The Demise of the Gasoline Excise Tax?

by Ronald C. Fisher

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In this installment of State Fiscal Affairs, Fisher discusses the decline of motor fuel excise taxes as a state revenue source and how states are most likely to replace them.

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The transportation future is electric — and I don’t just mean exciting. State tax adjustments are among the many changes this will bring.

Excise taxes on sales of gasoline and other motor fuels, which started in Oregon in 1919, have effectively financed an extensive road and highway infrastructure. But their time is coming to an end.

In 2019 there were more than 4.2 million miles of roads in the United States — on which approximately 276 million registered motor vehicles were driven about 3.3 trillion miles by 229 million licensed drivers.¹ Yes, there are more vehicles than drivers. Motor fuel taxes fund a bit more than half of total highway spending for all purposes; roads are also funded through tolls, local property taxes, vehicle fees, and other state taxes.

State excise taxes on gasoline in 2021 average 26.3 cents per gallon and vary from 8 cents per gallon in Alaska to 57.6 cents per gallon in Pennsylvania. State taxes on diesel fuel average 28.2 cents per gallon and vary from 8 cents to 74.1 cents (also Alaska to Pennsylvania, respectively).² These state motor fuel excise taxes generated $49.8 billion of revenue in 2018.³ The federal tax of 18.4 cents per gallon of gasoline and 24.4 cents per gallon for diesel fuel generated roughly another $36 billion of revenue.

Motor fuel excise taxes have many positive features. They function in large part as user charges for roads, because the amount of tax paid depends — at least partly — on both the amount of road use and the nature of the vehicle. The more miles an individual travels, the more fuel required and thus the more excise tax implicitly paid. Similarly, larger or heavier vehicles generally require more fuel than smaller or lighter ones to travel a given distance, which corresponds to road “use” if larger and heavier vehicles impose greater maintenance or safety costs on the highway system. Fuel tax collection entails relatively low administration costs, partly because they are usually collected at the wholesale or distributor level — where there are fewer firms than at retail.

So what is the demise? In short, purchases of motor fuels have not increased as much as highway travel, so motor fuel tax revenue is not increasing proportional to road use. So far this has happened primarily because of the steadily increasing use of more fuel-efficient vehicles, but also because of changes in fuel prices.

³ U.S. Census Bureau, 2018 State & Local Government Finance Historical Datasets and Tables (last updated Oct. 8, 2020).
government rules about fuel efficiency, and changes in consumer preferences. In response, states have adjusted their motor fuel taxes in an attempt to maintain revenue. Thirty-one states have increased their motor fuel tax rates since 2013, while other states have switched from fixed tax rates per gallon to variable, indexed, or ad valorem tax rates. However, none of these policies will solve the bigger changes that are coming.

This trend will soon be more pronounced because of a switch to vehicles powered partially or entirely by electricity. Although electric vehicles currently account for a small share of new vehicle sales and an even smaller share of the total number of vehicles using roads, dramatic change is expected in the next decade. General Motors Co. has announced it will offer 30 new electric vehicles by 2025, and it intends to switch to producing solely electric vehicles by 2035. Doing GM one better, Volvo intends to move entirely to electric vehicles by 2030. Similarly, Ford Motor Co., Volkswagen, and Honda Motor Co. have announced major moves toward electric vehicles. Volkswagen expects electric vehicles to comprise 50 percent of North American sales by 2030, while Honda plans for 40 percent of vehicles to be electric by 2030 and 100 percent by 2040.

As these changes take effect, excise taxes on motor fuel (gasoline and diesel) will become inefficient, inequitable road financing methods. The current system is not sustainable. Some states have already added fees for electric vehicles, but just as standard vehicle registration fees do not account for road use, neither do fees per vehicle. Gasoline and diesel taxes have been good, but there is an even better option.

What’s the alternative? A vehicle mileage tax (VMT) or fee is a preferred substitute for fuel excise taxes. First, the VMT would vary based on road use just as fuel excise taxes have in the past. Those who directly use roads more would pay more toward the maintenance or expansion of the infrastructure. Second, the mileage fee could vary by type of vehicle, location, and time of use. For instance, just as larger and heavier vehicles pay more in fuel tax per mile now, the mileage fee could accomplish the same. Unlike fuel excise taxes, however, a vehicle mileage fee could also serve as a congestion charge, being set higher for congested areas or times of day.

But vehicle mileage fees do not have public support (yet), have been opposed by the trucking industry, and face various implementation challenges — including how to measure, how to collect, privacy concerns, and interstate transportation. Opposition seems to arise primarily from a misperception of cost, concern about privacy and technological collection mechanisms, and worry about out-of-pocket start-up or adoption costs.

Research shows that people often overestimate how much they would pay with a vehicle mileage fee. In a Michigan survey, only about 30 percent correctly estimated the amount they would pay with a fee of 1 cent per mile, with about 50 percent thinking it would be more than double the actual amount. Suppose a person drives 100 miles in a gasoline-powered vehicle that gets 25 miles per gallon. This requires 4 gallons of gasoline, which costs an average of $1.05 in state gasoline tax and another 73 cents in federal gasoline tax. That is an average of $1.88 per 100 miles of travel. Or to put it another way, that is equivalent to a vehicle mileage fee of 1.88 cents per mile.

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A comparison of the monthly expense for several mileage tolls with the average state or state-plus-federal gas excise is shown in Figure 1 for three different annual miles driven (the typical driver goes about 13,500 miles per year). At that mileage, the monthly mileage toll varies from approximately $6 at a rate of a half-cent per mile to $17 at a rate of 1.5 cents per mile. Obviously, the expense is less for fewer miles driven and greater for more miles. The last two sets of bars show the monthly expense for the average state gasoline tax and for the combined average state-plus-federal gasoline tax. At 13,500 miles, these amounts are approximately $12 and $20 per month. It seems clear from this comparison that the current average state gas tax is about equivalent to a 1 cent per mile mileage toll, whereas the combined average state plus federal tax is similar to a mileage toll of slightly more than 1.5 cents per mile.\(^{11}\)

Interestingly, drivers seem to prefer road tolls to vehicle mileage fees. Denvil Duncan and colleagues reported the results of a survey about funding options for road maintenance, construction, and repair. Tolls were supported by 34 percent compared with only 21 percent supporting what they called a “mileage user fee.”\(^{12}\) Of course, a mileage user fee is a toll with a different name. In fact, as Rob Wassmer and I note in a 2018 *Tax Notes* column, charges from toll highways have been the fastest growing component of highway finance, much greater

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\(^{11}\)For my economist readers, this is tax or toll liability. The ultimate economic burden would be different if either the tax or toll is shifted to other economic agents through market adjustments.

than fuel excise taxes.\footnote{Fisher and Wassmer, “Tolls Rule,” State Tax Notes, July 23, 2018, p. 339.} From 2010 to 2018, highway tolls increased by 68 percent in real terms to $18.5 billion, while motor fuel taxes rose by 11 percent, even with the tax rate increases (see Figure 2).

Potential VMT collection methods include simple odometer reading, collection at a gas pump or charging station that reads miles from vehicles, and electronic monitoring of miles. Although there seems to be widespread concern about electronic measuring or collection of VMTs, electronic highway and bridge toll collection methods are widely used and accepted currently (think E-ZPass, I-PASS, or license plate readers). Interstate freight trucking mileage by state is already monitored and used to allocate fuel tax revenue among states based on usage. Of course, in the early 1960s William Vickery famously envisioned the idea of receiving a monthly bill for road or transit use, just as we are billed for our metered use of electricity, natural gas, water, and telephone service.

If electric vehicles are eventually autonomous (self-driving) as well, then metered use based on miles driven — and even time or location — might be accomplished more easily or automatically. The issue is whether the autonomous vehicle is operated solely with self-contained cameras and sensors or is connected digitally to a network. If these vehicles are operated in private or public fleets, as many analysts expect, then network connection is assumed and monitoring miles becomes automatic.\footnote{For a discussion of the fiscal implications of autonomous vehicles for state and local governments, see the Forum articles by Fisher, William Fox, and Benjamin Clark in the March 2020 issue of the National Tax Journal.}
A shift in the main revenue source for funding road maintenance and construction is not the only major change states may face as use of electric vehicles becomes common. Eventually, facilities for charging vehicles will displace fuel stations. Independent of whether charging facilities are private or public or a mixture, could government add a surcharge or tax to the electricity price for road finance? This parallel to fuel excise taxes has severe liabilities. First, it would be difficult to separately identify and tax electricity used to charge a vehicle at a home from electricity for other purposes. Second, the connection between the electricity surcharge and the cost per mile of vehicle use would seem even more difficult for owners to discern than for fuel taxes. Third, electricity surcharges — like fuel taxes — could not function as congestion charges, which is a main advantage of mileage tolls.

Vehicle mileage fees have been attempted in a few pilot programs and only used to any significant degree in Oregon, which also pioneered gasoline excise taxes more than 100 years ago. A pilot program in the state eventually led to the optional opt-in mileage fee alternative to the gasoline excise tax that is now available (but selected by few drivers). A few other states have seriously studied vehicle mileage fees, but without adoption. Now a bill is being considered for a requirement to have Oregon drivers of new, high-MPG vehicles pay a mileage fee starting in 2026. In Governing, Andrew Theen reported that “Oregon has estimated its highway fund, of which 40 percent comes from gas tax revenues, will be insolvent by 2024 without significant action.”

Inevitably, fuel excise taxes will be replaced as an effective means of road finance. The only questions are how soon, how it will be implemented, and which states or governments will lead. It might be most efficient administratively for the federal government to implement a mileage toll (my preferred term) to replace federal fuel taxes. A federal mileage toll could also be used to replace state fuel taxes, with allocation to states based on vehicle-miles of travel. But such a system would eliminate state autonomy to levy and collect different tax rates. And it would be difficult for a federal toll to be used to address congestion, which is a local phenomenon.

Thus, states might lead again — although this change is ultimately being driven by private industry, rather than government directly imposing change. Obviously, states where adoption of electric vehicles is highest or where road congestion is a serious problem have the greatest incentive to act. But there might be first-mover advantage as well, because a state could signal to potential residents and businesses that it is willing to adopt the most forward-looking, modern, and efficient financing system. Given that states have already seen the value of highway and bridge tolls, it is a bit surprising that more of them have not yet extended pricing to all roads through a mileage toll.

Importantly, such a change is not automatically a tax increase, but rather just a change in how people are charged for road use. Given this common misunderstanding and how individuals typically overestimate the personal expense of a mileage toll, an extensive information effort will be a necessary component of any policy proposal. It may be that as one or a few states begin to implement a mileage toll widely, others will learn from the experience and act quickly. States will charge up the policy apparatus, power up an information campaign, and get on the road to a modern electric transportation future. Perhaps even my state of Michigan, the home of the U.S. auto industry, will become one of those leaders. Gov. Gretchen Whitmer (D) has pledged to “continue engaging in forward-looking policies to remain on the cutting edge of mobility and electrification growth,” and Sen. Mallory Mc Morrow (D) said that “Michigan is

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15 Oregon H.B. 2342.
17 Many others have made this point as well. A list follows this article.
18 I suppose one could envision a federal mileage toll collected at different rates in different states and allocated back to those states. But this seems hopelessly complex. Such a system is not seriously considered for state income or sales taxes (even for remote sales), although the mechanism is the same. And states generally do not even do this with local income or sales taxes.
well positioned to become a leader in electric vehicles.”

Just as states once followed Oregon’s example in adopting a gasoline excise tax, soon — and clearly within a decade — they will follow other examples in implementing a new, modern road finance system likely based on some form of mileage toll. Perhaps even Vickery’s vision of monthly or quarterly road-use bills will become just as common as electricity or water bills. I suspect most drivers will be quite pleasantly surprised to get such a road use bill each month — for perhaps $20. Seems quite a bargain.

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