TRANSPORT-RELEVANT POLICIES AND MEASURES: U.S. EXPERIENCE

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Abstract: The U.S. has numerous goals for transportation in the following general areas: safety, mobility, economic growth and trade, human and natural environment, and national security. Logically a "best practice" policy would contribute to all of these goals, and would have well-accepted monetized costs and benefits that are compelling. However, because of limits to the priorization of different goals and disagreements about the monetization of some impacts, the identification of "best practice" transportation policies is, and will likely remain, controversial. It may be more practical to consider "relevant" policies, examples of which in the U.S. include fuel economy standards, support for vehicle technology development, tax incentives for efficient vehicles and alternative fuels, and financial support for transit systems, carpools, and vanpools. Related to policies and measures, at least two somewhat fundamental questions also warrant consideration: First, to what extent should transportation sector emissions be managed separately from those of other sectors? Second, to what extent should governments be involved in the selection of ultimate means of reducing or offsetting transportation sector emissions?

Transportation Goals

The U.S. has multiple transportation-related goals, including:

Safety - Promoting the public health and safety by working toward the elimination of transportation-related deaths, injuries, and property damage;

Mobility – Ensuring a transportation system that is accessible, integrated, efficient, and offers flexibility of choices;

Economic Growth and Trade - Advancing economic growth through efficient and flexible transportation;

Human and Natural Environment - Protecting and enhancing communities and the natural environment affected by transportation; and

National Security - Advancing security interests by ensuring that the transportation system is secure and available for defense mobility and that borders are safe from illegal intrusion.

More specific expressions and measures of these goals are provided in strategic and performance planning documents prepared by DOT and other agencies. For example, DOT's performance plan for fiscal year 2000 includes more than 60 measures of performance across these five general goals.

Best Practice in the Transportation Sector

Logically a "best practice" would contribute to all of these goals, and would have a compelling and indisputable benefit/cost ratio in monetized present-value terms. However, except that safety represents a primary goal, there is no agreed-upon prioritization of all the different broad and specific goals for transportation. Further, some policy impacts are difficult to quantify, even with significant resources. Also, there is considerable disagreement about how to monetize some impacts. Therefore, rather than attempting to identify "best practices" in the transportation sector, it is likely more realistic and productive to attempt to identify "relevant" policies.

Transportation sector GHG emissions are influenced by many factors, a partial list of which includes land availability and development, human population and demographics, wealth and the distribution of wealth, commercial activity, the price of raw materials (energy, steel, etc.), the price and performance of technology and finished products, and consumer preferences. The U.S. has policies that influence each of these factors. With respect to transportation sector GHG emissions, those that influence vehicle characteristics, fuel characteristics, and transportation demand and operations are especially relevant.

Vehicle Characteristics

Among the policies that influence vehicle characteristics are support for research and development, and financial incentives and regulatory requirements related to the purchase and sale of efficient and alternatively-fueled vehicles.

The Partnership for a New Generation of Vehicles (PNGV) is a prominent example of U.S.-supported R&D related to light vehicles, and is being pursued through collaboration with industry and research institutions. The goals of the program include developing prototype vehicles that achieve up to a tripling in fuel economy without compromising safety, utility, performance, or life-cycle cost. This is a very ambitious goal. Based on available projections of potential market adoption and prevailing trends in vehicle fleet turnover, it appears that vehicles meeting this goal are most likely to have impacts in the longer term rather than, for example, within the next ten years. The U.S. has provided significant financial incentives for the purchase of electric vehicles. This year, the President has proposed a schedule of tax credits for hybrid electric vehicles that would provide an incentive of as much as $3,000 per vehicle purchased between now and 2009, as well as a $4,000 credit for pure electric and fuel cell vehicles.

The U.S. also supports R&D to improve the energy efficiency of heavy trucks and other transportation vehicles. Diesel engine research aims to improve thermal efficiency by thirty percent. Also, an Advanced Vehicle Technologies Program (AVP) aims to double the fuel economy of heavy trucks and triple that of transit buses.

The U.S. also has in place fuel economy standards for automobiles and light trucks. These standards were adopted to primarily to save energy, and are applicable to both imported and domestically-manufactured vehicles. Compliance is based on average fleet performance, and additional credit toward compliance is available to alternatively-fueled vehicles. The program is measurable and enforceable. Also, both cars and light trucks have labels so that consumers have a clear indication of the relative fuel economy of vehicles they might choose to purchase.

However, the standards are subject to wide-ranging discussion and debate regarding issues such as effectiveness, timing, the cost of technological and other vehicle changes, safety implications, appropriate structure and stringency, consumer preference, and myriad technical issues (e.g., test procedures). In any event, looking at the historical trends, it seems clear that U.S. fuel economy standards have been preventing an increase in the fuel consumption of cars and light trucks. Although there is considerable debate about the relative roles of fuel prices and fuel economy standards during the late 1970s, the fact that manufacturers are now operating so close to the standards suggests that the standards have been having a binding effect at least since 1990.

Fuel Characteristics

Policies that influence fuel characteristics include R&D support, financial incentives and regulatory requirements related to the purchase and sale of different fuels and blending agents, and the regulation of conventional fuels. U.S. R&D support includes work toward alternative feedstocks and fuels, cleaner petroleum-based fuels, and fuel distribution and storage. Key issues for alternative fuels include the availability of resources (e.g., land, feedstocks), the cost to produce and deliver fuel, and the pathways for transitioning from a petroleum-based system to alternatives.

Ethanol is one of the petroleum alternatives that currently receives a great deal of attention in the U.S. and elsewhere. Corn-based ethanol can reduce full fuel-cycle GHG emissions by up to roughly a quarter on a per-kilometer basis relative to gasoline. Because processing can produce excess electricity that can be added to the electrical grid, cellulosic ethanol could possibly achieve a reduction of more than one hundred percent. Up to a point, ethanol can be blended with gasoline for use in existing vehicles, and is already used in this manner in some areas to boost octane and/or meet gasoline reformulation requirements. However, on equal-energy basis, it remains much more expensive to produce ethanol than to produce gasoline, and ethanol accounts for only about one percent of the energy used for transportation.

For ethanol to play a greater role in the future, the U.S. is supporting R&D to develop energy crops suitable for ethanol production, to develop advanced, cost-competitive ethanol production technology, and to collaborate with industry to demonstrate commercial-scale production technology. U.S. tax rates for highway fuels significantly favor ethanol. For example, gasoline with 10 percent ethanol is subject to approximately a 30% lower tax than straight gasoline. This reflects a subsidy of about $0.14 per liter of ethanol.

Transportation Demand and Operations

A number of U.S. policies are relevant to transportation demand and operations. States must demonstrate that their transportation plans are compatible with federal air quality requirements, or face possible restrictions on their use of federal highway funds. Revenues collected through federal taxes on highway fuels are used for a highway trust fund, but also for a transit trust fund. Currently, roughly a fifth of the money raised through national taxes on highway fuels is set aside for transit programs. Also, taxes on highway fuels provide about $1.4 billion annually through the Congestion Mitigation and Air Quality Improvement Program (CMAQ) to fund special projects and programs which reduce transportation-related emissions. Transit and vanpool benefits may now be offered in lieu of compensation payable to an employee, giving transit and vanpool benefits the same tax treatment as parking benefits. In 2002, the limit on nontaxable transit and vanpool benefits will increased from $65 to $100 per month, and will be indexed for inflation in the future. With respect to GHG implications, quantification, timing, and effectiveness remain major issues for such policies. For example, in some U.S. cities, recent data suggest that, on a passenger-kilometer basis, cars are actually now more efficient than bus and, in fewer instances, rail transit systems.

Conclusions

Transportation-related policies and measures universally accepted as "best practices" are likely to remain elusive. An analytical perspective suggests the ideal of a benefit/cost analysis in which all impacts are monetized and discounted, supplemented by an analysis of macroeconomic effects. However, analytical resource limitations, quantification difficulties, and wide-ranging views regarding the monitizing and discounting of some impacts can raise barriers to realization of this ideal for transportation-related policies. Within the context of GHG management, it is therefore more realistic to identify "relevant" transportation policies. In the U.S., there are numerous such policies that influence vehicle, fuel, and/or transportation demand characteristics. More generally, individual Parties may wish to consider the extent to which it is important or appropriate to manage transportation sector emissions separately from emissions from other sectors, and the extent to which it is important or appropriate for governments to be involved in selecting the ultimate means of limiting or offsetting transportation sector emissions.