

U.S. Energy Policy Should Include Transportation Planning and Operations

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Disruptions in the energy supply and the volatility of energy prices pose economic, social, and political risks to the United States. Transportation energy policy is essential to U.S. energy policy, but has been overlooked as a source for solutions.

Transportation accounts for 27 percent of all energy consumed in the United States and for 66 percent of all petroleum energy use. The United States imports approximately 54 percent of the petroleum it consumes; that percentage is unlikely to fall, since the nation holds only 2 percent of the worldwide reserves of petroleum. With less than 5 percent of the world's population, the United States accounts for 26 percent of world petroleum consumption.

Most modes of transportation depend on petroleum energy; in many cases, substitution of an alternative energy source would be as impractical as a coal-powered high-speed aircraft. Of all energy used for transportation in the United States, 97 percent comes from petroleum. Without a strategy and a plan, growth in demand for petroleum energy will continue and the amount supplied from U.S. sources will be relatively less.

Fuel Economy Measures

More than 80 percent of the transportation energy consumption in the United States occurs on the highways—a good place to direct policy-making attention. So far, policy has focused on improving the fuel economy of vehicles to reduce petroleum demand.

In the past 25 years, corporate average fuel economy (CAFE) standards have had a significant impact, as the fuel efficiency of the passenger car



fleet as a whole—including old cars as well as new—has increased by 60 percent. However, nearly all of this improvement occurred from the mid-1970s to the early 1990s; during the past 10 years, the fuel efficiency of the passenger car fleet as a whole has barely changed. Many have advocated raising the CAFE standards, but Congress has not had the political will to pass the legislation.

The recent phenomenal growth in the market share of sport utility vehicles—21 percent of new car sales in 2000—has counteracted the improvements in fuel economy. Model year 2000 vehicles recorded the lowest average fuel economy ratings since model year 1980. Automobile manufacturers, however, are pursuing new technologies, such as hybrid vehicles, which can achieve more than 50 miles per gallon.

Future Opportunities

Improving vehicles was an opportunity seized successfully in the past to reduce petroleum demand, but improvements in planning, infrastructure, and operations offer future opportunities. So far, the public sector has not pursued these opportunities as aggressively as the private sector has.

With this article TR News inaugurates "Signals," a guest editorial feature to be published on an occasional basis. Authors will be invited to offer thought-provoking commentary to stimulate discussion on topics related to transportation research, practice, and policy. Reader response is encouraged in the form of letters to the editor.



Impact Assessments

The transportation arena needs to raise the level of consciousness about energy consumption to match that for transportation safety, environmental impacts, and air quality. Federal policy requires states to conform to Highway Safety Program Standards, to prepare Environmental Impact Statements (EIS), and to develop Transportation Improvement Programs in conformity with the Clean Air Act Amendments. Why not also give equal consideration to the energy impacts of major projects?

For nearly 30 years, the EIS has served to assess and disclose the environmental impacts of major projects. Assessing the relative energy impacts of alternatives also makes sense and, with minimal additional effort, could become part of the EIS process. Strategic long-range decisions—such as long-range transportation plans and major investment decisions—also should assess energy consumption.

Operational Improvements

The energy benefits of coordinated traffic signal systems, improved traffic signal timing, freeway management systems, and a host of other operational

improvements are well known, but these activities have not been pursued aggressively enough. Tens of thousands of signalized intersections use outdated, inefficient timing, and only a fraction of the signalized intersections that could be coordinated are linked in systems.

In 1991 the Intermodal Surface Transportation Efficiency Act designated funding specifically to combat congestion and improve air quality. Why not also dedicate funding for transportation projects that reduce energy consumption and improve fuel efficiency? The public benefit from many of these projects would exceed in value the public funds invested.

In most instances, the operational improvements that reduce energy consumption also offer collateral benefits, such as reduced vehicle emissions, improved safety, and reduced congestion. Gaining political support for these improvements should be easier than for increases to the CAFE standards, because there are fewer adverse effects.

Role of Research

What are the direct benefits of these improvements? One estimate 20 years ago projected that the universal application of coordinated traffic signal systems, improved traffic signal timing, and freeway management systems could yield a 5 percent fuel savings in urban areas. Another dated source conservatively estimated that coordinated traffic signals might have a total benefit-to-cost ratio of at least 20 to 1.

Transportation research has a role in developing future policy. Research can update past findings to present circumstances and quantify the fuel savings and other benefits achievable by each of the planning and operations techniques. The research results can help to build political support for including transportation planning and operations in national energy policy making.

Few transportation energy reduction measures can be implemented overnight; most take time. Now is the time to take the initiative and make the commitment. The transportation community has an obligation to help society prepare for future disruptions in energy supply and for volatility in energy prices. Otherwise, the nation will face undesirable economic, social, and political consequences.

EDITOR'S NOTE: In a report accompanying the Department of Transportation appropriations legislation for FY 2001, the Appropriations Committees of Congress directed the National Academy of Sciences to evaluate the Corporate Average Fuel Economy standards. TRB is assisting the National Research Council's Board on Energy and Environmental Systems in the conduct of the six-month review, due to Congress in July 2001.