AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

S. HRG. 111–1233

OPPORTUNITIES TO IMPROVE ENERGY SECURITY AND THE ENVIRONMENT THROUGH TRANSPORTATION POLICY

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

MARCH 24, 2010

Printed for the use of the Committee on Environment and Public Works

Available via the World Wide Web: http://www.gpo.gov/fdsys

U.S. GOVERNMENT PUBLISHING OFFICE

21–636 PDF WASHINGTON : 2016

For sale by the Superintendent of Documents, U.S. Government Publishing 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

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ONE HUNDRED ELEVENTH CONGRESS
SECOND SESSION

BARBARA BOXER, California, *Chairman*

MAX BAUCUS, Montana
THOMAS R. CARPER, Delaware
FRANK R. LAUTENBERG, New Jersey
BENJAMIN L. CARDIN, Maryland
BERNARD SANDERS, Vermont
AMY KLOBUCHAR, Minnesota
SHELDON WHITEHOUSE, Rhode Island
TOM UDALL, New Mexico
JEFF MERKLEY, Oregon
KIRSTEN GILLIBRAND, New York
ARLEN SPECTER, Pennsylvania

JAMES M. INHOFE, Oklahoma
GEORGE V. VOINOVICH, Ohio
DAVID VITTER, Louisiana
JOHN BARRASSO, Wyoming
MIKE CRAPO, Idaho
CHRISTOPHER S. BOND, Missouri
LAMAR ALEXANDER, Tennessee

BETTINA POIRIER, *Staff Director*
RUTH VAN MARK, *Minority Staff Director*

C O N T E N T S

Page

MARCH 24, 2010

OPENING STATEMENTS

Boxer, Hon. Barbara, U.S. Senator from the State of California 1
Inhofe, Hon. James M., U.S. Senator from the State of Oklahoma 2
Cardin, Hon. Benjamin L., U.S. Senator from the State of Maryland 28
Carper, Hon. Thomas R., U.S. Senator from the State of Delaware, prepared statement 115

WITNESSES

Porcari, Hon. John D., Deputy Secretary of Transportation, U.S. Department of Transportation 4
Prepared statement 6
McCarthy, Hon. Regina A., Assistant Administrator, Office of Air and Radiation, U.S. Environmental Protection Agency 11
Prepared statement 13
Responses to additional questions from Senator Boxer 16
Response to an additional question from Senator Carper 17
Responses to additional questions from:
Senator Cardin 18
Senator Inhofe 19
Greene, Larry F., Executive Director, Sacramento Metropolitan Air Quality Management District 30
Prepared statement 33
Responses to additional questions from Senator Boxer 35
Response to an additional question from Senator Inhofe 39
Lovaas, Deron, Federal Transportation Policy Director, Natural Resources Defense Council 40
Prepared statement 42
Responses to additional questions from Senator Boxer 65
Response to an additional question from Senator Inhofe 71
Siglin, Douglas V., Federal Affairs Director, Chesapeake Bay Foundation 75
Prepared statement 77
Kolodziej, Richard, President, NGVAmerica 88
Prepared statement 90
Responses to additional questions from:
Senator Boxer 99
Senator Inhofe 102

ADDITIONAL MATERIAL

Letter to Senator Boxer and Senator Inhofe from the American Gas Association, April 2, 2010 118

OPPORTUNITIES TO IMPROVE ENERGY SECURITY AND THE ENVIRONMENT THROUGH TRANSPORTATION POLICY

WEDNESDAY, MARCH 24, 2010

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The full Committee met, pursuant to notice, at 10:05 a.m. in room 406, Dirksen Senate Office Building, Hon. Barbara Boxer (chairman of the full Committee) presiding.

Present: Senators Boxer, Inhofe, Cardin, Merkley, Carper, and Udall.

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Good morning, everybody.

Senator Inhofe and I welcome our panelists, and we wanted to share some information. It may be that we have some objections to our meeting this morning due to unrelated matters that are happening on the Senate floor. Therefore, I am going to ask our panelists to just stick with the clock and get this done.

And what I am going to do is put my full statement in the record. I will just summarize it in a couple of minutes if you want to run the clock.

We are going to examine ways we can use the next Surface Transportation Bill to improve our Nation's energy security and the environment. The witnesses will discuss the ways we can use transportation policies to promote energy security as well as cleaner air and water.

We spend $1 billion a day to import foreign oil, and two-thirds of it is used for transportation. So, if we make our transportation system more efficient, reduced oil consumption will make our country less dependent on countries that, frankly, do not like us very much.

We also know the health impacts. Diesel, for example, the exhaust from diesel, contributes to asthma attacks, bronchitis, other illnesses, heart disease, permanent harm to the lungs of kids, and causes cancer. And we know there are ways to make the diesel cleaner.

As a matter of fact I visited a place in Sacramento where there is this incredible technology that reduces the pollutants that come out of the diesel by about 80 percent. So there are ways that we can encourage this kind of technology.

Two of my main goals for the reauthorization of our bill are to improve goods movement and to reduce air pollution from transportation. We have to find ways to reduce harmful emissions while we speed up the movement of people and goods. And there are several programs that provide funding for projects that will benefit the quality of our air.

I will look forward to hearing from today's witnesses as we work to develop a transportation bill that will help reduce pollution and make America more secure.

And I would yield the time to Senator Inhofe.

[The prepared statement of Senator Boxer was not received at time of print.]

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. Madam Chairman, I will also cut back because it could be that we will have to leave in about 45 minutes. So, we will get to the panelists.

Senator BOXER. OK.

Senator INHOFE. I will say this. I always have to say this when I am at one of these meetings. If we really are serious about wanting to be independent from other countries, all we have to do is develop our own resources. As we all know, now, no one questions, the CRS came out and showed the United States of America is No. 1 in terms of reserves of recoverable resources. So, we are talking gas, oil and coal.

The main thing I was trying to get across on this is I have introduced a lot of legislation. Back when gas was over $4 a gallon, natural gas was, the equivalent to a gallon was 98 cents. And that just made sense.

We know about the obstacles, the bureaucratic obstacles that are out there. I have introduced the Drive America on Natural Gas Act. I have been joined by Democrats, Senator Pryor, and one of the strongest proponents of my position is Dan Boren, a Democrat in the House. So, we are working on this together.

There are all kinds of reasons, environmental reasons as well as other reasons, cost reasons. And now that we know what the reserves are out there, every time, every week that goes by, in the shale, in the deposits, all of these things are out there, and we want to be sure that we are able to do that.

And knock down some of the bureaucratic obstacles in terms of certification of engines. It is ridiculous to have to recertify something if the same engine has already been certified but used in a different vehicle.

We are going to work all together on this and try to make this a reality, Madam Chairman.

And I will put the rest of my statement in the record.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE,
U.S. SENATOR FROM THE STATE OF OKLAHOMA

Thank you, Madam Chairman, for holding this hearing, and thank you to all the witnesses for joining us this morning. The purpose of today's hearing is to explore some of the policy recommendations that benefit the environment while making us

less dependent on foreign oil. One innovative way to achieve that goal is through greater use of natural gas powered vehicles.

In 2008, when gasoline prices were above $4 per gallon, I was the first in Congress to introduce a comprehensive bill to promote the use of natural gas as a realistic alternative for the many Americans who were looking for price relief. The bill I introduced was called the "Drive America on Natural Gas Act." Today, I'm encouraged to see that several members on Capitol Hill have introduced similar bills promoting the use of both natural gas and propane as a transportation fuel. Last summer I joined with Senator Pryor to once again introduce a comprehensive bill to promote these fuels for America's drivers. In October Senator Wicker and I introduced legislation to simplify the EPA emissions certification process for aftermarket fuel conversion systems. I'm glad to report that Senator Landrieu is now a cosponsor of that bill.

The bipartisan support for both natural gas and natural gas vehicles speaks to its potential to strengthen energy security and serve as a viable alternative to gasoline powered vehicles. But to achieve these goals we must take advantage of our abundant, domestic supply of natural gas for use as a transportation fuel.

There is no question about the supply of natural gas—we have plenty of it, and we can develop it. Last year the Potential Gas Committee released its latest assessment showing that America possesses 2,047 trillion cubic feet of natural gas—an increase of more than 35 percent just since the Committee's 2006 estimate. At today's rate of use this is enough natural gas to meet American demand for nearly 90 years. Just this January the Department of Energy released new statistics showing that the United States had eclipsed Russia as the world's largest producer of natural gas.

The advent of horizontal drilling is fueling an economic boom. A recent study from the Pennsylvania College of Technology estimates that drilling for natural gas in the Marcellus Shale alone will create 98,000 Pennsylvania jobs and inject more than $14 billion into Pennsylvania's economy in 2010. Multiply these numbers across several emerging natural gas plays nationwide, and the potential economic impact equates to millions of jobs and trillions of dollars.

We have the natural gas supply and proven NGV technology, which has existed for decades. Therefore its promise as a mainstream transportation fuel is achievable today—not 15 or 20 years from now.

As we work across the aisle to promote the development and use of our abundant natural gas supply, members on both sides of this Committee are also working together to pass a reauthorization of the Nation's transportation bill. I won't get into the details of the reauthorization debate, but I want to make clear that we need to avoid weighing down the bill with environmental regulation. For example if members favor reducing greenhouse gas emissions or establishing stormwater regulations for the transportation sector then they should do so in the context of climate legislation or the Clean Water Act.

While we all share the important value of environmental protection it should be a value considered on par with the energy, economic, safety, mobility and other benefits of proposed transportation projects. In short we need to devise ways to balance our transportation needs with our environmental goals.

Thank you, Madam Chairman. I look forward to discussing these issues with our witnesses.

Senator BOXER. Thank you so much. Senator, would you agree that we should keep our question time to 3 minutes instead of 5?

Senator INHOFE. Sure. I think particularly on the first panel because they may shut us down——

Senator BOXER. Yes, I know.

Senator INHOFE. And we want to get to the second panel.

Senator BOXER. I know.

So, with that, and speeding along, we are honored to welcome our first two panelists, Hon. John Porcari, Deputy Secretary of Transportation, United States Department of Transportation. He will be followed by Hon. Regina McCarthy, Assistant Administrator, Office of Air and Radiation, U.S. EPA.

So, why don't you start? And we give you 5 minutes.

STATEMENT OF HON. JOHN D. PORCARI, DEPUTY SECRETARY OF TRANSPORTATION, U.S. DEPARTMENT OF TRANSPORTATION

Mr. PORCARI. Chairman Boxer, Ranking Member Inhofe, thank you for the opportunity to testify today. This is an important topic, and protecting our Nation from the risks associated with our reliance on foreign oil and the destabilizing effects of a changing climate is one of the President's highest priorities.

We have to commit ourselves to an economic future in which the strength of our economy is not tied to the unpredictability of oil markets. We need to improve the energy and environmental performance of the transportation sector so that we can continue to provide mobility for the public and for the economy.

Today I would like to highlight some of the innovative transportation and energy programs of the Obama administration that we are pursuing with the support of Congress. These initiatives address the energy transportation nexus on all fronts—better vehicles, clean fuels and transforming our infrastructure.

One of the President's earliest actions on taking office was to direct the Environmental Protection Agency and our National Highway Traffic Safety Administration to develop a joint fuel economy and tailpipe greenhouse gas emissions standard for cars and light trucks, covering the model years 2012 through 2016. In September of last year the two agencies issued a joint Notice of Proposed Rulemaking. NHTSA issued an Environmental Impact Statement in February of this year, and we expect to issue a final rule in the near future.

Our colleagues, meanwhile, at the Department of Energy are administering $7.5 billion of loans under the Advanced Technology Vehicle Manufacturing Improvement Program. This helps make possible the commercial deployment of U.S. built electric and plug-in hybrid vehicles, which will set the stage for a transformation of the light duty vehicle sector.

In clean fuels my colleague, EPA Assistant Administrator McCarthy, will tell you about EPA's new final rule for the revised Renewable Fuel Standard issued on February 3rd. This new rule lays the groundwork for vastly expanding the output of low carbon renewable fuels such as cellulosic, ethanol and biodiesel.

Our main focus at the Department of Transportation lies in transforming our transportation infrastructure. Large scale transportation infrastructure investments inevitably require a Government role. We believe that these initiatives will change the face of the U.S. transportation system. I would like to highlight six key DOT initiatives undertaken with the support of Congress and especially this Committee. And we thank you for that support.

First, high speed rail. On January 28th the President announced $8 billion in Recovery Act grants to States across the country to develop America's first nationwide program of high speed intercity passenger rail service. These Recovery Act dollars are a historic investment in our transportation infrastructure. They will create jobs and transform travel in America.

Second, transit grants. The Federal Transit Administration has used Recovery Act funding to award $8.6 billion in grants for more than 965 transit projects across the country. These Recovery Act

funds have supported the purchase of nearly 11,000 buses, vans and rail vehicles, and also supported the construction or renovation of more than 850 transit facilities across the country.

Third, our TIGER Program, Transportation Investment Generating Economic Recovery. On February 17 Secretary LaHood announced $1.5 billion in awards for 51 projects across the country, including improvements to roads, bridges, rail, ports, transit and intermodal facilities. The TIGER grants include activities that are difficult to fund under our existing programs, and many of the grants will help alleviate some of our key freight, rail and goods movement bottlenecks.

Fourth, livable communities. DOT is partnering with the Department of Housing and Urban Development and EPA to better integrate regional housing, transportation and land use planning and investment. We are helping redefine affordability to reflect the rising transportation costs, harmonize the HUD and DOT programs so they work in concert, and undertake a joint research data collection and outreach program.

Sustainable development that is transit oriented and friendly to pedestrians and bicyclists will help foster economically competitive, healthy, opportunity rich communities throughout the country and will also have a positive impact on fuel consumption and greenhouse gas emissions.

Fifth, managing demand peaks. Transportation demand fluctuates by time of day and by season, as you well know. Network congestion adds hidden—and sometimes not so hidden—costs for travelers, infrastructure providers, and the environment. The costs include wasted time, additional greenhouse gas emissions, urban air pollutants, excess fuel consumption and infrastructure costs. We are working with our State and local partners to create better choices for travelers including bicycle and pedestrian options and transit innovation such as bus rapid transit.

And then sixth and finally, NextGen. We have a transformational opportunity with the Federal Aviation Administration in our Next Generation Air Transportation System. NextGen, as you know, is a comprehensive multi-year overhaul of the national airspace system that will improve performance, enhance safety, and reduce aviation fuel usage and greenhouse emissions through improved and more direct routing and reduced congestion and delay.

These are some of the many transportation infrastructure related activities that we are pursuing. In the long run transformational initiatives such as the ones I have described here today will have a powerful, positive effect on our society by creating more attractive, economically competitive communities and enhancing the overall performance of our system.

Thank you, and I look forward to answering your questions.

[The prepared statement of Mr. Porcari follows:]

STATEMENT OF
THE HONORABLE JOHN D. PORCARI
DEPUTY SECRETARY OF TRANSPORTATION

BEFORE THE

COMMITTEE ON ENVIRONMENT
AND PUBLIC WORKS
U.S. SENATE

Opportunities to Improve Energy Security and the Environment through Transportation Policy

MARCH 24, 2010

Chairman Boxer, Ranking Minority Member Inhofe, and Members of the Committee:

I want to thank you for giving me the opportunity to testify today on the opportunities to improve energy security and the environment through transportation policy. Protecting our Nation from the serious risks associated with our reliance on foreign oil and the destabilizing effects of a changing climate is one of the President's highest priorities. Our reliance on oil poses a threat to our economic security. Over the last few decades, we have watched our economy rise and fall along with the price of a barrel of oil. We must commit ourselves to an economic future in which the strength of our economy is not tied to the unpredictability of oil markets.

As the President has said:

> *"So we have a choice to make. We can remain one of the world's leading importers of foreign oil, or we can make the investments that would allow us to become the world's leading exporter of renewable energy. We can let climate change continue to go unchecked, or we can help stop it. We can let the jobs of tomorrow be created abroad, or we can create those jobs right here in America and lay the foundation for lasting prosperity."*

Transportation systems are on the front lines in the struggle to make our Nation's economy more sustainable. According to the Energy Information Administration, transportation accounts for 71 percent of U.S. petroleum consumption, and about 28 percent of U.S. greenhouse gas emissions. Petroleum, in turn, accounts for 98 percent of the sector's energy consumption.

The transportation sector is essential to the U.S. economy. The value of final demand for transportation services (including vehicles) in 2007 was $1.5 trillion, more than 10 percent of the Gross Domestic Product (GDP), with commercial "for hire" transportation exceeding $400 billion.

We need to improve the energy and environmental performance of the transportation sector, so that it can continue to provide mobility for the public and the economy. If we implement measures that are economically attractive, then we can simultaneously improve the

environmental and economic performance of the transportation sector and the broader economy, while creating the basis for American leadership in high performance industries of the future.

There are three broad areas where we can improve the performance of the transportation sector:

- Efficient Vehicles;
- New Fuels; and
- Transforming Infrastructure.

Today, I would like to highlight for you just a sampling of the many innovative initiatives that the Administration and DOT are pursuing with the support of Congress.

Efficient Vehicles. One of the President's earliest actions on taking office was to direct the Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) to develop a joint fuel economy/tailpipe greenhouse gas emissions standard for cars and light trucks covering model years 2012-2016. In September 2009, the two agencies issued a joint Notice of Proposed Rulemaking. NHTSA issued an Environmental Impact Statement in February, and we expect to issue a final rule in the near future. We anticipate that the joint National Program, if adopted, will save 1.8 billion barrels of petroleum and reduce carbon dioxide emissions by a cumulative 950 million metric tons over the life of the regulated vehicles.

The Department of Energy (DOE) has been charged with administering $7.5 billion of loans under the Advanced Technology Vehicle Manufacturing Improvement Program, authorized by the Energy Independence and Security Act of 2007 (EISA). DOE has been using these funds to invest in a range of advanced vehicle manufacturing and battery facilities. This is helping make possible the commercial deployment of a range of US-built electric and plug-in hybrid vehicles built by multiple current and new entrant manufacturers, that sets the stage for a transformation of the light duty vehicle sector. DOE also continues their research and development program for advanced vehicle and truck technologies.

The Federal Aviation Administration (FAA) is supporting research and development of environmentally sound engine, aircraft and fuel technologies through the Continuous Lower Energy Emissions and Noise (CLEEN) program.

Even in the absence of current Federal programs, transportation operators and equipment vendors are recognizing the economic impact of higher oil prices. We are seeing more fuel efficient locomotives, hybrid tugboats, and improved heavy duty diesel engines. In the aviation sector, Boeing has finally resolved many of the development issues with the advanced technology Boeing 787. Boeing says that this aircraft will use 20 percent less fuel per flight than comparable existing aircraft. The prototype made its first flight in December, and there are now four aircraft in flight test. Boeing expects to begin delivering this advanced aircraft to airlines in the fourth quarter of 2010.

New Fuels. Our colleagues at the EPA released the final rule for the revised Renewable Fuel Standard on February 3, which laid the groundwork to significantly expand output of low carbon

renewable fuels such as cellulosic biofuel and biodiesel. By 2022, production of renewable fuels is set to increase to 36 billion gallons, with 16 billion gallons coming from low-carbon cellulosic biofuels.

In addition, the Department of Defense (DOD) and the FAA are carrying forward research and development work on alternative and renewable fuels in the aviation sector. The DOD is working through requests to procure approved alternative jet fuels; while FAA is sponsoring a joint industry-Government partnership, the Commercial Aviation Alternative Fuels Initiative, facilitating new alternative fuel standards at ASTM and supporting alternative fuel testing.

The Federal Transit Administration (FTA) is testing and deploying alternative fuel and hybrid transit buses through its Clean Fuel Grant Program, and Research and Innovative Technology Administration (RITA) is pursuing research on a range of new fuel approaches through our University Transportation Centers. DOT has also been adding alternative fuel vehicles to the fleet of vehicles we use to conduct business. Within DOT's own facilities and vehicle operations, we are putting sustainable concepts into practice. For example, we are in the process of making greenhouse gas reduction commitments, adding new alternative technologies and fuels to our fleet, pursuing renewable energy projects, and new sustainable designs for our facilities.

It is likely that the Department's most important contribution to new fuels is developing safety codes and standards for new vehicles and new fuel transportation systems. An effective safety regime is critical to public acceptance of new transportation technologies and systems. In cooperation with the DOE and other agencies, our operating Administrations are researching how Federal Motor Vehicle Safety Standards might better accommodate hydrogen and electric vehicles. We are also examining the safety and operating issues raised by ethanol and hydrogen pipelines.

Transforming Infrastructure. Our main focus at the DOT lies in transforming our transportation infrastructure. Transportation infrastructure development inevitably has a substantial Government role. DOT's biggest job over the past year has been undertaking our responsibilities under the American Recovery and Reinvestment Act (Recovery Act), including deploying $26.6 billion made available to the States for highway projects, $1.3 billion for aviation-related improvements, and $98 million for small shipyards. I would like to highlight several particularly transformative infrastructure investments: some funded under the Recovery Act, some using existing funding:

- **High-Speed Rail**. On 28 January, the President announced $8 billion in grants to States across the country to develop America's first nationwide program of high-speed intercity passenger rail service. Funded by the Recovery Act, these dollars represent an historic investment in the country's transportation infrastructure, which will help create jobs and transform travel in America. In addition to high speed rail, the Federal Railroad Administration was allocated $1.3 billion for capital grants to Amtrak.

- **Transit Grants.** The FTA has used Recovery Act funding to award $8.6 billion in grants for more than 965 transit projects across the country. Included within this amount was funding for $100 million for the competitive Transit Investments in Greenhouse Gas and

Energy Reduction (TIGGER) program, awarded on October 14, 2009 to 43 projects. So far, Recovery Act funds have supported the purchase of nearly 11,000 buses, vans, and rail vehicles, the construction or renovation of more than 850 transit facilities, and the performance of more than $620 million in preventive maintenance, which has helped to save transit service and jobs, and enhance service reliability.

- **Transportation Investment Generating Economic Recovery (TIGER) grants.** On February 17, Secretary LaHood announced $1.5 billion in Recovery Act grants for 51 transportation projects including improvements to roads, bridges, rail, ports, transit and intermodal facilities. TIGER grants include activities that are difficult to fund under existing transportation programs, such as multi-state and multi-modal projects, and alleviating some key freight rail bottlenecks.

- **Livable Communities.** DOT is partnering with the Department of Housing and Urban Development (HUD) and EPA in an interagency task force to enhance integrated regional housing, transportation, and land use planning and investment; redefine affordability to reflect rising transportation costs; develop livability measures; harmonize HUD and DOT programs, and to undertake joint research, data collection and outreach. As part of this initiative, HUD will be funding Sustainable Communities Planning Grants for communities to improve regional planning efforts that integrate housing and transportation decisions. EPA has created a new Office of Sustainable Communities that will, among other activities, help States use Clean Water Funding to support efforts to make their communities more sustainable.

  DOT has proposed to create a counterpart office within the Office of the Secretary. Our Office of Livable Communities will lead DOT's efforts throughout the Department and with HUD and EPA. We propose, within our FY2011 budget request, that the Office would coordinate the distribution of $200 million for capacity enhancement at state and local transportation agencies. Through this support, state and local agencies could be better equipped with the tools, data and training needed to understand how transportation, housing, economic development and other infrastructure investments impact one another.

  Planning and capacity enhancement grants to State and Local governments may, at first glance, appear to involve small sums of money, but they leverage far larger sums of private and public transportation and real estate investment over periods of many years. Because transit-oriented development requires private investment spurred by the cooperation of multiple Governmental bodies, we cannot depend on markets alone to create these communities. Sustainable development that is transit –oriented and friendly to pedestrians and bicyclists will help foster economically competitive, healthy, opportunity-rich communities, while reducing petroleum consumption, increasing energy security, and reducing emissions of greenhouse gases and other pollutants.

- **Managing Demand Peaks**. Transportation demand fluctuates by time of day and by season, as anyone who has driven a morning commute can testify. Network congestion adds hidden and not-so-hidden costs for both travelers, infrastructure providers, and the environment. Costs include wasted time, additional greenhouse gas and urban air

pollutant emissions, excess fuel consumption, excess infrastructure costs. The brute force approach to congestion is simply to add capacity: put in another lane. Sometimes, that is what is necessary. Often, though, we can be smarter. At DOT, we are working with State and Local Governments to create better choices for travelers, including bicycle and pedestrian options, transit innovations such as dedicated-lane bus rapid transit. We can apply advanced technology to vehicles and roadways. We can use market forces where appropriate. And, we encourage employers and employees to participate in livability-enhancing initiatives such as telecommuting, ride-sharing, and flexi-place.

- **NextGen.** Equally transformational is the FAA's Next Generation Air Transportation System (NextGen). NextGen is a comprehensive multi-year overhaul of the national airspace system to improve performance, enhance safety, and reduce aviation fuel use and greenhouse gas emissions via improved routing and reduced congestion and delay.

- **Marine Highway.** DOT is investing $59 million in the new America's Marine Highway Program this spring. This program will seek, wherever possible, to move freight on the Marine Highway – to save fuel, reduce green house gases, and build system capacity. A comparison of long haul freight movement concluded that inland towing can move a ton of freight more than three and a half times further than trucking on the same gallon of fuel.

These are just a few of the many transportation infrastructure-related activities the Administration is pursuing. In the long run, transformational initiatives such as those I have described here today will have a powerful long run effect on our society by creating more attractive, economically competitive communities, increasing the overall performance of the U.S. economy, improving the functioning of the transportation system, and fostering the industries of the future while steadily reducing transportation's energy and environmental impacts.

Thank you and I look forward to answering your questions.

Senator BOXER. Thank you very much.

Regina McCarthy, Assistant Administrator, Office of Air and Radiation. Welcome.

STATEMENT OF HON. REGINA A. MCCARTHY, ASSISTANT ADMINISTRATOR, OFFICE OF AIR AND RADIATION, U.S. ENVIRONMENTAL PROTECTION AGENCY

Ms. MCCARTHY. Thank you very much.

Chairman Boxer, Ranking Member Inhofe, members of the Committee, I want to thank you for the invitation to testify today on opportunities to improve energy security and the environment through transportation policy. I am pleased to be on the panel with Deputy Secretary Porcari.

Today the U.S. transportation system accounts for about 57 percent of all nitrogen oxide emissions and 34 percent of volatile organic compound emissions, the two major ozone forming pollutants. The transportation sector also accounts for 16 percent of the total emissions of fine particulate matter.

More than 126 million Americans, nearly half of the population of the United States, live in areas where air quality does not meet our national health based standards. In addition all transportation sources contribute about 28 percent of the total U.S. greenhouse gas emissions.

While stringent vehicle emission regulations have significantly reduced emissions from traditional criteria air pollutants, from 1990 to 2007 transportation greenhouse gas emissions rose by 29 percent, due in large part to increased demand for travel and the stagnation of fuel efficiency across the U.S. vehicle fleet.

This Administration has committed to moving forward on transportation policies that can address both energy security and the environment. In May 2009 President Obama set in motion a new national program that would dramatically reduce greenhouse gas emissions and improve fuel economy for new cars and light trucks sold in the United States.

In September 2009 EPA and DOT announced the proposal for this new national program, and we are soon to be finalizing that proposal. Under the proposed program the average greenhouse gas emission standard in 2016 would be set at 250 grams per mile, which is equivalent to 35.5 miles per gallon if manufacturers meet the standard entirely through fuel economy improvements.

The environmental and security benefits from the national program will be significant. Together the proposed EPA and DOT standards would cut greenhouse gases by an estimated 950 million metric tons and about 1.8 billion barrels of oil over the lifetime of the vehicles sold under this program. Because of the increased fuel efficiency of these vehicles we estimate that the average American family that purchases a 2016 new car will save $3,000 in fuel costs over that vehicle's lifetime, even after taking into account the increased up front vehicle costs.

We expect to establish the final standards, as I said, no later than April 1st.

In February of this year EPA will also establish new requirements for the Renewable Fuel Standard, which is an important step for the environment, U.S. energy policy, and the economy. The

Energy Independence and Security Act of 2007 mandates our transportation fuel include 36 billion gallons of renewable fuel by 2022. We estimate that in 2022 the program should displace about 7 percent of our annual gasoline and diesel consumption with renewable fuels produced primarily right here in the United States.

While renewable fuels and more efficient vehicles and engines are crucial to reducing transportation emissions, we also have to take steps to cut emissions from the millions of vehicles currently navigating America's highways, railways and waterways.

In the past 2 years alone EPA's National Clean Diesel Campaign has awarded more than $350 million to help reduce exposure to harmful diesel exhaust. Through EPA's SmartWay Transportation Program we have joined with 2,600 partners to reduce fuel consumption in the freight sector. The SmartWay Transport Program has been able to assist the freight industry in adopting cost effective technologies and practices that can significantly reduce greenhouse gas emissions and save money for truck owners and operators.

In July 2009 President Obama said, "For too long Federal policy has actually encouraged sprawl and congestion and pollution rather than quality public transportation and smart, sustainable development." EPA has been working over the past year with DOT and HUD in this partnership that is advancing communities' ability to make smart development decisions.

I would like to acknowledge Secretary LaHood and Deputy Secretary Porcari for their leadership, along with Secretary Donovan and Administrator Jackson, on this effort. Their strong voices for better coordination of land use, housing transportation investments and air quality planning represents a bold new vision for the transportation system in this country and the relationship between our agencies.

And let me wrap up by saying that at the request of Senator Kerry we have developed some data that is now on the Web and that I believe the Committee has, that looks at how we can reduce greenhouse gases through new technologies and efficiency improvements in the transportation sector.

I am happy to walk through that data analysis and answer any questions.

Thank you very much.

[The prepared statement of Ms. McCarthy follows:]

STATEMENT OF REGINA A. MCCARTHY
ASSISTANT ADMINISTRATOR
OFFICE OF AIR AND RADIATION
U.S. ENVIRONMENTAL PROTECTION AGENCY
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
March 24, 2010

Chairman Boxer, Ranking Member Inhofe, and Members of the Committee, thank you for the opportunity to testify today on opportunities to improve energy security and the environment through transportation policy. I am pleased to offer this testimony together with Deputy Secretary Porcari from the Department of Transportation. Our two agencies have developed a strong partnership and we look forward working together to align our transportation, climate and air quality goals.

Today, transportation accounts for about 28% of all U.S. greenhouse gas emissions, and 57% of nitrogen oxide and 34% of volatile organic compound emissions, the major ozone forming pollutants. More than 126 million Americans—nearly half the population of the United States— live in areas where the air quality does not meet our national standards.

While stringent vehicle emission regulations have significantly reduced the emissions of traditional criteria air pollutants, from 1990 to 2007, transportation greenhouse gas emissions rose by 29 percent due, in large part, to increased demand for travel and the stagnation of fuel efficiency across the U.S. vehicle fleet. The number of vehicle miles traveled by light duty motor vehicles (passenger cars and light-duty trucks) increased 40 percent from 1990 to 2007. These numbers are indicative of the challenges we face in moving toward a low-carbon transportation sector.

This Administration is committed to moving forward on transportation policies that can address both energy security and the environment. In May 2009, President Obama set in motion a new National Program that would dramatically reduce greenhouse gas emissions and improve fuel economy for new cars and light trucks sold in the United States. In September 2009, EPA and the DOT announced the proposal for this National Program, which reflects unprecedented collaboration and consensus between the federal government, states, and private industry. This proposal would establish for the first time uniform federal standards to regulate both fuel economy and greenhouse gas emissions for these cars and light trucks.

The environmental and energy security benefits from the National Program will be significant. Together, the proposed EPA and DOT standards would cut carbon dioxide emissions by an estimated 950 million metric tons and about 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016). We have been reviewing public comments on our joint proposal and expect to establish final standards by April 1st.

Progress can also be made to reduce greenhouse gas emissions from heavy duty trucks and buses and nonroad vehicles and engines. In addition to a petition regarding emissions from highway vehicles, EPA has received, and is currently evaluating, seven petitions from states and environmental organizations requesting that the Agency use existing Clean Air Act authorities to set GHG standards for locomotives, marine vessels, aircraft, and other nonroad engines. Together, heavy duty trucks and buses and nonroad sources comprise 42 percent of all transportation greenhouse gas emissions in the United States. We expect significant growth in this sector in the coming years.

In February of this year, EPA also established new requirements for the Renewable Fuel Standard, which is an important step for the environment, for energy policy, and the U.S. economy. The Energy

Independence and Security Act of 2007 mandates our transportation fuel include 36 billion gallons of renewable fuel by 2022. This volume includes a substantial increase in the volume of advanced cellulosic biofuels, which will reach 16 billion gallons by 2022. Based on the agency's final analysis we estimate that in 2022, the program should displace about 7 percent of our annual gasoline and diesel consumption, reduce our dependence on oil by 328 million barrels annually, and avoid greenhouse gas emissions equivalent to removing 27 million cars from the road. In addition, we estimate that it will increase farmers' income by $13 billion annually by 2022.

While lower carbon fuels and more efficient vehicles and engines are crucial to reducing transportation emissions, we must also address emissions from the fleet of vehicles and engines already navigating America's highways, railways, and waterways.

In the past two years, EPA's National Clean Diesel Campaign has awarded close to $350 million to help reduce exposure to harmful diesel exhaust. EPA estimates that for every $1 spent on clean diesel projects, up to $13 of public health benefits accrue. Reduction in emissions from highway construction equipment has been one of the program's priorities.

Through EPA's SmartWay Transport program, we have joined with 2,600 partners to reduce fuel consumption in the freight sector. The SmartWay Transport program has been able to assist the freight industry in adopting cost-effective technologies and practices that can significantly reduce GHG emissions and save money. Our innovative SmartWay Finance grants have provided lower cost loans and leases to help truck owners--especially smaller trucking firms and owner-operators--purchase cleaner and more fuel efficient vehicles and technologies.

Providing incentives to reduce the number of miles we drive should also be part of the solution. A recent report, titled *Moving Cooler*, which EPA, DOT and others helped to support, provides new evidence that travel efficiency strategies like public transit, Smart Growth, congestion pricing, carpools and intermodal freight can reduce emissions in 2050, according to the report's "Low Cost Scenario," by 15 percent to 18 percent below projected levels.

This Committee outlined in the *Clean Energy Jobs and American Power Act* an approach to promote these travel efficiency strategies, assess the impact of transportation infrastructure investments, and encourage the development of integrated transportation and land-use plans, standardized models and state and MPO transportation greenhouse gas reduction targets.

In July of 2009, President Obama said, "For too long, federal policy has actually encouraged sprawl and congestion and pollution, rather than quality public transportation and smart, sustainable development." EPA has been working over the past year with DOT and HUD in a partnership focused on providing our communities the tools they need to make these smart development decisions. The Partnership for Sustainable Communities announced on June 16th by Secretaries LaHood and Donovan, and Administrator Jackson is designed to fully coordinate our actions to overcome the significant challenges we face together. Through this partnership, we have been working with stakeholders to identify barriers within our agencies that limit state and local efforts to build more sustainable neighborhoods and regions.

I would like to acknowledge Secretary LaHood and Deputy Secretary Porcari for their leadership on this effort. Their strong voice for better coordination of land-use, transportation investments and air quality planning represents a bold new vision for the transportation system in this country and the relationships between our agencies. We look forward to continuing our work with DOT and HUD and to sharing EPA's experience in transportation and air quality planning in our work together to make sure that investments by any one of our agencies will meet our shared goals.

In response to a request from Senator Kerry, EPA recently released an analysis of the potential greenhouse gas emissions and oil savings across the transportation sector through 2030. I want to emphasize that this was not part of a regulatory plan, but was rather a broad scoping exercise based on the application of known technologies, operational improvements, and travel efficiency measures in all key transportation subsectors, identified and analyzed by EPA experts. For example, in the light-duty sector, we assumed that the annual rate of improvement in greenhouse gas emissions and fuel economy from 2017 to 2030 would be equal to or slightly greater than the rate that will be required by the Administration's National Program discussed above. One way to achieve these levels would be for new technologies such as plug-in hybrid electric vehicles and other types of electric vehicles to account for one-third to one-half of all new personal vehicles in 2030, and for conventional hybrid vehicles to account for the majority of the remaining new vehicles sales in 2030. We also assumed that the fuel economy of new freight trucks could increase by 60 percent by 2030. We looked at travel efficiency strategies for passenger transportation analyzed in the *Moving Cooler* report, such as public transit, smart growth and carpools. Improvements were also identified for aviation, marine, rail, and nonroad engines and equipment.

Our technical experts projected that, by 2030, greenhouse gas emissions from the transportation sector could be reduced by 600 to 1000 million metric tons annually, which would be the equivalent of taking 120 to 200 million cars off the road. The projected oil savings are 4 to 7 million barrels per day, representing one-third to over one-half of our current oil imports. These greenhouse gas emissions and oil savings represent a 25 to 40 percent reduction in the transportation sector relative to the Energy Information Administration's 2009 Annual Energy Outlook baseline.

It is important to note what this scoping exercise in response to Senator Kerry's request did not do—it did not account for changes in emissions or oil consumption in transportation fuel production or distribution (such as upstream greenhouse gas emissions from power plants used to power electric vehicles), it did not assess the costs or other impacts of these measures, nor did it address the policy drivers that might be necessary to promote these changes. This analysis makes no distinction between different policy drivers nor does it reflect a regulatory plan or budget proposal. We make no assessment of the relative merits, costs, or impacts of various approaches.

In closing, I believe that Congress and the Administration have a tremendous opportunity and responsibility to move forward on polices in the transportation sector that can improve our environment, reduce dependence on oil, and create long-term economic prosperity for our nation. I am encouraged that this Committee is dedicated to keeping transportation a part of the solution, both in the context of pending climate and energy legislation, as well as the upcoming transportation bill reauthorization. EPA looks forward to working with DOT and this Committee. I would be pleased to answer any questions that you may have.

Environment and Public Works Committee Hearing
March 24, 2010
Follow-Up Questions for Written Submission

Questions for Gina McCarthy

Senator Barbara Boxer

1. In your testimony you mentioned that more than 126 million Americans (nearly half of the population) live in areas where air quality does not meet our national standards. What do you believe would be the most effective approach at the Federal level to address the transportation sector's contribution and to reduce that number and improve air quality nationwide?

Improving air quality is a top priority at EPA. To address air pollution from the transportation sector, we are implementing a suite of vehicle, engine, and fuel standards to dramatically cut NO_x and PM emissions from new vehicles and engines – including cars, trucks, buses, nonroad equipment, and locomotive and marine engines. To complement regulations for new vehicles and engines, the National Clean Diesel Campaign is helping to address harmful diesel exhaust from the legacy fleet. The program has awarded close to $350 million for upgrades to engines, vehicles and vessels across the country. The upgrades from the $49.2 million of grants in FY08 alone are estimated to reduce particulate matter by 2200 tons, NO_x by 46,000 tons and CO_2 by 465,000 tons and will result in an estimated $580 million to $1.4 billion in public health benefits. We anticipate significant additional benefits from the $294 million of clean diesel project grants that we awarded last year with American Recovery and Reinvestment Act funding.

Providing cost-effective options that enable us to reduce the number of miles we drive should also be part of the solution. This could include more transit and better coordination of land-use, transportation investments and air quality planning. We also need to promote standardized transportation, land-use and air quality models and data to better assess the impact of transportation infrastructure investments and strategies. The EPA-HUD-DOT Partnership for Sustainable Communities is also helping to improve air quality by providing communities the tools and targeted resources they need to make smarter development decisions.

2. Can you specifically describe some of the technologies, operational improvements, and travel efficiency efforts that EPA's technical experts project could reduce greenhouse gas emissions from the transportation sector?

The analysis we conducted in response to Senator Kerry's request reflects widespread deployment of known technologies and strategies for all of the key transportation subsectors – including light-duty, heavy-duty, aviation, marine, rail, and off-highway engines and vehicles – that our experts considered to be feasible in the 2015-2030 timeframe. This analysis does not consider the policy or market choices that would be needed to generate certain GHG outcomes, which is a valuable but complex analysis. Instead, it focuses more narrowly on the GHG reductions that could be derived directly from the transportation sector if effective drivers were in place. We make no assessment of

the relative merits, costs, or impacts of various approaches. This analysis is available on our website.[1]

Examples of technologies that we included in the analysis:

- Light-duty: advanced gasoline vehicles (e.g. downsized engines with turbochargers, better aerodynamics and tires), conventional hybrids, plug-in hybrids, electric vehicles.
- Heavy-duty: aerodynamics, low rolling resistance tires, advanced engines, hybrids.
- Aviation: geared turbofans, compressor optimization at low speed, lighter weight materials, laminar flow technology, and blended wing body.
- Rail: engine efficiency improvements, electric hybrid powertrains, improved bearings and brakes.
- Marine: engine system optimization for existing ships, improved hull design, propeller design optimization.

Examples of the travel efficiency strategies and operational improvements we included in the analysis:

- Light-duty: eco-driving, carpools, smart growth, and transit.
- Heavy-duty: idle reduction and improved driver performance.
- Aviation: improved ground operations and air traffic management.
- Rail: double-stacking and GPS-assisted dispatch optimization.
- Marine: voyage optimization and weather routing, speed reduction.

3. You mentioned the SmartWay Transport program and how you've used it to reduce fuel consumption in the freight sector. Can you describe this program and how it is being used to help truck drivers purchase cleaner and more fuel efficient vehicles and technologies? Do you think a similar approach can be used for buses?

The SmartWay program provides information, tools and incentives to freight carriers and their customers to help them track, assess, and reduce emissions from goods movement. SmartWay helps truck drivers identify cleaner and more fuel efficient vehicles and technologies by testing, verifying, and promoting technologies that demonstrate a measurable improvement in environmental performance. The SmartWay Finance Program uses Diesel Emission Reduction Act funding to support innovative loan and other incentive programs to help trucking companies (often small fleets or individual operators) purchase or lease cleaner, more efficient vehicles and technologies. SmartWay recognition for improved environmental performance allows shippers to identify and choose top-performing freight providers, providing an additional incentive for trucking operators to adopt greener technologies. We are continuing to explore opportunities to save fuel and reduce emissions through application of SmartWay-verified technologies beyond trucks.

Senator Thomas R. Carper

1. Transportation is the second largest emitter of greenhouse gases in this country, accounting for nearly one-third of emissions. The EPA says that we can reduce transportation emissions by 26 - 40 % in 2030 if we adopt a comprehensive set of policies. I believe that an essential

[1] www.epa.gov/otaq/climate/GHGtransportation-analysis03-18-2010.pdf

component of that strategy must be to allow Americans to spend less time in traffic and have increased mobility options. In order to reduce oil consumption and protect the environment, how should climate and transportation policy address mobility?

Policies that support the development of alternatives to driving can help reduce greenhouse gases and oil consumption, as well as protect Americans from increases in gas prices. One way to advance the implementation of mass transit, smart growth, and other travel efficiency measures is for states and local governments to encourage greenhouse gas reductions as part of the transportation planning process. The Committee laid out in Sections 112 and 113 of the *Clean Energy Jobs and American Power Act* one approach to promote these travel efficiency strategies, assess the impact of transportation infrastructure investments, and encourage the development of integrated transportation and land-use plans, standardized models and state and MPO transportation greenhouse gas reduction targets.

Senator Benjamin L. Cardin

1. Americans spend far too much time stuck in traffic. Wasting time in traffic impacts our economic productivity, the time we spend with family, and is a tremendous waste of energy resources and source of C02 emissions.

Will developing transit-oriented transportation systems achieve significant fuel/energy savings?

We believe that smart growth and mass transit can play an important role in helping to save fuel and reduce greenhouse gas emissions from the transportation sector. A recent report, titled *Moving Cooler*, which EPA, DOT and others helped to support, provides new evidence that travel efficiency strategies like public transit, Smart Growth, congestion pricing, and carpools can reduce emissions in 2050, according to the report's "Low Cost Scenario," by 15 percent to 18 percent below projected levels.

In 2007, EPA published a study titled, *Measuring the Air Quality and Transportation Impacts of Infill Development*[2], which included three case studies that evaluated transit-oriented development and other smart growth development strategies. For example, this study showed that increased use of smart growth strategies in Denver could reduce congestion by six percent and emissions by four percent. In Charlotte, the study found that a new light rail project would reduce emissions on its own, but with significant transit-oriented development around its stations, ridership would increase by 6,000 trips per day and the emissions reduction benefits would be ten times larger.

2. Last Summer Energy Secretary Steven Chu and EPA Administrator Lisa Jackson both testified before this committee that incorporating more transit systems into our transportation infrastructure would achieve remarkable reductions in greenhouse gas emissions from the transportation sector.

Do you agree that increase accessibility and availability of transit in communities both large and small would achieve significant fuel savings and C02 emissions reductions?

[2] U.S. EPA. Measuring the Air Quality and Transportation Impacts of Infill Development. EPA 231-R-07-001. November 2007

What level of investment in transportation alternatives, like transit, multi-modal transportation systems, and smart growth designs, would you recommend we make to achieve adequate fuel consumption reductions?

We agree that increasing accessibility and availability of transit could achieve significant fuel and greenhouse gas savings, as discussed in the response above. Significant new funding would be crucial to support state and local planning and implementation of travel efficiency strategies that could achieve the levels of greenhouse gas and fuel savings outlined in the *Moving Cooler* report. We expect that states and local governments would consider costs and benefits to determine the appropriate level of investment in transportation alternatives.

Senator James M. Inhofe

1. One of my biggest concerns with the Administration's Livability Initiative is that, to date, it is an amorphous concept that every Administration official has defined differently. What do the terms "livability" and "livable communities" mean to you?

Livable communities are where transportation, housing and commercial development investments have been coordinated such that people have access to adequate, affordable and environmentally sustainable travel options. The specific attributes that define livability in any individual community are shaped by the values of its citizens and unique local conditions. However, it is possible to identify broad principles to define basic aspects of livable communities. When Administrator Jackson, Secretary Dononvan and Secretary LaHood appeared before the Senate Banking Committee last July, they presented a set of Livability Principles defining the HUD-DOT-EPA Partnership for Sustainable Communities. These principles provide a basic definition of livable communities:

- **Provide more transportation choices.** Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
- **Promote equitable, affordable housing.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Enhance economic competitiveness.** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.
- **Support existing communities.** Target federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.
- **Coordinate and leverage federal policies and investment.** Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.
- **Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

2. You testified that the *Moving Cooler* report shows that greenhouse gas emissions can he reduced by 15 to 18 percent by 2050 by using the report's "Low Cost Scenario." Which of the included activities in the referenced scenario does the Administration support? Please answer yes or no to each of the following:

a. in all metropolitan areas with a population of at least 50,000, tax all free private parking lots with more than 50 spaces (retail and employer);
h. in all metropolitan areas with a population of at least 50,000, tax residential on-street parking at least $400 biannually with other costs for delivery and service vehicles and visitors;
c. implement congestion pricing on urban roads, congested rural freeways and arterials, with average peak hour per mile price of $0.65 on congested segments;
d. toll all intercity (rural) Interstates at a minimum of $0.05 per mile;
e. require enacting a growth boundary on all areas of more than 50,000 people;
f. require that at least 90 percent of new development be only multifamily homes or on lots of 1/8th an acre;
g. provide Metropolitan Planning Organizations with the authority to disapprove local land use plans and ordinances if not consistent with regional plan, enforced through withholding of funding for transportation projects;
h. require that existing streets within one-half mile of transit stations, schools, and business districts be audited for pedestrian accessibility and retrofitted with curb ramps, sidewalks, crosswalks, and traffic calming measures;
i. require all new commercial buildings of more than 100,000 square feet to provide showers, lockers, and covered/protected bicycle parking;
J. require all new multi-unit residential buildings to have indoor bicycle parking;
k. implement a bicycle network consisting of a combination of bicycle lanes, bicycle boulevards, and shared-use paths provided at one-quarter-mile spacing, implemented in areas with population density of more than 2,000 persons per square mile;
1. locate "bike stations" providing services including parking, rentals, repair, changing facilities, and information at all major activity centers and transit hubs as well as in the central business district for all metropolitan areas with a population of at least 50,000;
m. lower transit fares by 50 percent;
n. in all metropolitan areas with a population of at least 50,000, provide subsidy or public procurement sufficient to ensure continuous presence of one or more public, private, or nonprofit car-sharing organizations per market;
o. in all metropolitan areas with a population of at least 50,000, provide free or subsidized lease usage of convenient public street parking for car-sharing vehicles;
p. in all metropolitan areas with a population of at least 50,000, have a goal of one car per 1,000 inhabitants of medium-density and per 500 inhabitants of high-density census tracts;
q. in urban areas, require all government agencies to require four-day work weeks;
r. in all metropolitan areas with a population of at least 50,000, tax all commercial parking spaces $5 per space per weekday, with employers required to pass along the cost to employees;
s. use proceeds from *r* to provide free transit passes for employees;
t. in all metropolitan areas with a population of at least 50,000, implement a parking freeze on new parking supply, capping the absolute number of commuter spaces in central business districts and regional employment and retail centers;

u. in all areas of the country, lower the national speed limit to 55 mph and provide significantly increased enforcement, including speed cameras;
v. implement eco-driving training and vehicle maintenance programs, reaching 50 percent of the population and 20 percent net adoption;
w. implement specific electronic roadway monitoring activities;
x. implement specific incident management activities;
y. implement specific traveler information activities;
z. allow indivisible load permits for trucks carrying shipping containers at gross vehicle weights up to 110,000 pounds for distances up to 250 miles;
aa. allow divisible load permits for B-Train longer combination vehicles carrying natural resources on designation non-IS truck routes at weights up to 129,000 pounds and up to 138,000 pounds for eight-axle B-Trains;
bb. install Mainline Weigh-in-motion at all truck weigh stations and use to allow all vehicles with transponders to bypass static scales;
cc. expand the PrePass and NORP ASS electronic credentialing systems so that they cover all 49 mainland states and both systems are recognized at all weigh stations and inspection sites, with an equivalent system in Hawaii;
dd. require the installation of battery-operated heating and/or cooling systems in all sleeper cabs;
ee. in metropolitan areas with a population of at least 1,000,000 and some metropolitan areas with a population of at least 400,000, establish consolidation centers on the periphery of the urbanized area, with time-of day restrictions on most deliveries to the central business district, as well as a permitting system to consolidate shipments to nearby destinations.

As part of the scoping exercise we conducted in response to Senator Kerry's request, we used the "low cost" bundle of travel efficiency strategies from the *Moving Cooler* report to develop an illustrative estimate of emissions reductions that could be technically feasible in the light-duty sector by 2030. As we explain in the response to Senator Kerry's request, "The reductions presented in this analysis represent those that could be brought about by a mix of existing authority as well as new legislative authority and funding. This analysis makes no distinction between these pathways nor does it reflect a regulatory plan or budget proposal." Furthermore, we explain in our response, "This analysis does not consider the policy or market choices that would be needed to generate certain GHG outcomes, which is a valuable but complex analysis. Instead, it focuses more narrowly on the GHG reductions that could be derived directly from the transportation sector if effective drivers were in place. We make no assessment of the relative merits, costs, or impacts of various approaches." States and local governments are in the best position to evaluate the type of travel efficiency measures that would be most appropriate to reduce greenhouse gas emissions while providing access to jobs, education, health care, and other goods and services. We recognize that some communities may prefer not to implement certain strategies included in the *Moving Cooler* report. Furthermore, our inclusion of certain strategies in our illustrative analysis should not be seen as an indication of Agency support or agreement with any specific strategy.

3. As you may know, I am very supportive of the Diesel Emissions Reduction Act (DERA), but I also take grants oversight very seriously. Unfortunately, I heard some very troubling anecdotes about the application process for DERA grants under the stimulus bill. Most of the concerns had to do with the web-based Diesel Emissions Quantifier (DEQ) that applicants use to calculate the emissions reductions that would result from their proposed

projects. Specifically, applicants reported having great difficulty getting the DEQ to work, even when trying to use it late at night, early in the morning or on weekends as suggested by EPA. Some applicants who were able to use it, then realized that the information calculated for them was incorrect. In one instance, the DEQ reported that a proposed project would reduce a fleet's emissions by more than 100 percent. While that result may be easy enough to catch as a faulty answer, other incorrect results may seem reasonable, especially to grant applicants who may not be experts at diesel technologies.

a. What specific steps have you taken or do you plan to take to ensure that potential applicants do not experience the same DEQ capacity problems in the future?

The Diesel Emissions Quantifier (DEQ) is a tool to estimate emissions from any given set of parameters in a clean diesel project. EPA developed the DEQ for its clean diesel stakeholder community to utilize when estimating potential emission reductions from diesel retrofit projects. EPA works hard to assure that it is as accurate and as user-friendly as possible. At times EPA receives comments, suggestions and/or complaints about the way the DEQ is functioning. EPA always takes these comments and complaints seriously and strives to make sure that the DEQ is functioning properly.

During the Recovery Act grant competitions, EPA received complaints that users were not able to access the DEQ. The Agency quickly realized that the problem was a limit on the number of same-time users. EPA worked to expand the capacity for the number of same-time users at the web server from approximately 50 to over 500, which alleviated the problem. This action occurred well within the time period in which applicants could submit their grant applications. In addition, as always, grant applicants were allowed to use other methodologies for calculating emissions reduction estimates as long as these alternatives were explained in their grant applications. Some applicants chose to use other calculators or methods, such as EPA's MOBILE6 or NMIM tools.

b. What specific steps have you taken or do you plan to take to ensure that the DEQ does not provide grant applicants with incorrect information in the future?

At times, users report problems with the DEQ's calculations. When a problem regarding the DEQ's inoperability is brought to EPA's attention, EPA must determine if the issue is with the tool or with the user not being able to interpret the data. The majority of the time the issue of concern is the latter. In these cases, EPA explains the results to the user.

In rare cases where there is an actual problem with the calculations, EPA works quickly to identify the source of the issue and updates/corrects the appropriate coding within the DEQ. Specifically, the computer code associated with that problem is reviewed and appropriate changes are made, if warranted, and then the new code is applied.

In addition, to streamline EPA's approach in evaluating any future problem areas, an extensive review of the functionality of the existing code and database was performed to ensure there were no extraneous lines of code or data hindering the operations of the DEQ.

c. Once EPA was made aware of these problems, what actions did the agency take to make potential applicants aware of the fact that they might need to rerun information through the

DEQ, including reentering fleet information, to ensure accurate results? If no such actions were taken, why not?

In response to the problem of users having trouble due to limited capacity, EPA advised users on its DEQ home web page to potentially utilize the tool during non-peak hours. In addition, we continually updated the DEQ User Guide as we made changes to the tool. We also recorded and posted a tutorial on how to use the DEQ on EPA's web site. Finally, EPA made an announcement about the DEQ through its email listserv, highlighting the expanded capacity for same-time users.

d. In light of these known problems, what specific steps did you take or do you intend to take when reviewing submitted applications to ensure that the information being used to compare applications is accurate, a fundamental requirement for a fair competition?

It is important to note that the emission reductions are considered estimates during the grant application phase. These figures are only one of a number of criteria evaluated prior to award of any grant. Specifically, during the Recovery Act competitions, EPA allotted four points out of 100 to these diesel emissions reduction estimates. When reviewing applications, if EPA deemed the data to be reasonable based on past project experience, the applicants received all points. Should an applicant submit data that appears to be inconsistent with the project, EPA will still consider the application for award.

4. Ms. McCarthy, you talked in your testimony about the benefits of the One National Program for fuel economy and greenhouse gas standards. I agree with you on the need to reduce dependence on foreign oil and promoting automotive innovation, technology and alternative fuels. However, as you know, I have problems with EPA's role in this and in particular the endangennent finding, which triggers costly and disruptive backdoor greenhouse gas regulations on stationary sources. At the hearing, I asked if you agreed with the National Highway Traffic Safety Administration's (NHTSA) view that overturning or disapproving the endangerment finding "does not directly impact" NHTSA's statutory authority to set fuel economy standards under the Energy Policy and Conservation Act, as amended by the Energy Independence and Security Act of 2007. You instead referred to a letter by Secretary LaHood. Do you agree with the NHTSA Chief Counsel that, as a strictly legal matter, the Murkowski Resolution does not directly impact NHTSA's independent statutory authority to set fuel economy standards, yes or no? Please explain.

As NHTSA's Chief Counsel (O. Kevin Vincent) stated in the February 19, 2010 letter to a staff member in Senator Feinstein's office (Matthew Nelson):

> As a strictly legal matter, the Murkowski Resolution does not directly impact NHTSA's independent statutory authority to set fuel economy standards under the Energy Policy and Conservation Act (EPCA), as amended by the Energy Independence and Security Act of 2007 (EISA). However, passage of the Murkowski Amendment would have profoundly adverse effects on the national economy, national environmental and energy security objectives, and the economically distressed automobile manufacturing industry. While NHTSA's promulgation of independent, stand alone CAFE standards would make important contributions, its standards could not avoid those adverse effects.

President Obama's National Fuel Efficiency Plan, announced in May 2009, involves the adoption of harmonized and consistent national greenhouse gas emissions (GHG) standards by the United States Environmental Protection Agency (EPA) and CAFE standards by NHTSA. The plan garnered the unprecedented support of a diverse group of stakeholders (i.e. states, environmental groups, automobile manufacturers and labor unions) which had been at odds for years. It did so by replacing a patchwork of state and federal rules governing fuel economy and GHG emissions that were inadequate, uncertain, potentially conflicting, and in a constant state of flux. The Nation Plan also was crafted to resolve contentious and longstanding litigation and to deliver numerous additional benefits to consumers and the nation as a whole. These include:

- Delivering substantial fuel savings to consumers (e.g. over $3,000 worth of fuel over the life of a 2016 regulated vehicle);

- Implementing one clear and consistent set of standards that an economically distressed industry could satisfy by building a single national fleet, instead of the pre-existing patchwork of standards that would have required companies to build separate fleets for different states;

- Reducing GHG emissions by 950 million metric tons over the life of the regulated vehicles; and

- Saving an estimated 1.8 billion barrels of petroleum over the life of the regulated vehicles.

If NHTSA were forced to proceed on its own, many of these benefits would substantially erode. Moreover, given EPA's grant of the California waiver request in 2009, California and the States that adopted the California standards could move forward to enforce standards that are inconsistent with the Federal standards, thus creating confusion, encouraging renewed litigation, and driving up the cost of compliance to automobile manufacturers and consumers alike. (The benefits of adopting the National Plan are set out in greater detail in the USEPA and DOT Notice of Upcoming Joint Rulemaking to Establish Vehicle GHG Emissions and CAFE Standards, 74 Fed. Reg. 24007 (May 22, 2009) and in the Agencies' Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 74 Fed. Reg. 49454 (Sept. 28, 2009)).

5. It was recently reported that California officials may be forced to rescind regulatory changes adopted Feb. 25 that harmonize the state's vehicle greenhouse gas (GHG) emission standards with the landmark One National Program if the rules fail to address lingering concerns that the national plan will not achieve the same emission reductions as the original state rules.
a) Do the commitment letters that enshrine this deal require that the federal standards be of equivalent stringency" to the state's?
b) Besides the commitment letters, is there any legal basis for this deal?

On April 1, 2010 EPA issued the final rule setting greenhouse gas standards for light-duty vehicles and trucks, starting with model year 2012. Sections I.D. and III.A. of the final rule discuss in detail the legal basis for EPA's rulemaking. Your question refers to reports that California officials might

be forced to rescind the regulatory changes adopted by the California Air Resources Board on February 25, 2010. Those reports were unfounded, as California approved, on April 1, 2010, the final regulations that allow manufacturers to elect to demonstrate compliance with California greenhouse gas emissions standards by demonstrating compliance with the greenhouse gas program adopted by EPA.

6. When does the waiver Lisa Jackson granted under Section 209 of the Clean Air Act expire? Is it indefinite? So after 2017, is it true that California would be free to impose whatever GHG tailpipe standards they wish to impose, regardless of whether they are in sync with the DOT rules or the EPA rules? I have read reports that they are currently looking to set standards through model year 2050. Is that true?

EPA's waiver of Clean Air Act preemption, granted to California on June 30, 2009, does not expire. EPA's waiver of preemption for California to enforce its greenhouse gas emission standards for motor vehicles begins with the 2009 model year and California's standards feature increases in stringency through the 2016 model year. Under EPA's waiver, California is authorized to enforce the 2016 model year levels in 2016 and subsequent model years. However, if California moves to increase the stringency of its standards (e.g., to increase stringency after the 2016 model year), they will need to request a new waiver from EPA and EPA will, again, apply the criteria set forth in section 209.

The California Air Resources Board (CARB) has recently adopted amendments to its motor vehicle greenhouse gas regulations, including a provision which allows manufacturers to demonstrate compliance with its program by meeting the recently finalized federal EPA-DOT program starting with the 2012 model year through the 2016 model year.

We are aware that CARB recently held a workshop to examine motor vehicle greenhouse gas emission standards past the 2016 model year levels.

Senator BOXER. Thank you very much.

I want to start with you, Administrator McCarthy. It is only going to be 3 minutes. Did you say that over, because of the new fuel efficiency standard, that we would see a saving of $3,000? Is that what you said?

Ms. MCCARTHY. I said an individual consumer would actually achieve a $3,000 savings over the lifetime of the vehicle that they purchased in 2016 as a result of the increased fuel efficiency.

Senator BOXER. I think that is really an important point here. I mean, it is the same kind of thing when you look at retrofitting buildings and making them energy efficient. It has a really good payoff even if there is a little bit of an up front cost. So, thank you for that.

I would like to ask you, Mr. Porcari, about TIGER grants because people at home really think they are very good, and they have gotten funded through the Recovery Act, and they were able to fund multimodal and multi-State transportation projects that are difficult for us to fund through existing transportation programs.

Do you think there is a way to make our highway, our renewal of our SAFETEA-LU, which we call MAP–21, do you think that program could work better for those types of projects? What would we have to do in order to write a section that dealt with those?

Mr. PORCARI. It is an excellent question, Madam Chair. I think the TIGER grants point the way to the future in intermodal transportation. As you know there was tremendous demand around the country, over 1,400 applications. The single largest category that was funded was freight rail capacity projects, which have a number of environmental benefits, including reduced fuel consumption, but also take some of the goods movement off the highway network and move it through more efficient modes.

So, in our goods movement hierarchy where we want to keep goods moving on water as long as possible and then on rail as long as possible, and truck it for the last miles, it is a big step forward. The TIGER grant process really, I think, shows the way for doing that intermodally in the future.

Senator BOXER. And you think that you can help us write some kind of a title that would be in the new bill? I am interested in that. I do not know if my colleagues agree, but I would like to have your technical help on that.

Mr. PORCARI. We would be very interested in working with you on that.

Senator BOXER. Thank you.

Senator Inhofe.

Senator INHOFE. Thank you, Madam Chairman.

First of all, I think this an area where we all agree. I know the Chairman and I do, and I think also from information that we have gotten from Secretary LaHood that he does, and that is, they were talking about in this proposed bill that we still have not seen and which may never surface, the Kerry-Graham-Lieberman bill, they talk about the linked fee, and what they are talking about is increased gas tax.

We have had conversations among ourselves up here, and of course hearings with Secretary LaHood, and the statement that he

had made was, with these hard economic times, President Obama and the Administration do not believe that raising the gas tax is good for Americans who are out of work and can least afford the gasoline tax raise.

We will stand by that. I would ask if you agree with it. That is still the statement and the position of the President?

Mr. PORCARI. That is still the position. And I would add, Senator, that as we are in the beginning stages of a recovery it is as important as ever to make sure that recovery is accelerated in every way possible.

Senator INHOFE. That is good.

Ms. McCarthy, there has been a lot of discussion on Senator Murkowski's bill to overturn the EPA's Endangerment Finding. They say it would dismantle the auto deal with California, the auto companies and the EPA and NHTSA. I contend that it would not.

In fact the General Counsel of NHTSA wrote a letter to Senator Feinstein that said it would not. He wrote that "in a strict legal sense the Murkowski resolution does not directly impact NHTSA's independent authority to set fuel economy standards under the Energy Policy and Conservation Act as amended by the Energy Independence and Security Act of 2007."

So, let me first ask you, do you agree with NHTSA's view on the effects of the Murkowski resolution?

Ms. MCCARTHY. Senator, my understanding is that the Endangerment Finding is clearly an underpinning—and a necessary underpinning—of EPA's greenhouse gas standards that they are setting in the light duty vehicle role. Because we are doing that in joint role with NHTSA it is important that the Endangerment Finding stay intact or else we will have no ability to issue that rule by the end of March and it will not be able to address——

Senator INHOFE. Yes, but the question is do you agree with his statement?

Ms. MCCARTHY. The only statement that I am aware of is I have read a letter from the Secretary, Secretary LaHood, addressing this issue where I think he was very clear in stating that the joint rule would not be able to move forward if the Endangerment Finding were overturned.

Senator INHOFE. Well, but they are talking about the Murkowski resolution, that it does not directly impact NHTSA's independent authority to set fuel standards. That is the question. You might want to give me that answer for the record because that is the thing that I am asking.

Ms. MCCARTHY. Yes, that would be fine.

Senator INHOFE. Yes, that is fine. Thank you, Madam Chairman.

Senator BOXER. Thank you.

What I would like to do, because I know Senator Cardin has a panelist, I would like to bring the next panel up and then turn to you, Senator. I will give you my time there to make a combination introduction opening statement. Is that all right with you?

Senator CARDIN. That is fine. Thanks.

Senator BOXER. So, thank you both very much. And then we would have our next panel come forward. Again, the reason we are rushing this a little bit more than usual is because we are fearful

that we may have to shut down because of some unrelated matters on the Senate floor.

Mr. Larry Greene, Executive Director, Air Pollution Control Officer, from the Sacramento Metropolitan Air Quality Management District. I certainly welcome you, Mr. Greene. Mr. Deron Lovaas, Federal Transportation Policy Director, Natural Resources Defense Council. We welcome you. Then Mr. Doug Siglin, Federal Affairs Director of the Chesapeake Bay Foundation. I am sure we will hear from Senator Cardin in a moment on that. And I want to make sure, is it Kolodziej?

Mr. KOLODZIEJ. Yes, it is.

Senator BOXER. Oh. That is good. Mr. Richard Kolodziej, President of NGVAmerica. And what does that stand for, NGV?

Mr. KOLODZIEJ. It stands for Natural Gas Vehicles for America. We are the national trade association.

Senator BOXER. Very good. Wonderful.

OK, we will start first by hearing from Senator Cardin, actually, and then we are going to go to the panel.

OPENING STATEMENT OF HON. BENJAMIN L. CARDIN, U.S. SENATOR FROM THE STATE OF MARYLAND

Senator CARDIN. Madam Chair, let me just welcome Doug Siglin here from, as you pointed out, the Federal Affairs Director for the Chesapeake Foundation. He is a Marylander who has done an incredible service to our State.

The Chesapeake Bay Foundation is a non-profit organization that for 42 years has sought to improve the great estate of the Chesapeake Bay. And this Committee has heard me frequently talk about the Chesapeake Bay, so I will not go into more details.

Let me just compliment the Chairman for the subject of the day dealing with transportation as it relates to our environment and security. We need an energy policy in this country. Transportation can play a key role.

Madam Chair, I just really want to underscore the environmental point for one moment. You all know the greenhouse gas emissions, that 30 percent comes from transportation. We know we can do a better job. In this region of the Nation, where you have the second most congested area where people are wasting their time and wasting energy stuck in traffic, it really speaks in volumes as to what we need to do in improving our transportation infrastructure to make it more efficient, use less greenhouse emitters, and have a better lifestyle for the people of our Nation.

But I want to use my remaining 1 minute to really stress the stormwater runoff issue. We now have impervious surfaces in America that exceed the area of the State of Ohio if you put it all together. Stormwater runoff is the single largest source of pollutants going into our streams, our rivers, our bays and our oceans. Everything from contaminated heavy metals, sediments, road salts and deicing, brake dust and garbage you had listed, and it is having a tremendous impact on our ability to clean up our water bodies in this Nation.

We, as a Committee, spoke volumes when we said that when the Federal Government constructs new buildings, we need to have a

storm runoff game plan to minimize the disruption from the new construction. We need to have the same in transportation.

There is no reason why we cannot build our way in more environmentally friendly ways as it relates to storm runoff. Otherwise all we are doing is building ways in which water increases its volume and increases its detrimental effect on our environment.

Let me give you one number. For every inch of rain, for every mile of two-lane highway, it is 52,000 gallons of polluted stormwater runoff. Multiply that times the number of inches of rain and the number of miles, we can do much better.

Thank you for having this hearing.

[The prepared statement of Senator Cardin follows:]

STATEMENT OF HON. BENJAMIN L. CARDIN,
U.S. SENATOR FROM THE STATE OF MARYLAND

Madam Chairman, thank you for holding this hearing. In this Congress this Committee has often touched on the significant impact the transportation sector has on the Nation's energy consumption. This is an issue that must remain at the forefront of our work in designing a new transportation bill.

The next transportation bill must work to create new job opportunities for America, advance new transportation infrastructure projects that significantly reduce our fossil fuel consumption and reduce our carbon emissions.

I am also pleased that the scope of this hearing goes beyond the transportation sector's impact on energy consumption and climate change but also looks at the other environmental impacts of roads. I am particularly concerned with the tremendous impact polluted highway stormwater has on water quality.

Two weeks ago I talked about spring's arrival being emblematic of the start of construction season. Spring is also one of the wettest times of year, and with every spring rain a myriad of pollutants washes off our roads and into our precious lakes, rivers, streams, bays and coastal waters.

Stormwater is the Nation's largest source of water pollution. While rain itself contains air pollution particulates that are deposited in every drop most stormwater pollution is picked up on the surface and carried off as runoff. Stormwater washes a myriad of contaminants from the millions of miles of roads into storm drains that discharge into nearby waters, typically without being treated.

Contaminants like:

- oil
- heavy metals
- sediments
- road salts and other de-icing chemicals
- brake dust, and
- garbage

are all harmful pollutants found on road surfaces.

When rain falls on these hard, impervious surfaces it often has nowhere to go but down the channels created by curbs and retaining walls, into storm drains and into the nearest natural water body. According to research compiled by the National Oceanic and Atmospheric Administration's (NOAA's) National Geophysical Data Center, the U.S. is covered by more than 112,600 square kilometers of impervious surfaces. That is a space larger than the State of Ohio.

According to calculations based on USGS and DOT figures just a half an inch of rain falling on a mile-long stretch of a two-lane highway generates 52,660 gallons of polluted stormwater runoff. According to NOAA last year 43.5 inches of rain fell on Baltimore, Oklahoma City experienced 36 inches rain, Cleveland 38 inches, and San Francisco 22 inches inch of rain.

Impervious surfaces in the Chesapeake Bay watershed and in the State of Maryland are a major contributor to the Chesapeake Bay's impairments. Maryland is taking a comprehensive approach to address stormwater by incorporating highways into its statewide stormwater permitting program. I look forward to Mr. Siglin's testimony on this issue which will help us all understand the importance of addressing this problem.

Highway development must be done responsibly with an eye toward the water quality impacts highway design has on our Nation's waters. The 2007 energy bill required that all new Federal buildings be designed in a manner that preserves the

pre-existing hydrology of the area that the building will occupy. This same standard must be applied to highway designs.

As with most pollution abatement strategies the cost of preventing stormwater pollution is more effective and easier to implement than trying to clean up and remediate after the destruction has occurred.

In that same spirit of addressing a problem before it is too late we must use the opportunity to reauthorize the transportation bill to significantly reduce the transportation sector's energy intensity and CO_2 emissions. According to the United States Energy Information Agency (EIA) the U.S. consumed an average of 18.7 million barrels of oil per day in 2009. As a result the U.S. transportation sector is responsible for 30 percent of the United States' greenhouse gas emissions.

While burning fossil fuels is the source of transportation carbon emissions, the amount of carbon emissions is a factor of how much time people spend in their cars and trucks, especially the extraordinary waste of fuel and time spent when motorists are stuck in traffic.

During a hearing last summer Secretary Chu and Administrator Jackson's noted that increased availability and accessibility of public transportation would lead to significant carbon emission reductions.

The 2009 Texas Transportation Institute Mobility Report notes that public transportation saved travelers 646 million hours in travel time in 2007. This same report had troubling news that the DC Metropolitan Area, including Maryland, has the second worst traffic in the Nation. The report goes on to note that each motorist in the Maryland, DC, Virginia metro area loses an average of 62 hours and wastes an average of 42 gallons of fuel a year because they are stuck in traffic. This is despite transit ridership in the region being the second highest in the country.

According to the American Public Transportation Association public transit currently saves 37 million metric tons of CO_2 emissions per year. These carbon savings increase as more and more energy is generated from renewable sources.

Sweeping improvements in efficiency and pollution reduction to our Nation's transportation systems are just as visionary as President Eisenhower's concept of a national infrastructure system and are equally attainable.

The opportunity for economic expansion and job growth in the transportation sector is nearly limitless. It is time to usher in a new era of transportation infrastructure design and road building that protects the environment and increases the energy efficiency and reduces travel times.

I look forward to working with my colleagues to promote a more efficient transportation system and secure investments in transit from revenues generated by the legislation we construct. Again I thank the Chairman for holding this hearing, and I look forward to our witnesses' testimony.

Senator BOXER. Thank you so much, Senator.

So, we will start with Larry Greene. Welcome to Washington. And you brought a little bit of California weather with you, but not quite enough. So, Mr. Greene, we are very proud to have you here from the Sacramento Metropolitan Air Quality Management District.

Please proceed.

STATEMENT OF LARRY F. GREENE, EXECUTIVE DIRECTOR, SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Mr. GREENE. Thank you, Chairman Boxer.

Chairman Boxer, Ranking Member Inhofe and members of the Committee, I am Executive Director of the Sacramento Metropolitan Air Quality Management District, one of 35 local air districts in California. I also have the privilege this year to serve as the Co-President of the National Association of Clean Air Agencies.

Thank you for the opportunity to appear before you today. In my brief comments I will highlight how I believe Federal transportation policy can help with the significant challenges facing the air quality and transportation communities today and in the future.

The Sacramento region includes all or part of Sacramento County and five surrounding counties with a combined population of over 2 million. The region is a Federal non-attainment area for both ozone and fine particulate pollution. In Sacramento the major driver for non-attainment and related health impacts is emissions from the transportation sector including trucks, cars, planes, trains and construction equipment.

In 2008 of the two air pollutants contributing to ozone formation 89 percent of the nitrous oxide pollution and 63 percent of the reactive organic gas emissions were from the transportation sector. The State of California also estimates that almost 40 percent of the statewide greenhouse gas emissions come from transportation. A variety of tools are needed to address this high percentage of transportation emissions.

One key Federal policy for protecting air quality has been conformity under the Clean Air Act. Each State implementation plan developed to meet air standards establishes a conformity budget for air emissions from transportation projects. This puts a cap on emissions and encourages the use of innovative strategies to reduce emissions. This key program should remain in place as an important element in improving national air quality.

There are other programs that have played important roles in reducing pollution from vehicles, such as the development of cleaner technology for engines and requiring the use of cleaner fuels. Local agencies like our district have been leaders in providing incentive programs to assist business installing cleaner on and off road engines. The Federal Diesel Emissions Reduction Act has been of great assistance in this effort and must be continued.

While these programs are important new thinking has emerged on ways to ensure that investments we make in transportation enhance the livability of communities, conserve community financial resources and meet the needs of changing population demographics.

Our agency has been a proud partner with the Sacramento Area Council of Governments in their regional Blueprint Plan. The SACOG Blueprint offers an outstanding win-win example of effective transportation planning. The key is creating development patterns that are sustainable over time, support walking and bicycling, and that reduce, on the average, the length of commutes.

The Blueprint process visualizes where to make the best investments with Federal and local transportation money, identifies congestion hotspots, and supports both transit and air quality plans for the region. With the cooperative efforts of our local governments the Blueprint vision is being implemented in current land use decisions and was the matrix upon which the latest Metropolitan Transportation Plan was developed.

Another element to be considered is that rural towns and agriculture must be full partners in regional planning. A study called the Rural-Urban Connections Strategy is underway at SACOG to ensure they benefit in ways that enhance and support their communities.

Using this regional modeling process to highlight the best infrastructure and project mix in the regional transportation plan resulted in an overall increase is density around transit assets such

as light rail stations, a better jobs housing balance in the region, and far less use of agricultural land for development. For air quality the new plan provided a 1.6 ton per day reduction in emissions over the previous plan. This was 15 percent of the reductions needed to meet the regional 2009 8-hour SIP submission.

It is critical that the upcoming transportation reauthorization bill support and promulgate such programs so that they become a common element in regional planning across the U.S. The Federal program should require regions to develop plans that outline the most effective use of funding to support sustainable community growth. The program should require collaboration between air quality and transportation organizations when developing and evaluating targets. It is also important that funding be provided to enhance planning and modeling resources and provide incentives for higher quality planning efforts.

In closing it is critical that transportation reauthorization support new ideas to further the goals of cleaner air, sustainable communities, reducing congestion and wise use of financial resources. A collaborative process between air and transportation communities will be important in meeting these goals.

Thank you for this opportunity to provide testimony to the Committee.

[The prepared statement of Mr. Greene follows:]

March 24, 2010

Washington, DC

UNITED STATES SENATE COMMITTEE ON THE ENVIRONMENT AND PUBLIC WORKS:
BRIEFING ON *OPPORTUNITIES TO IMPROVE ENERGY SECURITY AND THE ENVIRONMENT THROUGH TRANSPORTATION POLICY*

TESTIMONY OF LARRY F. GREENE
SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Senator Boxer and committee members:

My name is Larry Greene. I am the Executive Director of the Sacramento Metropolitan Air Quality Management District, one of 35 local air districts in California. Our primary mission is protecting public health by reducing air pollution through a range of programs including incentives for the early introduction of clean equipment, promoting clean and healthy transportation alternatives and implementing state and federal regulations that relate to air quality. I also have the privilege to serve this year as the Co- President of the National Association of Clean Air Agencies.

Thank you for the opportunity to appear before you today. In my brief comments I will highlight how I believe federal transportation policy can help with the significant challenges facing the air quality and transportation communities today and in the future.

The Sacramento region includes all or part of Sacramento County and five surrounding counties with a combined population of over 2 million.
The region is a federal non-attainment area for both ozone and fine particulate pollution. In Sacramento, the major driver for non-attainment (and the related public health impacts) is emissions from the transportation sector including, trucks, cars, planes, trains, and construction equipment. In 2008, for the two air pollutants contributing to ozone formation, 89% of the nitrous oxide emissions and 63% of the reactive organic gas emissions were from the transportation sector. To attain federal health standards for air quality, we must continue to steadily reduce these emissions over time. The state of California also estimates that almost 40% of the statewide greenhouse gas emissions come from transportation. A variety of tools are needed to address this high percentage of transportation emissions.

One key federal policy for protecting air quality has been conformity under the Federal Clean Air Act. Each State Implementation Plan developed to meet air standards establishes a conformity budget for air emissions from transportation projects. This puts a cap on emissions and encourages the use of innovative strategies to reduce emissions. This key program should remain in place as an important element in improving national air quality.

There are other programs that have played important roles in reducing pollution from vehicles such as the development of cleaner technology for engines and requiring the use of cleaner fuels. For each of these strategies there are both federal and local components. Local agencies like our district have been leaders in providing incentive programs to assist business in installing cleaner on and off road engines. The Federal Diesel Emissions Reduction Act has been of great assistance in this effort and must be continued. While these programs are important, new thinking has emerged on ways to ensure that the investments we make in transportation enhance the livability of communities, conserve community financial resources and meet the needs of changing population demographics.

Our agency has been proud to partner with the Sacramento Area Council of Governments (SACOG) on their regional Blueprint Plan. The SACOG Blueprint offers an outstanding win-win example of effective transportation planning. The key is creating development patterns that are sustainable over time, support walking and bicycling and that reduce on the average the length of commutes. The Blueprint process visualizes where to make the best investments with federal and local transportation money, identifies congestion hotspots, and supports both the transit and air quality plans for the region. With the cooperative efforts of our local governments, the Blueprint vision is being implemented in current land use decisions and was the matrix upon which the latest regional Metropolitan Transportation Plan was developed. Another element to be considered is that rural towns and agriculture must be full partners in regional planning. A study called the Rural-Urban Connections Strategy is underway at SACOG to ensure that they benefit in ways that enhance and support their communities.

Using this regional modeling process to highlight the best infrastructure and project mix in the regional transportation plan resulted in an overall increase in density around transit assets such as light rail stations, a better jobs housing balance in the region and far less use of agricultural land for development. For air quality, the new plan provided a 1.6 tons/day reduction in emissions over the previous plan. This was 15% of the reductions needed to meet the regional 2009 8-hour SIP submission.

It is critical that the upcoming transportation reauthorization bill support and promulgate such programs so that they become a common element in regional planning across the US. The federal program should require regions to develop plans that outline the most effective use of funding to support sustainable community growth. The program should require collaboration between air quality and transportation organizations when developing and evaluating targets. It is also important that funding be provided to enhance planning and modeling resources, and to provide incentives for higher quality planning efforts.

In closing it is critical that transportation reauthorization support new ideas to further the goals of cleaner air, sustainable communities, reducing congestion, and wise use of financial resources. A collaborative process between air and transportation communities will be important in meeting these goals.

Thank you for this opportunity to provide testimony to the committee.

Responses to Question from Chair Boxer:
U.S. Senate Committee on Environment and Public Works
March 24, 2010

1. In your testimony you mentioned the Sacramento Council of Government's "Blueprint" as an effective use of transportation planning. Can you describe the blueprint process and the air quality benefits the Sacramento region is expecting to derive from this plan?

The Sacramento Region Blueprint is a voluntary collaboration of local governments. Its purpose is to provide cities, counties, developers, community groups and other interested parties with the data and modeling tools necessary to better inform transportation and land-use project decision-making. By reducing traffic congestion, the Blueprint is projected to improve air quality by well over ten percent as compared to a business-as-usual scenario of uncoordinated growth.

Background: In 2002, the Sacramento region faced a prospective future of worsening congestion—a projected increase of over 50 percent by the year 2025—and increasingly worse air pollution based on current land-use patterns, transportation funding levels, and transportation investment priorities. To attempt to solve these challenges, the Sacramento Area Council of Governments (SACOG) Board of Directors initiated the Sacramento Region Blueprint project, an extensive study of the linkages between transportation, land use, and air quality.

The philosophy behind the regional visioning process was that planning and design choices made by a community have many impacts on regional development patterns, modal choices, infrastructure costs, redevelopment potential, natural resources, and other aspects of livability. By being aware of the consequences of their community's development choices, residents can improve their economies, environments, and quality of life. If communities work together at this process, then these positive effects can be seen regionally.

As its core goal, the Blueprint aimed to support local governments with high-quality data and modeling tools so that decisions regarding future growth and its effects on quality of life issues, such as traffic congestion and air pollution could be made with the best information available.

In addition to developing detailed land-use and travel data, an extensive community outreach effort—involving over 5,000 residents across the six-county region—was conducted with SACOG's non-profit partner Valley Vision to develop and assess guiding principles for the region's long-term growth.

The learnings from the regional visioning process were also used by SACOG, the region's transportation planning and funding agency, to make choices about what transportation projects will best serve the region in the Metropolitan Transportation Plan for 2035.

To the question of air quality benefits, with the Blueprint, per capita, there would be 14 percent less CO_2 and particulates compared to the business-as-usual base case.

2. How do you believe the Federal government could use your Blueprint as a model to encourage other parts of the country to develop similar planning efforts?

SACOG has shown that a simple, practical approach to improving the state and regional transportation decision-making processes will yield substantial results. Over a decade, SACOG has learned some important lessons from its integrated planning commitment:

- It is possible for a relatively small regional agency (about 50 employees) to develop state-of-the-art data, models and civic engagement methods.
- Information is very powerful — citizens, stakeholders, local governments and others will act to change their traditional practices if provided credible, objective information about future impacts, trade-offs and choices.
- Broad-based cooperation and agreement is possible — citizens, stakeholders and local governments through traditional democracy processes are capable of thinking beyond their borders and selecting options that optimize benefits at all scales for a wide range of conditions and interests.
- Improved quality of life is about increasing choices, not decreasing choices — the growth patterns of the recent past too often limited transportation, housing and community living environment choices to monolithic products.
- New growth patterns that provide choices cost less — by over $16 billion through 2050 in our region alone.
- A classic top-down regulatory system is not needed to effect change — in fact a bottom-up approach is more effective because it stimulates locally tailored innovation, and competition.

3. How much is air quality affected by emissions from off road engines, specifically construction equipment? If funding were available to reduce emissions from construction equipment used on transportation projects, what is the best approach to achieving near term reductions of harmful particulates and other pollutants?

Off-road engines are a significant source of pollutants that impact public health. There are approximately 10,500 pieces of construction equipment[1] in the Sacramento Federal Ozone Non-Attainment Region (SFNA) contributing approximately 15% of our total regional NOx emissions of 222.95 tons per day and approximately 19% of our total particulate emissions of 11.57 tons per day [2]. The overwhelming majority of this equipment is diesel-powered. Estimates provided by two of the major construction companies in the SFNA[3] indicate that approximately 15% of the work performed by construction equipment in this region is work done on transportation projects.

---

[1] CARB Staff Report, Initial Statement of Reasons for Proposed Rulemaking, Appendix E, In-Use, Off-road Diesel Vehicle Regulation. statewide construction and mining equipment population ratioed to the SFNA region based on human population.

[2] CARB Almanac Emission Projection Data, 2008 Estimated Annual Average Emissions

[3] Teichert Construction estimates that in normal economic times, 10% - 20-% of their work was on public transportation projects. Rados Construction estimates that in normal economic times, up to 35% of their work was related to public transportation projects.

Recently adopted regulations will require that construction equipment fleets operating in California become significantly cleaner over time[4] but the rate of progress does not match the federally mandated ozone attainment commitment for the SFNA (2018). Therefore, strategies to reduce ozone-forming and particulate matter (PM) emissions from construction equipment fleets could be very beneficial for attainment and human health.

Currently, there are several strategies for reducing construction fleet emissions. Ten retrofit devices meeting the CARB Level 3 PM standard (85% reduction) are verified for use in California on off-road mobile equipment. One of these devices is also verified to reduce NOx emissions by 40%. Fleets can also "modernize" by acquiring new equipment with the latest technology. It may also be possible to replace the engines in some pieces of equipment with new engines meeting lower emission standards. Engines meeting the very low Tier 4 emission standard will begin phasing in between 2011 and 2014.

Several approaches could be used to accelerate emission reductions from construction equipment used on transportation projects. The most effective strategy would be to require that any work performed on projects receiving federal transportation funds meet a fleet average emission value for both NOx and PM that is some percentage amount lower than the then-current statewide construction fleet average. This approach would not necessarily require any incentive funds but would be unpopular with construction fleets because it would place the full cost of modernizing or retrofitting their fleet to a lower fleet average emission level on the fleet owners.

Using the same starting point of requiring any construction fleet working on a transportation project using federal transportation funds and using the same evaluation criteria of requiring that the fleet meet a percent reduction below the then-current state fleet emission average for NOx and PM, several approaches could be used to provide incentive funds to the construction fleets to help offset the increased costs of achieving lower emission levels. First, a sliding scale could be used to provide incrementally larger reimbursements as the construction fleets bidding to perform the work commit to using equipment that meets lower and lower fleet average emission levels. Second, a flat reimbursement could be supplied based on a mandate to achieve a specified target fleet average emission level.

Several points should be kept in mind when considering a program to reduce emissions from construction equipment operating on federally funded transportation projects:

- Over 90% of the population of California lives in areas that are ozone non-attainment or that transport ozone precursors to ozone non-attainment areas. Therefore, reducing NOx emissions is critical for achieving air quality goals.
- Diesel PM has been declared a Toxic Air Contaminant in California and is associated with increased health risks from cancer to cardio-pulmonary diseases. PM filter technology is available that can practically eliminate PM emissions from the exhaust of many classes of off-road equipment (i.e. Level 3 retrofit devices).

---

[4] Phased compliance to the In-Use Off-road Diesel Vehicle Regulation is mandated between 2020 and 2026 based on fleet size and type of pollutant.

- Any strategy that imposes additional requirements on construction fleets will be strongly opposed. Retrofit devices are expensive to purchase and install, require additional maintenance and are not universally applicable. Modernizing fleet equipment and/or engines is extremely capital intensive.
- Any strategy that incents or mandates certain performance characteristics will need to be monitored in order to be effective. The monitoring process will impose additional workloads on the public agencies awarding the contracts for construction work.
- Although a minority of the construction equipment in the SFNA is used on federally funded transportation projects, that same equipment will be used in other construction work. Thus, federal transportation policy requiring or incentivizing cleaner construction equipment will provide enormous co-benefits by reducing harmful emissions associated with the construction of schools, businesses and other infrastructure.

Responses to Question from Ranking Member Inhofe:
U.S. Senate Committee on Environment and Public Works
March 24, 2010

1. *Mr. Greene, please tell me how much it cost to develop the SACOG Blueprint, as well as the breakdown of funding sources.*

Blueprint Project Revenue Sources (FY 2000-01 through April 2005)

Core Revenues Available to SACOG	
Federal Planning Funds (FHWA & FTA)	$ 535,000*
SACOG Regional Planning Funds (TDA)	$1,643,000
Subtotal	$2,178,000 (51%)
Special Revenues Made Available for Blueprint Project	
California Housing & Community Development Grant	$ 515,000
Congressional Earmarks	$ 470,000
Valley Vision (through private foundations)	$ 400,000
State Treasurer's Grant	$ 330,000
Caltrans Grant	$ 300,000
Sacramento Regional Foundation	$ 100,000
Subtotal	$2,115,000 (49%)
Grand Total	**$4,293,000 (100%)**

** This includes only those funds spent directly on the Blueprint Project and represents about six percent of our federal planning funds. During this four-year project approximately another 50 percent of our federal planning funds were spent on public outreach, land-use monitoring, land-use and travel model development, and forecasting all of which provided the basis for a successful Blueprint Project. The other 45 percent of federal planning funds were used to meet our mandates as a Metropolitan Planning Organization (multi-modal planning and programming, and air quality conformity).*

Senator BOXER. Thank you so much, Mr. Greene.

Mr. Lovaas, Federal Transportation Policy Director for the Natural Resources Defense Council. Welcome.

STATEMENT OF DERON LOVAAS, FEDERAL TRANSPORTATION POLICY DIRECTOR, NATURAL RESOURCES DEFENSE COUNCIL

Mr. LOVAAS. Thank you very much, Chairman Boxer and Ranking Member Inhofe, for this important opportunity to testify.

Transportation drives America's dependence on foreign oil since it is 96 percent reliant on petroleum products. The single biggest oil consumers in transportation are vehicles on our roads, accounting for almost 80 percent of the total. Transportation plus other categories add up to a 20 million barrel a day habit which is a concern because the vast majority of oil resources are held by other nations, most in the troubled Middle East.

A transportation sector shackled to oil leaves us vulnerable to price hikes and spikes, as in 2008 when the price of oil climbed to almost $150 a barrel. Oil prices could shock the American economy again due to conflicts over resources in oil rich regions, terrorist attacks on production facilities, or weather disruptions.

There is also security challenge due to heat trapping emissions since transportation accounts for about a third of U.S. greenhouse gas pollution. Security experts have identified the effects of climate change as a concern, with the CNA Corporation referring to the potential threat multiplier in regions already stressed due to poor social, economic and/or political conditions.

Thankfully boosting fuel economy standards for cars and trucks can save oil. The Administration raised the bar from 2012 through 2016, saving a whopping 1.8 billion barrels of oil. We can also move to a pluggable fleet. Driving on electricity from the grid is virtually oil free, and vehicles are arriving on the market soon with ranges that exceed average daily needs. A recent EPA analysis shows this technology could save 2 million to 3 million barrels of oil a day by 2030. The transportation bill should address the need for public charging infrastructure as well, and ensuring intermodal connections between transit and short range electric vehicles.

NRDC has three priorities for the new transportation law. First, reducing oil use and greenhouse gas pollution; second, increasing the number of locations accessible by transit, biking and walking; and third, spurring creation of good jobs with clean transportation investments.

We are also proud backers of the Transportation for America Route to Reform blueprint, and I have worked with unusual allies in a new bipartisan coalition called Mobility Choice, which has a 10-point plan.

First, to better reflect the hidden cost of oil, an oil security fee could be levied either per barrel or at the pump. This would enable consumers to make more economically informed transportation choices.

Second, we also agree on more widespread use of tools such as Highway Occupancy Toll lanes and congestion pricing to better finance projects and to save fuel wasted due to excess traffic.

Third, providing transportation choices reduces oil consumption as long as there are enough riders that the transit vehicle con-

sumes less oil per passenger than driving. Transit routes with the highest load factors save the most oil, and investments should be based in part on loads or expected loads.

Fourth, while most drivers in the U.S. pay the same amount for insurance per year regardless of how many miles they drive, all else being equal, the likelihood of an accident increases with more driving. Converting variable insurance costs into a per mile cost for drivers, a system known as pay as you drive, will correct price signals with a majority of drivers actually saving money under such a system.

Fifth, to boost ridership, allowing transit agencies to become more self-sustaining, vouchers could be provided for low income households paid for by fare increases for other riders. Vouchers could be redeemed with other either existing transit agencies or private entrepreneurs running buses, shuttles, van pools and jitney buses.

Sixth, extensive outreach programs by employers can educate computers about options such as online ride matching and van pool services. And telecommuting offers opportunities to eliminate some trips entirely since taking the broadband highway saves more oil than any alternative mode of transport, and policy should encourage more of it.

Seventh, metropolitan areas now host most of the Nation's population, employers, GDP and traffic and are logical recipients of more direct investment.

Eighth, by creating more transportation efficient land use patterns, people can choose modes other than driving. Yet outdated rules stand in the way of neighborhood designs that allow minimal driving. Eligibility of municipalities for some Federal transportation funds should be conditioned on changing rules to meet market demand.

Ninth, upgrading infrastructure with 21st century technology such as variable signage, providing real time information to travelers, and traffic management systems to improve flow of traffic, saves oil and cuts pollution by reducing congestion and idling. A new bill should have a robust intelligent transportation title.

Last, but not least, intercity rail can shift auto and air trips to fuel efficient trains. Federal funds for rail can be targeted to expand service on lines that will attract enough ridership to operate with relatively high load factors.

These combined mobility choice strategies, our analysis shows, could save more than 2 million barrels of oil a day by 2030. We can become a Nation that offers more means to opt out of oil addiction including vehicle choices, fuel choices, as well as mobility choices, by crafting better transportation law that is led by this Committee.

I look forward to working with you to make it so.

Thank you very much.

[The prepared statement of Mr. Lovaas follows:]

Testimony of Deron Lovaas
Federal Transportation Policy Director
Natural Resources Defense Council

Opportunities to Improve Energy Security and the Environment through Transportation Policy

Environment and Public Works Committee
March 24, 2010

Chairman Boxer and Senators of the Committee, thank you for the opportunity to discuss with you the important and timely topics of energy security, the environment and transportation policy. My testimony will cover various issues:

I. Energy and Climate Security

II. The Danger of Environmentally Damaging and Expensive Substitutes

III. Solving Energy and Climate Security Threats by Saving Oil

IV. Saving Oil Via Better Fuel Economy Performance

V. Saving Oil by Electrifying Transportation

VI. NRDC Priorities for Transportation Policy

   a. Reducing U.S. transportation sector oil use and greenhouse gas pollution

   b. Increase the number of locations accessible by transit, biking and walking

   c. Spur creation of good jobs with clean transportation investments

VII. Saving Oil by Delivering Mobility Choice

   a. Ensure the Price of Fuel Better Reflects Oil Security Costs

b. Deploy "HOT" Lanes and Congestion Pricing

c. Allocate Transit Dollars to Optimize Oil Savings

d. Increase Insurance Choice

e. Provide Transit Vouchers for Mobility Choice for Low-Income Households

f. Increase Commuting Options and Telecommuting

g. Return Gas Tax Revenues to Areas with the Most Traffic and Oil Savings Potential

h. Improve Local Land-Development Rules

i. Deployment of Smart Traffic Management

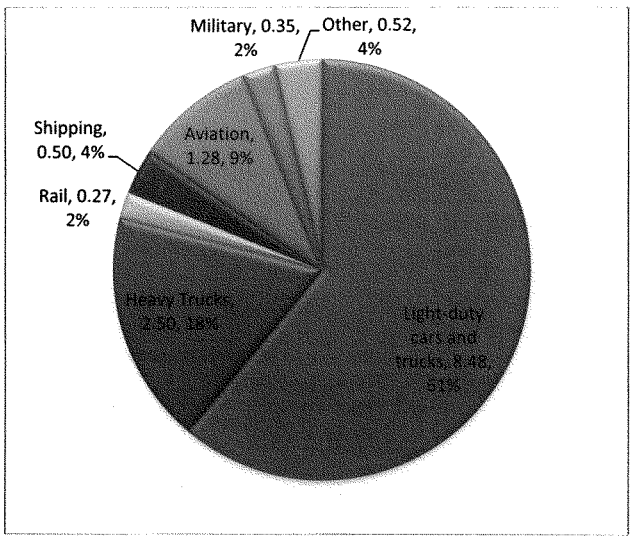
j. Deploy Cost-Effective Intercity Rail Options as Justified by Cost Efficiency and Oil Displacement Potential

VIII. Securing Our Energy and Climate Future

Energy and Climate Security

Transportation drives America's dependence on foreign oil. While we have weaned the electricity sector almost completely off oil, with some notable exceptions such as Hawaii, transportation remains 96-percent dependent on petroleum products, mostly gasoline and diesel.[1] As the graph below shows, the biggest single sub-sectoral oil consuming category is light-duty vehicles, which account for about 60 percent of the total.[2] Heavy-duty vehicles comprise about one-third that percentage, and aviation about half of that. The remainder is rail, marine and other uses.

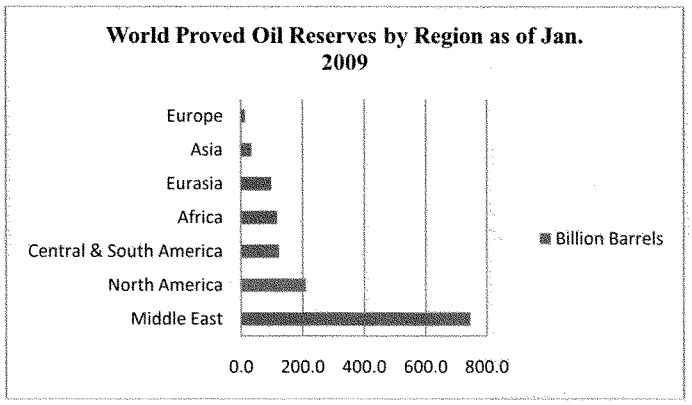
Transportation Energy Consumption in 2009
(million barrels per day oil equivalent)



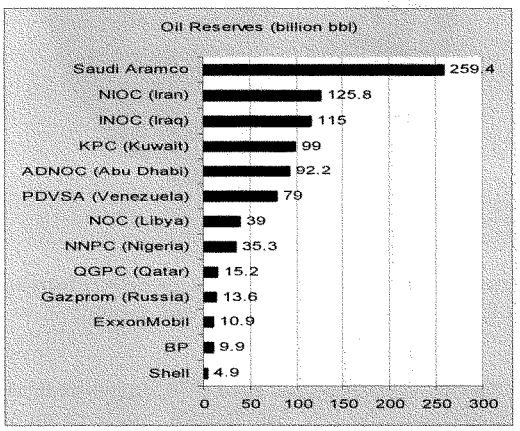
Taken together, our oil consumption adds up to a 20 million-barrel-per-day habit. This tremendous thirst for oil is a concern because the vast majority of oil resources are held by other nations.

Oil production in the United States peaked circa 1970, despite tremendous investments in exploration and production. The U.S. has 560,000 producing oil wells versus Saudi Arabia's 1,500, for example -- as well as thorough subsurface mapping.[3] To meet our gargantuan demand oil imports have risen steadily from 35 percent in 1973 to more than 60 percent now, a situation unlikely to change except via demand moderation since other countries have vaster reserves and therefore longevity of production capacity.[4] The graph below illustrates this, and the bitter irony is that the more rapidly we deplete our remaining domestic reserves in order to cut imports for the short-term, the more we tilt

the long-term playing field in favor those nations that already have much better positions vis-à-vis reserves and production capacity.



This imbalance is further exacerbated by the remarkable rise of national oil companies. Big, private oil companies are not as influential in the global oil game as they once were. Now, companies affiliated with nation-states loom large, owning about 90 percent of the world's remaining reserves as shown in the graph below.[5]



This increasing nationalization of resources gives the modern-day global oil marketplace some disturbing characteristics. These state players, especially if they cooperate as part of the global cartel of Oil Producing and Exporting Countries or OPEC, tend to push the price of oil upwards to ensure adequate revenue. Some also tend to underinvest in production capacity. As the Director of Harvard's Environment and Natural Resources Program Henry Lee put it, therefore "consuming countries will find themselves paying

more to import oil, which will affect their current accounts and their economic growth levels..."[6] And in the past decade we have indeed paid quite a bit, not just in aggregate but as individual consumers. A recent report quantified it in a novel way in a recent report, finding that the rise in gasoline prices cost the average consumer $1,990 more a year in 2008 compared to 2001. This figure happens to be almost exactly the amount saved by the median household due to cumulative changes in the tax code during that same time period ($1,900), meaning that tax cuts were trumped by payments at the pump.[7]

A host of possible events could exacerbate this alarming situation further, including:

- Potential attacks on oil production facilities or pipelines by non-state actors, as evidenced by al Qaeda itself urging its followers to attack "the umbilical cord and lifeline of the crusader community";[8]
- Direct support of terrorist activities by some oil-rich nations with significant wealth, and especially alarming in light of the sheer size of revenues to such nations (for example, OPEC's net annual revenues soared ninefold to almost a trillion dollars in the ten years ending with 2008 before dropping due to the recession, according to the Energy Information Administration);[9]
- Increasing resource conflicts within and between nations over land-based and offshore oil deposits, requiring us to "acknowledge and live with varying degrees of insecurity" as summed up by former Secretary of Defense and Energy James R. Schlesinger in 2005 Senate testimony;[10]
- Potential disruption of supply from state-owned firms and foreign actors, such as Iran and Venezuela, with the largest reserves and production capacity should they decide to use the "oil weapon" again as in the 1970s oil embargoes;
- Empowerment of the powerful monopolistic cartel OPEC, whose 13 members control more than three-quarters of the world's oil reserves and whose members have an interest in continued U.S. oil addiction, or as Saudi Oil Minister Ali Naimi told fellow members in 2004 "environmental and energy security concerns have been channeling technologies and research towards alternate fuels...the research and investment in those technologies pose long-term challenges to the oil industry in general and to the NOCs [national oil companies] including our own."[11]

Any of these factors could limit oil supply, putting constraints on U.S. transportation and industry and driving global oil prices upward. Repeated simulations have demonstrated that such a combination of disruptions could send a real shockwave through the U.S. economy.[12] We saw a vivid demonstration of the impact of price shocks on our economy just a couple of years ago, when a combination of factors drove oil prices to nearly $150 per barrel, causing the national average gasoline price to $3.59 in July, 2008; at some

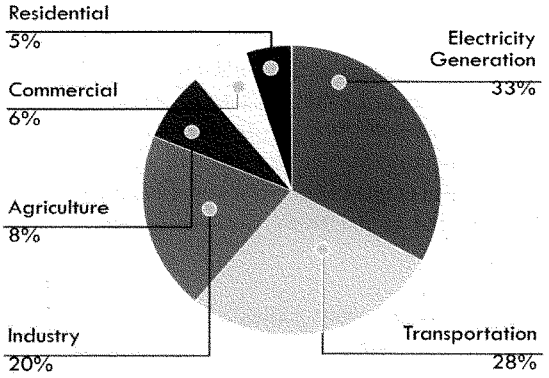
retailers the price even jumped above $4, prompting *New York Times* columnist Tom Friedman to pen a column calling it our "4/11" moment.[13]

Overall oil intensity of the U.S. economy – the amount of oil used per unit of GDP – has declined substantially since the 1970s due to greater energy efficiency and fuel switching.

However, this has not been the case in the transportation sector, which therefore remains shackled to global oil marketplace trends. Therefore repercussions of oil price increases and spikes can be severe and widespread. High oil prices have an immediate impact on transportation costs for both households and businesses. As transportation costs rise, goods and services that must transported also rise in price. Food, consumer goods, raw materials, and other fundamentals of our economy are all simultaneously affected. Our economy is therefore held hostage to a fickle and at times turbulent global oil market, which is influenced by diverse factors such as consumer behavior in other large growing nations such as China and supply decisions made by unaccountable oil monopolies, often with state ties or ownership. This fact poses a significant economic threat which we would have little ability to address in the short term.

Apart from economic impacts, our oil dependence poses a national security concern for strategic military and defense reasons. Oil consumption in the U.S. driven by the transportation sector is a major source of heat-trapping pollution, accounting for approximately one-third of U.S. greenhouse gas emissions as shown in the graph below.

US GHG Emissions by End Use Economic Sector 2006



Source: Environmental Protection Agency (EPA). "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007." April 2009, http://epa.gov/climagechange/emissions/usinventory.html.

In addition to the numerous environmental impacts of climate change, which have been well documented before this Committee, climate change carries worrisome security implications. An increasing number of security experts at CNA Corporation, the Center for Strategic and International Studies as well as the Defense Department have identified climate change as a challenge to the nation. CNA describes a "threat multiplier" effect due to climate change whereby regions of the world that are already stressed due to poor social, economic and/or political conditions risk degenerating into disaster and/or civil war zones with additional stress due to the unpredictable impacts of climate change.[14] Asian, African and Middle Eastern countries are particularly susceptible to such a scenario. As CNA sums up:

> Economic and environmental conditions in already fragile areas will further erode as food production declines, diseases increase, clean water becomes increasingly scarce, and large populations move in search of resources. Weakened and failing governments, with an already thin margin for survival, foster the conditions for internal conflicts, extremism, and movement toward increased authoritarianism and radical ideologies.[15]

In its latest review, the Defense Department essentially concurs, stating among other things that "While climate change itself does not cause conflict, it may act as an accelerant of instability or conflict, placing a burden to respond on civilian institutions and militaries around the world."[16]

The Danger of Environmentally Damaging and Expensive Substitutes

As NRDC research, analysis and advocacy has described before, as conventional oil supply and production capacity struggles to keep up with seemingly insatiable demand, the energy industry is tapping harder-to-exploit resources.[17] These so-called "unconventional" resources include, for example, the tar sands of Alberta, Canada, where more than one million barrels a day of this resource are being extracted.

"Extracted," however, is a euphemism. This very diffusely deposited substance is mined using the world's largest trucks in a process that has denuded hundreds of acres of boreal forest and could ultimately destroy the land cover of an area the size of Florida. Not only does this mean the loss of pristine forest and migratory bird species that rely on it for habitat, it dramatically increases the life-cycle carbon emissions of the final product because the extraction and refining process is so much more energy-intensive.

Some analysts project ever-greater reliance on such unusual energy resources:

> Indeed, a process of 'deconventionalization' of reserves is taking place that will probably make the future supply of oil the result of a mosaic of many increments, many of them relatively small, coming from both new and traditional producing countries, and from unconventional sources such as gas liquids, ultra-deep offshore deposits, ultra-heavy oils, shale oils, and tar sands.[18]

Fortunately these trends aren't destiny, since 'deconventionalization' in some cases means more 'carbonization' of the fuel mix, steering us away from the Scylla of supply constraints and towards the Charybdis of expensive energy, likely conflicts over resources, and widespread environmental damage including climate change.

Solving Energy and Climate Security Threats by Saving Oil

What is to be done to address the energy and climate security threats confronting us? We must put together a strategy to reduce our dependence on this resource, with some specific objectives in mind. The first is to further reduce the economy's oil intensity. The good news is that we have done this before. Specifically, oil intensity dropped by one-third between 1978 and 1985, such that every $1,000 of gross domestic product (GDP) required just one barrel of oil to create.[19] This was mostly policy-driven (although prices played a role), and due in part to shifting to other sources of energy for electricity generation and to dramatic increases in fuel economy thanks to the new Corporate Average Fuel Economy (CAFE) mandates included in the 1975 energy bill (EPCA, P.L. 94-163).[20] However, reductions in intensity slowed down in the late 1980s. We must make a concerted effort to drive them down further, to insulate the economy from price increases and shocks.

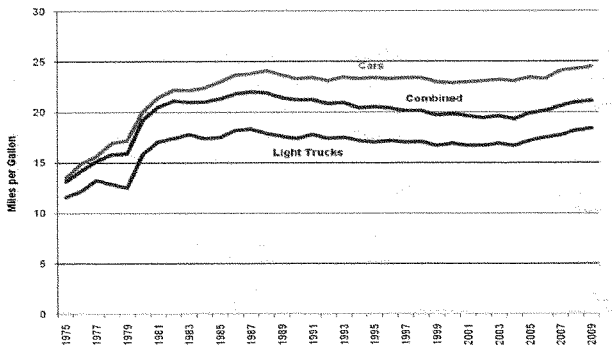
A loftier goal enunciated by Anne Korin of the Institute for the Analysis of Global Security is transform oil into just another commodity, as opposed to one that has a stranglehold on our transportation system. Anne reminds us that salt was once a strategic commodity, with nations going to war over this resource.[21] That changed when viable substitutes for meat preservation were developed, such as refrigeration. As Jim Woolsey and Chelsea Sexton sum up in a recent essay:

> For a number of reasons we must strive to set oil on a similar path of decline in influence—away from being a strategic commodity and toward being simply a commodity. Oil will still be useful and valued for its high energy content and its relative ease of shipment for a long time. It will also be used in heating and in the production of some chemicals, although in those uses it is already, in a sense, no longer a strategic commodity because it has competitors. Doubtless it will be used for many years to produce transportation fuel as well. But in the interests of our national security, our climate, and our pocketbooks, we should move together as a nation to destroy, not oil of course, but oil's strategic role in transportation as quickly and as thoroughly as possible.[22]

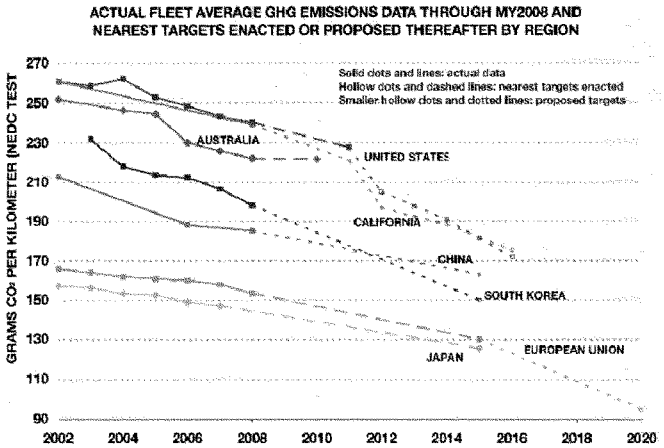
Saving Oil Via Better Fuel Economy Performance

Enactment of the Energy Independence and Security Act of 2007, or EISA (P.L. 110-140), boosted fuel economy standards for the first time in decades. This important policy driver is finally raising the bar again for fuel economy performance of our cars and trucks. This is important since the last time fuel economy jumped substantially during the mid-1970s and 80s it was due only part to increasing prices and more to enactment and

enhancement of these standards (called Corporate Average Fuel Economy or CAFE).[23] This initial boost and then the stagnation that followed until the past few years is shown in the graph below.[24]



Last year, as one of its first and most effective actions, the Obama Administration took advantage of the fact that Congress established a floor, not a ceiling, for new standards by promulgating a joint DOT-EPA rule for increasing performance of the vehicle fleet even faster. The upshot is that the U.S. light-duty vehicle fleet is slated to achieve 35.5 miles per gallon by 2016. This is about a 40 percent jump from the status quo ante, although we need to keep making progress if we are to catch up to other industrializing and industrialized nations as shown in the graph below.[25]



Saving Oil by Electrifying Transportation

Consumers deserve more efficient vehicles, and they deserve more clean energy options, as I wrote several years ago:

> Currently, vehicles and fuels are a far cry from offering consumers real choices, and odds are good that the car you like isn't available in a hybrid-electric version. At most retail gas stations, the only products under the canopy are made from petroleum. In this regard, car dealerships and gas stations are more like shelves in a Soviet grocery store than a modern American retail outlet. Consumers demand, and deserve, more choices.[26]

This remains largely true, although progress towards a world with more choices has accelerated in the past few years, driven by policy and prices. Pluggable cars have attracted a great deal of attention from policymakers and reporters, for example, and with good reason.

Driving on electricity from the grid is virtually free of oil. (In 2009, less than 1% of electricity generation came from petroleum liquids or coke.[27]) Plug-in electric vehicles arriving in the market over the next couple of years are expected to cover the bulk of daily driving needs with electricity. According to the Department of Energy, personal vehicles are typically used for less than 30 miles per day.[28] The Nissan Leaf, available in some states starting this year, is expected to travel 100 miles on a charge. The Chevy Volt plug-in hybrid, also expected to be released this year, will have an expected electric range of 40 miles.

Transitioning our petroleum-powered light-duty vehicle fleet to one running primarily on grid electricity can deliver massive oil savings for our country. Recent analysis by the Environmental Protection Agency, in response to a request from Senator Kerry, shows that a future fleet comprised of a combination of electric-drive vehicles and cleaner, more efficient combustion vehicles could cut light-duty vehicle oil consumption 20 to 42 percent, or 2.1 to 3.1 million barrels per day, in 2030. To reach these goals, EPA assumed new passenger vehicles sales twenty years from now are one-third [32%] to nearly half [47%] comprised of electric vehicles and plug-in hybrid electric vehicles.

Vehicle electrification can also dramatically reduce global warming pollution. Considering today's electricity production mix, an electric-drive vehicle could emit just half the emissions of today's conventional combustion engine car. However, emissions benefits are maximized by charging with cleaner grid resources, especially renewable sources like wind and solar. Any electric vehicle running on the power of the sun is truly zero emissions.

The transportation bill should support the electrification of our transportation system, which is currently 97 percent dependent on petroleum. We can accelerate the transition to low carbon mobility by evaluating the need for and installing public charging infrastructure. Projects that connect transit with short-range electric vehicles can get

people out of long-distance drives without having to run transit to every location. Beyond passenger vehicles, transportation funds should go to encourage maximum reductions in global warming pollution in heavy-duty and non-road applications that are amenable to electrification, such as at truck stops and in port drayage operations.

Given the need to proceed strategically with vehicle electrification, it is important to develop a multi-year, multi-step policy. One proposal worthy of consideration was recently put forward by the Electrification Coalition, whose members include Peter Darbee of Pacific Gas & Electric, Carlos Ghosn of Nissan Motor Company and Fred Smith of FedEx. The coalition initiative would create "ecosystems" – defined as "a group of interdependent entities that work or interact together to accomplish a common task or goal" and meant to include electric and transportation sector representatives among others -- in select large metropolitan regions.[29] These ecosystems would be launched in two phases, with the purposes of showing "proof of concept," driving economies of scale and allowing "learning by doing." This is a useful concept which could eventually be implemented by a collaborative initiative between the Departments of Transportation, Energy, Housing and Urban Development as well as the Environmental Protection Agency to accelerate electrification at the regional level.

NRDC Priorities for Transportation Policy

NRDC recommends that this Committee and others tasked with writing the next transportation law focus on three key outcomes:

- **Reducing U.S. transportation sector oil use and greenhouse gas pollution:** The first of these can be accomplished by overhauling the program such that a greater portion of the funding is distributed in mode-neutral, performance-driven ways as described by groups including the Bipartisan Policy Center in a recent report.[30]Oil savings and greenhouse gas pollution criteria can also be built into transportation planning processes, with added incentives to promote projects that achieve both goals.
- **Increase the number of locations that are accessible by transit, biking and walking**: Providing Americans with more transportation choices will improve quality of life in neighborhoods across the country. This can best be achieved by increasing funding for clean transportation projects and by reforming transportation planning in order to link transportation and land use.
- **Spur creation of good jobs with clean transportation investments**: Smart technology can help improve both highway and transit systems, and the new bill should have an ITS title. Additionally, it should include transit manufacturing and workforce development incentives.

NRDC is also a proud member of Transportation for America, a diverse and growing effort to reform transportation policy. The blueprint, *The Route to Reform*, is a comprehensive map for enactment of a new transportation that would save oil and cut

pollution, including proposed objectives, performance targets, program structure and revenue options.[31]

NRDC and Transportation for America proposals take serious steps towards energy, economic and environmental security. I have also joined an unusually broad right-left coalition which has developed a complementary set of proposals for saving oil through transportation policy, as described below.

Saving Oil by Delivering Mobility Choice

Raising the bar on fuel economy performance of our vehicles and providing consumers with more fuel choices are key components of a three-pronged attack on oil dependence. The third is greater mobility choice. This is most relevant to the transportation bill, since it has helped determine transportation options available – or not – to Americans since at least the National Interstate and Defense Highways Act (P.L. 84-627) enacted in 1956.
In fact, some respected conservative advocates have proposed a new national program of a similarly audacious scale, a "National Defense Public Transportation Act." This act would maintain existing services, provide transit service to any county in the nation that opts into the program, build new intercity rail, and then electrify rail across the country. This proposal deserves serious consideration, especially by moving forward with what the authors call a "skeletal national public transportation network," explaining that

> If (or when) interruptions to the country's oil supply become chronic, we can quickly put more flesh on the skeleton by adding more buses and trains. It is much easier to build up something that already exists than to create it from scratch in time of national emergency. Even a thin, skeletal network, national in scope, would give us the "virtual" energy independence national security demands.[32]

A national survey performed just last month shows there's support for this kind of proposal. More than four-in-five voters say that "the United States would benefit from an expanded and improved public transportation system, such as rail and buses" with a majority saying the "strongly agree." Two-thirds say they "would like more transportation options" and 73% feel they "have no choice but to drive as much as" they do.[33]

Growing public demand is one reason I am collaborating with an unusually broad set of energy and transportation experts interested in transportation reform. Launched in December, the *Mobility Choice* project was initiated by the Institute for the Analysis of Global Security (IAGS), and our blueprint for transportation reform has ten elements as described below.[34]

Ensure the Price of Fuel Better Reflects Oil Security Costs

To better reflect the hidden costs of oil, primarily those associated with its national security impact, an oil security fee could be levied either per barrel or at the pump. This fee would send a more accurate signal to consumers about the real cost of their gallon of gasoline or diesel. Reflecting the hidden costs of oil at the pump would enable consumers

(assuming modal choices exist and vehicles are platforms on which fuels can compete) to make more economically informed transportation choices.

The amount of oil saved through an Oil Security Fee would depend on the amount of the fee. **For example, implementing a fee equivalent to an additional 25 cents per gallon of gasoline in 2020 could generate annual savings of almost 240 million barrels of oil and generating $44 billion of revenue**. Motor fuel taxes are particularly effective policy tools for saving oil for two main reasons. First, they are completely comprehensive: they put a price on every mile driven in the U.S. Secondly, these fees provide an incentive to drivers to take action on both the number of miles they drive *and* the fuel economy of the vehicles they own. Faced with a fuel tax, drivers can minimize cost by finding ways to drive less and by buying vehicles with better fuel efficiency.

Deploy "HOT" lanes and Congestion Pricing

The concept of pricing to address congestion was first proposed by Nobel Laureate William Vickrey about fifty years ago and at present the federal program has supported more than 50 projects in more than a dozen states with more than 20 projects in operation.[35] The use of this tool helps to address a "tragedy of the commons" issue with transportation, whereby public goods are consumed inefficiently due to a lack of accurate price signals unlike, for example, time-variable prices for daytime cell use and midday electricity use.

The source of funding for the Highway Trust Fund – used to construct new highway, bridge and tunnel infrastructure and to maintain the current system – could be shifted more strategically to rely more on user fees such as tolls and congestion pricing. For instance, federal policy could allow and encourage the National Highway System to implement pricing when congestion reaches a certain threshold. User fees can help reduce congestion by providing incentives to forego discretionary trips or to travel in off-peak periods; this reduces oil consumption by decreasing the amount of driving done in stop-and-go traffic. An emphasis on roadway-based user fees may also help ensure that transportation investments are made where demand – and therefore toll revenues – are highest, ensuring the best use of highway dollars.

There are a number of different options for implementing user fees, including:

- Congestion pricing: Variable tolls can be implemented on congested roadways so that the toll cost is set to reduce traffic jams and achieve a specified level of service on the roadway. This can include time-of-day pricing in which higher tolls are charged during peak hours, or more sophisticated dynamic pricing in which toll rates vary depending on the real-time level of congestion being experienced on the roadway. Dynamic pricing can be used to ensure that the road stays at a constant high level of service.
- HOV/managed lanes: Both HOV lanes and high-occupancy toll (HOT) lanes provide a separate lane for carpoolers with a higher level of service. HOT lanes also allow single-occupant vehicles into these lanes for a toll; this toll - in another form of

congestion pricing - can vary according to traffic levels to ensure a high level of service in the lane. Vehicles carrying two or more people (or three or more, depending on the level of congestion) would be exempted from the toll, to encourage carpooling.

- Intercity tolls: Outside urban areas, interstates and other limited access roads can be tolled to introduce a per-mile (or equivalent) fee to users.
- Truck-only toll lanes: Toll lanes dedicated exclusively to trucks allow freight to move more efficiently through congested areas. In addition, truck-only lanes may have safety benefits by separating truck and auto traffic.

Such strategies have been deployed more aggressively elsewhere in the world, including Singapore, London, Stockholm and the Netherlands. Political and public acceptance has been a challenge in many cases, with lessons that could be useful in the United States. Specifically, to earn support from the public and other stakeholders – including environmental groups – proposals must address a real problem that pricing would help resolve (such as oil savings), have a credible plan for the revenues including investments in transportation alternatives such as bus rapid transit, come from a trustworthy source and start incrementally.[36] The last of these is particularly important. Launching modest-sized projects can offer the public "proof of concept" and build momentum towards wider use of pricing tools.

Together, these user fee strategies could save nearly 80 million barrels of oil in 2020, and twice that in 2030 as pricing becomes more comprehensive. More than three-quarters of these reductions are associated with congestion pricing. This is because more than one-third of U.S. highway travel occurs on congested urban roadways; focusing on these roads gets to the core of the fuel consumption issue. As with all pricing mechanisms, benefits are achieved both because of the reduction in the number of miles driven and by better traffic flow that decreases the amount of time spent – and fuel consumed - in stop-and-go conditions.

Allocate Transit Dollars to Optimize Oil Savings

Providing transportation choices can be an effective way to reduce oil consumption – as long as there are enough riders that the transit vehicle consumes less oil per passenger than those riders collectively would have consumed driving their individual cars. The transit routes that have the highest load factors, therefore, save the most oil. Taxpayer dollars allocated to transit can be focused on capital improvements that would:

1. Improve service on, and recapitalize to maintain a state of good repair, existing high load routes with an eye toward maintaining a consistently high load factor. For instance, this might mean more frequent service during peak usage hours; this would reduce travel times, which would in turn attract even more riders.

2. Add new routes that are expected to be consistently high load.

Adding transit service attracts more riders, by providing new mobility options that make it worthwhile for them to switch modes. A number of strategies can contribute to

improved service levels and expand service to additional new routes. Technology can play an important role in increasing speed and reliability through signal prioritization and synchronization, automatic vehicle location systems for real-time scheduling adjustments, and improved fare collection such as integrated transit fare systems that allow riders to use a single smartcard for all the modes and systems they may want to use. Service improvements - such as express, limited stop service – can provide new options for riders. More capital-intensive options focus on adding more buses and rail vehicles to increase the frequency of service and to allow transit systems to expand to cover larger geographic areas. For instance, bus rapid transit (BRT) – as demonstrated most extensively in cities such as Bogota (Colombia) and Curitiba (Brazil) – provides a flexible and cost-effective way to provide much higher levels of service than traditional bus service, often by using a dedicated right-of-way to avoid congestion and reduce conflicts with general traffic. Compared to heavy or even light rail projects, BRT costs less and takes less time per mile to build, and operations costs are also lower.

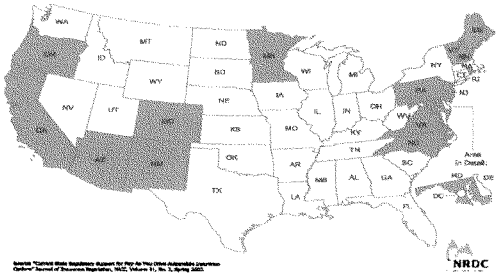
Our analysis shows that increasing the level of service on routes that have better than average load factors could save more than 4 million barrels of oil in 2020, and more than 6 million in 2030. Expanding service to reach new geographic areas, assuming again that only routes with better than average load factors would be funded, could save almost 21 million barrels of oil in 2020 and more than 38 million barrels in 2030.

Increase Insurance Choice

Car insurance is a fixed-cost for most drivers in the U.S. today – they pay the same amount per year regardless of how many miles they drive. Yet, all else being equal, the likelihood of an accident for a given driver increases as he or she drives more. As a result, low-mileage drivers effectively are subsidizing risk for high-mileage drivers; this results in distorted price signals for the costs of driving. Converting the variable portion of insurance costs into a per-mile cost for drivers – a system known as Pay as You Drive (PAYD) - will correct these price signals. Research shows that the majority of drivers in the U.S. would *actually save money* under such a system, since the current subsidy to the smaller pool of relatively high-mileage drivers would be eliminated.

States are taking note of the advantages and pollution reductions afforded by PAYD. No fewer than 14 states are relying on PAYD as a strategy to combat global warming pollution, and expect PAYD alone to contribute on average 3% of their state's total emissions reduction. In all cases, PAYD is projected to have either no cost or to result in net savings.

PAYD in State Climate Action Plans
Nearly 25% of All Driving in America



In spite of increasing interest among states there are very few PAYD policies available. The overwhelming majority of Americans continue to drive with one-price-fits-all policies and virtually no insurance companies offer PAYD. The reasons for this include:

- State Regulations: In 2003, the Georgia Institute of Technology surveyed states' insurance regulations for their compatibility with PAYD, and found more than 15 states with regulatory obstacles. Since then, California, for one, has moved to permit PAYD, but work remains to be done in other states.

- Administrative Start-Up Costs: Many insurers are unwilling to explore PAYD because of uncertain start-up and administrative costs. In most cases PAYD will require, at a cost, that insurers enact actuarial and administrative changes to incorporate the new verified mileage with risk and premium costs. Although insurers stand to benefit from the increased actuarial accuracy that will result in most cases, these benefits are not immediately apparent to them, especially in an industry as competitive as auto insurance.

- Verification Costs: An essential element of PAYD is to guarantee insurers the right to verify mileage and adjust premiums accordingly. Many insurers are unsatisfied with current methods of mileage collection and their attendant cost. While many prefer proprietary devices that can collect mileage, such devices face significant privacy concerns and general market acceptability questions. Insurers appear to lack confidence in the ability of drivers or other 3rd parties to accurately and honestly report their mileage to them.

- Lack of Consensus: After literally decades of PAYD as a subject of policy debate and speculation, there is still not a consensus definition of PAYD. This makes it difficult for policymakers and regulators, not to mention insurers and consumers, to identify exactly what they are striving for.

To implement PAYD, state regulations that prevent insurance companies from offering consumers the option of pay-as-you-drive insurance would first need to be lifted. Federal discretionary dollars can be used aggressively to finance research by the Transportation Research Board (TRB) on how such policies could be structured, and to quantify the relative benefits of different mileage-verification methods (some of which may have a greater impact on driver behavior by sending more frequent price signals). The federal government can also develop guidance on how PAYD legislation and regulations can be structured, finance pilot demonstrations of the PAYD concept, and provide incentives to insurance companies to offer PAYD insurance. For example, auto insurance companies offering PAYD insurance policies could receive a 20% fully-refundable business tax credit based on a portion of active PAYD policies.

A standard definition of PAYD would also be helpful. In concert with current Congressional efforts to create HomeStar and BuildingStar programs for energy efficient buildings, EPA could create specifications for PAYD—an "ENERGY STAR for Auto Insurance" or "DriveStar"—to provide guidance to regulators, policymakers, insurers and even consumers who are interested in proposing, evaluating and encouraging PAYD-type insurance products. NRDC, with Ceres and others, has developed such a standard as a starting point.

If PAYD policies were made an option for all drivers, between 20-40 percent of drivers could be expected to use it as a way to reduce auto insurance premiums. **Allowing PAYD as an option in all states could generate savings of 56 million barrels of oil in 2020 and almost 60 million in 2030.**

Provide Transit Vouchers for Mobility Choice for Low-Income Households

While lowering transit fares is a proven way to increase ridership, this comes at a cost to transit agencies in the form of lower farebox revenues – undercutting agencies' ability to maintain service in the long run. To allow transit agencies to become more self-sustaining while meeting mobility goals, subsidies can be focused on helping the people that actually need financial support. To this end, transit vouchers could be provided for low-income households, paid for by fare increases for other riders. This policy would help transit agencies avoid farebox losses by giving them the chance to charge higher fares for consumers who can afford it. Policies could be designed so that vouchers could be redeemed with either existing transit agencies or private entrepreneurs running private sector buses, shuttles, vanpools and jitney buses.

Research shows that lower- and higher-income riders have different responses to fare price changes, with lower-income riders more sensitive to cost. As a result, our analysis shows that the ridership gains from subsidies to low-income riders outweigh the ridership losses from higher-income riders who switch to other modes when faced with fare increases. This analysis recognizes that subsidies will attract some new transit riders who will switch from non-auto modes (such as walking or bicycling) that consume no oil. **Even accounting for the relatively higher share of low income transit riders who will make this switch, providing low-income fare subsidies would save nearly 0.7 million barrels of oil each year.**

Increase Commuting Options and Telecommuting

A large share of trips are -- particularly at peak hours -- to the workplace. There are many strategies that can encourage commuters to choose travel options other than driving alone. For example, parking cash-out programs reward employees who find other ways to get to work by giving them the cash-equivalent to a parking benefit. On-line ride matching, vanpool services and guaranteed ride home programs provide commuters an alternative to driving alone. Extensive outreach programs by larger employers can be used to educate employees about the commute options available. Transit agencies can offer employers "bulk discounts" on monthly transit passes, providing incentives for greater transit use. Finally, government employers can levy a fee (such as four dollars per parking space per day) on employee parking that can be used to fund the provision of these shared-ride programs and transit passes. **Implementing all of these strategies could yield oil savings of more than 57 million barrels of oil each year.**

Telecommuting and compressed work weeks offer opportunities to eliminate entirely some trips to the workplace. The choice to take the "broadband highway" to work, shop or run errands saves more oil than any alternate mode of transport. As one energy expert put it, "consider the potential of virtualization as a disruptive energy technology. If for only one day a week the herd of stop-and-go business commuters was allowed to telework from hom or from a networked satellite office near their neighborhood, over 30 million gallons a day of gasoline would be saved."[37] While telecommuting is on the rise, there are ways that policy measures can accelerate this trend. First, government agencies could set a good example by encouraging telecommuting and a compressed workweek of its workforce, as appropriate depending on job descriptions and citizen needs. Barriers to telecommuting in state and local tax codes can be eliminated, and tax incentives can be provided for telecommuting setup and maintenance costs, similar to the tax free benefits currently provided for other workplace transportation costs (parking and transit use). **Fully implementing these actions would save another 14 million barrels of oil each year.**

Return Gas Tax Revenue to Areas with the Most Traffic and Oil Savings Potential

Our nation's metropolitan areas have grown into hosts to most of the nation's population, employers, GDP and traffic. They are therefore logical recipients of a larger proportion of federal gas tax receipts, as recognized by both the Bush Administration and Democratic Transportation Committee Chairman Rep. James Oberstar, who both included substantial metropolitan mobility programs their proposals for a new transportation program. Any new program should send a much larger proportion of gas tax receipts – either through a brand-new program or through the existing Surface Transportation Program – directly to metropolitan regions in a process referred to as "suballocation," with appropriate conditions to maximize efficient and transparent use of the funds. One condition could be to focus support for transit operations on high-load routes. This strategy is supportive of others on this list, and its oil savings are difficult to estimate in isolation.

Improve Local Land-Development Rules

Transportation choices and land use are inextricably linked. By creating more transportation-efficient land use patterns, people can choose modes other than driving for some trips, and reduce the number of miles they need to drive. Mixing commercial and residential land uses makes it possible for residents to walk or bicycle to neighborhood stores, and higher density development centered around transit stops can make public transportation a much more attractive and viable option for residents. Yet current regulations often stand in the way of neighborhood designs that allow minimal driving, with zoning codes that prohibit mixed-use developments and that do not allow for a mix of housing types and lot sizes. Government policies need to be revamped to encourage – rather than impede – efficient development patterns, and eligibility of municipalities for certain federal transportation funds should be conditioned on liberalization of rules to meet market demand.

Some recent analyses provide evidence of a mismatch between what the marketplace provides and changing consumer preferences. One analysis looked at Atlanta households and found that "the segment of the housing market that is interested in these alternatives is underserved—that is, there is unmet demand for alternative development in the Atlanta region."[38] Another analysis compared Boston and Atlanta, finding that 70% of Bostonians who wanted to live in a walkable suburb actually did while only 35% of the same in Atlanta did.[39]

And a national survey of developers found that more than 60% agreed with the statement "In my region there is currently enough market interest to support significant expansion of these alternative developments," with a high of 70% in the Midwest and a low of 40% in the South Central region. In terms of location within metropolitan regions (central city, inner suburb, outer suburb, or rural) the highest percentage (80%) reported an intent to develop more densely should land-use regulations be relaxed in inner suburbs.[40]

Merely removing barriers to mixed-use development and providing incentives for regional and city planning agencies to plan for more efficient land use could save more than three million barrels of oil in 2020. This initial savings would more than triple by 2030 as these policies have more time to influence development. Due to the length of time it takes for individual properties to turn over to new uses and development patterns to change, incentives for land use changes represent a long-term policy option. Many of the most powerful effects of implementing these policies will be felt beyond the 2030 timeframe.

Deployment of Smart Traffic Management

Traveling on roads and transit in other industrialized nations, one witnesses a host of technologies that could improve operating efficiency of existing transportation modes, from variable signage providing real-time information to system users to traffic management centers to keep traffic flowing freely. Upgrading our current infrastructure with 21st-century technology is one of the first steps we can take to save oil and reduce pollution by reducing congestion and idling. These technologies save time, money, and

frustration for travelers. A wide range of technologies and operational improvements can be implemented. Here are some of the strategies for improving traffic flow for cars, trucks and buses on our roads:

- Freeway management. Roadway capacity and flow can be dynamically managed with real-time information on traffic conditions, collected by sensors and cameras. Ramp meters can be installed to regulate the flow of vehicles entering a highway to the optimal level at any given time, speed limits can be adjusted in real time to respond to changing conditions, and shoulders can be converted to travel lanes at peak hours or during congestion. Traffic management centers can coordinate ITS technologies across multiple roadways to best reduce congestion area wide.
- Traveler information. Up-to-date information on traffic conditions provided to travelers can enable them to choose the best route and avoid congestion. Variable message signs, 511 systems, and traveler information call centers can all be deployed.
- Incident management. A variety of techniques can be used to more quickly identify and clear incidents (accidents and other obstructions) that are causing traffic jams, including free cellular call systems for reporting incidents, closed-circuit cameras, service patrols, and travel management centers to coordinate response.
- Arterial management. Improved signal synchronization and variable message signs can be used to improve traffic flow on arterial roadways. This can also be combined with priority access through intersections for transit.
- Road weather management. Inclement weather can badly snarl roadways. Implementing coordinated weather advisories, speed limit reductions, and snow and ice treatments promotes safe and smooth travel operations in bad weather.
- Vehicle Infrastructure Integration (VII) or IntelliDrive^{SM}. Not yet widely deployed, these systems would equip vehicles with technology that would communicate with roadside sensors and other vehicles to help drivers avoid accidents and make efficient use of roadway capacity.
- Truck idling reduction. Idling wastes both fuel and money for trucking companies and operators. Overnight idling at truck stops can be reduced through truck stop electrification, which provides heating and cooling for the driver in the sleeper cab, or by installing auxiliary power units on trucks that allow drivers to shut off the main engine. Weigh-in-motion (WIM) systems and electronic credentialing allow trucks to bypass weigh stations and safety inspections, eliminating the idling associated with these stations.

Together, these technologies could save almost 5 million barrels of oil in 2020 and almost 10 million barrels in 2030, while simultaneously improving traffic flow on arterials and freeways in the nation's congested urban areas.

Deploy Cost-Effective Intercity Rail Options as Justified by Cost Efficiency and Oil Displacement Potential

For medium distance trips, intercity rail offers the opportunity to switch intercity auto and air trips to more energy-efficient trains. As with transit expansion, the greatest oil saving benefits can be gained by implementing service with relatively high load factors, rather than introducing service with low ridership. Federal funds for rail can be targeted to expand service on lines that will attract enough ridership to operate with relatively high load factors.

Leveraged targeting of investments will require development of criteria and a phase-in approach for new capacity. One noteworthy white paper by America 2050 lays out a methodology for screening potential city pairs that could be linked by high-speed rail based on six criteria aimed at ensuring adequate ridership: Metropolitan size, distance, transit connections, economic productivity, congestion (for both auto and air travel) and whether or not pairs are part of one of 11 "megaregions" that are already interconnected in various ways. Based on these criteria, as part of a three-phase investment plan the group proposes first building new rail connections in Northeastern, Midwestern and California megaregions. This method is worthy of consideration whether or not new rail capacity is "high speed."[41]

If funds are dedicated to expanding ridership on routes with at least 20 percent higher load factors than the Amtrak average, funding intercity rail could save half a million barrels of oil per year. Intercity rail strategies will also have synergies with transit expansion strategies, because better transit systems in destination cities reduce the need for passengers to have a car upon arrival. This further reduces the incentive for travelers to drive.

Securing our Energy and Climate Future

Moving forward into the second decade of the new millennium, we have a chance to chart a new course for the future. When I envision my daughter in adulthood, I see a nation and a world that offers more means to opt out of oil addiction. Fareed Zakaria has written about one exciting vehicle choice that should be available in the future: The 500-mpg car, an pluggable car that can run on a blend of advanced biofuel and traditional fossil fuel.[42] Between the electricity and the biomass, this car would dramatically reduce the number of times you have to go to the pump, and in aggregate would cut our dependence on oil.

In addition, I see a real network of public and private transportation options linking cities and towns across the country, with neighborhoods retrofitted or designed from the start with walkability and bikeability in mind. An array of real mobility choices for U.S. citizens would further boost energy independence. Such a bright future is contingent on enactment of new transportation policy, led by this Committee. I look forward to working with you to make it so.

[1] Energy Information Administration, *Annual Energy Review 2008*, Transportation Sector Energy Consumption, http://www.eia.doe.gov/emeu/aer/txt/ptb0201e.html
[2] Energy Information Administration. *Annual Energy Outlook 2010* Early Release.
[3] Maugeri, L. 2006. The Age of Oil. Westport, CT: Praeger.
[4] Import figure drawn from Jaffe, A.M. 2009. The U.S. Energy Predicament. The Aspen Institute Congressional Program Vol. 24, No. 2: 11.
[5] 90 percent figure from Marcel, V. 2006. Oil Titans: National Oil Companies in the Middle East. London: Chatham House. Figures for graph from Maugeri, L. 2006. The Age of Oil. Westport, CT: Praeger.
[6] Lee, H. 2009. Oil Security and the Transportation Sector in Acting in Time on Energy Policy, edited by K.S. Gallagher, 56.-88. Washington, D.C.: The Brookings Institution.
[7] Electrification Coalition. November, 2009. Electrification Roadmap: Revolutionizing Transportation and Achieving Energy Security. Washington, D.C.: Electrification Coalition.
[8] Luft, G. and Korin, A. Terror's Next Target. Journal of International Security Affairs December 2003.
[9] From chapters by Koknar, Ali and Jaffe, A.M. 2009. The Epidemic of Energy Terrorism and OPEC: An Anatomy of a Cartel respectively in Energy Security Challenges for the 21st Century, edited by G. Luft and A. Korin, 18-30 and 78-90 respectively. Santa Barbara, CA: Praeger Security International.
[10] Klare, M. 2009. There Will Be Blood: Political Violence, Regional Warfare, and the Risk of Great-Power Conflict over Contested Energy Resources in Energy Security Challenges for the 21st Century, edited by G. Luft and A. Korin, 44-65. Santa Barbara, CA: Praeger Security International
[11] Jaffe, A.M. 2009. OPEC: An Anatomy of a Cartel in Energy Security Challenges for the 21st Century, edited by G. Luft and A. Korin, 78-90. Santa Barbara, CA: Praeger Security International.
[12] Oil Shockwave, "Video Samples," Securing America's Future Energy, http://www.secureenergy.org/site/page.php?node=344&id=93
[13] Friedman, Thomas L. "9/11 and 4/11." New York Times, July 20, 2008, http://www.secureenergy.org/site/page.php?node=344&id=93
[14] The CNA Corporation. 2007. National Security and the Threat of Climate Change. Alexandria, VA: The CNA Corporation.
[15] Ibid.
[16] Department of Defense. February, 2010. Quadrennial Defense Review Report. Washington, D.C.: Department of Defense.
[17] See for example Bordetsky, A., et al. June, 2007. Driving It Home: Choosing the Right Path for Fueling North America's Transportation Future. New York, New York: Natural Resources Defense Council.
[18] Maugeri, L. 2006. The Age of Oil. Westport, CT: Praeger.
[19] Parry, W.H. and Anderson, J.W. Winter 2005. Petroleum: Energy Independence is Unrealistic. Resources 156: 11-15.
[20] Greene, D. Why CAFE Worked. 1997. Oak Ridge, Tennessee: Oak Ridge National Laboratory.
[21] Korin, A. and Luft, G. 2009. Turning Oil into Salt: Energy Independence Through Fuel Choice. BookSurge Publishing.
[22] Woolsey, R.J. and Sexton, C. 2009. Geopolitical Implications of Plug-in Vehicles in Plug-In Electric Vehicles: What Role for Washington? Edited by D.B. Sandalow, 11-21. Washington, D.C.: Brookings Institution.
[23] Greene, D. Why CAFE Worked. 1997. Oak Ridge, Tennessee: Oak Ridge National Laboratory.
[24] U.S. EPA. 2009. Fuel Economy Trends Model Years 1975-2009.
[25] The International Council on Clean Transportation (ICCT), "Passenger Vehicle Greenhouse Gas and Fuel Economy Standards: A Global Update," ICCT, http://www.theicct.org/information/reports/passenger_vehicle_greenhouse_gas_and_fuel_economy_standards_a_global_update
[26] Lovaas, D. 2007. Going Green by Empowering Choice in The Futurist January-February 2007: 27.
[27] EIA, Electric Power Monthly, Net Generation by Source, Table 1.1, March 2010.
[28] Davis, Diegel and Boundy, Transportation Energy Data Book: Edition 28, Oak Ridge National Laboratory for the US Department of Energy, 2009.
[29] Electrification Coalition. November, 2009. Electrification Roadmap: Revolutionizing Transportation and Achieving Energy Security. Washington, D.C.: Electrification Coalition.

[30] Bipartisan Policy Center. 2009. *Performance-Driven: New Vision for U.S. Transportation Policy.* Bipartisan Policy Center.
[31] Transportation for America, *The Route to Reform*, Transportation for America http://t4america.org/blueprint/
[32] Weyrich, P.M. and Lind, W.S. 2009. Moving Minds: Conservatives and Public Transportation. Alexandria, VA and Oakland, CA: The Free Congress Foundation and Reconnecting America.
[33] Pre-release data from A National Transportation Survey of 800 Registered Voters Conducted February 27-March 2, 2010 by Public Opinion Strategies and Fairbank, Maslin, Maullin, Metz & Associates for Transportation for America, Smart Growth America and NRDC.
[34] The coalition is made up of myself as well as the following individuals (organizations listed for affiliation purposes): Anne Korin and Gal Luft of IAGS; Cliff May of the Foundation for the Defense of Democracies; Robert McFarlane, former National Security Advisor; R. James Woolsey, former CIA director; James Strock, former California Secretary of the Environment; John Norquist, President of the Congress for the New Urbanism; Matt Rojansky, Partnership for a Secure America; Kenneth Green of the American Enterprise Institute; Peter Pantuso of the American Bus Assocation; Admiral Dennis McGinn; Chuck Wilsker of the Telework Coalition; and Lisa Margonelli of the New America Foundation.
[35] Buxbaum, J. N. 2009. Transportation Research Board. 2009. Transportation Research News 263: 4-7.
[36] Higgins, T. 2009. Transportation Research Board. 2009. Transportation Research News 263: 32-34.
[37] Tertzakian, P. and Hollihan, K. 2009. The End of Energy Obesity: Breaking Today's Energy Addiction for a Prosperous and Secure Tomorrow. Hoboken, NJ: Wiley.
[38] Levine, Jonathan, and Lawrence Frank. (2007) Transportation and Land-Use Preferences and Residents' Neighborhood Choices: The Sufficiency of Compact Development on the Atlanta Region. Transportation 34(2):255-274.
[39] Levine, Jonathan, Aseem Inam and Gwo-Wei Torng. (2005) A Choice-Based Rationale for Land-Use and Transportation Alternatives: Evidence from Boston and Atlanta. Journal of Planning Education and Research 24(3):317-330.
[40] Levine, Jonathan and Aseem Inam. (2004) The Market for Transportation-Land Use Integration: Do Developers Want Smarter Growth than Regulations Allow? Transportation 31(4):409-427.
[41] Hagler, Y. and Todorovich, P. 2009. Where High-Speed Rail Works Best. New York, New York: America 2050.
[42] Zakaria, F. *Imagine: 500 Miles per Gallon* in *Newsweek* March 7, 2005.

Questions for Senator Boxer

1. **Of the various transportation policies you described that can help reduce our dependence on oil and reduce emissions, which policy (or policies) do you think can be most effective in the short-term? Are there other policies we should implement now, but that might not pay off for several years?**

Policies relating directly to transportation system efficiency and pricing are among those with the strongest short-term impact. Other policies have modest effects in the near-term but pay off in later years, particularly those related to the construction of new public transportation infrastructure and those that encourage more efficient land use and transportation planning.

Short Term Strategies

Of the short-term strategies, I urge consideration of policies which support – via requirements that they be considered in plan and program development, incentives such as more favorable investment matches and/or dedicated funding sources -- the following, which are supported by our new Mobility Choice Coalition and examined in the Department of Transportation's recently-released report to Congress, *Transportation's Role in Reducing U.S. Greenhouse Gas Emissions*:

- **Tolls, VMT Fees, Cordon and Congestion Pricing (including HOT lanes)**: Transportation experts agree that various means of road pricing that send more accurate signals to consumers are the quickest and surest method to influence travel choices. The infrastructure and technology to implement such systems are well-understood and widely available, and years of successful operation of such systems enable cities and metro areas to begin such programs quickly.
- **Commuter-Based Programs**: While accounting for only about 25% of total VMT, employer- and employee-based commuter reductions (or TDM: Transportation Demand Management) programs have significant short-term potential. Transit passes, parking cash-out, carpooling and ride matching, telecommuting and compressed workweeks all have been shown to reduce single occupancy vehicle trips and accompanying VMT.
- **Oil Security Fee**: Levied by the barrel or at the pump, such a fee, similar to the road pricing measures above, would send a more accurate signal to drivers as to the real cost of their oil use, while encouraging consideration of more oil-efficient transportation alternatives.
- **Pay As You Drive Insurance**: Our analysis and the new project PAYD insurance with a relatively large fuel-savings and emission reduction effects in the short-term. Realization of PAYD's potential will require States to adjust insurance regulations to permit usage-based policies, with significantly greater effects should states consider incentivizing or mandating PAYD policies.
- **Deploy Smart Traffic Management Technologies and Increase System Efficiency**: Existing technologies, such as ramp and lane metering, informational signage, variable signal control, and state-of-the-art incident and traffic management, can improve traffic flow and the efficiency of our existing transportation system, without requiring costly and time-consuming road construction and capacity expansion.

Long-Term Strategies Requiring Investment Now

Longer-term strategies are those that require either considerable lead-time for construction (such as new rail capacity) or those whose effects will take years to materialize (changing projected development patterns through improve land use).

- **Investment in New High-Occupant Transportation Vehicles and Infrastructure**: It is not reasonable to expect Americans to reconsider driving alone when there are no convenient, reliable and safe alternatives. Communities throughout the country could attract riders to new, or improved, transportation services. Such services should not be limited to rail projects, but should include an array of public and private sector options plying our highways and roads. Modern, comfortable intercity buses, bus rapid transit, as well as more flexible options such as jitneys and vanpools should be available as mobility choices.
- **Encouraging Nonmotorized Mobility**: While biking and walking offer modest fuel-saving and emission-reducing potential on their own, they are an inexpensive complement to highway and transit infrastructure, and enhance fuel-saving and emission-reducing potential. Our existing system must be retrofitted to permit safe travel by these modes and funding for new roads must call for the design of "complete streets," usable by all travelers regardless of mode.
- **Investments in Rail**: For commuters, inter-city travelers and businesses that move goods vast distances, a renewed commitment to rail is essential to decrease the energy and environmental harms and costs due to transportation.
- **Improved Land Use and Transportation Planning**: It has taken decades for America to become over-dependent on oil, and it will take decades to change course to realize high-quality communities that allow us to live more efficiency. Land use and transportation planning, with an eye to reduced oil dependence and reduced GHG emissions, are essential steps. The sooner our long-range planning includes these factors, the better. Metropolitan areas should set specific GHG and oil reduction targets, and commence land use and transportation with the goal of meeting those requirements.

2. **In your testimony you state that the next authorization bill should have an Intelligent Transportation Systems (ITS) title. What policies would you like to see in such a title? How can ITS improve existing infrastructure while simultaneously lessening the impact of this infrastructure and its use on our environment?**

Deploying advanced technology across all modes of transportation would yield fuel savings emission reductions due to improved system efficiency and traffic flow. For example, the Department of Transportation's new Climate Change Report examined traffic management strategies (such as ramp metering) and technology providing real-time information to travelers (such as variable signage on roads). While the benefit were modest compared to some other strategies examined, the costs could be modest as well and there were significant co-benefits such as greater consumer satisfaction.

While considering ITS as a strategy for protecting the environment, however, one must keep in mind its role as a facilitator for other strategies that offer greater benefits. This means that ITS must not be considered in isolation, but as a complement to other emission reduction strategies. For instance, traffic

signal optimization for rapid transit buses improves service and boosts ridership, easing congestion and making investments in buses more cost-effective.

ITS America has shared a draft set of policy concepts that could readily be included in an ITS title, and I urge the Committee to seek their counsel, as well as that of individual members, regarding this matter. Their proposal includes:

a. A competitive pilot program with a limited number of model deployment sites for integration of the latest technology, with public investment conditioned on specific performance objectives, adequate data collection and evaluation, innovative financing and other requirements;
b. A comprehensive program to accelerate the deployment of technology solutions system-wide via dedicated funding; and
c. A requirement that DOTs, MPOs and transit agencies perform a cost-benefit analysis for investments and justify diverting support away from ITS solutions if they stack up well.

This three-pronged approach seems like a reasonable means to modernizing our transportation system with the latest technology. Should the Committee choose to write this title, collaboration with the Banking Committee will be important since the program should have a multimodal focus so that we boost functional efficiency across the entire system and maximize fuel savings and emission reductions.

3. **How will pay as you drive insurance reduce emissions? Can you describe how states are using this idea as part of their emission reduction plans?**

Pay As You Drive Insurance (PAYD) ties insurance premiums directly to the amount policyholders drive. Just as gas prices influence how far and how much consumers drive, the making the price of insurance variable based on mileage can have a similar effect. Currently, although insurance is required to take the number of miles people drive into account, such figures are most often merely estimate, and inaccurate ones at that.

Estimates vary as to the effect of PAYD, but all studies point to reductions in miles traveled:

- University of California-Berkeley's Aaron Edlin sees a potential national VMT reduction somewhere between 9% and 10%;
- Victoria Transport Policy Institute's Todd Litman projects VMT reductions up to 10%, depending on how PAYD is implemented; and
- the Brookings Institution forecasts up to an 8% VMT reduction nationally.

Pilot projects in Texas and Minnesota have resulted in VMT reductions between 4%-5%. NRDC's own analysis of PAYD potential in California, based on a range of VMT reductions from 4%-8% and a modest 50% participation rate among California's lowest mileage drivers, projects a greenhouse gas emissions reduction range of 1.3 – 2.6 million metric tonnes by 2020. Additional NRDC analysis projects similar nationwide reductions.

There other significant co-benefits from implementing PAYD insurance and reducing VMT. PAYD insurance promotes fairness as low mileage drivers no longer subsidize high mileage ones, as occurs in today's "lump pricing" insurance market. It also promotes equity, as low income drivers (who tend to drive less) will no longer subsidize higher income drivers. Reductions in VMT also improve public safety

by reducing collisions and collision-related injury. And studies show that PAYD could save 2/3 of households an average of $250 on their annual transportation expenses.

Currently, no fewer than 14 states have PAYD specifically listed in their climate action plans.[1] On average, its contribution is assessed at three percent of each state's total emissions reductions, and all states that have included a cost-benefit analysis of PAYD see either no cost or a net savings. As auto insurance is regulated at the state level, each state will approach implementation differently.

- Arizona and New Mexico both call for a review of their insurance regulations to ensure that PAYD was permitted, and for the launch and evaluation of a pilot program: "Assuming this pilot is successful, market penetration could increase to 100% by 2020...either through competitive pressure...or through a change in State policy mandating PAYD insurance..."[2]
- Maryland's Climate Action Plan called on the Maryland Insurance Administration, along with the State's Department of Transportation and Department of the Environment, to convene a working group to evaluate PAYD approaches, and to "push for adoption by Maryland drivers in the 2012 time frame."[3] The Insurance Administration found no regulatory obstacles to PAYD in Maryland and has recommended talks with insurance companies about offering PAYD products.[4]
- North Carolina's Climate Action Plan proposes requiring insurance companies to offer PAYD as part of their menu of insurance choices. The Plan begins with a small-scale pilot project with a goal of full North Carolina light-duty fleet PAYD coverage by 2020.[5]
- California's Climate Change Scoping Plan noted that the California Department of Insurance was considering regulations to permit PAYD on a voluntary basis.[6] In December, 2009, the Department of Insurance finalized those regulations.
- Pennsylvania's Climate Action Plan, released only in December, notes that legislation may be required to implement PAYD and encouraged the review of current policies. The State is pursuing grant opportunities with FHWA to test mileage devices for use in PAYD programs and is exploring marketing strategies to drivers and the potential need to create a system of auditing stations to check or confirm mileage.[7]
- Washington and Oregon have both considered legislation to provide tax credits for PAYD policies.

According to a 2003 Georgia Institute of Technology survey, a number of States have regulations in place that may prevent PAYD policies. New policy should require or offer strong incentives for states to change regulations in order to permit, or require, the offering of PAYD policies.

---

[1] The states are Arizona, California, Colorado, Maryland, Maine, Minnesota, New Hampshire, New Jersey, New Mexico, North Carolina, Pennsylvania, Rhode Island, Virginia and Vermont

[2] Arizona Climate Change Advisory Group, "Climate Change Action Plan," August 2006, p. 73. New Mexico Climate Change Advisory Group, "Final Report," Dec. 2006, p 6-6.

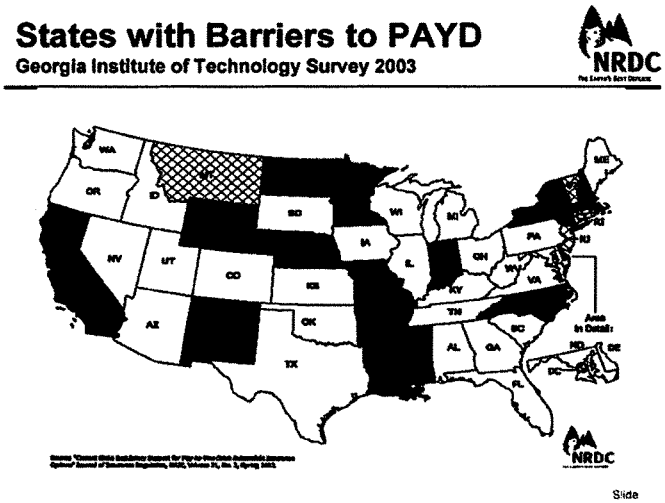
[3] Report of the Maryland Commission on Climate Change, "Chapter Four: Comprehensive Greenhouse Gas and Carbon Footprint Reduction Strategy," p 97.

[4] Maryland Insurance Administration, "Review of Pay-As-You-Drive Programs in Maryland," Sept. 2009.

[5] North Carolina Climate Action Plan Advisory Group Report, Appendix A, 2008. p. G-44

[6] California Air Resources Board, "Climate Change Scoping Plan," Dec. 2008.

[7] State of Pennsylvania, "Final Climate Change Action Plan," Dec. 2009, p G-31



Slide

4. **It appears that providing convenient and easily accessible transportation options is a key to reducing energy consumption and improving our environment. How can the Federal-aid highway program encourage states and localities to provide these options?**

First of all, I encourage your Committee to collaborate with others, most notably the Banking Committee, as you draft the new transportation authorization bill. While transportation modes have traditionally been separated into different "silos" by both Congress and the Administration, the nation's plan for a new transportation system should be multimodal and intermodal in focus.

The highway program in and of itself also offers ample opportunity for policies that boost mobility choices, including:

- Bringing planning and programming into the 21st-century by establishing relevant performance measurement and standards for those seeking federal assistance. Specifying performance requirements is important for saving energy and the environment, improving infrastructure quality and integrity, ensuring road safety and other valued goals.[8] Standards should include fuel savings and greenhouse gas emission reductions and contain incentives and penalties for noncompliance, and large metropolitan areas – hosts to most miles of vehicle travel – should be part of a special program with requirements and funding for performance-based linkages between land use and transportation planning.
- Boosting system efficiency on the existing network, and boosting mode share for nonmotorized travel, before building new capacity by:

[8] For more information, see Transportation for America, The Route to Reform: A Blueprint for a 21st Century Federal Transportation Program, T4America, 2009.

  - Eliminating the deferred maintenance backlog for existing infrastructure by creating a much larger and dedicated program for road and bridge repair and maintenance;
  - equipping highway infrastructure with modern technology (i.e., ITS); and
  - accommodating nonmotorized travelers (i.e., requiring "complete street" retrofits nationwide).
- Including initiatives, incentives and financing for more widespread adoption of road pricing measures, for example providing tolling authority for Interstates and National Highways (with appropriate oversight).
- Enacting a national goods movement strategic plan and dedicated funding for a new freight program that includes all modes as well as ports and air quality considerations, and requiring MPOS and states to prepare regional and corridor freight plans.
- Focusing on the congestion- and emission-reduction potential of buses on our roads and highways. A bill should include a Bus Rapid Transit Strategic Plan for the nation, for example, with dedicated and/or flexible funding available for projects. Funding, incentives and planning should spur more private sector initiatives and more demand-responsive transit such as jitneys and vanpools, examples of which were profiled in a recent report by the Environmental Defense Fund.[9] And MPO modeling and planning should include private operators when analyzing commuter, intercity transit and bus rapid transit.

[9] Reinventing *Transit: American Communities Finding Smarter, Cleaner, Faster Transportation Solutions*, 2009.

Questions from Senator Inhofe

1. Assistant Administrator McCarthy testified that the Moving Cooler report shows that greenhouse gas emissions can be reduced by 15 to 18 percent by 2050 by using the report's "Low Cost Scenario." Which of the included activities in the referenced scenario does the NRDC support?

Thank you for the opportunity to address these important questions. NRDC was a member of the *Moving Cooler* Steering Committee and I enjoyed the opportunity to work with a wide range of partners including ITS America, Shell Oil Company and the Urban Land Institute.

In the energy policy arena, the type of analysis contained in *Moving Cooler* is analogous to an assessment of "technical potential," which in the case of technological advances can be defined as "the achievable energy savings that result from introducing the most energy-efficient technology at a given time, without taking into account the costs of introduction or the life of the equipment to be replaced."[10]

NRDC's view of the value and utility of the report mirrors its own description of goals and applicability:

> *Moving Cooler* is designed to provide an objective analysis of **opportunities** for reducing GHG emissions...The findings of this analysis **do not advocate** for implementation of any particular strategy or set of strategies, nor for any policy, funding, or institutional changes that might be needed to achieve implementation....The results of the study can serve as a tool for the following:
> - Policy makers who are charting national initiatives;
> - Transportation planners and managers who are assessing **options** for climate action strategies; and
> - Researchers who need to better understand the **magnitude** of potential reductions.[11]
>
> [emphases added]

NRDC does not consider *Moving Cooler* a policy platform, a proposal for legislation or regulation, or a document representing official NRDC positions. NRDC views *Moving Cooler* as a useful analytical tool for assessing and discussing the potential magnitude of certain strategies. I hope it will spur more research and inquiry into the important and often overlooked linkages between energy use and transportation.

Within this context, I am happy to answer your questions, respecting the directive to reply "yes" or "no" regarding NRDC's support of particular activities:

a. in all metropolitan areas with a population of at least 50,000, tax all free private parking lots with more than 50 spaces (retail and employer); No, NRDC does not currently support this activity.

b. in all metropolitan areas with a population of at least 50,000, tax residential on-street parking at least $400 biannually with other costs for delivery and service vehicles and visitors; No, NRDC does not currently support this activity.

c. implement congestion pricing on urban roads, congested rural freeways and arterials, with average peak hour per mile price of $0.65 on congested segments; No, NRDC does not currently support this activity.

---

[10] Elsevier Press *Dictionary of Energy*, 2006.

[11] Moving cooler Steering Committee, *Moving Cooler*, Urban Land Institute, 2009, p. 16.

d. **toll all intercity (rural) Interstates at a minimum of $0.05 per mile**; No, NRDC does not currently support this activity.

e. **require enacting a growth boundary on all areas of more than 50,000 people**; No, NRDC does not currently support this activity.

f. **require that at least 90 percent of new development be only multifamily homes or on lots of 1/8th an acre**; No, NRDC does not currently support this activity.

g. **provide Metropolitan Planning Organizations with the authority to disapprove local land use plans and ordinances if not consistent with regional plan, enforced through withholding of funding for transportation projects**; No, NRDC does not currently support this activity.

h. **require that existing streets within one-half mile of transit stations, schools, and business districts be audited for pedestrian accessibility and retrofitted with curb ramps, sidewalks, crosswalks, and traffic calming measures**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

I. **require all new commercial buildings of more than 100,000 square feet to provide showers, lockers, and covered/protected bicycle parking**; No, NRDC does not currently support this activity.

J. **require all new multi-unit residential buildings to have indoor bicycle parking**; No, NRDC does not currently support this activity.

k. **implement a bicycle network consisting of a combination of bicycle lanes, bicycle boulevards, and shared-use paths provided at one-quarter-mile spacing, implemented in areas with population density of more than 2,000 persons per square mile**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

l. **locate "bike stations" providing services including parking, rentals, repair, changing facilities, and information at all major activity centers and transit hubs as well as in the central business district for all metropolitan areas with a population of at least 50,000**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

m. **lower transit fares by 50 percent**; The *Mobility Choice* coalition, of which I am a member, supports providing transit vouchers to low-income travelers. Providing such vouchers would allow a given transit agency to increase fares on other riders more able to pay, increasing farebox recovery and self-sufficiency (and saving fuel on a net basis as our analysis shows). NRDC may support lowering transit fares by 50 percent but would have to study any such proposal, which would presumably be part of a broader policy package.

n. **in all metropolitan areas with a population of at least 50,000, provide subsidy or public procurement sufficient to ensure continuous presence of one or more public, private, or nonprofit car-sharing organizations per market**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

o. **in all metropolitan areas with a population of at least 50,000, provide free or subsidized lease usage of convenient public street parking for car-sharing vehicles**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

p. **in all metropolitan areas with a population of at least 50,000, have a goal of one car per 1,000 inhabitants of medium-density and per 500 inhabitants of high-density census tracts**; No, NRDC does not currently support this activity.

q. **in urban areas, require all government agencies to require four-day work weeks**; No, NRDC does not currently support this activity. The *Mobility Choice* coalition is, however, examining the fuel-saving potential of compressed workweek policies for government workers.

r. **in all metropolitan areas with a population of at least 50,000, tax all commercial parking spaces $5 per space per weekday, with employers required to pass along the cost to employees**; No, NRDC does not currently support this activity.

s. **use proceeds from *r* to provide free transit passes for employees**; No, since NRDC does not currently support *r*.

t. **in all metropolitan areas with a population of at least 50,000, implement a parking freeze on new parking supply, capping the absolute number of commuter spaces in central business districts and regional employment and retail centers**; No, NRDC does not currently support this activity.

u. **in all areas of the country, lower the national speed limit to 55 mph and provide significantly increased enforcement, including speed cameras**; No, NRDC does not currently support this activity.

v. **implement eco-driving training and vehicle maintenance programs, reaching 50 percent of the population and 20 percent net adoption**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

w. **implement specific electronic roadway monitoring activities**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

x. **implement specific incident management activities**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

y. **implement specific traveler information activities**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

z. **allow indivisible load permits for trucks carrying shipping containers at gross vehicle weights up to 110,000 pounds for distances up to 250 miles**; No, NRDC does not currently support this activity.

aa. **allow divisible load permits for B-Train longer combination vehicles carrying natural resources on designation non-IS truck routes at weights up to 129,000 pounds and up to 138,000 pounds for eight-axle B-Trains**; No, NRDC does not currently support this activity.

bb. **install Mainline Weigh-in-motion at all truck weigh stations and use to allow all vehicles with transponders to bypass static scales**; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

cc. **expand the PrePass and NORPASS electronic credentialing systems so that they cover all 49 mainland states and both systems are recognized at all weigh stations and inspection sites, with an**

equivalent system in Hawaii; Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

dd. **require the installation of battery-operated heating and/or cooling systems in all sleeper cabs;** Yes, NRDC would support this activity under certain conditions including, for example, adequate federal and state assistance.

ee. **in metropolitan areas with a population of at least 1,000,000 and some metropolitan areas with a population of at least 400,000, establish consolidation centers on the periphery of the urbanized area, with time-of-day restrictions on most deliveries to the central business district, as well as a permitting system to consolidate shipments to nearby destinations.** No, NRDC does not currently support this activity.

Senator BOXER. Thank you very much.

Next, Doug Siglin, Federal Affairs Director of the Chesapeake Bay Foundation. Do you want to say anything in introduction? We will just hear from you, sir.

STATEMENT OF DOUGLAS V. SIGLIN, FEDERAL AFFAIRS DIRECTOR, CHESAPEAKE BAY FOUNDATION

Mr. SIGLIN. Thank you Chairman Boxer, Senator Inhofe, and especially Senator Cardin.

Thank you for this opportunity to talk about water in this hearing today. It is a bit of an outlier, but it is extraordinarily important in the context of this bill.

Let me just say one thing about the Chesapeake Bay before I start. Forty-five years ago this year this Committee appropriated—or sorry—authorized the first amount of money to study the Chesapeake Bay. Forty-five years ago this year. One of the things which came from that study was the role of what we call today stormwater pollution plays.

Forty-five years later we are still struggling to get the Chesapeake Bay under control. Senator Cardin has got a bill before you that I hope you pay attention to because it is an extraordinarily important approach to getting this waterway, and all national waterways, under control.

I want to go off script and do something a little bit different. I want to make the point that nationally, nonpoint source pollution, particularly stormwater pollution, is an extraordinarily important problem. It is the problem that we have to face with water quality in America today.

I have got one statistic to give you. According to recent assessments 39 percent of the assessed stream miles, 45 percent of the assessed lake acres, and 51 percent of assessed estuary acres remain impaired, largely by nonpoint source pollution. That is the kind of pollution that we have to face now.

Second, highways are an extraordinarily efficient delivery mechanism for pollution to our waterways. The way we have engineered our highways we take the pollution off the roads, and we put it in our water. That is what we do here. We need to change the notion that a highway is an efficient delivery mechanism for pollution.

Third, things that we have in the law currently to try to get this under control are not working. We have NEPA review, it has been in the law for 40-some years, we have the Clean Water Act provisions that have been in the law for now almost 40 years, we have policy language, and we have the availability of funding that were in the last two transportation bills. It is not working yet. We need to do something different in this particular reauthorization.

What we are suggesting to you is that what we need is a national policy statement in the bill about how highways need to be designed to control water pollution.

Now, I do not presume to be a highway engineer or an expert, but I do know that in our region of the country we have a water quality problem. In many other regions of the country, Oklahoma, sir, and others, you have a water quantity problem. And one of the ways you could address this problem would be to design highways

in a better way to try to stop the pollution and to put the water back in the ground where it can recharge the aquifers.

That is a national policy that I would urge your Committee to consider. We spend about $40 billion a year in Federal funds subsidizing highways. I would argue as a taxpayer that for that $40 billion a year it would be entirely appropriate for us to have a policy statement that says this is how we want our money to be used and our roads to be built.

Thank you very much.

[The prepared statement of Mr. Siglin follows:]

Statement of Douglas V. Siglin
Federal Affairs Director, Chesapeake Bay Foundation
Before the Senate Committee on Environment and Public Works
March 24, 2010

Chairwoman Boxer, Senator Inhofe and other distinguished members of the EPW Committee, I am grateful for the opportunity to be here today to encourage you to include in your upcoming Federal Surface Transportation Act new policy language to minimize the water pollution impacts of our federal-aid highways.

I begin with reference to the Chesapeake Bay, which is the waterbody that I know best. You are all aware that large areas of the Bay continue to be severely deprived of oxygen during much of the year, a condition that the federal government has been attempting to understand and ameliorate since this committee authorized six million dollars in the Rivers and Harbors Act of 1965 – four and a half decades ago. Since then, many billions of federal dollars have been authorized, appropriated, and spent. Yet still we have a serious nonpoint pollution problem to which highways are a significant contributor.

Water quality in the mainstem of the Chesapeake Bay, and in the streams and rivers throughout its 64,000 square mile watershed, remains impaired by inadequately controlled discharges of nitrogen, phosphorus and sediment from many sources. The effects of this pollution are felt across the watershed, from the loss of high-quality trout streams in New York, Pennsylvania, and West Virginia to the loss of watermen communities in Virginia and Maryland that are over 300 years old.. Excess nutrient pollution is responsible for algal blooms and oxygen free dead-zones that destroy habitat, aquatic life and the commercial and recreational fisheries dependent upon them in the mainstem of the Bay. Sediment pollution buries aquatic vegetation and habitat. Excess nutrient pollution in particular is a phenomenon of global significance, and has been extensively explored in the world's scientific literature, by among others, Dr. Jim Galloway of the University of Virginia.

The six states of the Chesapeake Bay basin, the District of Columbia and the federal government have long recognized the decline in the Bay's water quality, prompting several inter-jurisdictional agreements to fix the problem, none of which have been successful. Today, cooperative work is underway to complete the largest and most ambitious Total Maximum Daily Load ever developed pursuant to the Clean Water Act, and this committee has before it legislation introduced by Senator Cardin, Senator. Carper and others that holds promise for eventually restoring the Bay's water quality at some unknown date after 2025 – perhaps seven or eight decades after you first authorized funds to study the problem.

In the meantime, pollution running off impervious surfaces in the Chesapeake Bay watershed continues to grow as regional population increases and the associated paving-over of the land proceeds at a rapid pace. Stormwater runoff from these areas contributes a significant amount of pollutants to the streams and rivers that supply freshwater to the Bay. The Environmental Protection Agency's Chesapeake Bay Program has reported that 17 % of phosphorus, 11 % of nitrogen and 9 % of sediment loads to the Bay come from stormwater runoff.[1] Furthermore, the Bay Program notes that, "Transportation and its infrastructure (roads, parking lots and driveways) account for 55 to 75 % of all paving of open space in cities, towns and subdivisions. This conversion of natural land to impervious surfaces creates excess stormwater runoff, which contributes a growing amount of pollution to the Bay and its rivers and streams".[2] The Bay Program also notes that "Chemical contaminants from runoff can rival or exceed the amount reaching local waterway from industries, federal facilities and wastewater treatment plants."[3]

Among the major contributors of impervious runoff in the Chesapeake region are the 97,044 miles of federal-aid highways that run through the six Chesapeake Bay states and the District of Columbia. Statistics from the Maryland State Highway Administration provide an illustrative example of the lack of controls to mitigate pollution from roadways. As of October 2008, SHA calculates that 89.9% of the impervious surfaces that it manages (overwhelmingly highways) in Maryland's eight largest counties have not installed pollution reduction mechanisms to control stormwater runoff. In other words, 90% of the highways in Maryland's eight largest counties channel pollution to local waterways and the Chesapeake Bay every time it rains. Even worse is that Maryland routinely outperforms the other Bay states in treating discharges from these impervious surfaces.

Stormwater Runoff from Federal-Aid Highways is a National Problem

Roads and highways built with federal financial assistance have an enormous negative impact on water quality, not just in this region but throughout the nation. Rain and melting snow runoff from the nation's 985,139 federal-aid highway miles are directly responsible for a huge quantity of pollutants that enter and degrade nearby lakes, streams, rivers, bays, and coastal areas across the nation. This includes many pollutants in addition to nutrients and sediment. Heavy metals, toxics, nutrients, bacteria and other pollutants can all be discharged into waterways through stormwater runoff.

According to a recent assessment of the nation's waters, for the nation as a whole, 39% of assessed stream miles, 45% of assessed lake acres, and 51% of assessed estuary acres remain impaired, largely by nonpoint source pollution. I certainly do not mean to suggest that all impairment is related to highways, although the effect of highways is, in fact, significant. The most recent 303(d) list of impaired waterbodies, required by the Clean Water Act, includes over 28,000

[1] EPA Chesapeake Bay Program, http://www.chesapeakebay.net/stormwater.aspx?menuitem=19515
[2,3] EPA Chesapeake Bay Program, http://www.chesapeakebay.net/transportation.aspx?menuitem=14672

separate impairments which are impacted by stormwater discharges from federal-aid roadways. Over 9,000 of these impairments are related to mercury, and more than 6,000 each are related to heavy metals, sediment and nutrients such as nitrogen and phosphorus.

Highways contribute to water quality impairments in three ways. First, an expanding roadway network generates increases in vehicle miles traveled, which in turn increases the discharge of nitrogen compounds and other particulate matter into the atmosphere. Several studies, including those of Dr. Robert Howarth of Cornell University show that these pollutants settle back onto roadways and areas relatively close to them. Nitrogen compounds deposited onto roadways join all of the other pollutants that have been directly deposited there by vehicular traffic, including those from the wearing down of tires, brake pads, engine parts, and chassis parts, fluid leaks, and chemical applied on or near roadways. This stew of pollutants can include toxics, heavy metals, bacteria, sediments and nutrients including pollutants such as mercury, asbestos, petroleum products and copper. In the absence of adequate controls, these vehicle-generated and roadway-associated pollutants are simply channeled off of roadways during weather events.

The following chart lists some of the sources and pollutants directly associated with roads.

Source of Pollutant	Pollutant
Brake Lining Wear	Asbestos, Nickel, Copper, Chromium
Metal Painting and Rust	Particulates, Nickel, Iron, Copper, Chromium
Tire Wear	Rubber, Pesticides, PCBs, Zinc, Lead, Calcium
Fuel and Exhaust	Petroleum, Particulates, Sulphate, Bromide, Lead, Nickel, Nitrate
Oil Grease and Hydraulic Fluids	Petroleum, Sodium, Calcium, Zinc, Lead, Nickel
Engine and Parts Wear	Particulates, Asbestos, Lead, Manganese, Iron, Copper, Chromium
Roadbed and Roadside Wear	Petroleum, Pathogenic Bacteria, Particulates, Sulphate, Nickel
Sanding and De-icing agents	Particulates, Sulphate, Sodium, Cyanide, Chlorine, Calcium
Herbicide, Pesticide and Fertilizer Use	Pesticides, PCBS, Phosphorous, Nitrogen, Copper, Cadmium

Second, the impervious highway surface acts as a collector and efficient delivery system for other types of pollution that are generated elsewhere. Wind-blown sediment, nitrogen compounds from industries and agriculture, and a variety of additional airborne pollutants land on roadways. Road design features intended to channel water off of roadways quickly carry these additional

pollutants into nearby waterbodies as well. All of us have seen, for example, bridges where rainwater is simply shunted to open grating or some other drainage system and dropped into the stream below, carrying the load of chemicals with it.

I want to provide an example of the impact of chemical accumulation on our environment that comes from the river only a few thousand yards from this hearing room. The Anacostia River watershed is only 176 square miles, about half in Prince Georges County Maryland, and the rest split between Montgomery County and the District. Runoff from the Capitol Complex flows into the Anacostia. US Fish and Wildlife Service scientists have documented the highest liver tumor rates in the Anacostia's bottom-dwelling catfish of any species ever studied. The tumors are linked to a family of chemicals called polycyclic aromatic hydrocarbons that accumulate in the water and the bottom sediments. PAHs are the products of the use, particularly the combustion of, products derived from petroleum, and enter the river system by washing off the region's roadways and other impervious surfaces.

Third, in addition to the transport of pollutants collected on the roadways and directed into adjacent areas,, the volume and rate of flow of water discharges from certain roadways can cause severe sediment erosion during heavy rainfall events. Powerful discharges cause stream bank erosion along unprotected creeks and streams, increasing smothering sediment pollution loadings and contributing to loss of habitat. Additionally, phosphorus and other pollutants attached to sediment molecules are added to pollution loadings when stormwater discharges are not channeled properly and nearby stream banks are left unprotected.

Current Requirements and Approaches

In the roughly two decades since the development of the Clean Water Act's stormwater program and the subsequent passage of the 1991 ISTEA legislation, increasing attention has been given to the water quality impact of federal-aid highways. Within the surface transportation statute and programs there currently are several policies, requirements and initiatives intended to improve the water quality performance of federally-assisted highways. Since 2005, Title 23 has declared that "transportation should play a significant role in promoting economic growth, improving the environment, and sustaining the quality of life". The Federal Highway Administration has among its objectives to "improve the environmental quality of transportation decision-making" and "increase ecosystem and habitat conservation" through the use of "context sensitive solutions". Both Transportation Enhancement funds and core Surface Transportation Program funds and National Highway System funds can be used for environmental restoration and pollution control projects, including retrofits, and funds can be used for planning and environmental coordination in some circumstances. Moreover, as it has done for more than 40 years, the National Environmental Policy Act requires that an environmental assessment or environmental impact statement be done for federally-assisted highway projects in most cases to highlight environmental concerns.

The problem is that the language, the assessments, and the availability of funding doesn't add up to keeping America's waters clean and healthy.

The experience of the Transportation Enhancements Fund is illustrative. In ISTEA, Congress allowed 10 % of highway funds to be allocated to "environmental mitigation to address water pollution due to highway runoff" – one of ten uses of the set-aside, expanded to 12 in subsequent reauthorization bills. However, only 1.1% of available transportation enhancement funds have been used for environmental mitigation of any kind since 1992 according to the National Transportation Enhancements Clearinghouse[4]. The same summary of nationwide spending of TE funds notes that since the program was created, bicycle and pedestrian trails and facilities, historic preservation and landscaping and scenic beautification have accounted for 88.4 % of the TE expenditures.

Some will point to the regulatory aspects of the Clean Water Act as the mechanism that ensures that highways control stormwater pollution to needed levels. The Clean Water Act requires that EPA, or far more commonly the state regulatory agencies, issue National Pollution Discharge Elimination System stormwater permits to protect water quality degradation from stormwater in defined urbanized areas, as well as in larger construction projects outside those areas, and where special circumstances related to "Total Maximum Daily Loads" apply. Federally-aid highway projects sometimes, but not always, enter into that framework. Even when they do, the rigor with which permit requirements are developed and applied is highly variable.

This variability was a principal theme of the Water Science and Technology Board of the National Academies of Science in its 2008 report, Urban Stormwater Management in the United States. The report says

> *States and municipalities have not been very rigorous in determining what constitutes an adequate level of compliance. The self-defined compliance threshold has been translated into a wide range of efforts at program implementation.*

Even more explicitly, this passage, from the report's Executive Summary, calls into question the entire approach:

> *EPA's current approach to regulating stormwater is unlikely to produce an accurate or complete picture of the extent of the problem, nor is it likely to adequately control stormwater's contribution to waterbody impairment. The lack of rigorous end-of-pipe monitoring, coupled with EPA's failure to use flow or alternative measures for regulating stormwater, make it difficult for EPA to develop enforceable requirements for stormwater dischargers. Instead, the stormwater permits leave a great deal of discretion to the regulated community to set their own standards and to self-monitor. Current statistics on the states' implementation of the stormwater program, discharger compliance with stormwater requirements, and the ability of states and EPA to incorporate stormwater permits with Total Maximum Daily Loads are uniformly*

[4] *Transportation Enhancements Summary of Nationwide Spending as of FY2008*. National Transportation Enhancements Clearinghouse. May 2009. www.enhancements.org

discouraging. Radical changes to the current regulatory program appear necessary to provide meaningful regulation of stormwater dischargers in the future.

In a 2008 report requested by your colleagues in the House (Surface Transportation Programs: Proposals Highlight Key Issues and Challenges in Restructuring the Programs), the General Accountability Office recommends that Congress consider restructuring the multitude of surface transportation programs so that they (1) have goals with direct links to an identified national interest and role, and (2) make grantees more accountable through more performance-based links between funding and program outcomes. The GAO report also notes that a principal theme of most of the seven public and private sector restructuring proposals that it reviewed was to "link transportation policy and funding to the environment and energy sectors". [5]

Clearly, cleaning up and preserving America's water resources is a matter of high national interest. Despite the policy language, regulatory requirements for certain new projects, and funding availability cited above, the fact remains that most of the nation's nearly one million miles of federal-aid roads continue to funnel pollution into America's streams and rivers.

If this committee could ensure that federal-aid roads meet an ambitious stormwater control standard, not only when they are built, but when they are reconstructed, rehabilitated, resurfaced, or restored, and then make the federal dollars available to do so, it would ensure cleaner water throughout the nation, reduce flooding and stream bank erosion. It is because of this nexus between infrastructure and environmental health that this committee has jurisdiction over both the Clean Water and Air Acts and the Transportation Bill being considered today.

A New Policy Standard for Water Pollution

The Chesapeake Bay Foundation, representing a coalition of over 150 organizations including environmental and conservation groups, water treatment agencies, and industry associations, respectfully asks that the reauthorization of the Federal Surface Transportation Act set a policy standard for controlling stormwater discharges from federally subsidized roadways. Given the importance of cleaning up the nation's waterways, the role that highway-generated and channeled pollution plays in them, the unwillingness or inability of most states to issue strong stormwater permits, and the competing need for every transportation dollar, we believe that the current system of carrots and no sticks simply isn't likely to get the job done.

The governors of the six Chesapeake Bay states and the Mayor of the District of Columbia made the same request in their May 2009 letter to the House Transportation and Infrastructure Committee (letter attached). They wrote:

[5] *Surface Transportation Programs: Proposals Highlight Key Issues and Challenges in Restructuring Programs.* U.S. Government Accountability Office. GAO-08-843R. July 29, 2008.

"As your Committee prepares to reconsider the Federal Surface Transportation Act, we respectfully ask that you include in the reauthorization law a clear policy that triggers the necessary standards and guidance to ensure that all new construction and significant reconstruction of Federal-aid roadways mitigate the impacts of stormwater runoff. We believe that these policies should require construction that mimics pre-construction hydrologic conditions to the maximum extent feasible; and take into consideration the localized water quality impacts of roadway projects."

We agree with the governors that the stormwater policy standard should apply to new federal-aid roads as well as significant reconstruction or retrofit projects.

Developing a policy standard for federal-aid highways would parallel and complement the work that Senator Cardin and other members of this committee did in the 2007 Energy Independence and Security Act to ensure effective stormwater management for federal facilities. The statutory language of section 438, now U.S.C. Title 42, Section 17094, provides that

"The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

The EPA technical guidance for the statute, developed in coordination with other federal agencies, employs a performance-based approach which allows site designers maximum flexibility in selecting control practices appropriate for the site. It also allows for two options for compliance, creating a flexible system that takes into account regional topographic and weather variations. The first option requires that a site must retain stormwater discharges for a 95th percentile storm, or a storm whose rainfall equals or exceeds 95% of storms. Maintaining this amount of stormwater is akin to mimicking the natural or preexisting hydrology. In the event that this standard is either too lenient to protect water quality, or too stringent, the second option allows for site-specific hydrologic analysis, provided in recognition that there are established methodologies that can be utilized to estimate the volume of infiltration based on site specifics. Such guidance allows for a uniform performance standard with various options for how to achieve it. We believe that a similar standard makes sense for our nation's highway system.

Implementing such a policy standard would also assist the FHWA and other federal agencies to come more into line with the October 5, 2009 Executive Order on Federal Leadership in Environmental, Energy and Economic Performance. The EO affirms federal policy that Federal agencies shall, among other things, "conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services." It is further ordered that to achieve these goals and support their respective

missions, agencies shall prioritize actions based on a full accounting of both economic and social benefits and costs.

There are several ways that such a policy standard could be written. For the purpose of beginning a discussion we suggest that in addition to eliminating pollutants, an obligation, as with Section 438, should be to maintain or restore the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow to the maximum extent technically feasible. We further suggest four sequenced steps towards those ends:

- Preserve and retain natural features such as trees and shrubs as much as possible when new roadways are built or current ones expanded. These natural features reduce flow rates and allow for water to settle and be absorbed.

- Require measures such as frequent sweeping, catch basin cleaning, storm drain flushing, and management plans for deicing agents and roadside fertilizers.

- Treat as much runoff as possible on site utilizing elements of low impact development such as retention basins, swales and infiltration trenches and basins.

- Treat remaining stormwater discharges offsite or create appropriate offsets when onsite treatments are not viable.

In practice, such a standard would work as follows:

The first and most basic design feature should be that federal-aid highways, when possible, shall not destroy natural features that allow for infiltration and evapotranspiration of stormwater. By avoiding construction along steep banks, or by reducing the amount of vegetation that must be disturbed to complete a construction project, stormwater runoff can be defused or infiltrated cheaply and naturally.

Next, we suggest that standards should be developed to ensure that as many pollutants are removed or kept off of roadways prior to a rain event. Again, moderately inexpensive BMPs such as street sweeping and de-icing agent management plans can dramatically reduce total pollution discharges during a rain event.

However, retention of natural features and basic maintenance measures can only do so much. It is important that stormwater be treated onsite and allowed to settle into groundwater rather than directly discharging into waterways. The project must be designed in such a manner that it mimics the natural hydrology to the maximum extent practicable. "Maximum extent practicable" is the technical standard used in section 402 of the Clean Water Act. Since it has never been rigorously defined, it provides a good deal of flexibility to meet local conditions. In fact, regulations promulgated by the EPA in 1999 for Phase II of the stormwater program note that "the pollutant reductions than represent MEP may be different for each [permittee] given the unique local

hydrological and geological concerns that may exist and the differing possible pollutant control strategies." By defining an obligation but leaving the details to local designers, we can ensure that local conditions are respected and taken into account.

Finally, we recognize that right-of-way to construct appropriate infiltration techniques will not always be available. As it will be difficult to address stormwater runoff in these areas, we suggest that the policy standard require mitigation offsets and wetland restoration whenever on-site stormwater management is impossible or infeasible.

Such a standard for stormwater controls on federal-aid highways is similar to the guidance created per Section 438 of the Energy and Independence Act. It sets a goal and allows for various means of compliance, all based on local hydrology and weather. Yet whichever approach is chosen by a project developer, it will reduce stormwater discharges and impact water quality.

As noted above, we offer these recommendations to begin a discussion. They surely should be the subject of extensive technical discussion and revision. However, it is entirely appropriate that this committee consider the national interest in restoring and maintaining adequate water quality in the nation's streams, rivers, lakes, estuaries and coastal areas and recognize that the current arrangements are not getting the job done.

Thirty eight years ago, this committee declared a national goal to achieve adequate water quality to provide for the protection of fish, shellfish, and wildlife by 1985. We are still working towards that. You also declared a national policy to develop both point and nonpoint programs to achieve that goal. Programs have been developed, but more needs to be done. We ask you to give careful consideration to the benefits of a national policy standard for polluted stormwater management on the nation's federal-aid highways.

May 27, 2009

The Honorable James L. Oberstar
Chairman
House Committee on Transportation and Infrastructure
2165 Rayburn House Office Building
Washington, D.C. 20515

The Honorable John L. Mica
Ranking Member
House Committee on Transportation and Infrastructure
2163 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Oberstar and Ranking Member Mica:

As your Committee prepares to reconsider the Federal Surface Transportation Act, we respectfully ask that you include in the reauthorized law a clear policy that triggers the necessary standards and guidance to ensure that all new construction and significant reconstruction of Federal-aid roadways mitigate the impacts of stormwater runoff. We believe that these policies should require construction that mimics pre-construction hydrologic conditions to the maximum extent feasible, and take into consideration the localized water quality impacts of roadway projects. Finally, it will be critical that these standards promote cost-effective practices that maximize waterway protection while not compromising construction and maintenance of highway miles.

Nationwide, roads and related infrastructure comprise at least two-thirds of all paved surfaces. These impervious surfaces promote runoff—carrying with it pollutants from tailpipe emissions, fluid leaks, brake linings and tire wear – thereby delivering the roadway's pollutant load to the nearest receiving waterway.

Runoff from highways and related facilities constitutes a major part of the national water pollution problem. Most Federal-aid highways were built prior to this understanding, and therefore lack any stormwater controls. But best management practices to mitigate such impacts are now known and well understood and should therefore be an integral part of the reauthorized law.

In the Chesapeake Bay watershed, according to a 2002 Maryland study, highways account for 22 percent of urban nitrogen and 32 percent of urban phosphorus; 36 million pounds of nitrogen annually fall on Maryland alone from mobile and highway loads combined. One third of that, 12 million pounds, comes from mobile sources. By comparison, wastewater treatment plants contribute 17 million pounds of nitrogen a year.

The importance of mitigating the impacts of highway runoff stretch far beyond the Chesapeake. A study in Wisconsin showed that roadways produced some of the highest concentrations of phosphorus, suspended solids, bacteria and heavy metals. And a North Carolina Department of Transportation study showed that atmospheric sources related to automobiles accounted for up to 90 percent of nitrogen found in runoff from urban highways. Of the 42,256 impaired waters on the national Clean Water Act 303(d) list, 28,000 of the impairments are directly related to highway runoff. Unfortunately, over 28 percent of the impairments (12,001 water body

segments) are located within the Chesapeake Bay watershed jurisdictions. (DE 101; DC 27; MD 501; NY 610; PA 6,957; VA 2,534; WV 1,271).

Improved stormwater management is a national challenge presenting a vexing problem in the Chesapeake and waterways nationwide. Via the reauthorization process, we believe that it is possible to ensure that stormwater mitigation strategies are incorporated into all new construction and major retrofits of federal-aid roadways. Without this change, taxpayers will be forced to pay the more costly price of restoration to recover their degraded waterways.

We look forward to working with you on this important issue,

Governor Martin J. O'Malley
Maryland

Governor Edward G. Rendell
Pennsylvania

Governor Timothy M. Kaine
Virginia

Governor David A. Paterson
New York

Governor Joseph A. Manchin
West Virginia

Governor Jack A. Markell
Delaware

Mayor Adrian M. Fenty
District of Columbia

Delegate John A Cosgrove, Chairman
Chesapeake Bay Commission

Senator BOXER. Thank you. Would you like us to put your entire statement into the record?

Mr. SIGLIN. I would like to put the statement in the record, and I would also like to have your permission to put the attached letters from the six Governors of the Chesapeake Bay States arguing for the same thing.

Senator BOXER. Absolutely, we will do that.

We have just been informed that we, Jeff, I want to let you know, Senator Merkley, at 11 we are going to have to shut down because there is going to be an objection to our meeting.

So, my plan is to hear from Mr. Kolodziej. And then I am going to give my time over to you, Jeff, so you can make a statement and ask any questions. I am going to give that. All right?

Senator MERKLEY. Thank you, Madam Chair, I will really only have a couple of minutes.

Senator BOXER. That is fine. And then we will go back to Senator Cardin. And we could put questions into the record. But we are looking pretty good. Thank you for giving us that warning.

Senator CARDIN. Sure.

Senator BOXER. So, Mr. Kolodziej, please proceed.

STATEMENT OF RICHARD KOLODZIEJ, PRESIDENT, NGVAMERICA

Mr. KOLODZIEJ. Chairman Boxer, Ranking Member Inhofe, members of the Committee, as I mentioned, I am President of NGVAmerica. We are the national trade association for vehicles that are powered by natural gas and biomethane. Currently I am also President of the International Association of Natural Gas Vehicles, headquartered in New Zealand.

I thank you for the opportunity to be here today to discuss how increased use of natural gas vehicles can improve our national goals of reducing greenhouse gases, reducing urban pollution and reducing dependence on foreign oil. And while achieving all these goals more NGVs would help create jobs here at home.

NGVs are the fastest growing alternative to petroleum in the world. In 2003 there were only about 2.8 million NGVs in the world. Today, there are over 11.1 million NGVs, and the International Association of Natural Gas Vehicles forecasts that we will have 65 million NGVs in the world by 2020.

Most of the NGVs globally are small sedans. But for a number of reasons, including the sheer size of America, the strategy of the U.S. NGV industry has been to focus on high fuel use fleets—trash trucks, transit buses, short haul 18 wheelers, school buses, urban delivery vehicles of all types, shuttles and taxis. As a result, while we only have about 110,000 NGVs in the United States, we estimate that last year these vehicles used about 40 billion cubic feet of natural gas, which is the equivalent of 320 million gallons of gasoline that we did not have to import.

But with support of Government policies that number could reasonably grow to 1.25 trillion cubic feet of natural gas within 10 years, or the equivalent of 10 billion gallons. Now, some of this is going to be gasoline, but the majority is going to be diesel, which is important because diesel represents about 20 percent of the on road petroleum use. While there are many options to displace gaso-

line in light duty vehicles there are very few to displace diesel in heavier vehicles, and of those options natural gas can make the biggest impact the fastest.

And this would have substantial environmental benefits. For example, the California Air Resources Board recently concluded that on a wheel-to-wheel basis, NGVs produced 22 percent less greenhouse gases than comparable diesel vehicles and 29 percent less than comparable gasoline vehicles. This is as good as or better than some renewable fuels.

Importantly these numbers can be further improved if the natural gas is blended with renewable natural gas or biomethane, which can be made from landfill gas, animal waste, or sewage. That same CARB study showed that biomethane from waste is among the best greenhouse gas reduction strategies for transportation, reducing greenhouse gases by about 90 percent.

NGVs also produce less criteria pollutants like nitrogen oxides. EPA's recent announcement that they are considering further tightening national ozone standards means that more cities and counties than ever are going to be looking for economical alternatives for ozone reductions, and that means more natural gas vehicles.

And NGVs are economic. NGVs cost more to buy, but they are less costly to operate. Therefore, more miles driven means faster payback. The price of oil and natural gas historically has traded in an 8 or 9 to 1 ratio. That is 8 or 9 to 1 between a barrel of oil and 1,000 cubic feet of natural gas. But because of America's huge natural gas resource base and technology breakthroughs like horizontal drilling and gas shale fracturing that ratio is now 15 to 1—15 to 1 between a barrel of oil and 1,000 cubic feet of natural gas.

And the Energy Information Administration predicts that it is going to be 15 to 1 even in 2030. That means that NGVs will continue to be economically attractive to customers, especially fleet customers.

As to Federal policy, Congress could significantly accelerate the market penetration of NGVs through passage of S. 1408, the NAT GAS Act. This bill, which has bipartisan support in both the Senate and the House, would extend and expand the existing Federal financial incentives for the purchase and use of NGVs.

Senator Inhofe, the industry also appreciates your leadership in the introduction of S. 1809, a bill that would help streamline the EPA emission certification program for aftermarket conversion systems. If passed this bill would result in the availability of more systems for converting gasoline vehicles to run on natural gas—and they would be less expensive.

Thank you for your attention. I would be delighted to answer any questions.

[The prepared statement of Mr. Kolodziej follows:]

STATEMENT OF RICHARD KOLODZIEJ

ON BEHALF OF

NGVAMERICA

UNITED STATES SENATE COMMITTEE ON

ENVIRONMENT AND PUBLIC WORKS

March 24, 2010 Hearing

Opportunities to Improve Energy Security and the Environment through Transportation Policy

NGVAmerica
400 N. Capitol Street, NW
Washington, DC 20001
(202) 824-7366

STATEMENT OF RICHARD KOLODZIEJ
PRESIDENT, NGVAMERICA

UNITED STATES SENATE COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS

Opportunities to Improve Energy Security and the Environment through Transportation Policy

March 24, 2010

Introduction

NGVAmerica appreciates the opportunity to provide the following statement concerning America's energy security, the environment, and transportation policy. As the title of this hearing suggests, transportation policy has a profound impact on efforts to improve energy security and the environment. NGVAmerica believes that national transportation and energy policies should encourage the increased use of natural gas as a transportation fuel. Such policies would provide increased energy security, more U.S. jobs, cleaner air, and less greenhouse gas emissions -- while also providing significant economic benefits. These benefits result from the fact that natural gas is a domestic fuel with an abundant resource base here in the U.S. and North America. Natural gas also is a low-carbon fuel with a proven record of reducing emissions of harmful pollutants that contribute to ground level pollution and other air quality concerns such as particulate matter emissions and air toxics.

NGVAmerica is a national organization dedicated to the development of a growing and sustainable market for vehicles powered by natural gas, biomethane and natural gas-derived hydrogen. NGVAmerica represents more than 130 member companies, including: vehicle manufacturers; natural gas vehicle (NGV) component manufacturers; natural gas distribution, transmission, and production companies; natural gas development organizations; environmental and non-profit advocacy organizations; state and local government agencies; and fleet operators.

Energy Security Benefits of NGVs

Domestic Supply of Natural Gas

One of the historic barriers to increased support for natural gas vehicles (NGVs) has been the concern that the domestic natural gas resource base was not large enough to support both NGVs and traditional gas uses. For a number of years, the long-term forecasts of the U.S. Department of Energy and others tended to anticipate demand for natural gas exceeding U.S. production, leading to increased imports. That concern

has now been put to rest as a result of technology advances that significantly increase the natural gas production potential here in the U.S. and North America. Just a few years ago, it was estimated that the economically recoverable portion of our domestic natural gas resource base was sufficient to serve our needs for 65-years at current and projected use levels. Current estimates are that the U.S. now has well over 100 years of natural gas supply. As production technology improves further, it is expected that future estimates will be even greater.

Displacing Foreign Oil
Using natural gas in motor vehicles will reduce petroleum reliance. And using natural gas in high fuel use fleets -- particularly medium- and heavy-duty trucks -- is the most immediate pathway to lowering dependence on foreign oil. According to the U.S. Department of Energy, the average consumer drives about 12,000 miles per year, using about 500 gallons of gasoline. Light-duty *fleet* vehicles use more but, in general, the amount is still relatively small. On the other hand, large, medium- and heavy-duty trucks consume much more fuel on an individual basis. These high fuel-use vehicles (mostly operated in urban fleets) include trash trucks, transit buses, short-haul port trucks, goods delivery vehicles of all kinds, etc. An 18-wheel tractor trailer, for example, may drive 120,000 miles per year and get only 6 miles per gallon. That equates to 20,000 gallons of diesel fuel per year! Consequently, trucks and buses consume about a quarter of the on-road energy – mostly in the form of diesel fuel.

There are many alternative fuel and advanced technology options competing for the light-duty market (e.g., natural gas, propane, ethanol, electricity, plug-electrics). But for diesel-powered trucks and buses, the options come down to only two -- natural gas and biodiesel. Biodiesel is an excellent petroleum displacement fuel. However, biodiesel's potential is limited. Because of technical and other restrictions, existing diesel vehicles cannot use blends of more than 20 percent biodiesel, and most use only 5 or 10 percent. Plus, the availability of domestically produced feedstocks for biodiesel production (mostly soybeans) is limited. Natural gas, on the other hand, is an excellent heavy-duty fuel, with many models available today. In fact, most of the major truck and bus manufacturers now offer NGV models.

Environmental Benefits of Natural Gas

Criteria Pollutants
The same properties that make natural gas an excellent fuel for other applications also make it an excellent fuel for transportation. Natural gas burns cleaner than gasoline and diesel fuel, and most other transportation fuels as well. Not surprisingly, the first vehicles certified to the U.S. Environmental Protection Agency's (EPA) ultra-low

emission, super-ultra low-emission and Tier 2/Bin 2 standards were NGVs. The natural gas-powered Honda Civic GX has won numerous awards for its outstanding environmental performance. In 2009, the Civic GX was rated the "Greenest Car in America" by the American Council for an Energy-Efficient Economy – for an amazing seventh year in a row. Compared to the gasoline Civic, the natural gas-powered Civic produces 95 percent fewer emissions of volatile organic compounds and 75 percent less emissions of nitrogen oxides – pollutants that contribute to ozone formation. In fact, the vast majority of light duty NGV models currently available are certified to the Federal Tier 2/Bin 2 standard; only Bin 1, which requires zero emissions, is more demanding. In the medium- and heavy-duty truck and bus markets, Cummins Westport's and Emission Solutions' natural gas powered engines were the first engines to certify to the full-2010 federal emission standards, achieving extremely low NOx emissions levels well ahead of their diesel competition, and with less emission controls required.

The environmental benefits of NGVs are expected to continue to improve as new automotive technologies become available. As long as the internal combustion engine is with us and as long as refinements to it are possible, natural gas will be the cleanest transportation fuel to use in it. A recent National Academy of Science (NAS) report, titled *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use,* includes some very positive findings concerning NGVs. The report, which analyzes vehicle technologies as of 2005 and expected by 2030, projects that, with further expected improvements in vehicle technology and fuel efficiency, natural gas powered vehicles will provide superior benefits in terms of criteria pollutant reductions compared to nearly all other types of vehicles, *even electric and plug-in hybrid electric vehicles.*

NGVs Reduce Greenhouse Gases

NGVs also can play a role in reducing greenhouse gas emissions. Per unit of energy, natural gas contains less carbon than any other fossil fuel, and, therefore, produces lower carbon dioxide (CO_2) emissions per vehicle mile traveled. While NGVs do emit methane, another principal greenhouse gas, the increase in methane emissions is more than offset by a substantial reduction in CO_2 emissions compared to other fuels. The California Air Resources Board (CARB) has conducted extensive analyses on this issue, and concludes that burning compressed natural gas produces about 22 percent less GHGs than burning diesel, and 29 percent less than burning gasoline. The comparisons are based on well-to-wheels analyses, and include methane emissions. These reductions are equal to -- or better than -- some renewable liquid fuels.

Because of NGVs environmental benefits, many in the environmental community now support the use of natural gas for medium- and heavy-duty fleet vehicles. For example, at a National Clean Energy Roundtable last February, Former Vice President

Al Gore said "Electrifying the auto fleet, using natural gas for the 18- wheelers and the heavy vehicles as a transition -- then we can get off of all those imported liquid fuels that come from foreign oil and foreign products and solve the security and economic problem and put people to work in the process."

Natural Gas: A Renewable Fuel Option

Natural gas may be a fossil fuel, but its main component – methane – does not have to be. In fact, renewable natural gas or biomethane can be produced from any organic material, including landfill gas, sewage, animal and crop waste and even energy crops. A number of years ago, the U.S. Department of Energy (DOE) did a preliminary study that concluded that, from animal waste, sewage and landfill gas alone, America could reasonably produce 1.25 quadrillion Btus of biomethane per year. That's equivalent to about six percent of the natural gas used in this country. If crop waste and energy crops were considered, this number would be far larger. The CARB life-cycle analyses mentioned above also evaluated the greenhouse gas reduction potential of biomethane produced from landfill gas. Those analyses concluded that that this biomethane, when used in vehicles, reduces GHG emissions by almost *90 percent* compared with gasoline and diesel fuel – making it among the most effective available greenhouse reduction approaches. Given these findings, it is not surprising that the U.S. EPA's Renewable Fuel Program recognizes biomethane as an advanced biofuel.

Waste Management, an NGVAmerica member, and the nation's largest refuse and environmental management company, currently is producing biomethane at its Altamont landfill facility in California. The facility produces the equivalent of 13,000 diesel gallons of liquefied natural gas (LNG) daily. Waste Management uses the LNG to fuel 300 garbage trucks. In January, the U.S. Environmental Protection Agency's (EPA's) Landfill Methane Outreach Program presented Waste Management with one of its *Projects of the Year* awards for developing renewable natural gas at the Altamont facility. The LNG plant was built by another NGVAmerica member, Linde North America, and uses technology patented by America's Gas Technology Institute. According to EPA, the Altamont project's greenhouse gas benefits are equivalent to that provided by nearly 9,000 acres of pine or fir forests or the removal of 8,000 passenger cars. This and other landfill gas projects around the country demonstrate the feasibility of using renewable natural gas to power natural gas vehicles and displace petroleum.

Economic Benefits

Public policy benefits such as reducing oil dependence, urban pollution and greenhouse gases are critical, but vehicle owners – especially business fleet owners -- are overwhelming driven by economics. If they can save money, they are far more interested. Fortunately, for most customers -- especially, high fuel-use customers, NGVs make economic sense. NGVs do cost more money upfront to purchase. The Honda Civic GX, for example, has an incremental cost of about $6,000. Natural gas transit buses generally cost $40,000 - $50,000 more than diesel buses. For an 18-wheeler, the added cost could be as high as $80,000. These are not insignificant first-cost premiums. But the combination of much lower fuel cost, lower maintenance cost and federal (and, in some cases, state) economic incentives, translates into a very favorable rate-of-return for fleets. For example, a trash truck, which uses 7,500 to 10,000 gallons of fuel per year, could recover its investment in less than 2.5 years, and see a net life-cycle savings of up to $80,000. Step-vans, which are used for delivery of baked good, snack foods, overnight mail, etc., could see a payback in less than 1.4 years, with a net life-cycle savings of up to $66,000. Even school buses, which do not drive as far per day, can get a payback within 3 years.

In most states, retail compressed natural gas sells for less than $2.00 a gasoline gallon equivalent whereas gasoline is selling for close to $3.00. In Utah, natural gas is priced about $1.00 per gasoline gallon equivalent. Fortunately, it is anticipated that natural gas will continue to be priced far less than gasoline and diesel. Historically, the wellhead price of natural gas has traded in an 8- or 9-to-1 ratio with oil (barrel of oil to thousand cubic feet (Mcf) of natural gas). Currently, the wellhead price of natural gas is about $5.00 per thousand cubic feet and petroleum is around $80 per barrel. Therefore, today, the price ratio is 16-to-1. The U.S. Energy Information Administration forecasts that the wellhead price of natural gas will increase, but quite slowly. Specifically, the agency forecasts that natural gas will not exceed $8 per Mcf until 2030. Even at a price of $8 per Mcf, natural gas on a barrel-of-oil-equivalent basis sells for less than $47 per barrel of oil. However, when the world economy improves and the global demand for oil again begins to exceed supply, world oil prices will rise. At $100 per barrel and $8 per Mcf, the ratio is over 12-to-1. At $150 per barrel, the ratio is almost 19-to-1.

Jobs

More NGVs means more U.S. jobs. Jobs would result from engineers, technicians and others manufacturing engines, equipping new trucks with natural gas engines and cylinders, compressed and liquefied natural gas manufacturing storage vessels and

fueling dispensers for natural gas stations and providing other support services. More NGVs also would provide much needed support for the nation's automotive dealerships, which will be involved to retrofit and install aftermarket conversion systems. In addition, more NGVs would ensure that natural gas producers are able to continue to hire and retain employees who are drilling for and producing natural gas. These investments will put people to work, and strengthen energy security by ensuring that we use more domestic natural gas and less petroleum imports.

Accelerating the Use of NGVs

Because of the many benefits of NGVs, it makes sense to support transportation policies that encourage their increased use. The time to support NGVs has never been better. Many other promising vehicle technologies are "over-the-horizon" and need technical or other breakthroughs to be commercially competitive. Not NGVs. NGVs are here today. No breakthroughs are required. If you look at the product offerings available, that becomes clear. Natural gas options are now available from: every major trash truck manufacturer; all but one major transit bus manufacturer (and it now appears that the last holdout will be offering natural gas buses); two of the three largest school bus manufacturers; and many of the work/vocational truck chassis makers such as Kenworth, Freightliner and Peterbilt. Also, while only one light-duty vehicle is being sold in the US by an original equipment manufacturer (the Honda Civic GX), there is a long list of light-duty Ford and GM sedans, vans, SUVs and pick-up trucks for which EPA-and CARB-certified aftermarket conversion systems are available. And new NGV models keep being added all the time.

To accelerate the use of NGVs, Congress needs to continue its support for NGVs and expand current incentives for them. NGVAmerica urges Congress to pass the "New Alternative Transportation to Give Americans Solutions" (or NAT GAS) (H.R. 1835 and S. 1408). That bill would significantly extend and expand existing NGV incentives, and send a signal to America's fleets and consumers that increasing the use of NGVs is important to the country. The House version of the NAT GAS Act has 139 bipartisan co-sponsors. The Senate version also has bipartisan support, and has Majority Leader Harry Reid as an original sponsor. NGVAmerica estimates that enactment of the NAT GAS Act incentives will create and support between 400,000 to 600,000 direct and indirect jobs.

In addition, providing regulatory relief for manufacturers who produce alternative fuel conversion systems, as contained in S. 1809, would enable these businesses to expand their offerings of emission certified systems. Industry and EPA need to work together to find solutions that enable more conversion systems to be certified faster

and with less expense. NGVAmerica believes that the regulatory relief that has been proposed – streamlining certification, allowing carry-across certification of similar vehicles, and expanding the model year concept for aftermarket systems – are all reasonable steps that should be taken to facilitate the increased availability of natural gas fueled vehicles. If these provisions had been in place the last time petroleum prices surged, thousands (perhaps hundreds of thousands) more NGVs would be on the road today.

In addition to passing the NAT GAS Act, Congress also should authorize a new NGV research, development and demonstration program, such as contained in S.1350. The U.S. Department of Energy once had such a robust NGV R&D program, but several years ago stopped funding this critical work. Last year, Congress appropriated $5 million for NGV R&D. This support is much appreciated but still far short of what is needed. A robust and well-funded R&D program would ensure that NGVs continue to hold their advantage in terms of efficiency and environmental performance, would create new opportunities for renewable natural gas, and would send the signal to automakers and truck manufacturers that government is a willing and able partner in bringing new products to market.

For additional information concerning this statement, please contact:

Richard Kolodziej
President
NGVAmerica
400 N. Capitol Street, NW
Washington, DC 20001
rkolodziej@NGVAmerica.org
(202) 824-7366

Paul Kerkhoven
Director, Government Relations
NGVAmerica
400 N. Capitol Street, NW
Washington, DC 20001
pkerkhoven@NGVAmerica.org
(202) 824-7363

Jeffrey Clarke
General Counsel & Regulatory Director
NGVAmerica
400 N. Capitol Street, NW
Washington, DC 20001
jclarke@NGVAmerica.org
(202) 824-7364

Committee on Environment and Public Works
Follow Up Questions for Written Submission –
Questions to Richard Kolodziej, President of NGVAmerica

Senator Barbara Boxer:

Boxer Q. 1. You have suggested that transportation policy should support increased use of natural gas vehicles. Do you have any specific recommendations for the next surface transportation authorization?

The provision that would have the largest impact on the growth of the natural gas vehicle (NGV) market is the extension, for an additional 10 years, of the excise tax credit first included in the last transportation legislation (SAFETEA-LU) of 50 cents per gallon of compressed natural gas or liquefied natural gas when used as an on-road transportation fuel. This provision, which is included in S. 1408 (the NAT GAS Act), would make NGVs even more economically attractive to a greater number of fleet and individual customers.

In addition, there are a number of transportation programs – including CMAQ, FTA grants, CFF grants and the DERA program – the funding of which are heavily weighted to diesel-powered vehicles and diesel retrofits. We believe that much more of this funding could (and should) be targeted to non-petroleum fuels and technologies. To this end, the following list of items might be considered by the Committee. Some are modifications of existing programs. Some are new initiatives:

a. Direct the EPA to give higher priority to the replacement or repowering of diesel vehicles with NGVs under the Diesel Emissions Reduction Program and Clean School Bus Program. Modify the program to promote public-private partnerships that help finance alternative fuel school buses that displace diesel-based fuels, achieve the 2010 air quality standards (or any subsequent new standard), and reduce the carbon intensity of the fuel by at least 10%. (modification of existing program)

b. FTA has indicated that all new buses (standard diesel, natural gas and diesel-hybrid-electric) qualify for the 83 percent federal share based on the policy that such buses contribute generally to cleaner air and maintaining compliance with federal air quality standards. Under the past several transportation appropriations' acts, biodiesel buses, however, receive additional federal support in the form of an increased federal share of 90 percent of the total

vehicle cost. This inequity should be corrected. (modification of existing program)

c. Designate $100 million per year of highway funds (to be controlled by the Secretary of Transportation) to pay for natural gas school buses and infrastructure. (modification to CMAQ)

d. Provide federal incentives for federal, state and local governments to transition or convert their vehicles to natural gas. Designate $100 million per year of Highway funds (to be controlled by the Secretary of Transportation) to pay for public sector alternative fuel projects. (modification to CMAQ)

e. Direct the FTA to provide incentives for purchasing and using dedicated NGVs for the following programs: (1) Transportation for Elderly persons and Persons Disabilities (Sec. 5310); (2) Job Access and Reverse Commute (JARC) (Sec. 5316); and New Freedom formula grant (Sec. 5317). There would be no local match required for the incremental cost. (Modification of existing programs)

f. Climate Change Legislation/Energy Bill. The past several iterations of climate change legislation have included several significant provisions relating to the electrification of transportation. This includes providing allowances to the Department of Energy to conduct research and development on electric vehicles and electric infrastructure. The bills also encourage electric utilities to be involved in building out electric transportation infrastructure, and utility commissions are encouraged to provide favorable treatment for such investments. These types of programs certainly are needed, and we support them. However, these efforts should include natural gas as part of the electric transportation future and include ways of promoting the use of natural gas in hybrid and plug-in hybrid electric vehicles. In addition, natural gas utilities should be encouraged to invest in building-out natural gas transportation infrastructure.

Q. 2. **You discussed in your testimony the economic benefits of natural gas vehicles and the relatively quick payback, given the not so insignificant upfront cost of purchasing such vehicles for school bus and truck fleets. Do you have any suggestions on how to make natural gas vehicles more affordable?**

NGVs are making economic sense for an increasingly larger segment of vehicle market. This especially is the case in certain niche market applications (e.g., refuse trucks, transit buses, urban goods delivery, taxi fleets) that are high fuel-use vehicles capable of being centrally fueled. For a number of reasons, NGVs have greater first cost than comparable gasoline and diesel vehicles. However, natural gas costs less than gasoline and diesel fuel and, therefore, NGVs are less expensive to operate per mile than gasoline and diesel fueled vehicles. The more miles a vehicle drives in a given year, the more money the operator will save. The higher up-front cost can frequently be recouped in the case of high fuel-use fleet vehicles because of the lower cost of natural gas. However, in the case of lower mileage vehicles or vehicles that are sold after only a few years of use, the economics of owning an NGV is not as compelling. That is why government incentives are necessary. Longer term, the cost of NGVs will come down as there is more demand for these vehicles and the production volumes for NGVs allows for better economies of scale. Incentives help provide increased demand for NGVs now -- as do government programs that could encourage the purchase of NGVs (e.g., Clean Cities, DERA, FTA Bus Funding). Research and development programs also can help bring down the cost of NGVs. Government should partner with manufacturers to develop the next generation of natural gas-powered engines and vehicles. Without this support, manufacturers must subsidize the cost of their new NGV product offerings, sell them at a loss, or seek to recoup all of their investments based on low-production model offerings. Currently the latter option appears to be the one most often taken by manufacturers. Another critical factor in the cost of NGVs is the cost of the light weight storage cylinders. These cylinders rely on high-cost carbon-fiber wrap. Research and development programs could identify less costly processes for developing these materials or help identify less costly materials. In addition, in the case of light duty vehicles, some EPA emission certification rules are unnecessary and burdensome, and have made it difficult and costly to offer alternative fuel conversion systems. EPA is in the process of proposing regulatory relief to address some of these difficulties but more could be done legislatively. See response to Inhofe Q. 1.

Senator James M. Inhofe

Inhofe Q. 1. Mr. Kolodziej, as you know I've been working for some time with both the NGV industry and the EPA to simplify the emission certification process for after-market conversion kit manufacturers. For the benefit of the Committee, could you comment on the problems after-market conversion manufacturers are having with EPA's emission certification process?

The problems faced by aftermarket conversion companies are multi-faceted. Some of them are due to the fact that aftermarket conversions by definition involve the modification of vehicles manufactured by other companies. That means that, to develop an aftermarket system, the conversion company must acquire an OEM vehicle and determine how to engineer its system so that it is compatible with the OEMs proprietary systems. This process can take several months. The next step is to ensure compliance with the EPA emission certification requirements and EPA's on-board diagnostic (OBD) requirements. This may take several more months. The effect of these delays is that natural gas aftermarket conversion systems are generally not available until half the model year has expired. This significantly undermines demand for these products. EPA currently provides some allowances to aftermarket manufacturers by not requiring compliance with all the OBD requirements (as long as the manufacturer can demonstrate compliance with certain critical diagnostic functions). This flexibility, however, has not been codified in the regulations or EPA guidance.

Another difficulty with EPA's procedures is the need to renew certifications each model year even though the aftermarket system and vehicles to be converted have not changed. EPA could alleviate this burden by declaring that certificates for aftermarket conversions do not expire with respect to future use. We also would like to see EPA develop an alternative process for approving aftermarket conversion systems. The current regulations require certification of specific systems and vehicles. Manufacturers must perform emission testing and verification on each engine family for which they intend to install their system. This means that for some vehicles, such as the Ford F-150, they may have to certify the conversion system on five different engine families just to be able to cover all the different iterations of the F-150. With the cost of compliance being as much as $100,000 per engine family, this requirement can be a substantial economic deterrent. We would propose that EPA, like the European authorities, allow aftermarket manufacturers to certify that their conversion systems are capable of adapting to different OEM products -- much

the same way that computer software can be used in different computers without special changes. This latter approach, more than any other, would save a great deal of time and expense and allow for the proliferation of more aftermarket conversion systems.

Another obstacle is the fact that California has adopted different and more demanding requirements for aftermarket conversions. These regulations impact vehicles sold in California and, in some cases, vehicles sold in states that have adopted California's low-emission vehicle regulations. Many of the issues identified above are magnified in the case of California's regulations. And the fact that manufacturers must certify to two different sets of requirements further complicates and delays bringing aftermarket products to market. It is important to note that the difficulties associated with California's regulations do not have to do with difference in emission standards or emissions performance but rather have to do with emission testing procedures and the process of demonstrating durability and compliance with onboard diagnostic requirements.

Inhofe Q. 2. As you know, the NGV industry has a chicken-and-egg problem. Vehicle manufacturers won't make NGVs until the fueling infrastructure is in place and the fueling station owners won't put in stations until there are vehicles that could refuel. What's the industry's strategy to overcome this problem?

The NGV industry primarily has looked to the private sector (with government help when available) to build and operate NGV fueling stations and expand the NGV fueling infrastructure network. To make this significant investment, these stations must be profitable. The industry's initial strategy for developing profitable stations has been to focus on high fuel-use, centrally fueled fleets. This includes transit buses, refuse haulers, airport shuttle buses, goods delivery companies, and taxis. Because they are high fuel-use vehicles, fewer vehicles are needed to make stations profitable. However, once the stations to serve these fleets have been built, many of these stations create opportunities to bring in other fleets to use them. An excellent example is airport stations where many different applications (e.g., rental car shuttle buses, airport shuttle buses, hotel shuttle buses, taxicabs and the general public) can take advantage of central public access stations. Port facilities probably offer the next great opportunity in expanding fueling infrastructure for natural gas because of the large concentration of vehicles operating at each port facility and also serving

each port facility. Military bases and college campuses also offer many of the same advantages as noted above but, to date, have not been adequately addressed by our industry.

The NGV industry is now also aggressively pursuing what are referred to as "point-to-point" fleets. These are fleets that primarily drive between two cities (e.g., Los Angeles- and-San Francisco, Houston-and-Dallas, Oklahoma City- and Tulsa, New York-and Boston). There are tens of thousands of such vehicles in the U.S. Included in this category are short-haul and many over-the-road truck fleets. These markets offer the most immediate opportunity to replace large amounts of petroleum fuel with natural gas because of the amount of fuel these trucks use and because increasingly truck manufacturers are offering medium and heavy duty natural gas trucks for sale. Many of these fleets operate on major corridors throughout the U.S., and they are capable of driving long-distances without stopping for fuel. That means natural gas likely could capture a large share of these trucks by strategically placing natural gas fueling stations along key interstate highways and in major urban cities across the country.

Moving beyond the niche market fleets and medium- and heavy-duty trucks, the consumer represents a huge untapped opportunity for NGVs. Thus far, the natural gas industry has not targeted individual consumers except in certain targeted markets like Southern California, New York, and Utah. In order to capture a share of the consumer market, the proliferation of home refueling units and bi-fuel vehicles must occur. Our industry is in discussions with the OEMs, encouraging them to make more light-duty vehicles available. Many of these manufacturer's already offer light-duty NGV passenger cars in Europe, Asia and South America. Several companies also have indicated plans to bring a home refueling unit to the market in the near future.

Inhofe Q. 3. Mr. Kolodziej, I'm a strong supporter of bi-fueled NGVs, which can also help overcome the chicken-and-egg problem. They operate on either natural gas or gasoline at the flip of a switch. Coupled with a natural gas home refueling station, natural gas would likely cover 80 to 90 percent of the driving most people do. But because it's bi-fuel, you can still take that long distance trip from home and refill with gasoline if needed. It's very similar to the concept of a plug-in hybrid except that the technology exists today, not 10 or 15 years from now. What do you think is needed to promote the use of bi-fueled NGVs?

You are correct. Most of the NGVs around the world are bi-fueled, light-duty vehicles. The proliferation of bi-fuel vehicles in the U.S. would allow our natural gas industry to pursue non-centrally fueled fleets and the largest fuel consuming sector, individual consumers. Currently, there are federal financial incentives for the purchase or conversion of dedicated NGVs, but none however, for bi-fuel NGVs. The NAT GAS Act (S. 1408) would change that by providing a tax credit worth 50 percent of the incremental cost of a bi-fuel vehicle. This incentive would not only stimulate the conversion of gasoline vehicles to bi-fuel vehicles, but it would likely encourage OEMs to offer these vehicles for sale.

Inhofe Q. 4. It's my understanding that natural gas and propane powered vehicles have experienced strong growth in many other countries. Can you talk to us about the growth of NGVs around the world?

We believe that NGVs are the fastest growing non-petroleum transportation fuel in the world. In 2003, there were only 2.8 million NGVs worldwide. Today, there are over 11.1 million, and the International Association of Natural Gas Vehicles forecasts that, by 2020, there will be 65 million NGVs on the world's roads. Over 80 countries now have a growing NGV market. The leader is Pakistan with over 2,250,000 NGVs. Argentina has 1.8 million. Brazil has 1.6 million. Iran has 1.7 million, and their goal is to have over 3.5 million within five years. There are now 13 countries that have more NGVs on the road than the U.S. – including India, Italy, China, Colombia, Thailand, Egypt and even Bangladesh. NGVs offer the benefits of reduction in oil imports, urban air pollution, greenhouse gases and operating cost. In different countries, one or more of these benefits are the primary driver for NGV growth. In the U.S., all of these benefits are important.

Inhofe Q. 5.As mentioned in your statement, the natural gas Honda Civic GX, has been awarded the "Greenest Car in America" for 2009. Would you expand on a few of the environmental benefits the increased use of NGVs offer?

In general, natural gas burns cleaner than other fuels and, because it is a less complex fuel, the emissions from NGVs generally can be controlled with less complex emission control systems. The primary environmental benefits of NGVs are that they reduce air toxics, nitrogen oxide emissions, particulate

matter and greenhouse gas emissions relative to gasoline and diesel fueled vehicles. As noted, the Civic GX has won numerous awards and has been declared the Greenest Car in America for seven years in a row. Other natural gas vehicles also have achieved recognition for being the first vehicles to certify to the demanding ultra-low emission and super-ultra low-emission vehicle standards. The natural gas engines produced by Cummins Westport and Emission Solutions were the first engines to meet the demanding 2010 EPA emission standards for heavy-duty on-road engines.

In the past, environmental advocates have emphasized reductions in criteria pollutants such as nitrogen oxides, hydrocarbons, carbon monoxide, and particulate matter. We believe that the past achievements of NGVs will continue in the future. The use of more sophisticated emission control strategies and vehicle technologies will allow manufacturers that use natural gas to produce even lower-polluting vehicles. This point has been proven most recently by the fact that the Honda Civic GX has retained its claim to the Greenest Car despite the improvements in gasoline engines and the availability of hybrid vehicles. It also is important to note that there is no reason why natural gas could not be the fuel used in hybrid vehicles or even future plug-in hybrid vehicles. In fact, a new company, Hybrid Kinetic Motors, has recently announced that they will be building a factory in Alabama with the capacity to build 300,000 natural gas hybrid vehicles per year.

As mentioned, heavy-duty natural gas engines manufacturers also have achieved very low NOx and PM emissions without the need for selective catalytic reduction technology employed by most diesel engine manufacturers. And we expect those achievements to continue.

More recently the focus has been on carbon emissions. Per unit of energy, natural gas contains less carbon than any other fossil fuel, and thus produces lower greenhouse gas emissions per vehicle mile traveled. The California Air Resources Board (CARB) has concluded that NGVs produce 20-30 percent less greenhouse gases (well-to-wheels) than comparable gasoline and diesel fuel vehicles. Importantly, according to CARB, *renewable* natural gas (or biomethane) produces about 90 percent less greenhouse gas emissions than gasoline and diesel fuel. Biomethane can be produced from any organic material such as sewage, animal and crop waste or energy crops. Raw biogas is produced naturally in landfills. This biomethane can be blended with natural gas to further improve NGVs' greenhouse gas advantage. In the U.S., interest in renewable natural gas is only just beginning. In Europe, renewable natural gas is one of the most heavily promoted fuels.

Senator BOXER. Thank you.

Senator Udall, I just want you to know how we all send our love and condolences to you on your deep loss, and how we know how proud you were of your dad and how proud your dad was of you. So, on behalf of all of us, we wanted to say that.

Senator UDALL. Chairman Boxer, and to all the members of the Committee, thank you very much, and the outpouring has been overwhelming, really, more than anything. So, I just thank you for that. And my dad was very proud of the work this Committee has done. I know you talked to him on the phone a couple of months ago. So, he is following up there what we are doing.

Senator BOXER. OK.

Senator UDALL. He wants to see something done. He would have said to me, Tom, get back to work. And that is it. So, OK. Thank you very much.

Senator BOXER. So, here you are. Back to work.

Senator UDALL. Thank you.

Senator BOXER. Now our situation is, this is bad. We have 7 minutes before we are going to be shut down. I am going to give my time over to Senator Merkley, who has yet to speak. So, Senator, if we could just keep our statements or questions to 2 minutes? It is a shame, but we are caught up in something that has to do with healthcare.

Senator MERKLEY. Thank you. I will skip a statement and just ask a question so that my colleagues can ask one as well.

Specifically, when we are looking at 20 million barrels per day consumption, and I believe that about a little over 11 of that is imported, I know the numbers jump around, a fair amount is from Mexico and Canada, that number changes also, but in the end I think we are in the category of about 6 million or 7 million barrels per day from the Middle East and Venezuela. Is that about right?

OK. When we look at the combination of approaches that are being discussed here, ranging from diversification of our domestic car fleet, certainly to greater use of other transportation options, to conversion to natural gas, as was mentioned, if we are determined as a Nation, can we not easily eliminate our dependence on foreign oil over the next 20 years?

Mr. KOLODZIEJ. We could certainly make a huge impact. People talk about panaceas. There are no panaceas. We have a lot of options. We have electric vehicles, plug hybrids, natural gas, propane, ethanol, and methanol. We have a lot of options. But we really do not have choices. We have to use all the alternatives that we have available today in the applications where they make sense today if we are going to make an impact. We cannot just pick one or two. In the case of natural gas we feel that high fuel use vehicles, especially urban vehicles, are the place to go.

Senator MERKLEY. Granted we need to use all the options, but do you see this as an achievable goal over the next 20 years if we have a structured plan for our Nation?

Mr. KOLODZIEJ. We will not be independent, but we will be much less dependent, and much less dependent is something I think we should strive for. I think total independence probably is not achievable because of the world market for oil. But if we can have a system where our commercial infrastructure cannot be impacted be-

cause of an embargo, that would be something we ought to be focusing on.

Mr. LOVAAS. I agree that technically we would not be energy independent in 20 years but we would definitely be energy secure if we set our minds to it. And this has to do with some of the supply options that Mr. Kolodziej mentioned, and we need an array of those. And also it has to do with moderating demand, and that is about vehicle efficiency. And that is also about addressing travel activity through the transportation bill especially.

Senator MERKLEY. Thank you.

Senator BOXER. Thank you.

Senator Inhofe.

Senator INHOFE. Thank you, Madam Chairman. We have to make this real quick, so I will. I just have to get this in every time we talk about wanting to be independent. All we have to do is take the restrictions off the United States so we can develop our own resources like every other country does. That, combined with Canada and Mexico, we are putting together a study now to see how long it would take to be totally independent, and it is way, way less than 20 years.

First of all, I would ask for consent to put this letter in the record from the National Propane Gas Association.

Senator BOXER. Without objection.

Senator INHOFE. And I would say to you, Mr. Kolodziej, that we have been working on this for a long time. And I appreciate the comments that you made. We have bureaucratic obstacles, quite frankly. The EPA is helping us and working with us right now.

As you know, in my home town we have Tom Sewall who has developed technologies that he is actually selling to other countries. He is doing conversions along with the home units that you can convert your own natural gas to compressed natural gas. So, we are making some headway there.

And you are right. I would just like to make sure that everyone knows that those who are supporting our legislation to do this are Harry Reid, Orrin Hatch, Robert Menendez, Mark Begich, Mark Pryor, Lisa Murkowski, myself and others.

So, the question I would ask you, and it is a yes or no question, is have you ever seen anything that is enjoying that kind of bipartisan support?

Mr. KOLODZIEJ. Not recently.

Senator INHOFE. No. Thank you. The other thing that I would like to just have you, you stated it well before, on the potential we have in natural gas, that was to be able to develop those reserves that I talked about in my opening statement, we would have to be using the technology that is out there right now in hydraulic fracturing specifically. I think you said that in your statement, did you not?

Mr. KOLODZIEJ. Yes. Hydraulic fracturing is critical right now. And you know, since the 1940s we have drilled about 1 million of these fracturing wells, and the safety record has been extraordinary.

Senator INHOFE. Thank you. Thank you, Madam Chair.

[The referenced information follows:]

Statement for the Hearing Record

Opportunities to Improve Energy Security and the Environment through Transportation Policy.

Environment and Public Works Committee

United States Senate

Wednesday, March 24, 2010

The National Propane Gas Association (NPGA) appreciates this opportunity to present recommendations on the issue of improving U.S. energy security and environmental quality through transportation policy.

The National Propane Gas Association is the propane industry's national trade association representing 3,100 companies including producers, wholesalers, transporters, and retailers of propane gas as well as the manufacturers and distributors of associated propane equipment and appliances. The largest group of NPGA members are retail propane marketers, the vast majority of which are small businesses. Retail propane marketers distribute propane gas for use in residential and commercial installations, agricultural and industrial applications, and as a clean air alternative engine fuel for both over-the-road vehicles and off-road engines such as those used in forklifts. 50 million Americans choose clean-burning, efficient, and climate-friendly propane as their energy source.

Introduction to the Propane Gas Industry

Propane is a non-toxic, colorless, odorless gas that is derived from natural gas processing and petroleum refining. In 2007, 10.2 billion gallons of odorized propane were sold in the United States for use in residential, commercial, industrial, agricultural, and motor fuel applications. Approximately 0.9 percent of U.S. energy needs are met by propane and propane combustion accounts for 0.8 percent of total U.S. CO2 emissions. Over 90 percent of NPGA's retail marketer members are classified by the federal government as small businesses.

The propane industry in the United States is very diverse geographically. Propane marketers are located in every state and likely serve customers in every county. Propane marketers compete against each other for customers. Moreover, there is no such thing as an approved rate of return or a guaranteed service area in the industry, so companies must maintain their operational efficiencies in order to remain in business. Propane has been a useful energy resource for Americans since entrepreneurs found ways to store, transport and use it during prior to World War I. Use expanded steadily during the 1930s, and resumed in the post-war 1950s. Propane played a significant role in transportation during the middle decades of the 20th century, and is now experiencing a resurgence of interest.

With so much history behind it, the propane delivery and storage infrastructure is

extensive. There are approximately 70,000 miles of pipelines;10,000 retail distribution facilities; over 40,000 long-haul and local delivery trucks; 22,000 rail tank cars; and 56,000 trained and dedicated employees. Propane is well-known and understood by those who deliver it and those who rely on it. Moreover, propane is highly regulated by federal, state, and local governments and enjoys a superior safety record.

Propane Transportation and Energy Security

Approximately 90-percent of propane is manufactured in the United States through natural gas processing and petroleum refining, while approximately 10 percent of U.S. propane supplies are imported, primarily from Canada. Thus, propane is a readily available and secure energy source. Moreover, as natural gas exploration and production technology expands and improves to meet demand, the U.S. will find itself with more than adequate supply available to produce propane. In fact, according to the *American Clean Skies Foundation*, the United States has 2,247 trillion cubic feet of natural gas reserves, enough to last more than 100 years. In this context, efforts to increase the use of propane powered vehicles makes economic sense and will naturally reduce U.S. dependence on imported petroleum used for transportation fuel.

Noticeably reduced reliance on foreign petroleum sources will occur as large high-fuel-use government and commercial motor fleets begin to switch to propane engine technology. More importantly, propane engine technology exists in vehicles available today to help lower dependence on foreign oil. In the light-duty area, Ford Motor Company offers propane versions of both its F-150 and F-250 pickup trucks, and General Motors offers its 6.0 liter propane engine for use in a variety of commercial cargo and passenger vans. In the medium to heavy duty area, companies such as Cummins build propane powered engines for use in school buses, utility vehicles and other heavy duty applications.

From an economic perspective, propane is the most cost-effective alternative to conventional transportation fuels used in fleet applications when capital investment costs, operation, and maintenance costs are all taken into consideration. Propane fleet operating costs typically range from 20-to 40-percent less than those of gasoline-operated fleets. First of all, propane refueling infrastructure costs are lower than similar gasoline, diesel and natural gas infrastructure costs. In addition, of all available alternative fuels, propane offers the best mix of vehicle driving range, durability, and performance. As a result, the up-front costs of propane fleet vehicles and infrastructure set-up can be offset by lower operating and maintenance costs over the lifespan of the vehicles. The time it takes for these savings to offset capital costs depends on vehicle usage patterns, specifically, the average distance traveled monthly or annually. Fleet vehicles typically travel long distances and have very high fuel consumption, so the payback period on propane fleet vehicles can be very reasonable.

Propane Vehicles and Greenhouse Gas (GHG) Emissions

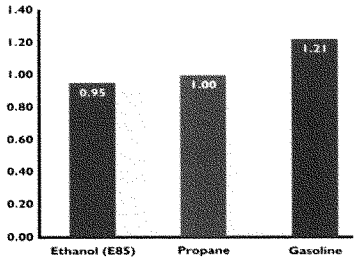
Propane has the lowest carbon dioxide (CO2) emissions per Btu of any common fuel except natural gas. Propane emits significantly less CO2 per Btu than ethanol, gasoline, kerosene, diesel, heavy fuel oil, and coal. Natural gas (Methane) is lower in CO2 than propane, but methane is chemically stable when released into the air and produces a global warming effect 25 times that of carbon dioxide. In comparison, propane has a very short atmospheric lifetime *and* low carbon content. In fact, the *Intergovernmental Panel on Climate Change* reports that "Given their short lifetimes…it is not possible to derive a global atmospheric burden

or mean abundance for most VOC from current measurements." (VOCs explicitly include propane.) This makes propane even more advantageous from a climate change perspective in many applications.

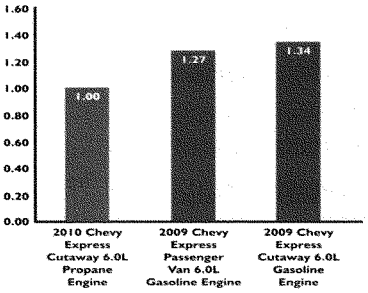
Propane shines as one of the most promising ways to reduce emissions in many applications including transportation. Programs administered by the Congressionally-authorized Propane Education and Research Council (PERC) are showing dramatic progress in moving cleaner solutions into the marketplace. The beauty of this situation is that propane is available today, is available everywhere in the nation, and has reduced carbon emissions already. Attached to this statement is a report entitled "Propane Reduces Greenhouse Gas Emissions: A Comparative Analysis." This report, published in November 2009 by PERC, quantifies the greenhouse gas profile of propane and other fuels in numerous applications.

From the PERC study, below are some comparison charts that illustrate graphically how propane CO2 emissions in various transportation applications exceed or favorably compare with similar vehicles powered by other fuels.

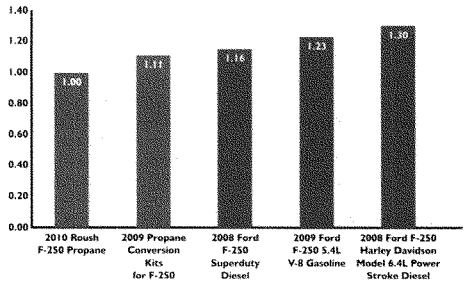
Ford F-150 - Greenhouse Gas Comparison



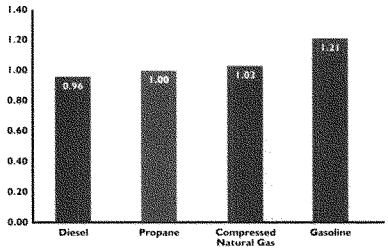
GM 6.0L Engine – Greenhouse Gas Comparison



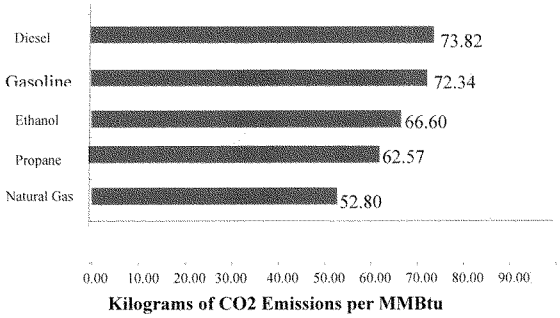
Ford F-250 – Greenhouse Gas Comparison



School Buses – Greenhouse Gas Comparison



Carbon Dioxide Emission Factors By Fuel



Ramping-Up Alternative Fuel Vehicle Programs and Investment

Propane vehicles offer proven high-performance and a superior greenhouse gas emissions profile. Moreover, propane vehicles are available today in a variety of fleet applications from school buses and maintenance vehicles, to taxis, delivery trucks, utility vehicles and shuttle vans.

NPGA is pleased that Congress is beginning to realize the role that transportation plays in the accumulation of total greenhouse gas emissions. Nonetheless, we believe the U.S. government can take a much bigger role in advocating increased use of clean-burning propane in the transportation sector. Below are some suggested initiatives that the propane industry believes will help bring propane fueled vehicles into the mainstream and help address our energy security and environmental goals.

- *Add Propane to and Pass the NAT-GAS Act* - Because of the similarities in carbon emissions and usage profile of propane and natural gas, NPGA strongly believes that propane should be given equal footing with natural gas in the *New Alternative Transportation to Give Americans Solutions* (NATGAS) *Act* (H.R. 1835/S. 1408), Properly amended, this legislation would extend incentives to produce natural gas and propane vehicles and signal to fleet operators that the federal government strongly supports rolling out clean vehicle technology.

- *Pass the Fueling America Act* (S. 1350) – While the NAT-GAS Act is exclusively aimed at helping the natural gas vehicle community, S. 1350 is a similar bill that takes a fuel neutral approach by including propane. S.1350 would provide tax incentives toward the purchase of propane and natural gas vehicles as well as propane and natural gas refueling infrastructure. The legislation also includes language that creates a federal alternative fuel R&D program, advocates switching federal fleets to run on propane or natural gas, and encourages a streamlined federal certification process for converting vehicles to propane or natural gas.

- *Pass Propane and Natural Gas Vehicle Conversion Legislation* (S. 1809/ H.R. 3431): Existing EPA emissions certification procedures effectively preclude converting vehicles to run on propane or natural gas. S. 1809/ H.R. 3431 would simplify the certification process by:

  - Eliminating the need for yearly recertification after a conversion system has been certified, thereby eliminating the need for conversion system manufacturers to resubmit data to EPA for a system that has not changed.

  - Directing EPA to establish criteria to place similar vehicle makes, models and model years on a single certification using test data from a single vehicle.

  - Instructing EPA to allow the submission of previous emissions testing data if a vehicle or the conversion system has not changed in a way that would affect compliance.

  - Easing conversions of vehicles that are beyond their useful life (10 years old and/or 120,000 miles).

By simplifying the EPA compliance process, S. 1809/ H.R. 3431would incentivize conversion manufacturers to offer more systems for additional vehicles. It would also reduce the costs of these conversion systems. Ultimately, this legislation will allow public and private fleet operators to lower transportation costs, cut harmful emissions, and help reduce our nation's

reliance on foreign oil.

- *Support Propane Vehicle Infrastructure* – Support programs that incentivize fuel providers to invest in alternative fuel infrastructure, particularly alternative fuel refueling stations, and related equipment. Propane and other alternative fuels are clean and widely available for vehicle use, perhaps even more so than current electric vehicle technology. Legislation designed to improve vehicle infrastructure should include all clean vehicle alternatives rather than picking favorites.

- *Alternative Fuel Vehicle Manufacturing Assistance Programs* – Support programs that provide financial assistance to help automobile manufacturers reconstruct and retool their industrial processes to produce alternative fuel (including propane) vehicles. Propane and other alternative fuel vehicles systems exist now. As such, programs that support propane vehicle construction and deployment will provide immediate greenhouse gas reductions.

- *Government Use and Support for Propane Vehicles and Infrastructure* – Support directing the Federal government to play an active role in propane and other alternative fuel vehicle procurement and use. More specifically, the Federal government should be required to: replace a substantial portion of their vehicle fleet with similar propane and other clean burning alternative fuel vehicles; provide aid to states, localities, and tribal entities toward the purchase of propane and other alternative fuel vehicles; and finally, help fund federal, state and local installation of alternative fuel infrastructure, including fuel storage facilities and refueling stations.

Conclusion

The National Propane Gas Association looks forward to participating in the ongoing debates over how to limit carbon emissions and how to reduce our country's dependence on foreign petroleum products. America's propane industry believes it has a role to play on both fronts. Moreover, we know that our product can play a pivotal role in our energy future because it is both domestically-produced and low in carbon content. The industry will keep Congress informed on how future legislation will affect propane marketers, propane customers, and the environment.

For additional information on this statement, please contact:

Phil Squair
Senior Vice President, Government Affairs
National Propane Gas Association
1899 L Street NW, Suite 350
Washington, DC 20036
202-355 -1322

Mike Troop
Vice President, Legislative Affairs
National Propane Gas Association
1899 L Street NW, Suite 350
Washington, DC 20036
202-355-1327

Brian Caudill
National Propane Gas Association
1899 L Street, NW Suite 350
Washington, DC 20036
202-355-1326

Senator BOXER. Thank you. I ask unanimous consent to place in the record a letter from the American Road and Transportation Builders Association and John Boesel of CALSTART, as well as a letter signed by a number of clean air task forces and a number of others. So, without objection, we will do that.

So, I am going to call now on Senator Cardin, who is not here, so Senator Carper. Go, Senator Carper, go.

Senator CARPER. Thanks very much.

This is a question I want to ask of Mr. Lovaas. Here we go. What role should intercity passenger rail play in the next transportation bill, and what are your suggestions for a primary source of funding?

Mr. LOVAAS. For a source of funding for passenger rail?

Senator CARPER. Intercity passenger rail. What role should intercity passenger rail play in the next transportation bill, and what are your suggestions for a primary source of funding?

Mr. LOVAAS. Well, we are working with this bipartisan coalition, the Mobility Choice Coalition, and as part of that we favor an oil security fee based on the national security implications of our dependence on oil and that could in part be a revenue source for new transportation choices, including intercity rail. And then the other more near-term bill that is on the table currently is the climate bill, which of course will have some sort of transportation component, and a portion of that revenue, as much as possible, should go to clean transportation infrastructure, including intercity rail.

Senator CARPER. All right. Good. Thanks.

Second question. How can transportation policy better integrate electric vehicles into our existing infrastructure?

Mr. LOVAAS. Well, there is an opportunity to look at public charging stations on the national highway system and the interstate highway system and other Federal facilities. And the transportation bill should encourage regions to adopt electrification programs to transition as quickly as possible to a pluggable fleet of cars and trucks.

Senator CARPER. All right. Thanks.

My time has expired. Thank you, Madam Chairman, and thank you for those crisp, succinct answers.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. THOMAS R. CARPER,
U.S. SENATOR FROM THE STATE OF DELAWARE

Chairman Boxer, thanks for holding this hearing on the nexus of energy, environment and transportation policy.

As a Nation we consume 20 million barrels of oil per day—nearly all of which goes to our petroleum dependent transportation system. More than 60 percent of that oil is imported from foreign countries.

This imbalance of domestic production and imports creates a harmful dependence upon other countries for our energy. The negative effects of that dependence on the environment and on our national security have been well documented before this Committee.

In March Senator Specter and I introduced CLEAN TEA, which seeks to reduce oil consumption and greenhouse gas emissions from the transportation sector. Four other colleagues on this Committee have signed on to the bill. And I would like to applaud Chairman Boxer for including the legislation in her climate change bill.

Over the past few years Congress and this Administration have taken bold steps to reduce emissions from transportation. In 2007 we increased CAFE standards to 36 miles per gallon by 2020. Thanks to the Obama administration we will reach

that level by 2016. These changes alone will reduce oil consumption by a million barrels per day.

Congress has also adopted a Renewable Fuels Standard to reduce the carbon content of gasoline. And we have invested billions of dollars in electric vehicles. These measures will take important steps toward reducing our oil consumption and protecting the environment.

However, we need to go further. We need a new transportation paradigm that fully embraces energy and environmental concerns.

We need a transportation system that does not force all Americans to spend a full week of every year stuck in traffic.

We need a transportation system that allows Americans—under their own free will—to travel by high speed train, to have better intercity bus service, or to live closer to their place of employment.

The members of this Committee have worked hard to make sure that climate legislation has a transportation focus. We have more work to do on that front, but I am confident that my colleagues in the Senate understand the necessity of reducing transportation emissions through a comprehensive set of strategies—including my CLEAN TEA bill.

In addition to a climate bill with a transportation focus we need a transportation bill with a climate focus.

This Committee has heard from a number of experts about the need to re-focus our transportation systems around a set of national goals. I believe that the reduction of greenhouse gas emissions and of oil consumption should be two of the goals that define our transportation investments.

I look forward to working with Chairman Boxer and my colleagues on this Committee to transform that aspiration into reality.

[The referenced information was not received at time of print.]

Senator BOXER. Thank you.

Senator Udall. And we can send our questions in for them to answer. Go ahead.

Senator UDALL. Thank you, Madam Chair. We will submit some into the record.

Just a quick one here, to Mr. Kolodziej. As we all know the U.S. is now importing around two-thirds of our daily oil requirements. Just a few years ago Congress feared that we would need to start importing liquefied natural gas. Recent natural gas discoveries in deep shale and other unconventional formations now mean that our supplies have increased by about 40 percent in just 2 years. That works out to over 100 years of supply at 2007 levels, perhaps a longer supply than we have of coal.

If the United States used even a modest portion of this gas in vehicles we could make a significant dent in our dependence on foreign oil. What natural gas vehicle policies do we have now that are making an impact, and how could they be enhanced to both improve energy independence and reduce pollution?

Mr. KOLODZIEJ. There are currently incentives that were passed in the EPAct of 2005 and the SAFETEA-LU bill for the purchase and use of natural gas vehicles. One of those has already expired and hopefully will be extended in the extenders bill. The other two would expire at the end of this year.

The NAT GAS Act, which I mentioned before, is a bill that would significantly expand and extend those incentives. And that would send a signal to customers—fleet customers and all customers—that Congress is four-square behind this use of natural gas, and it would provide the economic incentive to accelerate the use of natural gas in the marketplace.

Senator UDALL. Thank you very much.

I yield back.

Senator BOXER. Well, we made it through to 11 o'clock.

[Laughter.]

Senator BOXER. And we have not been told to stop yet. So, I guess I can ask a couple of questions. I had deferred those. So, let me.

I would like to ask Mr. Greene, my friend from the Sacramento area, what are some of the health impacts of emissions from the transportation sector in the Sacramento region?

Mr. GREENE. Well, obviously, we are non-attainment for those two Federal standards, and of course we have issues with people building homes, houses and such as that. Transportation being such a huge part of our inventory, we do not have the stationary sources that they do in Southern California and other parts of the State. So, the majority of our impacts are from transportation, and those impacts are typical things you see for health.

Senator BOXER. Thank you very much. I have been told that we were told that we need to shut down.

So, I deeply apologize to the panel. Paul, do you want to say who called us please? The Senate floor. This has to do with tactics by my Republican friends who are upset about what is happening on the floor, so they are saying that committees cannot meet. That is their absolute right to do it. So I am so sorry. With deep apologies for those of you who came a long way. But we got your testimony in and we thank you very much.

We stand adjourned.

[Whereupon, at 11:05 a.m. the Committee was adjourned.]

[Additional material submitted for the record follows:]

DAVID N. PARKER
President and CEO

April 2, 2010

The Honorable Barbara Boxer
Chair
Environment and Public Works Committee
United States Senate
Washington, DC 20510

The Honorable James M. Inhofe
Ranking Member
Environment and Public Works Committee
United States Senate
Washington, DC 20510

RE: March 24, 2010: Hearing on the Contribution of Transportation Policy to Energy Security and the Environment

Dear Senators Boxer and Inhofe:

The American Gas Association (AGA), founded in 1918, represents 195 local energy companies that deliver clean natural gas throughout the United States. There are more than 70 million residential, commercial and industrial natural gas customers in the U.S., of which 91 percent — more than 64 million customers — receive their gas from AGA members. Today, natural gas meets almost one-fourth of the United States' energy needs.

AGA strongly supports efforts to increase the use of natural gas as a transportation fuel, which would reduce America's dependence on imported oil and reduce vehicle emissions. AGA respectfully submits the following statement for the record:

Increasing the use of domestic natural gas as a transportation fuel decreases America's reliance on foreign energy sources. In 2009, it is estimated that natural gas vehicles (NGVs) used about 40 billion cubic feet of natural gas. That is the equivalent of 320 million gallons of gasoline that America did not have to import.

Today NGVs are the cleanest vehicles on the road. The increased use of NGVs can reduce emissions of greenhouse gases as well as NOx, volatile organic compounds and particulates. NGVs produce 22 percent less greenhouse gases than comparable diesel vehicles and 29 percent less than comparable gasoline vehicles.

NGVs are here and now. An important reason to increase the incentives to build new NGVs, convert existing vehicles to NGVs, expand the delivery infrastructure and use it as a transportation fuel is that the technology is readily available to deliver the benefits. While certain research, development and demonstration (RD&D) can be conducted to improve specific areas, NGVs are ready to help achieve America's public policy goals now.

The proven reserves of natural gas in the U.S. have increased by nearly 40 percent in recent years. We have more than 100 years of supply using conservative estimates. This is due to the development of new production technologies to unlock the gas from shale formations. Based on this information, America must alter certain aspects of its energy policies to take advantage of

400 North Capitol St., NW, Washington, DC 20001 ■ Telephone 202-824-7111, Fax 202-824-7092 ■ Web Site http://www.aga.org

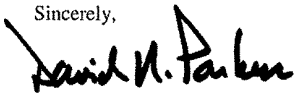
these newly available resources. Adopting policies that expand the use of natural gas in the transportation market should flow from this new information.

AGA urges Congress to enact the "New Alternative Transportation to Give Americans Solutions," H.R. 1835 and S. 1408 (referred to as the NAT GAS Act). This legislation would significantly extend and expand existing NGV incentives. Not only would the enactment of the NAT GAS Act accelerate the benefits noted above, it also would create and support 400,000 to 600,000 direct and indirect jobs.

Congress also should authorize a new NGV RD&D program, such as contained in S.1350. A well-funded R&D program would ensure that NGVs continue to deliver the benefits of energy security, efficiency and environmental performance.

Thank you for this opportunity to present AGA's position. We would welcome the opportunity to respond to any questions you may have. Should you have any questions, please contact Charles Fritts, vice president, government relations, at 202-824-7220.

Sincerely,



David N. Parker

○