



Moving Off the Gas Tax: Implications for the Toll Industry

By Edward J. Regan

Outside of the toll industry, the motor fuel tax has been the primary source of transportation finance in the United States for more than 80 years. However, for reasons described below, there is a growing realization—perhaps a growing consensus—that we will move away from this tax in the not-too-distant future. If this occurs, it could have major implications for not only the American toll industry but for the world toll industry, as well.

Gas Taxes 101

The gas tax is charged, of course, per gallon of fuel consumed. As such, it is only indirectly related to actual miles driven. When it was created years ago, the gas tax was intended to be a form of indirect road user charge. Back then, however, cars averaged much lower fuel economy than they do today. Now, with such a wide array of vehicles with differing fuel economies, there is less and less direct linkage between gas tax paid and miles driven on the roadway system.

Inflation and improved fuel efficiency have substantially eroded the purchasing power of the gas tax over the past two decades.

Inflation and improved fuel efficiency have substantially eroded the purchasing power of the gas tax over the past two decades. As a point of comparison, in 1963,

the average state gasoline tax rate was about 7.5 cents per gallon. Today, the state tax averages 21.6 cents per gallon, but after adjusting for inflation, its current purchasing power is just 4.8 cents per gallon, only about two-thirds of what it was in 1963. Meanwhile, today's federal gas tax is 18.4 cents per gallon. Combined with the 21.6-cent state rate, that means drivers pay an average of 40 cents per gallon in total motor fuel taxes, equivalent to about 1.5 cents to 2.5 cents per mile depending on vehicle fuel efficiency.

If we further adjust the current tax rates to account for increased fuel efficiency in addition to inflation, the net purchasing power of today's 21.6-cent-per-gallon state tax is equivalent to just 2.4 cents per gallon in 1963 dollars. That's only about a third of what was collected 41 years ago. Put another way, if states wanted simply to

equalize the purchasing power of the gas tax with what it was in 1963, the state gas tax alone would have to be increased to about 65 cents per gallon.

Considering the difficulty elected officials have with a tax increase of even a penny or two, the likelihood is slim that we'll soon see a gas tax increase of 40 cents or 50 cents per gallon. Over the past 10 years, in fact, only three states have raised

their tax rates enough to keep pace with inflation. Meanwhile, our average vehicle miles per gallon have about doubled in the past 20 years. That's great for the environment and resource conservation, but not so good for tax revenues.

Fuel consumption is a declining part of the transportation funding equation. The real demand for such funding today is based on roadway usage. The amount of vehicle miles of travel (VMT) determine when roads wear out or need to be widened and when new roads

are needed, and in the past 20 years, VMT has increased about twice as quickly as fuel consumption.

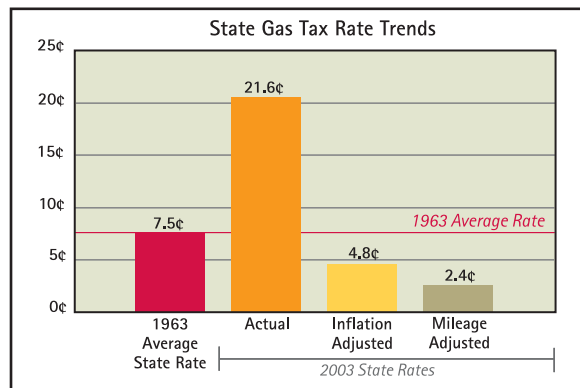
But the worst may be yet to come. The increasingly popular hybrid fuel electric vehicles are pushing fuel-consumption rates of 50 mpg. Fuel-cell vehicles, which don't use traditional motor fuels at all, will become more commonplace over the next 10 years as well. If the vehicle fleet includes just 20 percent hybrid and 20 percent fuel-cell vehicles by, say, 2010, it would reduce fuel consumption another 30 percent to 40 percent.

Again, that's great for the environment, great for conservation, and great for reducing U.S. dependence on foreign oil, but it's terrible for transportation funding—if we continue to rely primarily on the gas tax.

Planning Ahead

The process of planning for the future is about to begin. Late last year, the authors of a major study of various technology options suggested shifting from the gas tax to direct user charging, preferably using a GPS-type on-board unit. The study, undertaken by the University of Iowa and funded by the Federal Highway Administration and 15 states, envisions a scenario in which all vehicles would be equipped with an anonymous electronic toll-collection device, probably as the vehicles come off the assembly line.

Initial draft versions of the U.S. Department of Transportation's SAFETEA reauthorization proposal included formation of a blue ribbon task force to begin the process of coming up with a gas tax replacement. It targeted a final decision in the 2006–2007 time frame. That provision didn't make the final version of the DOT proposal, but it is likely to be included in both congressional versions of the reauthorization bill.



The Oregon DOT is already under way with a major research effort on the potential shift to direct user fees. The effort is being coordinated under the state's Road User Fee Task Force, and Oregon is about to begin testing applicable technology.

Because all 50 states, together with the federal government, use the gas tax, a change will take many years to implement. This will include technology development and testing, institutional planning and consensus-building, and equipment installation and phase-in. Full phase-in might involve 200 million vehicles—no small challenge indeed.

Direct User Fees As Reality

What if every vehicle in America were equipped for electronic direct user charging? What if, in one sense, all roads became toll roads?

At first glance it would seem that eliminating the gas tax and equipping all vehicles for electronic road user charging would be great news for the toll industry. We could simply take down the toll plazas and do away with cash-based toll collection. If all vehicles

were equipped with some form of toll-collection device at the assembly line, we could have true “open-road” tolling, probably without the need for video tolling or other techniques to replace cash.

Patrons and toll operators alike would benefit greatly from such an arrangement. Obviously, the foremost advantage would be the virtual elimination of all toll plaza delays, adding to public acceptance of toll roads. Major surveys in Illinois

and elsewhere have conclusively shown that the heaviest opposition to tolls lies not in paying them, but in waiting in line to do so.

Major surveys in Illinois and elsewhere have conclusively shown that the heaviest opposition to tolls lies not in paying them, but in waiting in line to do so.



Eliminating toll plazas would also reduce operating costs and provide other benefits to toll agencies and operators. In making such a change, the toll industry would need to consider some potential issues and problems, as described in this article. These points could be addressed with proper planning, but only if the toll industry gets involved—at an early stage—in the planning process.

Privacy Issues

Once we move from a “voluntary” electronic toll system to a “mandatory” one, privacy will become a major issue. This was well-recognized in the Iowa study, whose authors strongly suggested that the future U.S. road pricing system be based on anonymous GPS technology, as noted above. The authors suggested a system designed to accumulate mileage by jurisdiction, such as by state or county, and specifically not identify the road used.

Obviously, this concept wouldn't be suitable for collection of toll revenue on individual toll facilities, such as toll roads, bridges, or tunnels. This apparent conflict between the perceived need for anonymity and the need for route specificity for tolling may well be one of the most important issues in devising a national electronic road pricing system.

The Iowa study correctly focused such a system design on "smart vehicles and dumb roads." In essence, if all roads were priced, it would be far more efficient to accumulate information from satellite-based systems located in each vehicle rather than provide dedicated short-range communications (DSRC) readers on every road in America.



While this approach might be optimal for a national road pricing system, it does raise some technology questions. For example, would the toll-collection devices in each vehicle need to include some type of DSRC component to permit identification of miles driven on a particular toll road? From a technology standpoint, probably not: a GPS could likely be designed to cover this. From a privacy-protection standpoint, however, and to provide a basis for more-direct revenue transfer to individual toll agencies,

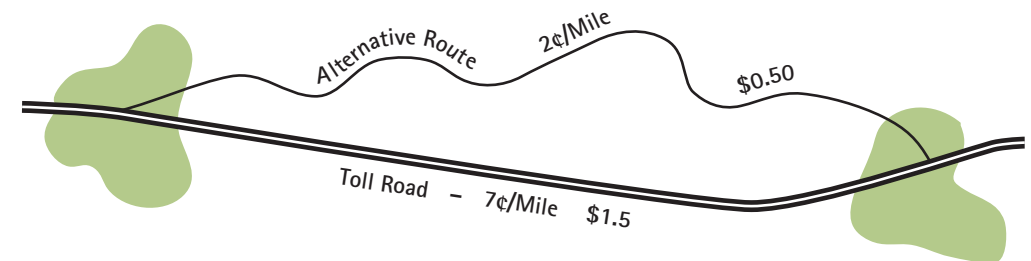
the ultimate system might well need a DSRC component that would communicate directly with a toll agency's accounting system.

What about managed lanes, which may well represent the highest potential growth area for toll facilities in the United States? In these cases, tolls are assessed only to vehicles traveling on a particular portion of the roadway, and are not charged to vehicles using other lanes. Would a GPS be sufficiently discriminating to identify not only the route used but also which lane was used, to assess the appropriate fees?

Competitive Balance and Double Taxation

A shift to direct road user charging on all facilities would probably improve the competitive balance between toll roads and alternative roads. The figure below shows a conceptual toll road of 20 to 25 miles with a toll of \$1.50, or about 7 cents a mile. Under our current tax structure, the alternative route is perceived as being "toll-free." However, if all taxation were converted to a mileage basis at a rate of, say, 2 cents per mile, the result would be a perceived toll on the alternative route, as well.

Helping the Competitive Balance



In the above example, the new competitive balance would be a charge of \$1.50 on the toll road versus an implied toll of 50 cents on the alternative route (25 miles times 2 cents). This might encourage increased utilization of toll facilities. This improved competitive balance would probably increase revenues for existing toll facilities.

There are other policy implications of such a change for the toll industry as well, mostly positive. Perhaps the most important is that a shift from the gas tax to direct road user charging could help solve the "double taxation" issue. For many years, opponents of toll facilities have claimed that charges on toll roads represent "double taxation," because the fuel being consumed while driving on the



toll road is also taxed. If all revenue came in the form of road user fees, however, double taxation would be eliminated along with the gas tax, and toll-facility fees would likely go to the appropriate toll agency, while charges for road use on other facilities would likely go to the federal and state governments.

A shift to direct road user charging would also be apt to encourage expanded use of the toll concept, because it would make new toll facilities much less costly and much easier to implement, given that the entire vehicle population would already be equipped with electronic toll-collection devices. This could have a major impact on congestion and value pricing: if all roads were essentially priced roads, value pricing would simply entail a variation of the charge by time of day or facility.

If more agencies were to use value pricing, which seems to be a trend, the new system would need to identify not only routes and, possibly, lanes of travel, but also travel times. While this would be technically feasible, it could raise significant privacy concerns.

Cash Flow and Operational Issues

Obviously, direct road user charging would pose important cash-flow considerations to the toll industry. For example, how would individual toll agencies obtain their revenue? Would it come directly from state or federal collection agencies? What about the method used to obtain payments from motorists? And what about “uncollectible revenues”? Could a state agency or the federal government become the revenue-collection agent for the toll facility? How would toll agencies hold governments accountable if they were unable to collect revenue from motorists? For taxation purposes, some type of “postpayment” system might be preferable. However, for toll agencies, a prepayment system might be more appropriate. Smart cards, an emerging trend, could help solve concerns about privacy as well as address cash-flow issues.

Direct road user charging might raise other financial issues as well. For example, what would be the potential impact, if any, on bonding capacity? Concerns among the financial community might include fund control, cash-flow problems, and potential state or federal intervention in revenue flow or toll-rate setting. These issues could likely be overcome, but only with the active participation of the toll industry in the planning process.

Perhaps the biggest operational challenge of all would involve the transition process from gas taxes to road user charges. It would likely take years to convert fully from gas taxes to user charging, a process that would include developing the necessary technology and, perhaps more important, building consensus among the states and the federal government as to what the optimum system would look like.



Get Involved

On balance, a future shift from the gas tax to direct road user charging would probably benefit the toll industry. But such a change won't take place until sometime around 2015, so why is it important now? Because the process of planning, consensus-building, technology development, phase-in, and deployment could well take 10 to 12 years. That means the critical planning process is likely to begin soon, possibly this year. A Transportation Research Board task force has already been appointed to examine the adequacy of the gas tax.

The toll industry needs to get involved in the planning process to ensure that the system selected to replace the gas tax meets the industry's needs. The time for action is now.

Edward J. Regan is senior vice president of Wilbur Smith Associates, a national transportation consulting firm based in New Haven, Conn. He can be reached at eregan@wilbursmith.com.

References

Forkenbrock, David J., and Jon G. Kuhl. 2002. *"A New Approach to Assessing Road User Charges."* Iowa City: University of Iowa, Public Policy Center.

Wachs, Martin. April 2003. *"Improving Efficiency and Equity in Transportation Finance."* Brookings Institution Transportation Reform Series. Washington, D.C.: The Brookings Institution.

Whitty, Jim. Not published. *"Road User Fee Task Force"* (Oregon Department of Transportation). Washington, D.C.: Presentation given at the 2004 Transportation Research Board Conference and to the U.S. Department of Transportation.