



USDOT's Energy Blueprint: Efficient Transportation for America



U.S. Department of Transportation
May 2012

U.S. Department of Transportation: Ensuring Efficient and Reliable Transportation Choices for Consumers

OVERVIEW

The Obama Administration has taken unprecedented action to build the foundation for a clean energy economy, tackle the issue of climate change, and protect the nation’s environment. Collectively the Administration’s energy actions are improving the efficiency of heavy and light duty vehicles, encouraging the use of alternative fuels through the Renewable Fuel Standard, and developing technologies for advanced vehicles and fuels.

The Department of Transportation (DOT) is fostering an energy efficient transportation system across all modes of transportation. Transportation accounted for 70 percent of U.S. petroleum consumption in 2010 and nearly a third of the nation’s greenhouse gas emissions. Light duty vehicles and heavy trucks are the greatest petroleum users in the transportation sector.

New policies put in effect by the Obama Administration will:

- Save consumers and businesses money at the pump and reduce greenhouse gas emissions through improved vehicles and aircraft, alternative fuels, and practical transportation alternatives.
- Provide more transportation choices so passengers and freight can move by the most efficient and convenient modes, offering substantial reductions in petroleum use.
- Reduce petroleum consumption and greenhouse gas emissions by measures to improve transportation system efficiency across all modes, for example by modernizing the aviation system.

U.S. Transportation Petroleum Use, 2009 (Million barrels per day)		
Sector	Usage	Percent
Highway		
Light Duty Vehicles	8.70	64%
Trucks	2.90	21%
Buses	0.14	1%
Total Highway	11.74	86%
Non-Highway		
Air	1.04	8%
Water	0.59	4%
Rail & Pipeline	0.22	2%
Total Non-Highway	1.85	14%
Total	13.56	100%
Source: TEDB, 2011		

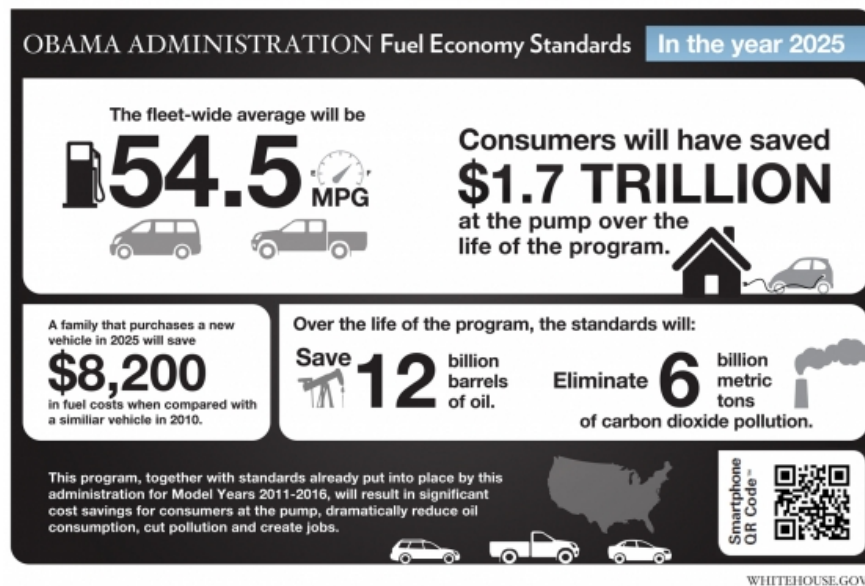
ACTIONS AND ACCOMPLISHMENTS

SAVING MONEY AT THE PUMP

A primary way to reduce transportation costs is to reduce the amount of petroleum-based fuels required for travel.

- Further Improving Efficiency for Passenger Vehicles:** President Obama has proposed new fuel economy and greenhouse gas standards that are estimated to increase average vehicle fuel efficiency to roughly 54.5 miles per gallon by 2025 if all improvements are made with fuel saving technologies. This new action, when combined with previous rulemakings including MY2011-MY2025, will save consumers \$1.7 trillion at the pump—roughly \$8,200 in fuel costs only compared to vehicles produced in 2010—reduce oil consumption by 12 billion barrels of oil and slash greenhouse gas emissions by 6 billion metric tons over the lifetime of the vehicles sold during this period. The standards were jointly proposed by the Environmental Protection Agency (EPA) and DOT in mid-November and are on track to be final in summer 2012.

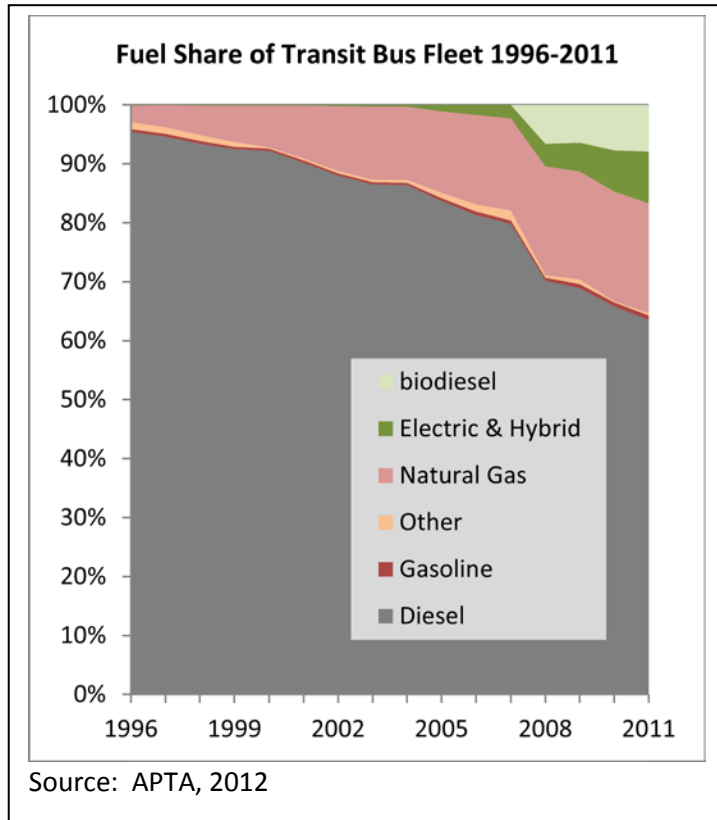
Effects of Proposed Rule Combined with MY2011-MY2025 Rulemakings¹



- Improving Truck and Bus Efficiency:** In August 2011, President Obama announced the first national program to set efficiency and greenhouse gas emission standards for medium and heavy-duty trucks and buses. The standards are estimated to reduce oil consumption for trucks and buses built in 2014-2018 by 530 million barrels and reduce greenhouse gas emissions by nearly 270 million metric tons. Standards were set for gasoline-and diesel-powered vehicles.
- Investing in Zero-Emission Transit Technology:** The Federal Transit Administration (FTA) announced more than \$13 million in grants through the FY 2011 National Fuel Cell Bus Program to continue development of commercially viable fuel cell bus technologies that will significantly improve fuel efficiency and reduce dependence on foreign oil. For example, FTA will invest \$3.3 million for UTC Power to integrate the next generation fuel cell into a lightweight transit bus using a hybrid-drive system. The zero-emission bus will be demonstrated at CT Transit in Connecticut.

¹ http://www.whitehouse.gov/sites/default/files/fuel_economy_report.pdf

- Investing in Cleaner Public Transit Bus Fleets:** In 2011, DOT announced over \$200 million in hybrid and alternative fuel bus and refueling facility grants to 70 transit projects across the country. These programs strengthen the economy through job creation and oil independence in cities such as Cincinnati, where this investment replaces aged diesel buses with hybrid buses, saving significant fuel expenses. FTA has \$51.5 million available for FY 2012 for clean fuels grant projects in non-attainment areas.



- Supporting Freight Rail Transportation:**

Transportation choices enable shippers to take advantage of lower-cost shipping options.

The Railroad Rehabilitation and Improvement Financing (RRIF) program authorizes up to \$35 billion in direct loans and loan guarantees to improve or rehabilitate railroads. A recent RRIF loan of \$54.6 million to Kansas City Southern Railway Company (KCSR) enables purchase of 30 new General Electric ES44AC locomotives. These diesel-electric locomotives, built in Erie, Pennsylvania, will help KCSR meet increasing economic demand. They are more energy-efficient and produce significantly lower carbon emissions than the locomotives being replaced.

- Identifying Marine Transportation Freight Alternatives:** In August 2010, U.S. Transportation Secretary LaHood identified 18 marine corridors, 8 projects, and 6 initiatives for development as part of America's Marine Highway Program. The program offers the potential to enhance the environmental sustainability of the nation's freight transportation system, as marine transportation shows significant fuel savings and emission reduction benefits per ton of cargo carried. For example, the James River Container Expansion Project (a project designee and Marine Highway grant recipient) expands an existing container-on-barge service on the I-64 Marine Highway between Hampton Roads and Richmond, VA by increasing the frequency of service. The I-64 surface transportation corridor is a major freight bottleneck, causing up to 500,000 hours of vehicle delays annually. In addition to reducing congestion, this alternative waterborne freight service offers enhanced public benefits because it uses low emission engines and ultra-low sulfur fuel.

- **Providing Truck Parking to Reduce Fuel Use:** Through a pilot program to address the shortage of long-term parking for commercial motor vehicles on the National Highway System, DOT awarded grants to 13 states to fund truck parking expansions, as well as traveler information and parking space reservation systems that allow truckers to plan for stops and minimize miles driven away from routes, all of which reduce fuel consumption.

Rural Transit: Recent trends in rural areas demonstrate that more transportation choices are needed across all communities. In 2011, transit ridership surged across the nation: the ridership increase of 5.4 percent, about double the national average, was largest in rural areas and cities under 100,000 people.

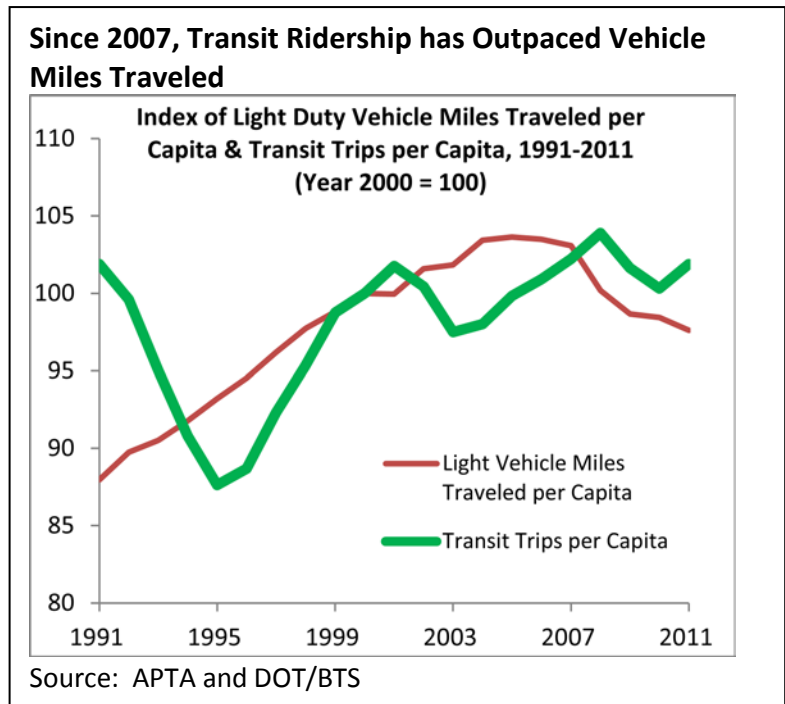
- **Aircraft Technology and Operational Improvement:** The Administration is pursuing efforts to develop new aircraft technology and operational capabilities with significantly improved fuel burn and lower greenhouse gas emissions. For example, the Federal Aviation Administration (FAA) launched the Continuous Lower Energy, Emissions, and Noise (CLEEN) partnership with five aviation manufacturers to accelerate development of technologies that reduce emissions and fuel burn and use alternative fuel. This program has a goal of developing technologies that provide a 33 percent reduction in fuel burn, relative to current technology, in the near term.

- **Alternative Fuels Development and Deployment:** The Administration has taken significant steps to facilitate the development and deployment of sustainable alternative aviation fuels leading to international standards approval in July 2011 of a 50 percent biofuel blend that can be used as a replacement fuel for today’s jet aircraft. U.S. and European airlines are already using these fuels in some commercial operations. FAA is continuing to identify alternative jet fuel pathways as well as foster commercialization of fuels with up to 80 percent lower lifecycle greenhouse gas emissions.
- **Alternative Fuels Pipelines:** Historically pipelines have rarely been used for the transport of alternative fuels. DOT research has focused on identifying and overcoming the engineering obstacles to the development of alternative fuels pipelines, including stress corrosion cracking and materials compatibility issues for ethanol and biodiesel pipelines.

PROVIDING TRANSPORTATION CHOICES

Creating transportation choices in communities allows commuters and businesses to avoid high costs during oil price spikes. Transportation is typically the second largest expense in a household budget, but families with multiple transportation alternatives have an option to reduce this cost when gas prices rise. Communities with a robust set of transportation choices are in high demand for that reason.

- **Informing Consumers about Cost Savings:** DOT and EPA jointly established an improved fuel economy and emissions vehicle labeling program for light duty vehicles providing American consumers more effective information, including fuel costs and savings, fuel economy and fuel consumption, and greenhouse gas and smog-forming emissions data.
- **Creating Solutions through Partnership:** DOT has partnered for three years with the Department of Housing and Urban Development (HUD) and EPA through the Partnership for Sustainable Communities. This partnership has removed critical barriers to its goal of providing more transportation choices. In 2010, in a groundbreaking collaboration, DOT and HUD jointly awarded \$75 million in funding for localized planning activities for projects that would integrate housing, transportation, and economic development. HUD has also commissioned a study to develop a national index that would measure combined costs of housing and transportation and inform consumers of hidden transportation costs of locations.



- **Funding Transportation Alternatives through TIGER:** DOT has used the TIGER (Transportation Investment Generating Economic Recovery) discretionary grant program to improve the efficiency of surface transportation infrastructure, reduce fuel consumption, and expand personal transportation choices, with over \$2.6 billion committed to date and another \$500 million to be committed in FY 2012. In three TIGER rounds, 172 projects have been funded across 50 states, the District of Columbia, and Puerto Rico. TIGER has funded innovative freight, multi-modal and urban transportation projects that will improve and expand travel options, cut energy use and make communities more livable.
- **Investing in High-Speed and Intercity Passenger Rail:** DOT has continued to develop and expand America’s high-speed and intercity passenger rail system. In May 2011, DOT announced \$2 billion in additional high-speed rail investments, bringing the total to \$10.1 billion since 2009, an unprecedented investment to transform travel in America. Intercity rail ridership surpassed 30 million trips in FY 2011, marking a new record in Amtrak’s history. Thirty-two states are building 153 rail projects that will provide service to five corridors that

have 44 percent of the U.S. population. As of 2011, \$1.65 billion in projects are under construction creating thousands of jobs.

- **Investing in Transportation Choices:** In 2011, FTA entered into more congestion-relieving major capital construction grants than in any single year – ever. These projects will provide Americans greater transportation choice while reducing our nation’s dependence on foreign oil. This year, FTA will keep the momentum going by investing in many new projects, including Charlotte, North Carolina’s 9.3 mile LYNX Blue Line Extension, which will provide commuters along the congested I-85/US-29 a fast, comfortable alternative to high gas prices. FTA currently provides more than \$10 billion per year in grants for the construction and operation of transit services ranging from local buses and paratransit services to streetcars and commuter rail.

ENHANCING RELIABLE, EFFICIENT INFRASTRUCTURE

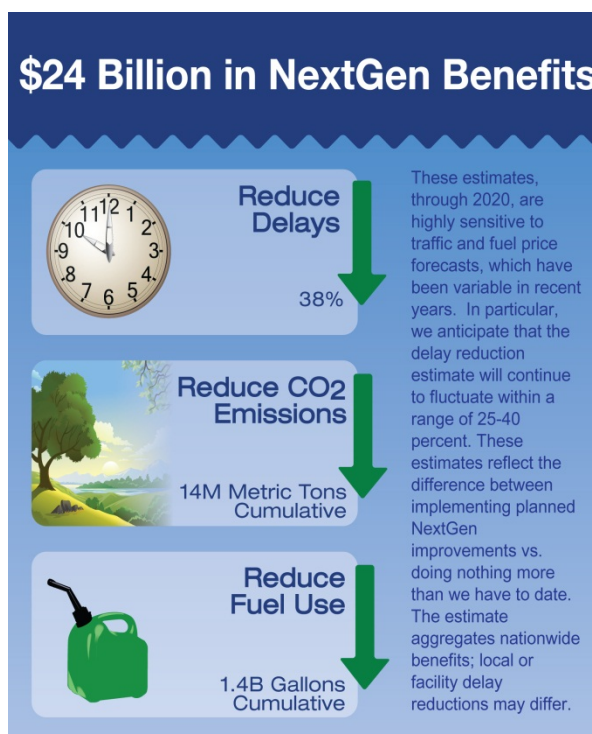
Reliable, uncongested transportation networks help businesses and consumers avoid extra transportation costs. Through DOT discretionary grant programs, the Administration is targeting investment to more efficient forms of transportation, improving the performance of the existing transportation system, and funding the acquisition of alternative fuel and hybrid transit buses.

- **Reducing Roadway Congestion:** The Congestion Mitigation and Air Quality Improvement (CMAQ) Program provides funding to implement transportation projects that improve air quality. Since 1992, more than \$27 billion in CMAQ funds have been obligated across the 50 states and the District of Columbia for projects that support alternative fuels, improve traffic flow, provide transit, accommodate bicyclists and pedestrians, and shift freight shipping to more fuel-efficient modes, among many other project types that help to reduce gasoline consumption. Measures such as idling-reduction supported by CMAQ through truck stop electrification are particularly important efforts to reduce wasted fuel. At one gallon of diesel fuel burned for each hour a truck idles, idling costs as much as 2,000 gallons of fuel every year. This amounts to 1 billion gallons of diesel fuel that can be preserved every year through idling-reduction technologies, saving as much as \$1.8 billion.

Every Day Counts Initiative:
FHWA has developed innovative strategies to address energy consumption through measures that reduce wasted oil such as accelerated bridge construction, adaptive signal control technologies, and reduced energy components of construction materials.

- **Maintaining a Reliable, Fuel-Efficient Bus Transit System:** In FY 2011, DOT awarded more than \$750 million through the Federal Transit Administration’s State of Good Repair discretionary grant initiative that will significantly help to modernize the nation’s bus fleet, including more than \$6 million awarded to Centre Area Transportation Authority in State College, PA to purchase 16 new energy-efficient, compressed natural gas buses.

- Planning for Efficient Transportation:** The Federal Highway Administration’s (FHWA) Transportation, Community, and System Preservation (TCSP) Program helps communities to integrate decisions about transportation and development to improve the efficiency of the transportation system and reduce its environmental impacts. For instance, the Atlanta Beltline City Hall East Bike and Pedestrian Bridge was awarded over \$750,000 in 2011 to connect the historic City Hall East project to the 22 mile Atlanta Beltline rail-to-trail and transit system with a corridor that will include a pedestrian and bicycle bridge. This project improves overall system efficiency and creates better commute options for thousands of local consumers and employees.
- Increasing Capacity and Reducing Chokepoints in Key Rail Corridors:** Over the past three years, DOT invested nearly \$3 billion in improvements for the Northeast Corridor to increase capacity and remove chokepoints, improving both service frequency and quality. In addition, FRA has just begun a multi-state planning initiative that will advance infrastructure projects on the Northeast Corridor and create a strategy for funding future corridor investments. These efforts will greatly improve passenger rail capacity for the over 50 million people served by the Northeast Corridor rail.
- Reducing Time and Fuel Costs for Transportation Construction:** FHWA is using innovative procedures and technology such as Adaptive Signal Control to improve traffic efficiency and reliability. Another technology, Warm Mix Asphalt, reduces the amount of energy consumed by the paving industry, resulting in fuel savings worth more than \$80 million in 2010.
- Modernizing the Aviation Sector:** FAA is overhauling the National Airspace System through the NextGen program to improve efficiency and reduce aircraft fuel burn. Through 2020, NextGen’s operational improvements are expected to save an estimated 1.4 billion gallons of aviation fuel, reducing carbon dioxide emissions by 14 million metric tons.² As a part of Next Gen, FAA’s Optimization of Airspace and Procedures in a Metroplex (OAPM) Initiative is optimizing the complex airspace in the vicinity of busy U.S. airports. For example, implementation of optimized descents and shorter flying distances in Washington, D.C. and north Texas will result in a substantial reduction in aircraft



² http://www.faa.gov/nextgen/implementation/media/NextGen_Implementation_Plan_2012.pdf As noted in the figure above, the benefit estimates reflected in this report are highly sensitive to traffic, fuel price forecasts, and other considerations.

fuel burn. For Washington, the estimated fuel savings per year is between 2.5 million and 7.5 million gallons, with associated carbon dioxide reductions between 25 thousand and 75 thousand metric tons. The north Texas actions are estimated to save between 4.1 million and 8.6 million gallons of fuel per year with associated carbon dioxide reductions between 41 thousand and 86 thousand metric tons.³

- **International Initiatives to Reduce Aviation Emissions:** Building on significant reductions in aviation greenhouse gas emissions achieved over the past decade, the Administration has set an ambitious goal of achieving carbon neutral growth for U.S. commercial aviation by 2020, using 2005 emissions as a baseline.⁴ Internationally, the Atlantic Interoperability Initiative to Reduce Emissions (AIRE) is one example of a collaborative effort between the U.S. and the European Commission to promote and harmonize environmental initiatives and procedures in European and North American airspace. In 2010 and 2011, the U.S. participated in three AIRE demonstration projects using a combination of flight optimization procedures in every phase of flight to reduce fuel burn and emissions. Several environmental-friendly procedures and best practices were adopted based on potential savings ranging from 235 to 327 gallons of fuel per flight.

The U.S. is also committed to the development of a meaningful carbon dioxide emissions (CO₂) standard in ICAO for implementation in the U.S. under the Clean Air Act. The ICAO Committee on Aviation Environmental Protection (ICAO/CAEP) is currently working toward adopting a meaningful CO₂ standard for aircraft with support from the U.S. government, and industry and environmental stakeholders. The standard would incentivize faster development of technology and serve as a basis for ensuring that less efficient aircraft and engine technologies are eliminated over time.

- **Improving Airport Efficiency:** Through the Airport Improvement Program (AIP) grants for planning and developing airports, FAA is supporting planning to meet airport requirements in a more sustainable way, and funding projects to make environmental improvements. Airports have taken voluntary measures to reduce emissions in areas of reduced air quality. For example, FAA's Voluntary Airport Low Emissions (VALE) Program has funded a wide range of projects to reduce ground emissions sources on an airport, including gate electrification, solar and geothermal, pollution control devices, and low emissions vehicles. The recent reauthorization allows the AIP to support new activities associated with the acquisition and operation of zero-emission airport vehicles, airport solid waste recycling, and energy efficiency improvements at airports.
- **Upgrading pipeline infrastructure:** Beginning in 2012, the Pipeline and Hazardous Materials Safety Administration will work with the Columbia Gas System to expedite their \$4 billion, ten-year program to replace of more than 1,000 miles of large-diameter gas transmission pipeline across five states, promoting the safe and reliable delivery of energy resources in the Midwest, Northeast, and Mid-Atlantic regions.

³ OAPM Overview Briefing, March 2012.

⁴ Goal adopted by the Obama Administration and unveiled at COP/15 and subsequently proposed by the U.S., Canada and Mexico at the ICAO Assembly in 2010.

OPPORTUNITIES FOR THE FUTURE

The transportation initiatives proposed in the FY 2013 President's Budget, if enacted, would give the U.S. Department of Transportation, the states, and modal partners the needed authorities and funding to accelerate the transformation of the transportation sector onto low petroleum, clean energy pathways. Some specific proposals include:

- President Obama has proposed a **Livable Communities Program** with \$4.0 billion in FHWA, and a **Transit Expansion and Livable Communities Program** with \$2.4 billion in FTA. If authorized, these programs would enable DOT to contribute to the funding of livable communities. As proposed, the Livable Communities program would include funding for complete streets projects, bike and pedestrian infrastructure, and safe routes to schools among other initiatives, and would explicitly require that recipients in non-attainment areas devote 15 percent of funding to activities that reduce emissions.
- Through the **National Infrastructure Investment** (\$500 million) and the **Transportation Leadership Awards** programs (\$700 million), DOT will have the opportunity to directly support the most innovative projects addressing critical national infrastructure improvements and system performance. These programs will use competitive grants to further the Department's strategic priorities, including livability and environmental sustainability.
- The **NextGen** program (\$1.03 billion) will improve the performance of air traffic control (ATC) in the United States. ATC improvements will allow commercial airliners to optimize routes, take-off and descent patterns to minimize fuel consumption. On the ground, airport improvement funded through the **Airport Improvement Program** can help improve airport efficiency and environmental stewardship.
- FRA's **Network Development Program** provides \$1 billion to continue developing the U.S. high-speed passenger rail system. Many of these improvements will have ancillary benefits for freight and commuter rail. In addition, **System Preservation and Renewal** grants (\$1.55 billion) will fund improvements to Amtrak service.

The Administration proposals to reform transportation policy are a vital complement to the Administration's energy policy. In the short run, a focus on vehicles and fuels is critical. In the long run, infrastructure decisions and urban settlement patterns will influence the demand for new vehicles and transportation systems.

The President's Budget proposal will allow DOT to better shape transportation infrastructure into more sustainable paths, and to pursue opportunities to reduce oil consumption. Enactment of the President's Budget will open a new chapter in which transportation and energy investments work together to achieve overarching national goals.