An average MTA trip saves over 10 pounds of greenhouse gas emissions.
Every time you ride the subway you are fighting climate change.

New York State has the lowest per capita energy consumption and greenhouse gas (GHG) emissions in the nation. This distinction and the associated economic advantages — such as relatively low impact from rising gas prices — results from the livability and walkability of New York City and much of its metropolitan area, and from land-use patterns that are facilitated by the existence of safe and reliable public transportation. Two-thirds of all New Yorkers live and work in the region served by the MTA. Thus, on average, New Yorkers are significantly less auto-dependent than other Americans and consequently extremely energy- and GHG-efficient.

You are proof that transit-rich regions are the most carbon-efficient places to live in.

Transit not only dramatically reduces a commuter’s carbon footprint, it also facilitates a larger shift away from automobile use. Without public transportation, the New York metropolitan region could not be nearly as bike and pedestrian friendly as it is.

MTA’s 2010 Third-Party Verified GHG Emissions

The MTA counts emissions from its entire fleet of commuter trains, subways and buses, associated stations, two tunnels and seven bridges, and the maintenance and administrative facilities needed to run our bistate network. Emissions from all our facilities and fleets are reported annually to The Climate Registry, using its reporting protocols. These emissions, in turn, are independently verified by LRQA Americas Sustainability, Inc. Following internationally recognized protocols and standards ensures rigorous data gathering. While many organizations report their carbon emissions following standard protocols, not all subject their GHG inventories to third-party verification. The independent audit of MTA’s GHG emissions enhances the credibility of our report and provides assurance of its accuracy to the public and other stakeholders. In 2010, MTA’s third-party verified GHG emissions were 2,109,562 metric tons carbon dioxide equivalent (metric tons).³

How do we know how much carbon each ride saves?

This is a complex question. The simplest thing would be to measure the amount of electricity that a subway train consumes to get from point A to point B and to divide that by the number of people riding the train that distance. Then do the same for when that same trip is taken in a car, with one person in it, and calculate the difference between the two amounts of GHG emitted.

But what if a customer is on a bus or a commuter train instead of the subway? And what if the distance between points A and B are very different on that customer’s commute as opposed to another’s?

To account for all these variances, the MTA followed a methodology — developed by the American Public Transportation Association (APTA)¹ — for calculating transit’s impact on greenhouse gas emissions. We combined the APTA methodology with complex modeling using over a thousand trip origins and destinations to calculate an average trip length.

Avoiding more than 10 pounds of greenhouse gas emissions per ride is like…

... saving the energy required to keep a 60-watt bulb burning for one full week straight;

... offsetting the entire carbon footprint of an iPad® every week—production, transportation, use — everything;

... the carbon footprint of over one month’s worth of disposable paper coffee cups;

... doing the work of hundreds of trees to capture carbon!

On average, every MTA trip avoids 10.4 pounds of GHG emissions. A carbon model prepared by Booz Allen Hamilton in 2008 showed a total avoidance from all MTA services to be 17 million metric tons. We divided that by the total trips to calculate avoidance-per-trip.
Additional modeling helped us understand **Mode Shift**, or how people choose public transportation over a car, or vice versa, and what carbon impact each decision has. For example, when the train isn’t an option, a commuter may drive the same distance in a suburban setting, but may instead walk, bike or hop into a cab in Midtown Manhattan.

**Congestion Relief** is another significant impact of transit, which is to say that cars on the Long Island Expressway move more efficiently in the morning because some people who could drive are sitting in a Long Island Rail Road train, reading the paper or responding to email, while they down that first cup of coffee.

The final and perhaps most significant impact of transit on regional emissions comes from the **Land-Use Factor**; this factor explains why people in urban areas tend to live, work, shop and play closer to each other than in suburban and rural areas. This results in more energy efficient homes and businesses, and leads to more walking and biking, and fewer trips to the grocery store in your car.

All these factors representing distances traveled, mode choices, and lifestyle choices, were thrown into a giant blender — actually a sophisticated mathematical model — which churned through thousands of pieces of data, both internal to the MTA and publicly-available databases like the U.S. Census. When the blender finally stopped spinning, it told us that every time you take a trip with us, together we save the world about 10½ pounds of carbon emissions. The more rides, the greater the savings!

### Together, the MTA and its riders helped the region avoid almost seventeen million metric tons of GHG emissions in 2010.

In other words, while the MTA itself produces 2.1 million metric tons, its transit operations actually reduce the overall carbon emissions of the region by 17 million metric tons annually. Without the MTA, annual GHG emissions in the region would be 17 million metric tons higher each year than they are today. Avoiding nearly 17 million metric tons of GHG emissions is more than three times the entire annual GHG emissions of San Francisco.5

The MTA is the first transit agency to quantify its impact on regional GHG emissions.6 Quantification of our annual carbon avoidance is part of our continuing effort to measure all of the benefits of public transportation. As research in this area evolves, and more transit agencies follow suit,7 the model will be refined and improved. In the meantime, this model allows us to quantify the value of public transportation as a GHG-reduction strategy.

The MTA has become more efficient over time. This is because we now use cleaner fuels and more efficient engines, but even more so because more and more people are choosing to make their daily commute with us. Ridership, at or close to historic highs, is responsible for much of our emissions savings.8 After all, how would we save emissions if trains and buses were running without commuters!

### Mass Transit vs. the Single Occupancy Vehicle

In 2010, MTA’s overall GHG emissions per passenger mile travelled (PMT) were 0.23 pounds carbon dioxide equivalent per PMT.9 This includes the direct emissions from all transit modes. That is about 25% of the national average of 0.91 pounds per passenger-mile in a typical light-duty vehicle in the same year.

The chart below compares MTA’s direct and indirect emissions per PMT for each transit mode to a single occupancy vehicle.10 While emissions per PMT vary by mode, it’s clear that transit modes are by far more carbon efficient than a single-occupancy vehicle, even including indirect emissions.
The MTA prevents about 17 million metric tons while emitting only 2 million metric tons, making it perhaps the single biggest source of GHG avoidance in the United States. The 13 million New Yorkers who live in our service area lead carbon-efficient lives, making New York the most carbon-efficient state in the nation. New Yorkers manage to be efficient without compromising health, lifestyle or income. In fact, we outperform our compatriots in most such indices even as we consume a fraction of the energy and emit a fraction of the GHG. This is the magic of plentiful public transportation. It benefits those who use it and those who don’t use it. It relieves congestion on the streets, insulates people from swings in energy prices, and ultimately, benefits the entire world.

Transit systems with rich legacies and great scalability need sustained investment. New York City’s population grew by one million in the previous three decades without a single new mile of highway or track. That’s unimaginable in a road-based paradigm and why a dollar spent on public transit is without a doubt the single most efficient way to improve both our economy and our environment.

For more information visit us at www.mta.info/sustainability.

References for GHG comparisons

Light bulbs: http://www.epa.gov/cleanenergy/energy-resources/agrid/index.html
iPad®: http://www.apple.com/environment/reports/
Coffee cups: http://business.edf.org/casestudies/starbucks-improving-cups
Trees: http://www.epa.gov/cleanenergy/energy-resources/calculator.html

1 The MTA is a Founding Member of The Climate Registry (TCR), achieving Climate Registered™ status in 2010. The Climate Registry is nonprofit organization that sets consistent and transparent standards to calculate, verify and publicly report greenhouse gas emissions into a single registry. The MTA’s GHG emissions from 2008 through 2010 have been reported and independently verified using TCR protocols are available at https://www.crisreport.org/web/guest/analysis-and-reports

2 LRQA Americas Sustainability, Inc. is one of the longest-standing accredited greenhouse gas verification bodies in the United States and is a member of the Lloyd's Register Group of entities. See http://www.lrqasustainability.us/

3 NYCT Access-A-Ride is a mandated paratransit service owned by the MTA that provides critical mobility for the disabled and elderly. Access-A-Ride is paid for by the MTA, but operated by contractors. Per TCR's General Reporting Protocol (GRP), this takes it outside the ambit of the MTA's operational emissions. As a result, MTA chooses to report these emissions voluntarily, but they are not subject to the third party verification process. Including Access-A-Ride emissions, MTA's total emissions were 2,193,844 metric tons carbon dioxide equivalent. The paratransit rides, as may be expected, are very carbon intense as they are often personalized for one rider. However, they form only about 4% of the entire emissions of the MTA.


5 San Francisco’s citywide carbon footprint totaled 5.4 million metric tons carbon dioxide equivalent in 2010. See http://www.sfmayor.org/index.aspx?page=593

6 Blue Ribbon Commission on Sustainability and the MTA. 2009. Impact of Public Transportation on GHG in the MTA Area. Prepared by Booz Allen Hamilton. http://mta.info/sustainability/index.html?c=reports MTA is the first transit agency to use the APTA methodology and create a model specific to its operating region.

7 The Regional Transportation Authority (RTA) of Chicago recently created its own carbon avoidance model also based on the APTA methodology and in Philadelphia, the Southeastern Pennsylvania Transportation Authority (SEPTA) has been following the APTA methodology using national multipliers where regional data is unavailable. See http://rtachicago.com/ and http://www.septa.org/

8 MTA NYCT subway ridership peaked in 1946 with 2.07 billion annual riders. In 2011, there were 1.64 billion annual subway riders.


11 Based on 2010 U.S. Census population figures for the following New York State counties in MTA’s service territory