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H. HRG. 111–3

# ENERGY REDUCTION AND ENVIRONMENTAL SUSTAINABILITY IN SURFACE TRANSPORTATION

## HEARING

BEFORE THE

SUBCOMMITTEE ON HIGHWAYS AND TRANSIT

OF THE

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE UNITED STATES HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

JANUARY 27, 2009

Printed for the use of the
Committee on Transportation and Infrastructure

U.S. GOVERNMENT PRINTING OFFICE

46–952 PDF WASHINGTON : 2006

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

**[ERRATA]**

H. HRG. 111-3

An error was made on pages vi-xiv of H. Hrg. 111-3. These pages have been replaced with the correct Summary of Subject Matter iii-xi.

# U.S. House of Representatives
## Committee on Transportation and Infrastructure
Washington, DC 20515

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January 26, 2009

**SUMMARY OF SUBJECT MATTER**

**TO:** Members of the Subcommittee on Highways and Transit

**FROM:** Subcommittee on Highways and Transit Staff

**SUBJECT:** Hearing on "Energy Reduction and Environmental Sustainability in Surface Transportation"

### PURPOSE OF HEARING

The Subcommittee on Highways and Transit is scheduled to meet on Tuesday, January 27, 2009, at 10:00 a.m., in room 2167 of the Rayburn House Office Building to receive testimony on approaches for addressing energy usage and environmental sustainability in surface transportation. This hearing is part of the Subcommittee's effort to prepare for the reauthorization of federal surface transportation programs under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users ("SAFETEA-LU"), which expires on September 30, 2009. The Subcommittee will hear from a State Secretary of Transportation, a general manager of a metropolitan transit agency, a representative of local government, a representative of an environmental defense group, a director of urban and land use policy for a think tank, and a number of representatives from industries that offer methods for improving environmental sustainability in the nation's infrastructure.

### BACKGROUND

America's intermodal transportation network serves as the backbone of our economic security and competitiveness, as well as our quality of life. It facilitates the safe movement of people and goods, and links communities to each other and to the world. In recent years, however, there has been a significant decline in the performance of the system, with many aspects of the surface transportation network operating at or near capacity.

The Texas Transportation Institute's 2007 Urban Mobility Report found that in 2005, 4.2 billion hours of travel delay resulted in 2.9 billion gallons of additional fuel used per year. This wasted fuel and time translated into a total congestion cost of $78.2 billion in 2005—$5.1 billion higher than a year earlier—and that in 2005, drivers in 28 metropolitan areas experienced 40 or more hours of delay per year. In 1982, only Los Angeles experienced that level of congestion and delays.

There are a number of factors contributing to this situation. Most important of these is the significant changes that have occurred in the U.S. since the development of the Interstate Highway System in 1956.

- Between 1950 and 2007, the U.S. population has doubled from 150 million to 300 million.
- The nation's GDP has grown from $345 billion to $13 trillion.
- Since 1970, imports to the U.S. have tripled and exports have doubled.
- The use of highways has become the primary mode of choice for most Americans. The 2001 National Household Survey (the last survey completed by U.S. Department of Transporation) found that 87 percent of daily trips involved the use of personal vehicles.
- According to the Federal Highway Administration ("FHWA"), VMT has grown three times faster than the U.S. population, and almost twice as fast as vehicle registrations.
- In 2007 there were more than 2.99 trillion vehicle miles traveled, nearly 5 times the level experienced in 1955.
- Land use, economic development, and migration patterns of the last fifty years have spread homes, businesses, and the surface transportation network farther from dense city centers where public transit infrastructure had largely been built.

Currently, the U.S. is the world's largest energy consumer and largest greenhouse gas ("GHG") emitter. According to the Environmental Protection Agency and the U.S. Department of Energy, approximately 30 percent of the United State's greenhouse gas emissions are produced by mobile sources. Private vehicles are the largest contributor to household "carbon foot prints"—accounting for 55 percent of carbon emissions from U.S. households—while 85 percent of transportation sector emissions are related to the surface transportation system. The U.S. is responsible for one-quarter of the 85 million barrels of petroleum consumed worldwide every day.

With the nation's population expected to grow from approximately 300 million today to 420 million by 2050, and freight volumes expected to grow by 70 percent by 2020, future demands on the intermodal surface transportation network will require implementation of a variety of approaches to address the challenges of the 21st Century. To address some of these challenges, some have suggested incorporating energy reduction and environmental sustainability principles into surface transportation policy and practice in the context of the next surface transportation authorization.

Though no one approach encapsulates the full breadth of the objectives of energy reduction and environmental sustainability, various strategies are being employed to meet emerging energy and environmental goals, such as:

- Employing practices in design and capital construction, such as using sustainable building materials, recycled materials, and solar and other renewable energy sources to make facilities as "green" as possible.

- Employing practices in operations and maintenance such as reducing hazardous waste, increasing fuel efficiency, creating more efficient lighting, and using energy-efficient propulsion systems.
- Employing community-based strategies to encourage land use and transit-oriented development designed to increase public transit ridership, walking, and bicycling.

Transportation choices can have a beneficial impact on both energy supply and the environment. According to a recent study, if Americans used public transit at the same rate as Europeans – for roughly 10 percent of their daily travel needs – the United States could reduce its dependence on imported oil by more than 40 percent, nearly equal to all of the crude oil that we import from Saudi Arabia each year[1]. A February 2008 report by ICF International found that a person, who switches a 20-mile round trip commute alone by car to existing public transportation, can reduce his or her annual carbon dioxide emissions by 4,800 pounds per year, equal to a 10 percent reduction in all GHG produced by a typical two-adult, two-car household. Recently, several groups, including the American Association of State Highway and Transportation Officials has called for the annual growth in VMT to be cut by one-half to lower emissions and address air quality concerns. According to the American Public Transportation Association, over 10 billion passengers used public transportation in 2007, the highest level in 50 years, while 2008 figures were on track to again break that record.

According to a Department of Transportation ("DOT") evaluation of the MOBILE Vehicle Emission Model used by the Environmental Protection Agency, emission factors are very sensitive to the average speed that is assumed. In general, emissions tend to increase as average vehicle speed decreases. As such, some groups have argued that road-based congestion pricing strategies and targeted capacity increases that keep car traffic moving at higher speeds also helps reduce GHG emissions and improve air quality.

## CURRENT PROGRAMS AND EFFORTS TO ADDRESS ENERGY AND ENVIRONMENTAL ISSUES

There are currently a number of programs within the U.S. DOT designed to address environmental impacts of surface transportation programs, and to encourage the development and expansion of transportation options.

### Federal Transit Administration

The Federal Transit Administration ("FTA") works with public transportation providers and other key stakeholders to implement strategies that reduce energy usage and greenhouse gas emissions from the transportation sector. FTA's grants, technical assistance, research, and policy leadership all play a role in the agency's efforts to address climate change.

*Transit Capital Investment Program*—The transit capital investment program provides capital assistance for three primary activities: new and replacement buses and facilities, modernization of existing rail systems, and new fixed guideway systems (New Starts and Small Starts). These systems provide

[1] "Conserving Energy and Preserving the Environment: The Role of Public Transportation" Shapiro, Hassett and Arnold, 2002.

local communities an effective means of increasing mobility, relieving congestion, reducing energy consumption and improving and protecting the environment.

*Clean Fuels Grant program and the National Fuel Cell Bus Technology Development Program (NFCBTP)*— These programs offer incentives for increasing alternative fuels use in the transit program. Both programs provide grant funds for capital costs, and NFCBTP also addresses certain operating costs, technical issues, and institutional issues for fuel cell vehicles. Clean fuel or alternative fuel vehicle-related equipment or facilities acquired under the grant programs currently have a 90 percent federal share of the net project cost.

*Planning Programs* – FTA provides technical assistance in planning for transit investments, including joint development and transit-oriented development guidelines. According to a January 2009 report issued by the FTA, combining investment in public transportation with compact, mixed-use development around transit stations has a synergistic effect that amplifies the greenhouse gas reductions of each strategy[2]. Current State and metropolitan planning requirements require consideration of strategies that will protect and enhance the environment, promote energy conservation, improve quality of life and promote consistency between transportation improvements and State and local planned growth and economic development patterns.

*Research* – FTA contributes to research on climate change mitigation and adaptation in the transportation sector through the U.S. Department of Transportation Climate Change Center. In 2008, the Center produced two key studies on the impacts of climate change on transportation infrastructure. The Center also produced a report on integrating climate change considerations into transportation planning and launched a web-based clearinghouse (see www.climate.dot.gov). Currently, the Center is preparing a report to Congress on a full range of strategies to reduce greenhouse gas emissions from all modes of transportation.

*Industry Partnerships* – FTA has also partnered with the American Public Transportation Association ("APTA") to develop a standard methodology for measuring greenhouse gas emissions produced by public transportation, so agencies can track and reduce their emissions. APTA has since launched a sustainability commitment, a voluntary environmental program open to all APTA members, whether they are part of the private or public sector. It calls on APTA members to commit to a set of actions on sustainability to take in a given period and offers a checklist of processes to conform to and reduction targets to meet the criteria of sustainability. Commitment signatories are asked to measure and communicate on the results of the actions they have taken on an annual basis.

In addition to working with FTA and APTA, public transportation agencies across the country are taking specific actions to reduce the energy intensity of their operations. Some agencies are building new facilities to Leadership in Energy and Environmental Design ("LEED") standards or higher. For instance, New York City Transit built a LEED certified maintenance facility that has fuel cell units, rooftop solar panels, natural lighting, and rain water storage to wash buses and cars. The agency is also using recycled construction materials and replacing older buses with new hybrid buses. Bus manufacturer New Flyer, with 42 percent of the U.S. transit bus market, reports that while hybrid buses comprised only one percent of its sales in 2003, hybrid buses are expected to comprise half of its sales in 2009.

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[2] "Public Transportation's Role in Responding to Climate Change" U.S. DOT, Federal Transit Administration, January 2009.

Transit agencies are also using alternative fuels such as biodiesel and piloting hydrogen fuel cell buses, which produce zero emissions when the hydrogen is produced from a zero emission power source such as solar. Rail agencies are looking to further reduce energy consumption by lowering the amount of electricity used in powering vehicles. In Phoenix, for example, the new light rail system uses regenerative braking to lower electricity consumption. As the electric power industry shifts to more renewable sources of energy, as has been mandated in several states, electric public transportation systems provide even more emissions reduction benefits. When the electricity is generated from a zero emissions source, such as wind, hydroelectric, nuclear, or solar, the public transportation systems that use these power sources are also zero emissions. Several transit agencies are installing on site renewable energy generation to power parts of their systems. Boston's transit agency is installing wind turbines, New York City Transit plans to harvest power from the tides by installing turbines in tidal waters, and Los Angeles Metro is installing solar panels on its properties.

**Federal Highway Administration**

There are a number of programs in place at the Federal Highway Administration ("FHWA") to tie transportation decision-making to air quality, as well as programs to reduce vehicle emissions and encourage alternative forms of transportation.

*Transportation Conformity*—The Clean Air Act Amendments of 1990 and the Intermodal Transportation Efficiency Act of 1991 (ISTEA) established a close linkage between clean air goals and transportation investments. This linkage has been retained in subsequent surface transportation reauthorizations. The Clean Air Act requires that, in areas experiencing air quality problems, transportation planning must be consistent with air quality goals. This is determined through the transportation conformity process. Where air quality goals are not being met, sanctions on highway program funds may be imposed under the Clean Air Act as an incentive for areas to comply with air quality planning requirements.

*Congestion Mitigation and Air Quality Program*—The Congestion Mitigation and Air Quality Improvement Program ("CMAQ") provides funding for projects that contribute to air quality improvements and reduce congestion. It provides funds to State DOTs and Metropolitan Planning Organizations ("MPOs") to invest in projects that reduce emissions from transportation-related sources. In addition, CMAQ funding is often "flexed" to transit agencies to fund public transportation projects.

Eligible uses of CMAQ funds include: public transportation improvements, traffic flow improvements, transportation demand management, bicycle and pedestrian projects, alternative fuel projects, inspection and maintenance programs, intermodal freight transportation, public education and outreach, idle reduction technology, intelligent transportation systems, diesel retrofits for on-road motor vehicles and for non-road engines used in highway construction projects, purchase of integrated, interoperable emergency communications equipment, and advanced truck stop electrification. Construction of additional highway capacity, other than construction of high-occupancy vehicle lanes, is not eligible for CMAQ funds.

*Transportation Enhancements*—Transportation Enhancements ("TE") provide funding opportunities to help expand transportation choices and enhance the transportation experience, including pedestrian

and bicycle infrastructure and safety programs, scenic and historic highway programs, landscaping and scenic beautification, historic preservation, and environmental mitigation.

*Nonmotorized Transportation Programs*—Nonmotorized forms of transportation, such as walking or riding a bike, are inexpensive, widely practicable, and present a simple way for people to get from place to place in an environmentally friendly manner. Several federal programs are helping to encourage Americans to incorporate nonmotorized forms of transportation into their daily lives.

*Nonmotorized Transportation Pilot Program*—Section 1807 of SAFETEA-LU provides $25 million over four years for each of the four participating communities: Columbia, Missouri; Marin County, California; Minneapolis, Minnesota; and Sheboygan, Wisconsin. Each of the four communities is working to create a nonmotorized transportation network, consisting of sidewalks, lanes, and pedestrian and bicycle trails that connect with transit stations, schools, residences, businesses, and community centers. The goal of this program is demonstrate the extent to which walking and bicycling can represent a significant portion of the transportation mode share, particularly when infrastructure is designed to make nonmotorized transportation easy and safe. The data resulting from this pilot will help to quantify the potential for mode shift.

*The Safe Routes to School program*—Established under section 1404 of SAFETEA-LU, this program provides $612 million over four years for states to establish programs to encourage kids to walk and bike to school. Each state receives a minimum of $1 million, with remaining funds being awarded on the basis of student involvement. Funds can be used for a variety of infrastructure and educational purposes, including sidewalks, traffic calming, bicycle parking, traffic crossing improvements, public awareness campaigns, and student training in bicycle and pedestrian safety. The program requires states to appoint a full-time Safe Routes to School coordinator to oversee their state's program, and created a national clearinghouse to allow states to share information and successful strategies. By encouraging walking and biking to school, the program strives to create new, environmentally-friendly habits that today's children will learn and pass along to future generations.

*Conserve by Bicycling program*—This program, included in the Energy Policy Act of 2005, was authorized but funds were never appropriated to this program. If provided with the authorized level of funding, the program would have made available $6.2 million to create pilot projects in 10 communities throughout the U.S for education and outreach to convert motor vehicle trips to bicycle trips. The program also would have required each community to document energy savings achieved as a result of the program, and instructed the Secretary to work with the National Academy of Sciences to create an Energy and Bicycling Research Study. Currently there is a significant lack of data on the prevalence and impacts of nonmotorized forms of transportation; this program represents a strong step in creating data sets that would allow transportation officials to more accurately gauge the effects that bicycling as opposed to driving can have on the environment.

## COMMISSION RECOMMENDATIONS

Congress established the National Surface Transportation Policy and Revenue Study Commission ("Commission") in Section 1909 of SAFETEA-LU. In establishing the Commission, Congress charged it with forecasting the surface transportation system necessary to support our economy 50 years in the future. The analysis is anticipated to enable lawmakers to establish long-

term goals regarding the transformation of the surface transportation system, and to move beyond simply making changes at the margins to the existing system.

The Commission report notes that the relationship between transportation and the environment has been a source of national concern for more than a half-century as we continue to better understand how vehicle operations can have adverse effects on air and water quality, noise, undeveloped land, community structures, and other resources that influence our quality of life. The Commission made the following recommendations for the next authorization bill:

- **Environmental Stewardship: Transportation Investment Program to Support a Healthy Environment**
  The Commission recommends investing seven percent of the total Federal surface transportation investment in environmental stewardship. This program would give more flexibility to the states in their efforts to mitigate congestion, and would have specific emphasis on four broad categories: air quality, including smoother traffic flow, intermodal freight options, and encouraging carpooling and transit; vehicle retrofit; transportation enhancements; and programmatic mitigation, including banking both money and land to preserve endangered habitats. Ten percent of the program funds would be spent on each of the four categories, with the remaining 60 percent for the state's discretion.

- **Energy Security: A Program to Accelerate the Development of Environmentally-Friendly Replacement Fuels**
  This program calls for investing $200 million per year over the next decade into transportation energy research and development in conjunction with ongoing research being conducted by the U.S. Department of Energy.

## PREVIOUS COMMITTEE ACTION

On May 11, 2007, the Committee on Transportation and Infrastructure held a hearing on the then-current Administration's proposals on climate change and energy independence.

On May 16, 2007, the Committee on Transportation and Infrastructure met to receive testimony from witnesses testifying on climate change and energy independence issues for surface transportation, public buildings, aviation, and water resources and maritime transportation.

On May 15, 2008, the Committee marked up H.R. 6052, the "Saving Energy Through Public Transportation Act of 2008" and ordered reported the bill to the House. The House passed the bill by a vote of 322-98 on June 26, 2008. The provisions of H.R. 6052 were incorporated into H.R. 6899, the "Comprehensive American Energy Security and Consumer Protection Act" which the House passed by a vote of 229-194 on September 16, 2008, and also H.R. 7110 which the House passed by a vote of 264-158 on September 26, 2008.

On April 9, 2008, the Subcommittee on Highways and Transit held a hearing regarding transportation challenges for metropolitan areas, which included discussions of energy and environmental issues.

## WITNESS LIST

### PANEL I

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