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**TESTIMONY**  
**Before the Highways and Transit Subcommittee of**  
**Transportation and Infrastructure Committee**  
**United States House of Representatives**

**Hearing on Structure and Viability of the Federal Excise Fuel Excise Tax**

**March 27, 2007**

Mr. Chairman and Members of the Committee, thank you for the opportunity to provide testimony on the impacts of fuel economy and alternative fuels on the viability of the federal fuel excise tax. I served on the 2005 National Academies committee that drafted the report, *The Fuel Tax and Alternatives for Transportation Funding*. My remarks are based in part on the findings of that study.

I am a professor of engineering and environmental policy and director of the Institute of Transportation Studies at the University of California, Davis (ITS-Davis). ITS-Davis is the leading university center for the study of transportation energy. I have devoted most of my professional career to the study of energy use in transportation. I've authored or co-authored over 200 technical papers and nine books, most of them on transportation energy issues. I was the founding chair of the alternative fuels committee of the Transportation Research Board of the National Academies, and advise most of the major car and oil companies in the world. In February 2007 I was appointed by Governor Schwarzenegger to the California Air Resources Board, where my principal focus is energy and climate policy related to transportation.

My statement addresses the effect of improved fuel economy and alternative fuel use on fuel tax revenues. I respond to two concerns: how to assure adequate funding for transportation, and how to reduce greenhouse gas emissions from transportation.

I note that many leaders in the transportation community are concerned that rapid reduction in gasoline use and rapid introduction of alternative fuels will empty the Transportation Trust Fund. For example, Oregon's Road User Fee Task Force was formed by the legislature in 2001 with a charge to develop a new form of revenue collection, with the assertion that "New technology will soon greatly improve the average fuel efficiency of the statewide passenger vehicle fleet. . . . As a result of fuel efficiency improvements, Oregon fuel tax revenues from the sale of gasoline are likely to level off during the next 10 years and then drop permanently" (Road User Fee Task Force 2003, 1).

I have three points:

- 1) Large drop-offs in fuel tax revenues are unlikely for the next 10 years.
- 2) Funding gaps can easily be solved over the next 20 years or so with very small increases in the fuel taxes.
- 3) A long term solution to both transportation funding and climate change concerns is to restructure fuel taxes to reward low-carbon fuels in a way that allows an expanding revenue stream for the Transportation Trust Fund.

To support my assertion that gasoline (and diesel) tax revenues are unlikely to dip much, if at all, in the next ten years, let me briefly summarize past trends and current proposals for fuel economy and alternative fuel use.

### **Past and Current Trends in Fuel Consumption and Alternative Fuels**

- Gasoline fuel consumption in the US has increased 40 percent since the early 1980s. This increase has come about for two reasons: the fuel economy of light duty vehicles has not improved in the past 25 years ago, while vehicle travel has steadily increased. Diesel fuel consumption, mostly in large trucks, has increased even faster. Vehicle travel is expected to continue increasing, due to increasing population and more intensive use of vehicles.
- Alternative fuel use has increased over time, mostly in the past few years, but still only accounts for only 4% of today's gasoline use (3% on an energy basis). However, almost all of the 4% is ethanol, which is blended into gasoline in small quantities (usually 5-10% of gasoline). This ethanol use has no effect on revenues available to transportation since the excise tax waiver for ethanol is refunded from general revenues.

### **Future Legislative and Regulatory Initiatives**

- President Bush is proposing to strengthen fuel economy standards for new vehicles by (up to) about 1 mpg per year starting in 2010-12, reaching about 34 miles per gallon in 2017. This represents an increase of ~4% per year. Today's (tested) fuel economy is about 24.6 mpg. A number of bills have been introduced in Congress that would have roughly the same impact as the President's proposal. Likewise, the new greenhouse gas emissions regulation for vehicles in California (AB1493) also would have roughly the same impact on fuel economy over roughly the same time period.
- President Bush is proposing to increase alternative fuel use from today's 5 billion gallons per year to 35 billion gallons per year in 2017 (compared to current gasoline consumption of about 140 billion gallons).

### **Impact of Current Legislative and Regulatory Initiatives**

The actual impact of these fuel economy and alternative fuel initiatives on gasoline use and fuel tax revenues will be more modest than appears at first glance, for the following reasons.

For fuel economy:

- No guarantee that the initiatives will be passed into law and adopted into regulation as proposed;
- Proposed increase of 4% per year is couched as “up to”;
- Rules are intended to be in place for a limited number of years;
- Most proposals are have escape clauses premised on findings of reduced vehicle safety and technological feasibility;
- Even if the more aggressive proposals are fully implemented, the slow turnover of vehicles combined with increased driving means that fuel consumption in 2017 would still be about the same as it is today.

For alternative fuels:

- Most of the alternative fuels used during at least the next 10 years, and probably well beyond, will have no effect on fuel tax revenues
  - Most will be ethanol, which does not reduce revenues into the trust fund;
  - Beginning in about 10 years, some alternative fuel production might be gasoline (and diesel) made from coal, but this fuel will likely be taxed the same as gasoline from petroleum;
- It is highly unlikely that the goal of 35 billion gallons by 2017 will be realized, for a variety of reasons, including high costs, dependence on high oil prices, competition with food, land availability, immature state of cellulosic biofuel technology, and more;
- The problematic fuels, from the transport trust fund perspective, are gaseous fuels (hydrogen, natural gas) and electricity (for plug-in hybrids and battery electric cars). These fuels are not subject to the gasoline and diesel excise tax requirement. But their use is likely to be a tiny proportion of gasoline (and even ethanol) use for a long time.

Today, about 140 billion gallons of gasoline are consumed per year by light and medium duty vehicles. Without these various policy and regulatory initiatives, consumption is expected to increase to about 160 billion in the next 10 years. If the more aggressive policies and rules were implemented in a timely fashion, the amount of liquid (taxed) fuels would be about the same as today. Most likely it will be higher.

**Conclusion**

Fuel tax revenues are unlikely to drop in the near future. As the 2005 National Academies report concluded, “the existing revenue sources will retain the capacity to fund transportation programs at historical levels” (p.2).

The report suggested that “A reduction of 20% in average fuel consumption per vehicle mile is possible by 2025 if fuel economy improvement is driven by regulation or sustained fuel price increases” (p.2). It now looks like there will be more aggressive regulations and it is possible that oil prices will stay at \$60 or higher. It is thus possible that average fuel consumption per vehicle mile will drop more than 20 percent (which, because of slow vehicle turnover, implies much larger reductions in new-car fuel economy), and that significant amounts of alternative fuels will be introduced. But because of increasing vehicle travel and

because ethanol use does not affect Trust Fund revenues, it is unlikely that tax revenues will drop below today's levels for at least 10 years, and probably quite a bit longer.

In other words, absent dramatic and unexpected changes, the structure of the gas tax is not threatened for some time.

The real point of this debate about the viability of the gasoline (and diesel) tax is simple: more funding is needed for transportation, and Congress and the state legislatures have been unwilling to raise fuel taxes to provide those funds. The fuel economy and alternative fuel argument is used by many to justify the need for new types of revenue mechanisms that might be able to generate additional revenues more easily than politically-unpopular fuel taxes.

The choice before Congress is whether to shift away from fuel taxes entirely – to other types of user based mechanisms (such as vehicle mileage fees) – or to adjust the fuel taxes to accommodate coming changes in fuels by rewarding those that are more environmentally beneficial. Or perhaps the two approaches can be combined.

A tax that rewards low-carbon fuels is becoming increasingly compelling. Some fuels generate much higher emissions than others. For instance, gasoline produced from tar sands has 20-50% more greenhouse gases (on a lifecycle basis) than gasoline produced from conventional oil. At the other extreme, the production of biofuels made from crop residues, switchgrass, or other cellulosic material, dramatically reduces GHG emissions, in some cases to zero. Why not impose a higher tax on high carbon fuels, and a lower tax on lower carbon fuels? The rates can be adjusted periodically to sustain revenue flows into the Transportation Trust Fund. This new carbon-based fuel tax solves the long term structural problems of today's gasoline and diesel taxes. It is responsive to both transportation and environmental goals.

### **Recommendations**

1. In the near term, Congress and state legislatures should have the political courage to increase taxes on gasoline and diesel fuels, such that transportation funding problems are temporarily solved.
2. Congress should create a longer term solution by restructuring the gasoline and diesel tax to accommodate increasing use of alternative fuels. Tax rates could be designed to impose lower fees on low-carbon fuels, such as cellulosic biofuels, and higher rates on high-carbon fuels, such as gasoline produced from tar sands. This can be done in a way that assures continued increases in the overall revenue stream.
3. Congress should tighten fuel economy standards and introduce low-carbon fuel standards (as in California and the European Union)... and prove me wrong about gasoline use not dropping off in the next ten years!

## **Background on How UC Davis Is Contributing to the National Effort to Improve Fuel Economy and Develop Alternative Fuel Technologies**

The Institute of Transportation Studies at UC Davis (ITS-Davis) is a multidisciplinary, internationally-recognized center that oversees more than 60 faculty and researchers, 90 graduate students, and a \$8 million annual budget. The Institute's mission is to serve the needs of society by organizing and conducting research on emerging and important transportation issues, disseminating this research through conferences and scholarly publications, and enhancing the quality and breadth of transportation education.

### **Research**

ITS-Davis is a leading center of transportation studies, specializing in sustainable transportation themes. It is unique in its multidisciplinary approach to transportation technology, fuels, basic science, human behavior and policy. The Institute's faculty, staff and students examine a range of transport topics in three core areas of research and analysis: travel behavior and transport systems modeling; environmental vehicle technologies and fuels pathways; and climate change, air quality, and other environmental impacts

The Institute flourishes due to a strong and diverse network of research partners. Strong relationships with government and nongovernmental organizations, and with energy, environmental, and automotive industry experts enhance the research program. Central research programs in the area of transportation energy include:

- Sustainable Transportation Energy Pathways to compare the pathways toward implementation of biofuel, electric and hydrogen/fuel cell vehicles, all in relation to existing and future fossil fuel pathways.
- Biofuels Energy Research Group to expand the interface between UC Davis's expansive agricultural research expertise and the evaluation of future, carbon-reducing biofuels for the U.S. transportation sector.
- U.S. Department of Transportation Sustainable Transportation Center at ITS-Davis to promote a broad range of sustainable transportation options, from improved land use planning to lower impact modes of travel.
- Plug-in Hybrid Vehicle Center established by the California Energy Commission to evaluate the technical, consumer and environmental feasibility of Plug-in HEVs.
- U.S. Department of Energy Graduate Automotive Technology Education (GATE) program to advance the education of students for tomorrow's environmental vehicle design challenges.
- China Center on Energy and Transportation to understand the energy and vehicle adoption dynamics of China.

### **Education**

The Institute's education program is designed to meet the world's growing needs for qualified, thoughtful and dedicated engineers, policy makers, technicians and advocates. Its interdisciplinary approach transcends the boundaries of traditional engineering-based studies to include social and behavioral sciences, ecology, and management. Students interact with a broad range of researchers and leaders from industry, government, public interest groups, and academia through seminars and workshops, internships, visiting lectures, fellowships and grants. ITS-Davis offers a variety of specialized courses, from social costs of transportation to fuel cell vehicle systems engineering. ITS-Davis hosts the UC Davis University

Transportation Center, a multi-year, multi-million dollar program funded through matching federal and state transportation grants designated for graduate education activities. It also hosts the U.S. Department of Energy Graduate Automotive Technology Education (GATE) program to train fuel cell and hybrid vehicle engineers.

## **Outreach**

ITS-Davis actively disseminates the many publications of its researchers, and offers an extensive series of seminars, workshops and conferences. The Institute's website ([www.its.ucdavis.edu](http://www.its.ucdavis.edu)) highlights its activities and the bi-monthly *ITS-Davis e-news* electronic newsletter is sent to over 5,000 people. For over 20 years the Institute has hosted the biennial Asilomar Conference on transportation and energy under the auspices of the Transportation Research Board's standing committees on Energy, Alternative Fuels, and Sustainable Transportation. The next Asilomar conference on August 21-24, 2007 will address Transportation and Climate Policy.

ITS-Davis maintains relations with more than 70 companies. Companies sponsor basic research, conferences and evaluations of demonstration projects; host graduate student interns; provide unrestricted support for specific programs and general Institute activities; and donate equipment. The Institute benefits greatly from these relationships; they strengthen laboratory capabilities and play a vital role in enhancing the diversity of educational and research experiences at UC Davis.

***ITS-Davis publications and other information are available at [www.its.ucdavis.edu](http://www.its.ucdavis.edu).***