

## DEPARTMENT OF TRANSPORTATION

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### Principal Areas of Focus

The Department of Transportation (DOT) conducts research and uses existing science to improve decisionmaking tools to address climate change. DOT supports research that 1) examines the potential impacts of climate variability and change on transportation infrastructure and services, 2) increases energy efficiency and reduces greenhouse gases, and 3) improves transportation greenhouse gas data and modeling. DOT has many programs that have either direct or indirect climate benefits, and is working to develop cross-modal strategies to reduce greenhouse gas emissions.

DOT's Climate Change Center is the Department's focal point for information and technical expertise on climate change. The Center coordinates research, policies, and actions related to transportation and climate change with DOT's component organizations. Supporting DOT's core goals of safety, mobility, environmental stewardship, and security, the Center promotes comprehensive approaches to reduce greenhouse gases, to prepare for the potential impacts of climate change, and to develop necessary adaptations to transportation operations and infrastructure. The Center's three primary objectives follow:

- Promote cost-effective strategies that reduce greenhouse gas emissions while supporting improved transportation safety, mobility, and efficiency
- Foster strategies to avoid, mitigate, or adapt to the potential impacts of climate change on the transportation system
- Provide leadership to the transportation community and coordinate DOT multi-modal activities on climate change.

The Center supports CCSP goals through these objectives. Specifically, the Center aims to inform CCSP Goal 4 by identifying and providing scientific inputs for evaluating adaptation options and CCSP Goal 5 by supporting adaptive management and planning for physical infrastructure sensitive to climate variability and change.

In addition to participating in the Center, the Federal Aviation Administration (FAA) has programs to assess and identify potential measures to reduce fuel consumption and greenhouse gas emissions. FAA conducts research to support CCSP Goal 2, leveraging research with other U.S. Government agencies to reduce uncertainties surrounding aviation emissions and their effect on climate change. For example, FAA research through the Partnership for Air Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence addresses the impact of aircraft contrails on climate change. FAA also has a number of ongoing operational initiatives to reduce fuel consumption and thus the amount of greenhouse gas emissions produced by aviation, including improved air traffic management, reduced vertical separation minimums, and the voluntary airport low emissions program that assists in deploying low emissions technology to airport operations. FAA also participates heavily in the work program of the International Civil Aviation Organization's Committee on Aviation Environmental Protection, and provides technical expertise and data to the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC).



# Appendix A

## Program Highlights for FY 2009

DOT's Climate Change Center is undertaking several research projects that support CCSP Goals 4 and 5:

- Refining a tool to allow comparative analysis of emissions from different modes of transportation, including aviation, automobile, marine, and diesel transportation
- Exploring adaptation to potential impacts of climate change by partnering with the Transportation Research Board of the National Academies
  - Reexamine the role of design standards for transportation infrastructure in light of potential impacts from climate change
  - Develop operational responses to potential climate change impacts
  - Review approaches to decisionmaking under uncertainty
- Conducting an emissions analysis of freight transport, comparing land-side and water-side short-sea routes to develop and demonstrate a decision modeling tool
- Determining the potential effects of sea-level rise on national transportation infrastructure
- Preparing a study for Congress of the impact of passenger and freight transportation on climate change and solutions
- Developing a web clearinghouse of passenger and freight solutions across all modes to reduce greenhouse gas emissions and environmental impact
- Conducting a pilot project to record best practices for metropolitan planning organizations (MPOs) to incorporate climate change into transportation planning.

The Center sponsored CCSP Synthesis and Assessment Product 4.7, *Impacts of Climate Variability and Change on Transportation Systems and Infrastructure—Gulf Coast Study*. This project—initiated under the President's Climate Change Research Initiative—was a joint research effort with USGS. A Federal Advisory Committee was formed in 2006, and Phase I was completed in 2007. Phase I provided an integrated overview of infrastructure sensitivities in the region. The final document was released in March 2008.

The Office of the Secretary is funding several projects, including a *Best Practices Guidebook for Greenhouse Gas Reductions in Freight Transportation* designed for use by companies and individual freight operators.

## Related Research

Many of DOT's programs have ancillary climate benefits:

- The Federal Highway Administration has numerous programs to prepare the highway system for weather irregularities and to reduce air pollutants:
  - *Road Weather Management Program*. This program seeks to better understand the impacts of weather on roadways. The Clarus initiative will develop and demonstrate a national integrated surface transportation road weather observing, forecasting, and data management system.
  - *Congestion Mitigation and Air Quality (CMAQ) Improvement Program*. The CMAQ program provides over \$8.6 billion in funds over a period of 5 years (2005-2009) to State transportation agencies to invest in projects that reduce emissions from transportation-related sources.
  - *Idle-Reduction Activities*. DOT, EPA, and DOE have provided funding for the implementation of idle-reduction projects around the country (both on-board and off-board technologies) for transportation, air quality, and energy stakeholders. The projects have resulted in reductions in

criteria air pollutants, such as nitrous oxides, as well as reductions in carbon dioxide emissions. This initiative has expanded to include idling emissions from marine, rail, and off-road heavy-duty engines.

- The National Highway Traffic Safety Administration sets new Corporate Average Fuel Economy standards for light trucks, increasing energy efficiency and thus decreasing greenhouse gas emissions. In FY 2008, NHTSA is developing café regulations for future model years, including implementing provisions of the Energy Independence and Security Act.
- FAA continues to develop a comprehensive suite of software tools to allow for the thorough assessment of the environmental effects and impacts of aviation (<[http://www.faa.gov/about/office\\_org/headquarters\\_offices/aep/models](http://www.faa.gov/about/office_org/headquarters_offices/aep/models)>). One element of the tools suite is the Aviation Environmental Design Tool (AEDT), which incorporates the legacy System for assessing Aviation’s Global Emissions (SAGE) tool. AEDT/SAGE takes as input detailed fleet descriptions and flight schedules, and produces estimates of noise and emissions inventories and fuel consumption at global, regional, and local levels. The tool can also estimate future output based upon forecasts, including potential technology advances or operational improvements, as well as the influence of potential market-based measures to reduce fuel consumption and greenhouse gas emissions. Data from AEDT/SAGE is used to calculate the FAA’s Flight Plan aviation fuel efficiency goal.
- The Federal Transit Administration (FTA) Fuel Cell Program has researched and demonstrated fuel cell bus technology since the mid-1990s. FTA also conducts alternative fuels research.
- DOT’s Research and Innovative Technology Administration conducts and administers a range of alternative fuel grants. The research focuses on developing and demonstrating alternative fuel and advanced propulsion technology systems with an emphasis on efficiency, safety, and sustainability. Research aims to inform stakeholders and facilitate technology.
- Other programs for congestion mitigation, hydrogen-powered transportation, and transit developments all will potentially reduce greenhouse gases.

