



***Saving Oil and Reducing Greenhouse Gas  
Emissions through U.S. Federal Transportation  
Policy***

*by*

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## Executive Summary

The United States consumes over 10 million barrels of oil per day moving people and goods on roads and rail throughout the country. Surface transportation generates over 23 percent of U.S. anthropogenic greenhouse gas (GHG) emissions. Transportation is the primary cause of U.S. oil dependence with its attendant risks to U.S. energy security. Contributions from this sector will be necessary in any effort to maintain a sustainable and secure economy in the future. There are many opportunities to save oil and reduce GHG emissions under existing federal law and possibly in the next surface transportation reauthorization legislation in the U.S. Congress, while increasing the mobility of people and goods in the U.S. economy.

This paper identifies opportunities possible in transportation reauthorization legislation and using existing legislative authority that will save oil and reduce GHG emissions. The strategy focuses on five key elements: vehicles; fuels; vehicle miles traveled (VMT); system efficiency; and construction, maintenance, and other activities of transportation agency operations.

## Potential New Legislative Provisions

1. Change the structure of the federal excise tax on fuel to ensure sufficient revenue and provide incentives for oil savings and GHG reductions
2. Enable and provide incentives for state and local governments to expand transportation pricing
3. Fund a major performance-based program to encourage innovations in transportation planning that save oil and reduce GHG emissions
4. Provide significant funding, incentives, and institutional support to dramatically increase carpooling and vanpooling
5. Establish national, state, and/or metropolitan oil savings or GHG emission reduction targets and a process and technical assistance to meet them
6. Fund coordination between transportation and land use planning activities
7. Establish incentives or requirements for state and local governments to expedite the transition to energy-efficient vehicles and low-carbon fuels
8. Establish a research and data collection program to save oil and reduce GHG emissions

## Using Existing Legislative Authority

1. Educate stakeholders on the benefits of saving oil and reducing GHG emissions and ways to do so
2. Conduct more and better evaluations of the effectiveness of existing programs at saving oil and reducing GHG emissions
3. Focus U.S. DOT discretionary awards more on GHG reduction and oil savings
4. Clarify that federal funding eligibility criteria can include GHG reductions
5. Form partnerships with the electric power sector on transportation electrification issues

The cost to society of oil consumption and climate change impacts are significant and rising. Lowering these costs, providing energy security, and stabilizing the climate should be a priority for the transportation sector. This paper identifies many opportunities to provide Americans with a more secure and sustainable transportation system.

## 1 Introduction

The importance of surface transportation to the U.S. economy cannot be overstated. The movement of people and goods over the country's vast network of roads and rail has been and will continue to be important to U.S. economic prosperity. The role of federal and state government is pivotal since the overwhelming majority of roads and other transportation systems are publicly built and maintained.

**The United States' highly mobile society faces concerns about energy security and climate change. At the same time, the United States has the potential to be a leader in rapidly growing clean energy markets.** There are many opportunities to save oil and reduce GHG emissions<sup>1</sup> from U.S. transportation, while improving U.S. competitiveness.

**Table 1: Surface transportation's oil consumption (EIA, 2010).**

	2010		2035	
	Oil Use (mmbd)	% of Total	Oil Use (mmbd)	% of Total
<b>Light-Duty Vehicles</b>	7.97	74.6%	7.86	66.5%
<b>Commercial Light Trucks</b>	0.28	2.6%	0.35	3.0%
<b>Freight Trucks</b>	2.09	19.6%	3.15	26.6%
<b>Freight Rail</b>	0.26	2.4%	0.35	2.9%
<b>Intercity Bus</b>	0.02	0.1%	0.02	0.2%
<b>School Bus</b>	0.06	0.6%	0.08	0.7%
<b>Passenger Rail</b>	0.01	0.1%	0.02	0.1%
<b>Total</b>	<b>10.69</b>	-	<b>11.83</b>	-

Surface transportation, which includes travel on roads and rail, accounts for more than 80 percent of the energy used in the U.S. transportation sector, and Americans consume over 10 million barrels per day (mmbd) of oil to move people and goods on roads and rail (Table 1). In the twelve months prior to November 2010, Americans drove nearly 3 trillion miles. This almost matches the all-

time peak for vehicle miles traveled (VMT) in the United States, which occurred before the spike in gas prices in 2008 (FHWA, 2010b). Looking into the future, with U.S. population projected to increase by 42 percent by 2050 and with expectations of future economic growth, Americans' use of transportation is projected to grow, for passengers and even more for freight, as shown in Table 1 (U.S. Census Bureau, 2010).

In January 2011, the Pew Center on Global Climate Change issued a report on all of the actions that can be taken across the transportation sector to save oil and reduce GHG emissions (Greene & Plotkin, 2011). The focus of this white paper is on what can be done through existing transportation-related state and federal authorities as well as through federal surface transportation reauthorization. It relies on Greene and Plotkin for estimates of cost-effectiveness and GHG emission impact of individual policy recommendations. The Pew Center also released a companion white paper that provides a primer on the federal surface transportation authorization and the highway trust fund (HTF).<sup>2</sup>

<sup>1</sup> Most policies aimed at reducing GHG emissions would also reduce oil consumption, so the terms are used interchangeably throughout this report.

<sup>2</sup> See the Pew Center's white paper, "Primer on Federal Surface Transportation Authorization and the Highway Trust Fund"

## 2 Strategies for Saving Oil and Reducing GHG Emissions

There is a wide variety of ways to save oil and reduce GHG emissions from transportation. This paper is built around five major categories of transportation strategies:

### **1. Energy-Efficient Vehicles<sup>3</sup>**

research to develop energy-efficient vehicles, incentives for users to purchase/use energy efficient vehicles, retrofit of diesel truck engines to reduce black carbon

### **2. Low-Carbon Fuels**

research to develop low-carbon fuels, incentives to use such fuels, installation of electric plug-in facilities and other infrastructure to support use of low-carbon fuels

### **3. VMT Reductions**

congestion pricing, cordon pricing, tolls, pay-at-the-pump (PATP) or pay-as-you-drive (PAYD) auto insurance, parking pricing, carpooling, parking supply management, travel demand management, promotion of high occupancy modes such as mass transit, telecommuting<sup>4</sup>, bicycle and pedestrian travel, compact land use planning<sup>5</sup>, oil savings and/or GHG emission reduction targets

### **4. Operational Efficiency**

congestion reduction strategies, speed reduction, promotion of eco-driving<sup>6</sup>, construction of roundabouts, traveler information systems, bottleneck removal, real-time traffic management centers, adaptive traffic management

### **5. Infrastructure Construction and Maintenance and Transportation Agency Operations**

Light Emitting Diodes (LED) traffic lights, low-carbon pavements, other low-carbon materials, energy-efficient construction practices, retrofits or replacement of diesel engines, construction & maintenance equipment to reduce black carbon and other emissions, vegetation management practices in highway rights-of-way, construction work zones to minimize traffic delays and idling

Ultimately, all of these categories and most of these strategies will be needed to achieve GHG reduction targets (such as 80 percent reductions below 1990 GHG levels by 2050) as well as national energy goals. In transportation, as in all sectors, there is a need for a “silver buckshot” strategy (as opposed to a “silver bullet”) – a comprehensive and varied policy approach to limit damage due to climate change and to provide energy security. Even with dramatic improvements in vehicles and fuels, it would be virtually impossible to meet GHG targets through technology and fuels alone (Parsons Brinckerhoff, 2009). Moreover, recent studies have shown significant GHG emissions and energy consumption are incurred in highway and transit construction, maintenance, and agency operations, so these strategies should not be ignored in efforts to achieve climate change and energy security goals.

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<sup>3</sup> Vehicle standards are an especially effective strategy as noted by Greene and Plotkin, but fall outside of the scope of transportation reauthorization.

<sup>4</sup> Over 50 percent of the millions of Americans that can telecommute do so at least twice per month (FHWA, 2010a).

<sup>5</sup> California’s Senate Bill 375 is a good example of compact land use planning policy. SB 375 requires metropolitan planning organizations (MPOs) to set GHG reduction targets for passenger vehicles. The law includes incentives, and no penalties, including provisions that exempt certain transit projects from administrative requirements of the California Environmental Quality Act. This outcomes-based policy allows different regions to determine the most cost-effective way to meet a stated goal by providing incentives to maintain or increase mobility while reducing GHGs emissions from transportation.

<sup>6</sup> Eco-driving includes avoiding unnecessary braking and acceleration, staying within legal speed limits, using cruise control on the highway, and minimizing idling. It can improve fuel economy between 5 and 20 percent (Greene & Plotkin, 2011).

### 3 Options under Existing Transportation Law

There are many ways the U.S. Department of Transportation (DOT), states, and MPOs could use existing law to achieve oil savings and GHG emission reductions. Current law, the “Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users” (SAFETEA-LU), allows federal surface transportation funding to be used for a very broad range of purposes, including environmental and energy goals. It establishes statewide and metropolitan planning processes that call for emphasis on environmental and energy goals (without explicitly mentioning climate change), and provides a federal transportation research program that supports research, research dissemination, workshops, training, and many other activities that can be focused on GHG emission reductions.

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) are already funding workshops on climate change for state DOTs and their partners, developing GHG methodologies and toolkits, supporting national webinars on climate change, carrying out research on integrating climate change into the transportation planning process, funding pilot programs<sup>7</sup>, and have identified climate change as an issue warranting discussion in the planning certification process for large MPOs.

Many state DOTs and MPOs are participating in these activities as well as initiating GHG-reducing activities of their own. For example, Oregon DOT is installing solar panels on highway rights-of-way, Washington DOT is funding vehicle trip reduction activities, Maryland DOT is increasing transit service, Tennessee DOT is installing alternative fuel infrastructure along major highways, MPOs in California are supporting more compact land use, and the District of Columbia MPO is increasing emphasis on biking, walking, ridesharing, and transit. These examples are merely illustrative – many other state DOTs and MPOs are undertaking these and other efforts to reduce GHG emissions and energy use.

To build on these good examples, specific recommendations are listed below to achieve greater GHG and energy reductions under current federal transportation law:

**Set Reduction Targets:** The President could set national oil savings or GHG emission reduction targets. U.S. DOT could then encourage states and MPOs to use federal transportation planning and core program funds to establish their own reduction targets, and to carry out planning activities to meet these targets, drawing on the strategies that make the most sense in each state and metropolitan area. FHWA and FTA could provide technical assistance, case studies, training, research, and other support.

**Promote Public Education Programs:** One of the impediments to reducing GHG emissions and energy consumption is lack of public awareness of the compelling reasons for reductions and the wide range of strategies that could help achieve reductions, often at a cost savings. States and MPOs could use federal transportation planning funds and most core program funds to raise awareness of the need to save oil and reduce GHG emissions. They could promote strategies such as eco-driving, changing travel choices, or buying fuel-efficient and low-carbon vehicles. FHWA and FTA could develop public educational materials for states and MPOs.

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<sup>7</sup> Such as vegetation management practices to reduce GHG emissions.

**Focus more on energy security:** Virtually the same transportation strategies that reduce GHG emissions also save oil – and measures to increase energy security may have broader support. To motivate state DOTs, MPOs, and local governments, U.S. DOT could ramp up its efforts to educate and support energy conservation nationally. U.S. DOT could provide educational materials on energy for transportation agencies and for the public, emphasizing the cost savings and other benefits. Federally funded workshops, conferences, research, planning tools, and energy-savings calculators could be helpful in gaining public and transportation agency support for strategies that save oil and reduce both GHG emissions. U.S. DOT could fund these activities through its federal research program, and state DOTs and MPOs could use most program funds for energy conservation education, planning, and project/system implementation. For their part, state DOTs and MPOs could adopt energy conservation targets and strategies to achieve those targets, and give energy conservation a higher emphasis in the transportation planning process.

**Use all five categories of reduction strategies (identified in Section 2):** The strategies identified in Section 2 have potential to achieve significant reductions including transportation pricing; speed management and enforcement; eco-driving; carpooling; incentives and infrastructure for energy-efficient and alternative fuel vehicles; telecommuting; low-carbon fuels; improving existing mass transit systems and promoting the most efficient ones; and low-carbon practices and materials for construction, maintenance, and agency operations. Many of these strategies have significant potential for reducing GHG emissions and energy use rapidly. All of these strategies could be given heightened emphasis in the planning process, in the use of federal transportation funds, and in research and education programs. Below are some examples of strategies that have not yet received significant emphasis, although they appear to have significant potential:

**Carpooling and Vanpooling:** There is enormous potential to increase carpooling for all trips and vanpooling for work trips. Carpooling and vanpooling are already responsible for more than three times as many passenger miles for work trips as transit. They serve rural areas and urban areas, have relatively low costs compared to other transportation programs, and save users money. Yet they have very little federal institutional support and funding. States and MPOs could use virtually all federal core program funds to promote carpooling and vanpooling, including ridesharing services. FHWA and FTA could issue guidance on whether states and MPOs can use core program funds for vanpool insurance, guaranteed rides home,<sup>8</sup> and payments for individuals to shift to carpooling<sup>9</sup>. FHWA and FTA could increase technical assistance and fund research on innovative programs, such as “flexible” or “casual” carpooling using social networking or neighborhood-based carpool and vanpool matching. FHWA and FTA could dedicate personnel to support carpooling and vanpooling.

**Pricing to Moderate or Reduce VMT:** FHWA and FTA could continue and expand their discretionary funding of innovative pricing pilot programs<sup>10</sup>, most of which would have the dual benefit of moderating congestion and reducing GHG emissions and petroleum consumption.

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<sup>8</sup> A guaranteed ride home is common component of a carpooling or ridesharing service to increase participation.

<sup>9</sup> MPOs in Washington and Atlanta already do this.

<sup>10</sup> Such as DOT’s Value Pricing Program (VPP).

FHWA and FTA could also issue guidance to clarify the extent to which core program funds may be used for pricing strategies such as PATP or PAYD auto insurance,<sup>11</sup> parking pricing programs, and cordon pricing.<sup>12</sup>

**Eco-driving:** States and MPOs could use federal planning funds and most core program funds to promote eco-driving, including conducting pilot programs, as done in Denver in 2009. FHWA and FTA could develop public outreach materials on the cost savings and the energy security and climate change benefits of eco-driving, and could provide technical assistance, training, and awards.

**Operational Efficiency:** States and MPOs could use virtually all federal core program funds for operational improvements, such as traffic signal synchronization, speed management, traveler information systems, and roundabouts. FHWA and FTA could issue guidance on the extent of such use, while providing training and other tools to promote operational efficiencies.

**Improving Mass Transit:** Efficient mass transit systems with high occupancy rates use considerably less energy and have much lower GHG emissions than personal vehicles. Strategies to promote transit should focus on improving the efficiency of current systems and promoting the most efficient systems (Greene & Plotkin, 2011).

**Efficient and Low-Carbon Construction, Maintenance, and Agency Operations:** States and MPOs could use most core program funds for low-carbon pavements, energy-efficient construction and maintenance practices, installation of LED lights, and more. FHWA and FTA could conduct research to document promising practices that save money, reduce GHG emissions, and save oil (e.g., using highway rights-of-way for alternative energy sources like solar panels) and to develop low-carbon materials and practices.

**Use workshops, peer exchanges, conferences, research, pilot programs, educational materials, case studies, technical assistance, webinars, and awards:** FHWA is already doing a great deal through workshops and peer exchanges. In addition, U.S. DOT is supporting innovative pricing pilot programs, such as the San Francisco Urban Partnership agreement that features a version of parking pricing. Continued emphasis on these efforts would be invaluable, especially peer-to-peer exchanges and funding of innovative pilot efforts. It would also be helpful to use these activities to give greater emphasis to alternative strategies outlined above. State DOTs could conduct similar outreach and educational activities for their district offices and for MPOs and local governments.

**Focus particularly on low-cost strategies with near-term impacts:** At a time of limited federal, state, and local budgets, as well as household economic constraints, U.S. DOT and state and local governments could focus on strategies that have the highest potential for low-cost, near-term reductions. These

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<sup>11</sup> The average insurance expenditure per insured vehicle was \$817 in 2006, which results in PATP insurance being about \$0.68 per gallon for a vehicle consuming 400 gallons of gasoline per year. At about a 25 percent increase in the cost of fuel, fuel consumption would decrease by about 5 to 10 percent (Greene & Plotkin, 2011).

<sup>12</sup> Cordon pricing is a pricing technique where a geographic line is drawn, usually around a congested central city. Vehicle trips that cross the cordon, into the congested area, are charged a fee (as in London).

strategies include eco-driving, operational efficiencies, weigh-in-motion screening for trucks, carpool and vanpool programs, and telecommuting programs. Speed enforcement and speed management also have high merits (along with important safety benefits), as well as parking management. One noteworthy program is to reduce black carbon by retrofitting diesel engines (including construction equipment engines as well as locomotives and heavy duty truck engines). All of these strategies are eligible under most federal transportation programs, and U.S. DOT can support them through research, technical assistance, and workshops.

**Conduct more and better evaluations of effectiveness:** Many strategies are being implemented with the goal of achieving GHG emission reductions and oil savings. However, there has been little rigorous evaluation of their effectiveness in the real world. U.S. DOT could create a rigorous program to evaluate the effectiveness of projects and programs that are implemented. These evaluations should be peer-reviewed. U.S. DOT awards for discretionary funds which are based on energy and environmental goals could include a requirement for evaluations of project effectiveness once implemented.

**Focus U.S. DOT discretionary awards more on GHG reduction and oil savings:** In recent years, U.S. DOT has used its discretionary funding authority to award grants to states, MPOs, and local governments with an emphasis on livability and other factors such as GHG emission reduction potential. However, DOT's ratings for funding applications have not been made public, and it is not apparent whether GHG reductions received significant weight. U.S. DOT could elevate the emphasis of its discretionary awards on GHG reduction and oil savings potential and could document publicly the GHG emissions and oil consumption associated with funded projects – including both construction and operational impacts.

**Clarify federal funding eligibility:** FHWA and FTA could issue guidance that clarifies how program funds can be used for strategies that reduce GHG emissions and save oil. This is particularly important for non-traditional activities, such as retrofitting of diesel engine equipment used in transportation construction, eco-driving education, installation of electric plug-in facilities, speed enforcement, and all pricing strategies (including administrative costs for pay-as-you drive insurance programs, parking pricing programs, and subsidies to individuals for carpooling and vanpooling). SAFETEA-LU provides extensive flexibility for the kinds of projects that can be funded within individual programs and for transferring funds among programs, so FHWA and FTA have opportunities to interpret eligibilities expansively and to make FHWA and FTA field offices, states, and MPOs aware of the full flexibility of these programs to support nontraditional projects.

**Form partnerships with electric power sector:** A shift to plug-in electric vehicles and hybrid-electric vehicles has great potential to save oil and reduce GHG emissions.<sup>13</sup> Transportation agencies will need to be involved in this shift, help accelerate the transition, and collaborate with the electric power sector in the planning for these vehicles. Some state DOTs are already involved, but U.S. DOT, state DOTs, and MPOs could increase their focus on this, through providing vehicle recharging infrastructure (such as charging stations at park-and-ride lots and other locations) and support for the “smart grid,” where the capacity of electric vehicles to reduce peak-load requirements is maximized.

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<sup>13</sup> For electric vehicles, this depends on the carbon intensity of electricity sources, but many states have low-carbon electricity, and it is clear that the electrical grid can and ought to be significantly lower in carbon intensity in the future.

## 4 Saving Oil and Reducing Emissions with New Legislation

This section describes opportunities for new legislation that would provide incentives for reductions in GHG emissions and energy consumption.

It is useful at the outset to consider whether all five categories of transportation strategies identified in Section 2 fit within the scope of transportation authorization legislation. Based on the wide-ranging scope of SAFETEA-LU<sup>14</sup> and its predecessors, virtually every type of surface transportation GHG emission and oil reduction strategy could be funded, mandated, or encouraged in the next authorization.

Table 2 presents the five categories and indicates the degree to which they fall within the scope of surface transportation legislation, based on past precedent.

**Table 2: Transportation strategies that save oil and/or reduce GHG emissions and their relative “fit” within the scope of surface transportation legislation, based on legislative precedent.**

Reduction Strategies for Transportation	Degree of Fit	Examples of Pertinent Precedents
1. <u>Energy Efficient Vehicles</u>	Moderate	Research and funding incentives for natural gas transit buses; federal gasoline tax and other transportation user fees; vehicle safety standards
2. <u>Low-Carbon Fuels</u>	Moderate	Ethanol tax exemption; funding for conversion to or purchase of natural gas transit buses
3. <u>VMT Reductions</u>	High	Congestion Mitigation and Air Quality Improvement (CMAQ) program; carpool/vanpool funding eligibility; environmental/energy factors in planning; congestion pricing pilot program; transit programs; Alternative Transportation in Parks program
4. <u>Operational Efficiency</u>	High	55-MPH speed limit; congestion management requirements; ITS research; ITS deployment; congestion pricing pilot program; public outreach through the planning process
5. <u>Infrastructure Construction and Maintenance and Agency Operations</u>	High	Funding for truck rest area electrification; pavement research; mandate for crumb rubber asphalt; wide-ranging eligibility for funding elements of infrastructure

Three of the five reduction categories are substantially within the scope of federal surface transportation authorization legislation: VMT Reductions, Operational Efficiency, and Infrastructure Construction and Maintenance and Agency Operations. The other two reduction categories (Energy Efficient Vehicles and Low-Carbon Fuels) also have a variety of precedents in surface transportation legislation, even though they largely fall under other legislation.<sup>15</sup> Based on their reduction potential,

<sup>14</sup> SAFETEA-LU is the existing federal surface transportation authorization and expired on October 1, 2009.

<sup>15</sup> Including the Energy Independence and Security Act of 2007.

however, transportation policy makers may want to consider giving as much emphasis to spurring the transition to lower-carbon vehicles and fuels as to changing travel behavior.

#### 4.1 Potential New Federal Legislative Provisions

This section identifies legislative provisions that have the power to save oil and reduce GHG emissions.

##### 1. Change the structure of the federal excise tax on fuel to ensure sufficient revenue and provide incentives for oil savings and GHG reductions

###### Benefits

- Sends a price signal to individuals and businesses to lower their transportation GHG emissions while restoring the user-financing basis of the surface transportation program.
- Avoids a shift to reliance on the U.S. Treasury's general fund to finance surface transportation, as that amounts to subsidizing travel.
- Avoids potentially debilitating cuts in transportation funding.

###### Strategy for overcoming obstacles

- Demonstrate to the public and Congress that the changes will improve the economy, reduce deficit pressures, support the transition to more energy efficient vehicles, reward highway users who reduce energy use, and support environmental and other goals.

###### Options

- Convert the federal motor fuel fee to an energy user fee based on transportation use and indexed to fleet-wide energy efficiency and inflation as proposed by Greene and Plotkin. Being fuel agnostic, the fee also corrects the problem of alternative fuels by uniformly supporting energy efficiency (Greene & Plotkin, 2011).<sup>16</sup>
- Phase out the existing federal tax credit for ethanol and shift the resulting federal revenues to GHG emission and oil savings programs (items 3, 4, 6, and 8 below).<sup>17</sup>
- Re-institute a federal passenger vehicle excise tax (which existed up to 1971), with the fee or rebate based on a GHG or oil savings differential similar to vehicle feebates.
- Revise existing truck excise taxes to include a factor for carbon or oil savings differential.

##### 2. Enable and provide incentives for state and local governments to expand transportation pricing

###### Benefits

- Reinforces the transportation user fee model through accurately pricing the social cost of driving.<sup>18</sup>
- Raises revenue for needed improvements.

<sup>16</sup> Simply increasing the federal fuel tax on gasoline and diesel would increase revenues, but would not be a true transportation user fee, because drivers of electric vehicles and some other alternative fuels would not be pay their fair share.

<sup>17</sup> The Government Accountability Office (GAO) says the subsidy costs \$4 billion per year and concludes: "[t]he Volumetric Ethanol Excise Tax Credit (VEETC), a 45-cent per gallon federal tax credit...is not expected to stimulate ethanol consumption beyond the level the RFS [Renewable Fuel Standard] specifies this year. The VEETC also may no longer be needed to stimulate conventional corn ethanol production..." (GAO, 2009).

<sup>18</sup> This could include the social cost of carbon (SCC). The purpose of the SCC is "to incorporate the social benefits of reducing carbon dioxide (CO<sub>2</sub>) emissions into cost-benefit analyses of regulatory actions that have small, or 'marginal,' impacts on cumulative global emissions." (Interagency Working Group on Social Cost of Carbon, United States Government, 2010)

- Reduces congestion (especially via congestion and parking fees).

#### Strategy for overcoming obstacles

- Elevate public education, including clarifying the true cost of using transportation.
- Conduct pilot pricing programs and document results.

#### Options

- Greatly reduce or eliminate federal constraints on congestion pricing, tolls, and cordon pricing. For example, eliminate the federal prohibition on instituting tolls (including congestion fees) on existing interstate highways.
- Expand the SAFETEA-LU program for congestion pricing, allowing the use of core funding for PATP or PAYD auto insurance programs, parking pricing programs, state vehicle feebate programs, carbon-based registration fees, and carbon-based vehicle excise taxes.

### 3. Fund a major performance-based program to encourage innovations in transportation planning that save oil and reduce GHG emissions

#### Benefits

- Supports the growing desire for performance-based transportation planning for all goal areas, and energy/environment goals in particular, similar to California's Senate Bill 375.
- Allows experimentation with new approaches that hold promise, but need to be tested.

#### Strategy for overcoming obstacles

- Provide funding and cite existing state programs as models for the federal program, to reduce skepticism.

#### Options

- Could be modeled after the Trip Reduction Performance Program (TRPP) at Washington DOT (WSDOT). WSDOT solicits applications for TRPP funding from cities, transit operators, employers, and private entities. Successful applicants receive 50 percent of requested funding up front, and additional funding is provided at the end of the performance period, depending on actual results achieved.
- Could allocate federal funds to states, by formula, for them to administer a program similar to WSDOT's in their states, but with "performance" defined as transportation oil savings or GHG emission reduction. This would stimulate innovations, partnerships, and a wide array of stakeholder participation, and allow for flexible approaches including improved system efficiency and/or VMT reduction.
- Consider reserving program funds for a similar program for MPOs, as well as states.

### 4. Provide significant funding, incentives, and institutional support to dramatically increase carpooling and vanpooling

#### Benefits

- Taps into existing vehicle capacity (empty seats), at relatively modest public sector cost, with potentially significant cost savings to those who carpool or vanpool.
- Avoids oil use and GHG emissions associated with constructing new highway or transit capacity (except for building new HOV lanes).
- Is applicable in rural areas, as well as suburban and urban areas.

### Strategy for overcoming obstacles

- Provide funding and increase awareness of the comparative advantages of carpooling and vanpooling, in terms of low public costs, user cost savings, wide applicability, and lack of political controversy.

### Options

- Promote new forms of carpooling, such as “casual” or “flexible” carpooling, in which riders are not locked into the same carpool at the same time and same locations every day.
- Harness social networking to increase participation.
- Institute a national vanpool insurance program to lower rates for all vanpool agencies.
- Create one-stop metropolitan or statewide ridesharing programs for both conventional and “casual” carpooling and vanpooling, with ride matching, a calendar for participants to log trips and receive rewards, and an interface with different networks (employers, cities, transit agencies, and statewide campaigns).
- Establish dedicated funding for carpooling/vanpooling as a major mode of transportation, with funding for guaranteed rides home, rider matching services, user screening programs, preferential carpool parking, advertising and promotional programs, HOV lanes, and even payments for individuals to try carpooling/vanpooling for several months.<sup>19</sup> Carpool and vanpool program funding could start low (\$500 million per year) and build to levels comparable to the Federal transit program (\$10 billion per year) if successful.
- Dedicate some FHWA and FTA staffing to promoting carpooling and vanpooling, as occurs for every other mode of transportation.<sup>20</sup>

## 5. Establish national, state, and/or metropolitan GHG emission reduction or oil savings targets and a process and technical assistance to meet them<sup>21</sup>

### Benefits

- Puts the focus directly on the key objective of saving oil and reducing GHG emissions.
- Allows flexibility for each jurisdiction to select strategies that are most appropriate to that state or metropolitan area.
- Is measurable and allows tracking over time.

### Strategy for overcoming obstacles

- Provide substantial technical assistance and other tools to assist states and MPOs in target setting, strategy decisions, and implementation.

### Options

- The federal government could establish a national target for surface transportation GHG emission reductions per capita by 2025 for passenger transportation (not freight).
- The federal government could require states and MPOs with over 1 million people to adopt their own targets, with justification required for setting lower targets than the national target.

<sup>19</sup> MPOs in Atlanta and Washington, D.C. pay \$2 to \$3 per day for people to start carpooling, a cost that is lower than the average cost of transit and highway trips and is comparable to WSDOT’s cost criteria for its TRPP.

<sup>20</sup> Currently there is no individual at U.S. DOT dedicated to maximizing carpooling/vanpooling.

<sup>21</sup> Much of this option is based on California’s SB 375.

- Within 2 years, states and MPOs could demonstrate with their Transportation Improvement Programs (TIPs) and plans how they will achieve their targets, and also do so in major TIP and plan updates thereafter.
- U.S. DOT and EPA could jointly issue guidance on GHG emission estimation methodologies and data collection standards, including possibly multiple methodologies in view of current uncertainties in modeling.
- Allow states and metropolitan areas to meet their targets through all means.
- Refrain from imposing penalties for falling short of targets, but give states and large MPOs which exceed the national target a bonus share of the GHG performance program funding described in #3 above.

## 6. Fund coordination between transportation and land use planning activities

### Benefits

- Supports voluntary efforts to improve land use and transportation planning, with maximum flexibility for different states and MPOs on the pace and nature of their efforts.

### Strategy for overcoming obstacles

- Provide funding and increase awareness of benefits of land use and transportation coordination emphasizing co-benefits such as improved air quality.

### Options

- Support state and local partnerships to coordinate transportation and land use planning that saves oil and reduces GHG emissions, and reduces congestion. For example, it could fund initiatives like Maine DOT's "Gateway One" project, in which the state DOT works with local governments along the highly traveled coast of Maine to identify, analyze, and implement options for coordinated transportation and land use changes that reduce vehicular impacts on communities while preserving economic growth.
- Promote coordination among state DOTs, MPOs, individual local governments, and businesses.
- Allocate funds to states and MPOs by formula (to minimize Congressional earmarking).
- Support both planning and implementation of coordinated transportation and land use plans that reduce GHG emissions.<sup>22</sup>
- Require recipients to produce biannual reports summarizing the use of the funds and the results achieved – including estimates of GHG emission reductions expected.

## 7. Establish incentives or requirements for state and local governments to help expedite the transition to energy-efficient vehicles and low-carbon fuels

### Benefits

- Provide incentives for the purchase of energy-efficient and alternative fuel vehicles by consumers.
- Uses the 4 million public vehicles in the nation's inventory to boost the energy-efficient and alternative fuel vehicle market.

<sup>22</sup> The Partnership for Sustainable Communities is a good example of an interagency effort that works towards this goal (EPA, 2010).

### Strategy for overcoming obstacles

- Provide additional federal funding that would be required for transportation agencies to support the transition to lower-carbon vehicles.

### Options

- Provide funding for installation of electric plug-in facilities.
- Require park-and-ride lots to have electric plug-in facilities.
- Require states and MPOs to develop plans for widespread electric plug-in and alternative fuel facilities, and support multi-state installation efforts.
- Provide formula funding incentives for states that achieve higher than average auto and light-duty truck fuel efficiencies.
- Establish eligibility for state and local governments to use core program funds to institute vehicle registration fees or taxes that vary according to each vehicle's carbon intensity and/or vehicle property taxes, or excise taxes based on vehicle carbon intensity.
- Establish a federal grant, loan, or loan-guarantee program for retrofit of diesel engines to reduce black carbon, particulates, and GHG emissions.
- Require or provide support for state and local governments to use high-efficiency, low-carbon vehicles in their own fleets.

## 8. Establish a research and data collection program to save oil and reduce GHG emissions

### Benefits

- Improves knowledge and expands options and chances of success.
- Supports the desire for performance-based planning, through better data and analysis.

### Strategy for overcoming obstacles

- Raise overall federal funding to support a strong R&D program and enhanced databases.

### Options

- Fund pilot efforts to reduce GHG emissions; research on GHG strategies for freight transportation; analysis of full life-cycle GHG emissions for transportation options; and the dissemination of information and training through workshops, webinars, conferences, and written material.
- Fund research, data collection programs, and deployment of innovations for VMT strategies, operational efficiency, and decarbonizing construction, maintenance, and transportation agency operations.
- Make improved data collection a major focus.
- Build the capability of surface transportation professionals and institutions to plan for and implement GHG emission reductions through workforce training, organizational change, and more.

## References

EIA. (2010). *Annual Energy Outlook 2010, DOE/EIA-0383(2010)*. Washington, D.C.: U.S. Energy Information Administration.

EPA. (2010, December). *Partnership for Sustainable Communities*. Retrieved February 4, 2011, from U.S. Environmental Protection Agency:  
[http://www.epa.gov/dced/pdf/partnership/2010\\_1230\\_psc\\_ejflyer.pdf](http://www.epa.gov/dced/pdf/partnership/2010_1230_psc_ejflyer.pdf)

FHWA. (2010a). *2009 NHTS Table Designer*. Retrieved February 4, 2011, from Oak Ridge National Laboratory: <http://nhts.ornl.gov/>

FHWA. (2010b). *Travel Trends (November 2010)*. Retrieved February 7, 2011, from Federal Highway Administration: <http://www.fhwa.dot.gov/ohim/tvtw/10novtvt/page2.cfm>

GAO. (2009). *Biofuels: Potential Effects and Challenges of Required Increases in Production and Use*. Washington, D.C.: Government Accountability Office.

Greene, D., & Plotkin, S. (2011). *Reducing Greenhouse Gas Emissions from U.S. Transportation*. Arlington, Virginia: Pew Center on Global Climate Change.

Parsons Brinckerhoff. (2009). *Strategies for Reducing the Impacts of Surface Transportation on Global Climate Change: A Synthesis of Policy Research and State and Local Mitigation Strategies*. Washington, D.C.: National Cooperative Highway Research Program.

U.S. Census Bureau. (2010). *The Older Population in the United States: 2010 to 2050*. Washington, D.C.: U.S. Census Bureau.