

Transit's Role in Environmental Sustainability

Source: transit.dot.gov

Published: May 9, 2016



Public transportation plays an important role in confronting environmental challenges. Public transportation can:

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Improve air quality

Public transportation can help metropolitan areas meet national air quality standards by reducing overall vehicle emissions and the pollutants that create smog.

Air quality is often the poorest in urban and suburban areas where traffic congestion is the worst. This has meant that residents of these areas, especially those living in close proximity to major thoroughfares or highways, confront much higher health risks due to poor air quality.

Public transportation can reduce the need for many separate trips by private vehicles in dense urban areas, replacing many separate emissions-producing vehicles with fewer transit vehicles that generally emit less pollution on a per person basis.

Most rail transit vehicles emit little or no pollution, as they are powered by electricity. Other transit vehicles, such as buses, use alternative fuels such as compressed natural gas (CNG), liquefied natural gas or fuel cells which produce fewer pollutants. Many other buses, traditionally fueled by diesel, are being replaced with hybrid-diesel or bio-diesel buses.

The Federal Transit Administration supports improvement of air quality through the Congestion Mitigation and Air Quality (CMAQ) Improvement Program, which is jointly administered with the Federal Highway Administration. Through 2005, the program has supported nearly 16,000 transportation projects targeted to reduce congestion and improve air quality across the country. Many of these projects are public transportation projects, recognizing the important role that public transportation can play in improving local air quality. Over 8.6 billion is authorized over the five year program (2005-2009), with annual authorization amounts increasing each year during this period.

Reduce greenhouse gas emissions

Transportation accounts for 29 percent of greenhouse gas emissions in the United States. By moving more people with fewer vehicles, public transportation can reduce greenhouse gas emissions. National averages demonstrate that public transportation produces significantly lower greenhouse gas emissions per passenger mile than private vehicles. Heavy rail transit such as subways and metros produce on average 76% lower greenhouse gas emissions per passenger mile than an average single-occupancy vehicle (SOV). Light rail systems produce 62% less and bus transit produces 33% less ([Public Transportation's Role in Responding to Climate Change \(PDF\)](#)). Transit can also reduce greenhouse gas emissions by facilitating compact development, which conserves land and decreases the distances people need to travel to reach destinations. Moreover, by reducing congestion, transit reduces emissions from cars stuck in traffic. Finally, transit can minimize its own greenhouse gas emissions by using efficient vehicles, alternative fuels, and decreasing the impact of project construction and service operations. For more information, see [Climate Change](#).

Facilitate compact development, conserving land and decreasing travel demand

Public transportation can support higher density land development, which reduces the distance and time people need to travel to reach their destinations, meaning fewer emissions from transportation. Compact development also leaves more land in the region for parks, wildlife preserves, forests and other uses such as agriculture. Finally, it reduces the need for pavement, meaning less run-off that degrades the water supply.

Transit-oriented development (TOD) is compact, mixed-use development near transit stations. A recent report, Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects, by the Transit Cooperative Research Program (TCRP) found that by encouraging in-fill and accommodating small lot projects, TOD can reduce pressures to convert farmland and environmentally sensitive areas into housing and commercial development. Another TCRP report, Costs of Sprawl – 2000, concluded that compact development could save the United States nearly 2.5 million acres of land. That TCRP report also found that compact development through

TOD can improve water quality through reducing the amount of impermeable surface runoff and preserve biodiversity through reducing fragmentation of natural habitat.

Save energy

Sharing rides through public transportation can save fuel. It also decreases the need for constructing more transportation infrastructure, manufacturing new vehicles, and extracting more fossil fuels, meaning further energy savings and fewer environmental impacts. Congestion relief from transit also saves fuel as vehicles stuck in gridlock waste fuel and generate emissions.

The transportation sector is one of the primary users of energy in the United States. With the growth in energy usage by many emerging world economies, the demand for scarce resources is increasingly outstripping available supply.

Petroleum use in private vehicles and growth in vehicle miles traveled are among the main drivers of the growth in energy usage in the United States. Public transportation encourages energy conservation, as the average number of passengers on a transit vehicle (10 for bus, 25 for a rail car) far exceeds that of a private automobile (1.6). Even as a single transit vehicle consumes more energy than a private vehicle, the average amount of energy utilized per passenger is far less.

In fact, a [study by ICF International \(PDF\)](#)

found that in 2004, taking transit saved 947 million gallons of fuel that would have been used if transit passengers had driven cars instead.

Congestion relief through the use of transit also saves fuel as vehicles stuck in gridlock waste fuel and generate emissions. The Texas Transportation Institute's 2007 [Mobility Report](#)

estimates that if public transportation service was discontinued nationwide and the riders traveled in private vehicles instead, urban areas would have suffered an additional 541 million hours of delay and consumed on the whole 340 million more gallons of fuel in 2005. The value of the delay and fuel that would be consumed if there were no public transportation service would be an additional \$10.2 billion congestion cost, a 13 percent increase over current levels.

Other benefits

In addition to its environmental benefits, [transit serves several other public purposes](#), including affordable mobility, congestion relief, and economic development.

Minimizing impacts

In addition, FTA grantees are working to minimize the impact of their operations and construction through environmentally sound practices, both through required environmental mitigation and going above and beyond requirements.

FTA works to ensure that our grantees' transit projects minimize the negative impacts on their surroundings and in their communities through environmentally sound practices. The FTA's environmental impact regulation ([Environmental Impact and Related Procedures](#) (23 C.F.R 771)), issued jointly with the Federal Highway Administration (FHWA), describes two types of mass transit projects that normally have significant effects on the environment:

1. New construction or extension of fixed rail transit facilities (e.g. heavy rail, light rail, commuter rail and automated guideway transit); and
2. New construction or extension of a separate roadway for buses or high-occupancy vehicles not located within an existing highway. e.g. bus rapid transit)

Other types of mass transportation projects may also require an [Environmental Impact Statement \(EIS\)](#) based on FTA's review of the proposed project and whether its impacts are judged to be potentially significant.

In addition, transit agencies often go above and beyond federal requirements. There are numerous examples of transit agencies taking action to minimize their impact on the local environment. Many transit agencies, for instance, have purchased compressed natural gas (CNG) buses, which significantly reduce air pollutants. FTA's grantees are also using hybrid-electric buses to conserve fuel and lower emissions. Some grantees are constructing Leadership in Energy and Environmental Design (LEED) certified buildings.

Several transit agencies are implementing Environmental Management Systems (EMS), which address various operation and management issues such as energy conservation, efficient water use, vehicle emission reduction, materials recycling, and management of hazardous materials.

For example, New York City Transit has implemented an Environmental Management System certified to international standards known as ISO 14000. As just one part of its EMS, New York City Transit constructed its new rail maintenance facility as a LEED-certified facility. It has a photovoltaic system for electricity, a fuel cell system for domestic hot water, a natural ventilation system, a rain water harvesting system for car wash, and a public education outreach program.

As yet another example, according to the Chicago Transit Authority (CTA), CTA was able to reduce its vehicle emissions by 16 percent even while expanding its fleet by nine percent. CTA also recycled 3.3 million pounds of material in one year alone, including cardboard, mixed office paper, bus shelter plastic and metals. In addition, the agency recycled 93 vehicles and 12,460 pounds of acid batteries.

Last updated: Monday, December 14, 2015
