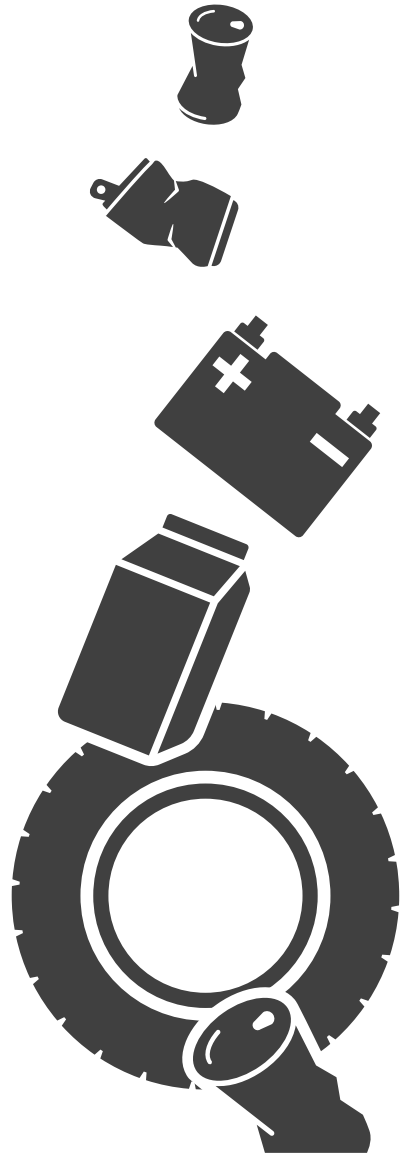


Waste Reduction and Recycling

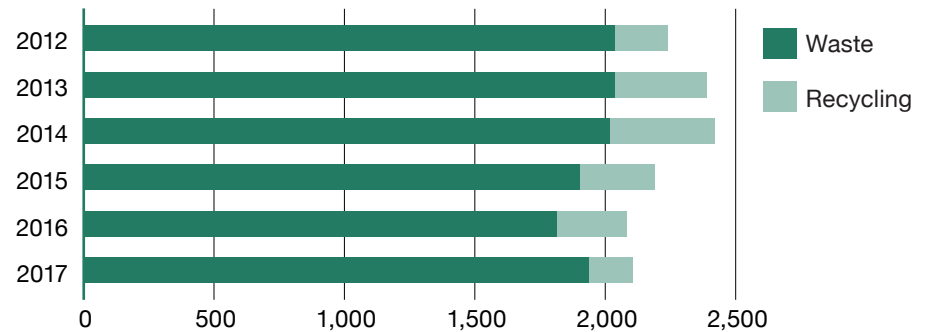
From what started organically in a single building in 2010, MARTA's Recycling Program has grown into a full-blown Authority-wide initiative encompassing multiple waste streams in our offices and at our facilities.

MARTA uses a single-stream recycling process in which recyclables—including paper, cardboard, plastic, and aluminum—are placed in a single bin and then separated at recycling facilities. MARTA's single-stream recyclables tonnage is based on standard estimation⁸ from our waste vendors; however, we continue to become more accurate in our accounting of our waste streams and how much waste is being diverted from landfills.

Through various separate vendors MARTA also recycles scrap metal, paper, used oil, bus and railcar glass windows, batteries, tires, electronic waste, and ink cartridges. Some of these data are presented in the figures below.



Total Annual Tonnage for Waste and Recycled Materials Produced by MARTA



Trash and Recyclables Streams Generated at MARTA, 2012–2017

CALENDAR YEAR (CY)	TRASH (Tons)		RECYCLABLES (Tons)			
	MSW	Wood ⁹	Single-Stream	Scrap Metal	Paper	Electronic Waste
CY 2012	2,002	40	48	139	16	0
CY 2013	1,998	39	55	224	74	0.8
CY 2014	1,958	56	64	277	64	0.6
CY 2015	1,837	59	108	128	52	4.38
CY 2016	1,751	61	92	107	72	1.5
CY 2017	1,877	54	37	55	80	1.2
Total	11,423	309	404	930	358	8



average
annual revenue
from recycling
scrap metal:
\$26k

Historically, MARTA has generated revenue from proper disposal of used oil and proper recycling of scrap metal. Used oil recycling revenue is highly dependent on the market price of oil. As the price of oil declined in 2015, revenue decreased. Subsequently, the price of oil decreased to such an extent that used oil recycling has not provided MARTA with any revenue since 2016, although MARTA has never ceased to properly dispose of used oil. Scrap metal revenue ranges each year dependent on market value per metal, and the quantity and type of metals that MARTA collects. The average annual revenue from scrap metal recycling from 2012-2017 is \$26,010. These recycling initiatives emphasize not only the cost savings from avoided landfill fees along with revenue generation, but also environmental protection through diverting waste, and the community benefits of keeping local watersheds and ecosystems clean—further emphasizing the triple bottom line of MARTA's sustainability program.

In one of several initiatives that create multiple benefits, MARTA eliminated the use of paper towels throughout the Authority's restrooms and replaced them with 290 high efficiency, low energy hand dryers.¹⁰ The savings for the Authority was immediate, with a major reduction in the purchasing and use of paper towels and the resulting reduction of trash production and waste sent to landfills. With an ROI of 1.4 years, the Authority saves over \$80,000 per year in eliminated cost of paper towels and maintenance. This Authority-wide initiative was completed in 2015.

eliminating paper towels
in restrooms
has resulted in
a savings of
\$80k+
per year

Similarly striving to achieve multiple benefits, in an effort to reduce waste and continue the Authority's sustainability efforts, MARTA installed water filling stations at all non-revenue operating facilities to eliminate the use of plastic water bottles. The water filling stations use an energy-efficient refrigeration system and effectively remove impurities. As an initial step

of this initiative, MARTA provided all employees with refillable stainless steel water bottles to give employees a safe and easy way to stay hydrated on the job, while promoting the elimination of plastic bottles and the cost-savings that the Authority would recognize. The entire program paid for itself during the first year of implementation, and will continue to save the Authority money with the elimination of purchasing bottled water. By giving employees reusable bottles, the program has avoided the purchase of over 141,000 plastic bottles as of 2015. MARTA installed 70 water filling stations at various operating facilities and offices.

MARTA implemented a number of initiatives to reduce office-related paper use, as this is a major waste stream for MARTA. This included requiring double-sided printing to be the default option on all computers and printers at Headquarters and offices.

MARTA disposes of
hazardous waste
carefully
and follows all regulations

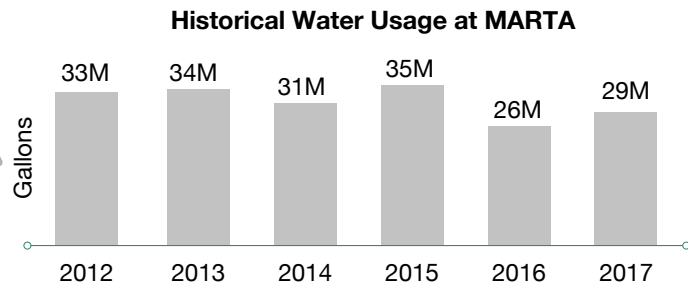
70 water filling
stations
installed

141k+ fewer
plastic bottles
purchased

MARTA also disposes of all of our hazardous waste carefully and follows all environmental regulations to protect our employees and the environment. For example, fluorescent light bulbs are used abundantly throughout MARTA's facilities and on MARTA's railcars. While many of these are low-energy-use light bulbs, new fluorescent bulbs contain a tiny amount of mercury, a dangerous element that can poison the groundwater supply if used bulbs are not disposed of properly. In all of MARTA's facilities, the Authority implements the Lamp Tracker Program to safely recycle used lamps. This program allows for spent fluorescent light bulbs to be collected and boxed in specific containers to be counted, documented, processed, and tracked to a proper recycling facility.



our wash systems reuse anywhere from **85-100% of water** used to wash our buses and trains



Water Usage

MARTA has monitored resource usage since 2012, including water (see figure, left). Roughly half of MARTA's water consumption occurs at our bus and rail maintenance facilities, followed by our offices and our stations.

MARTA has looked at ways to reduce its water consumption by reusing water at many of its facilities. At the Armour Yard Rail Maintenance Facility, collection tanks at the rail car wash station capture used wash water and stormwater, which is then treated and reused for additional rail car washing. Similarly, at MARTA's Perry and Laredo Bus Maintenance Facilities, MARTA collects wash water

at bus wash bays in order to treat and reuse for additional washing. All told, our wash systems reuse between 85–100 percent of water used to wash MARTA's buses and trains. This practice saves an estimated 3,500,000 gallons of water each year that would otherwise be drawn from the City's potable water system.¹¹ MARTA also regularly targets water efficiency upgrades, including improvements to the train wash systems and water treatment plant operations, maintenance and repairs to steam boilers and underground piping.

Asset Management System

MARTA's approach to asset management is based on the pillars of sustainability, integrated risk management, and life cycle management. Life cycle management at MARTA aims to track an asset from conception, creation, acquisition, or enhancement of the asset; the

utilization and maintenance of the asset; through to the decommissioning and/or disposal of the asset. With proactive life cycle management, MARTA can reduce risk and exposure, improve service delivery, and determine return on investment.

The Asset Management Policy (ED-PO-0001) sets the overall statement on the organization's commitment to asset management and continual improvement, and provides executive level direction of expectations and requirements. The purpose of the Asset Management Policy is

to communicate to management, employees and contractors, MARTA's commitment to maintaining all Authority assets in a state of good repair with emphasis on safety, operations, sustainability and continuous improvement in asset management and asset performance.



community

supporting and improving our surroundings





500k members
served per weekday

4.5k+ quality full-time and
part-time jobs provided

24.8k+ jobs
supported throughout Atlanta

continually striving
to be an
active member
of our **community**

It's not enough to say we serve over 500,000 members per weekday in the Atlanta metropolitan region with safe and reliable transit.¹² Nor is it adequate to say that as the region's leading provider of alternative transportation and as the only multi-modal transit system in the state, we are sufficiently doing our part to help the region's environment and traffic issues by taking cars off the road and thus improving the overall air quality of the region.

We also cannot rest on the fact that we provide over 4,500 quality full-time and part-time jobs directly to members of the Atlanta community and support over 24,800 jobs throughout Atlanta.¹³ As a leader in our community, we are proud of the role we currently play, and we are motivated to do even more.

At MARTA, we strive every day to be an active member of our community. Our employees and our riders live and work in the areas in which we operate, so it is of the utmost importance for MARTA to take care of and give back to the place we call Home. MARTA has many active community programs and partnerships that give us the opportunity to further connect with and support the people and neighborhoods that make MARTA who we are.



Transit-Oriented Development

MARTA is proud of the role that we can play in local sustainable development and connecting communities across the region. Anticipated population growth in Atlanta can be better accommodated near existing infrastructure through increased Transit-Oriented Development (TOD), furthering MARTA's role in supporting the city's overall sustainability goals.

A TOD is a pedestrian-friendly, mixed-used community that minimizes vehicle dependency by increasing access to transit for residents and workers. MARTA is pursuing TOD in an effort to increase ridership, generate new revenue and to support both local community development and regional economic development.

One example of a MARTA TOD is the Lindbergh Center Station, which is surrounded by apartment buildings, businesses, and office buildings—including MARTA's own headquarters. MARTA is expanding our TOD program to multiple locations throughout the system. Construction is well underway at Chamblee Station, Avondale Station and Edgewood/Candler Park Station. Progress continues to be made on TOD projects at Arts Center Station, King Memorial Station, Lindbergh Center Station and Hamilton E. Holmes



pedestrian-friendly mixed-use communities

Station. MARTA, in partnership with the cities of Atlanta and Decatur, has finalized recommendations for TOD in and around the East Lake Station.

MARTA is also currently in the planning phases to help create a low-impact shipping container "village" that will offer attractive, affordable space to small businesses and entrepreneurs at our H.E. Holmes rail station. A goal of the MLK Innovation Village is to spark interest in TOD at the stations in this corridor.

Connected Bike Mobility

Where MARTA can't take you door to door, we are working hard to accommodate a multimodal trip. MARTA has installed new bike kiosks at 37 rail stations (through fiscal year 2017). Each biking kiosk includes new bike racks, fix-it stands and tire pumps, enabling 500 bikes to be parked throughout the system at any given time. In addition, all MARTA buses are outfitted with bike racks to accommodate cyclists who cannot access rail stations.

MARTA also partnered with the City of Atlanta's Bike Share program, starting with bike share racks that hold ten bikes at or near selected stations. There are now bike share racks at five MARTA stations (Arts Center, Peachtree Center, West End, King Memorial, and Inman Park) and within two blocks of seven additional MARTA stations (Five Points, Civic Center, Midtown, Garnett, Georgia State, Buckhead, and Lenox). This allows passengers to continue their journeys throughout the city on various forms of sustainable transportation.



37 newly installed bike kiosks



Fresh MARTA Market

MARTA is also working to connect communities to local, healthy, and sustainable food options. The Fresh MARTA Market program started in 2015 and provides fresh produce kiosks at our rail stations. In 2017, the program expanded to four rail stations with the intention of targeting communities with less access to affordable fruits and vegetables (H.E. Holmes, College Park, West End, and Five Points).



MARTA partners with the Atlanta Community Food Bank, Community Farmers Market, Southwest Atlanta Growers Cooperative, and Organix Matters to manage these markets. Consumers can use cash, credit, Electronic Bank Transfer (EBT) or Supplemental Nutrition Assistance

Program (SNAP) to purchase nutritious foods at transit-accessible locations. Our program is planning to expand in 2018 due to a recently awarded United States Department of Agriculture (USDA) grant.



Artbound Public Art Program

MARTA launched a new arts program (Artbound) in 2017 aimed at aesthetically enhancing and integrating art throughout the rail system. MARTA is engaging the region's diverse artistic community inclusive of visual art, dance, theater, and live music with the goal of having our stations seem

like a destination in themselves. With our partner, Midtown Alliance, we are currently planning a large installation at our Midtown Rail Station to include murals, interactive seating, shade, and a solar phone charging station.

\$600k
raised annually

6k+ hours of community service

MARTA Employees' Charity Club

For over 25 years, MARTA has been serving the community, not only to address transportation and environmental challenges, but also through our community and charitable efforts. The MARTA Employees' Charity Club has raised an estimated \$600,000 annually from both employee donations and volunteer efforts,

making MARTA employees one of Atlanta's major contributors for both Atlanta and surrounding communities. The MARTA Employees' Charity Club is responsible for linking employees to non-profit organizations and resources that provide goods and services to low-income communities. We pride ourselves in providing the Atlanta

community with over 6,000 hours of community service through food and shelter initiatives. In addition, for the last 38 years, the club has organized a holiday drive for low-income parents. During the 2015 holiday season, more than 3,600 employees (or 75%) of MARTA employees donated money to the drive.



climate

mitigating and adapting to climate change



MARTA recognizes that the climate is changing. As a transit agency, we can play a unique and important role in supporting Atlanta in reducing regional GHG emissions.

We also acknowledge that MARTA can do a better job at reducing our own GHG emissions, and so we regularly update our carbon footprint to measure and monitor our emissions, and to identify opportunities to improve efficiency.

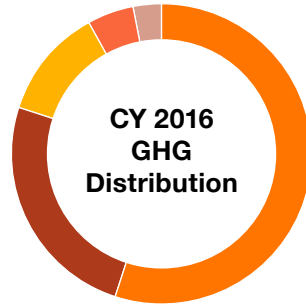
we play a
unique and
important
role in supporting
Atlanta in reducing
regional emissions.





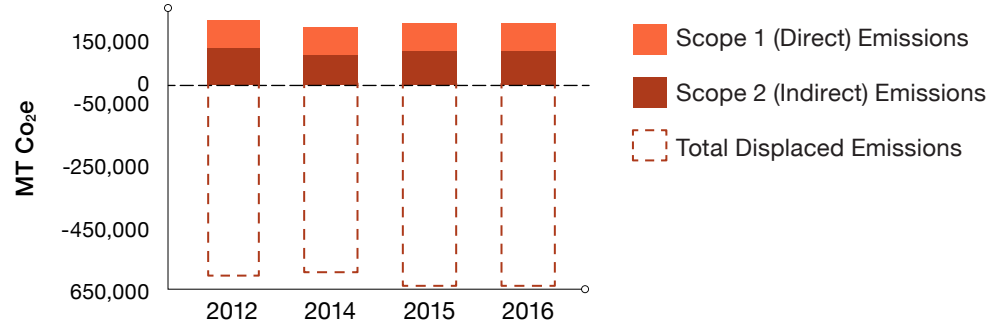
Greenhouse Gas Emissions

MARTA initially completed its first Carbon Footprint in 2008, and has updated its footprint for 2012, 2014, 2015, and 2016. Our 2016 emissions were 195,814 MT CO₂e, which was 44,410 MT CO₂e less than our 2008 baseline emissions. While MARTA's ridership (measured in Passenger Miles Travelled, or PMT) decreased by 8% between 2008 and 2016, MARTA reduced its GHG emissions per PMT by 11%, indicating that MARTA's transit services became less carbon intensive during that time period (see figure, below). The majority of our 2016 emissions are a result of moving people around Atlanta, which is our central mission as a public transit agency (see figure, right).



- 55% Electricity
- 25% CNG
- 12% Diesel
- 5% Gasoline
- 3% Stationary Natural Gas

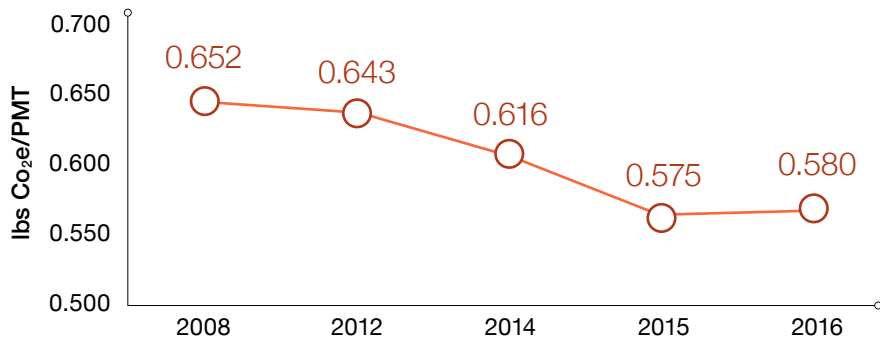
Overview of Emissions and Emissions Displaced by MARTA 2012-2016



The decrease in CO₂e emissions from 2012 to 2016 may be attributed to a decrease in older diesel buses and an increase in new Compressed Natural Gas (CNG) buses, as MARTA has continued to modernize our fleet. This fleet ratio change is accompanied by a decrease in diesel fuel usage for both revenue and non-revenue vehicles by 23%. The emissions decrease could also be due to a decrease in stationary gas combustion and refrigerant purchases. The decrease in emissions from 2012 to 2016 can also be attributable to changes to the Environmental Protection Agency's (EPA) electricity emissions factors for the SERC South sub-region. Emission factors for CO₂ and N₂O most likely decreased due to the region's shift from coal to cleaner energy options, such as natural gas.¹⁴

MARTA is proud of the significant role we play in the Atlanta metropolitan region in reducing GHG emissions through providing alternative transportation options that help to decrease the number of cars on the roads. MARTA services reduced regional GHG emissions by keeping 638,624 MT of CO₂e out of the atmosphere in 2016.¹⁵ This is equal to the annual GHG emissions from 136,750 passenger vehicles or 1,565,254,902 miles driven by passenger vehicles.¹⁶ An Atlanta Regional Commission (ARC) report on GHG emissions in Atlanta's neighborhoods concluded that neighborhoods with a MARTA station produce 60% less GHG emissions per residence than in neighborhoods without a MARTA station.¹⁷

Change in CO₂e Emissions Intensity 2008–2016



MARTA keeps **630k+ MT CO₂e** out of Atlanta's atmosphere every year that's like keeping **136k+** cars off the road!



GHG Emission Reduction Initiatives

In an effort to reduce our emissions, MARTA has established a program to increase the CNG part of the fleet by replacing older diesel buses. CNG buses have significantly lower emissions of nitrogen oxide (NOx), particulate matter (PM), and hydrocarbon (HC) than the older diesel buses that they replace. According to EPA's MOVES emissions model, a 2012 CNG bus emits 80% less NOx, 99% less PM, and 100% less HC than a model year 2000 diesel bus.¹⁸ In addition to these benefits, CNG is more cost-effective for bus vehicle miles than petroleum fueling, providing MARTA with important cost savings over time.

by 5% from our fleet ratio in 2012 (70% CNG). In addition, the current facility upgrades at our Brady and Hamilton Facilities focus around our clean fuel vehicles initiatives and further put CNG infrastructure in place to help us with our transition to an entire CNG revenue fleet in the near future.

In an effort to both decrease area emissions and provide ease of transportation for our employees, all MARTA employees are provided free transit passes. We encourage our employees to use MARTA for both their work commute and for personal travel.

In 2009, MARTA received the Clean Cities Lifetime Appreciation Award from the United States Department of Energy (DOE) for its partnership with the City of Atlanta to significantly reduce petroleum consumption in the transportation sector.



This award recognized MARTA for having served as a pioneer and industry leader since 1993 in the use of clean CNG buses and technology. In 2017, MARTA had 423 CNG buses, comprising 75% of our entire bus fleet. This has increased



incorporating
adaptation
strategies
to make MARTA more
resilient
to future climate
conditions

Climate Adaptation

Even with continued mitigation efforts, MARTA recognizes that some aspects of climate change may already be occurring and may pose a threat to MARTA and our passengers now and in the future. As such, we undertook a study in 2013 to consider what threats climate change may pose to MARTA so as to better identify how to reduce our vulnerabilities and increase our resiliency.

In partnership with the Georgia Institute of Technology, MARTA was awarded an FTA Grant through a competitive process to study how a transit agency's

asset management system can be used to support strategic investment decision-making to respond to climate change impacts.¹⁹ As part of this initiative, MARTA and Georgia Tech considered potential vulnerability to climate change and identified that MARTA's service area may face increased flooding, longer heat waves, droughts, and high wind events. We also considered potential adaptation strategies to incorporate into our asset management program to make MARTA more resilient considering future conditions. This includes looking at our vehicles, our facilities and infrastructure, and also the areas surrounding our stations.

The lessons learned from this study will be used not only to guide MARTA into the future, but also as considerations for other transit agencies.



vision forward

what's next!


Whether we are providing increasingly better service to our customers, or reducing our environmental footprint, continual improvement is what we at MARTA strive for in all aspects of our management and operations. In terms of our sustainability program, we are proud of how far we have come in such a short amount of time, but we recognize there are plenty of ways in which we can grow and improve. One of our main focuses in the next year is to better promote our efforts and accomplishments both internally to our employees and externally to our customers. By promoting our sustainability program, we're hoping to better engage stakeholders throughout the region on our work and set the bar even higher for us in the future.

continual improvement is what we strive for


MARTA has a number of exciting initiatives on the horizon, such as an increase in Transit Oriented Development in our communities, the addition of more farmers markets at our stations, the introduction of mobile ticketing systems to our passengers, and the expansion of our EMS program. We will continue to look for opportunities to improve efficiency in the way we use natural resources as we further measure and monitor our waste, water, and emissions.

With recent service expansion and plans to further expand service territory, we recognize this is an exciting opportunity for MARTA to grow our physical footprint while maintaining or reducing our environmental footprint. MARTA has committed to reduction targets for GHG emissions, waste tonnage, water usage, and diesel fuel consumption through our involvement with APTA. While all of this will certainly be a challenge, it is one we are excited to take head-on.

We are confident that with continued focus on our sustainability initiatives, we will be able to provide improved service to our customers and communities, while simultaneously being a better steward to our environment.



while all of this will certainly be a challenge, we're excited to tackle it head-on





appendix

Footnotes

- 1 [ARC Population Estimates](#)
- 2 [MARTA At A Glance](#)
- 3 [Airports Council International 2016 Passenger data](#)
- 4 Carbon dioxide equivalent is a measure most used to compare greenhouse gases based upon their global warming potential.
- 5 http://www.apta.com/mediacenter/pressreleases/2015/Pages/151112_Sustainability.aspx
- 6 [APTA 2017 Fact book](#)
- 7 [MARTA Environmental Management System \(EMS\)](#)
- 8 Calculated using estimated 35 lbs. of recyclables per cubic yard of dumpster and a dumpster utilization of 80% at the time of pickup.
- 9 Wood is sent to the landfill under MARTA's current waste contract.
- 10 Aside from some heavy maintenance facilities where towels are necessary for employees.
- 11 Average estimate taken from total water usage at Perry and Laredo (reuse bus washing facilities) vs. Hamilton (non-reuse bus washing facility) from CY2013 to CY2016
- 12 [MARTA At A Glance](#)
- 13 [MARTA At A Glance](#)
- 14 [US Energy Information Administration](#)
- 15 Value represents emissions displaced due to mode shift, congestion relief, and land use.
- 16 [EPA's Greenhouse Gas Equivalencies Calculator](#)
- 17 [Atlanta Regional Commission's Understanding Climate change and the Impact of Community Design on GHG Emissions \(2014\) Study](#)
- 18 [2012 Clear Air Task Force](#)
- 19 <https://smartech.gatech.edu/handle/1853/47649>



Acronyms

APTA	American Public Transportation Association
ARC	Atlanta Regional Commission
CNG	Compressed natural gas
CO₂e	Carbon dioxide equivalent
CY	Calendar year
DOE	Department of Energy
EBT	Electronic Benefits Transfer
EMS	Environmental Management System
EPA	Environmental Protection Agency
FTA	Federal Transit Administration
GHG	Greenhouse gas
HC	Hydrocarbon
HVAC	Heating, ventilation, and air conditioning
IOC	Integrated Operations Center
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
MARTA	Metropolitan Atlanta Rapid Transit Authority
MMBtu	Million British Thermal Units
MT	Metric tons
NOx	nitrogen oxide
PMT	Passenger Miles Travelled
PMT	Particulate matter
ROI	Return on Investment
SNAP	Supplemental Nutrition Assistance Program
TIGGER	Transit Investments for Greenhouse Gas and Energy Reduction
TOD	Transit-Oriented Development
USDA	United States Department of Agriculture
VOC	Volatile organic compound

Glossary

American Public Transportation Association (APTA):

A non-profit organization whose goal is to advance public transportation. MARTA is a member of this organization.

Carbon Dioxide Equivalent (CO₂e):

The standard unit for measuring greenhouse gas emissions by expressing each greenhouse gas in terms of CO₂. Greenhouse gases, e.g. N₂O and CH₄, are multiplied by a global warming potential to calculate their emissions in terms of CO₂e.

Climate change: A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. ([IPCC](#))

Electronic Benefits Transfer (EBT) and Supplemental Nutrition Assistance Program (SNAP): Monthly supplements for low-income families to purchase nutritious food provided by the government. ([USDA](#))

Environmental Management System (EMS):

A program based on the ISO 14001:2015 standards that help MARTA manage environmental impacts and demonstrate our commitment to the environment.

Greenhouse Gas (GHG): Gaseous constituents of the atmosphere which absorb and emit radiation at specific wavelengths, which causes the greenhouse effect. Water vapor (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), and ozone (O₃) are the primary greenhouse gases in the Earth’s atmosphere. ([IPCC](#))

International Organization for Standardization

(ISO): An independent, non-governmental international standard-setting body composed of representatives from various national standards organizations.

Leadership in Energy & Environmental Design

(LEED): Independent verification green building rating system of a building or neighborhood’s green features, allowing for the design, construction, operations and maintenance of resource-efficient, high-performing, healthy, cost-effective buildings. ([USGBC](#))

Light emitting diode (LED): Lighting products in which an electrical current passes through a microchip, which illuminates the tiny light sources called LEDs and the result is visible light. LEDs produce light approximately 90% more efficiently than incandescent light bulbs. ([Energy Star](#))

Passenger Miles Traveled: The cumulative sum of the distances ridden by each passenger. A commonly used normalizing factor for sustainability metrics at public transit agencies. ([FTA](#))

Transit-Oriented Development: Creation of compact, walkable, pedestrian-oriented, mixed-use communities centered around transit systems.



Internal Sustainability 2016 Poster

marta | METROPOLITAN ATLANTA RAPID TRANSIT AUTHORITY

SUSTAINABILITY

The Metropolitan Atlanta Rapid Transit Authority (MARTA) provides bus and rail service to approximately 420,000 passengers a day, keeping 185,000 cars off the road. Beyond the clear environmental benefits that public transit has to offer, sustainability has been incorporated into MARTA's objectives and daily operations.



Go for the environment

INITIATIVES



944 tons of waste from offices & facilities diverted from landfills to be recycled from 2012-2014



Installed 52 water filling stations Authority-wide, keeping 141,500 water bottles out of landfills



Installed 4,888 energy-efficient solar panels at Laredo that produce 1.2MW of green power & provide shade for buses



Replaced lights with high-efficiency LED lightbulbs in 10 stations, countless tunnels & is currently expanding



Transformed the bus fleet to 100% clean energy with Compressed Natural Gas and clean diesel buses



Reduced water consumption by reusing water for rail and bus washes at facilities



Planning Transit-Oriented Developments at rail stations to encourage ridership



Implemented LEED standards in design of new facilities and existing renovations



Started a reduced idling campaign, discouraging idling at garages, kiss n' rides, & loading docks

Detailed Sustainability Data

YEAR	2008	2012	2013	2014	2015	2016	2017
Recycling/Waste							
Scrap Metal Recycling (tons)		139	224	277	128	107	55
Single-Stream Recycling (tons)		48	56	45	108	92	37
Used Oil Recycling (gallons)		46,415	46,521	41,202	42,340	43,710	48,404
Electronic Waste Recycling (tons)		0	0.8	0.6	4.4	2	1
Paper Recycling (tons)		16	74	64	52	72	80
Municipal Solid Waste (tons)		2,042	2,036	2,014	1,896	1,812	1,932
Diversion Rate		9.1%	14.8%	16.1%	13.3%	13.1%	8.2%
Pounds (lbs.) waste & recycling / PMT		0.0064	0.0070	0.0071	0.0059	0.0056	0.0062
Energy Usage							
Propulsion Electricity (kWh)		84,755,425	84,500,218	89,172,383	92,260,860	92,324,642	91,288,461
Stationary Electricity (kWh)		99,421,291	99,536,821	103,099,365	104,294,807	103,990,794	103,101,273
Total Electricity Consumed (kWh)		184,176,716	184,037,039	192,271,748	196,555,667	196,315,436	194,389,734
kWh / PMT		0.263	0.270	0.280	0.266	0.264	0.267
Total Stationary Natural Gas Combustion (therms)		1,022,933	1,161,796	1,155,237	1,124,451	1,066,777	1,239,755
Therms / PMT		0.00146	0.00170	0.00169	0.00152	0.00143	0.00170
Water Usage							
Total Water Consumed (gallons)		33,384,685	33,940,595	31,037,073	34,900,740	25,840,667	28,964,573
Gallons / PMT		0.048	0.050	0.045	0.047	0.035	0.040
Mobile Fuel Usage (Revenue and Non-Revenue)							
Diesel Fuel (gallons)	3,400,000	3,105,175		3,262,438	2,623,705	2,537,015	2,625,127
Compressed Natural Gas (DGE)	7,200,771	5,485,662		5,329,457	5,465,831	5,867,303	5,995,539
Unleaded Gasoline (gallons)	416,000	270,579		355,576	1,045,385	1,091,211	1,177,975
Total Fuel Consumed (gallons)	11,016,771	8,861,416		8,947,471	9,134,921	9,495,529	9,798,641
Gallons / PMT	0.0136	0.0127		0.0131	0.0124	0.0128	0.0134
Greenhouse Gases Emitted and Displaced (GHG)							
Mobile Emissions (vehicles, traction power)		133,229		128,128	129,356	132,446	CY 2017 Carbon Footprint will be completed in FY 2019
Stationary Emissions (offices, stationary energy)		70,798		63,369	63,290	65,362	
Total Emissions (MT CO₂E)	240,224	204,027		191,498	192,646	195,814	
CO₂e Emitted/ PMT		0.643		0.616	0.575	0.580	
Emission savings - Mode Shift		160,083		157,517	170,244	172,216	
Emission savings - Congestion Relief		22,798		22,798	22,798	22,798	
Emission savings - Land Use		416,701		408,520	439,846	443,610	
Total Emissions Displaced (MT CO₂E)		599,582		588,835	632,888	638,624	
Agency Passenger Miles Traveled							
Paratransit PMT	5,423,341	7,815,843	7,707,939	7,729,688	8,242,697	8,504,172	9,343,763
Rail PMT	593,419,360	463,168,559	444,043,156	444,957,333	472,764,484	477,298,793	468,811,412
Bus PMT	213,459,568	228,212,493	230,560,804	232,782,142	257,024,824	258,545,484	251,234,929
Total Passenger Miles Traveled	812,302,269	699,256,894	682,311,899	685,469,163	738,032,005	744,348,449	729,390,104

Light grey boxes represent year in which the corresponding data were not collected
 Dark grey boxes represent data or calculations that will be completed in the future