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Mileage-Based User Fees and Highway Finance

S ix years ago, the Oregon Department of Transportation (ODOT) announced that it was inviting up to 5,000 people to voluntarily join its mileage-based user fee program. The Antiplanner rushed to be among the first to apply, which turned out to be unnecessary as, after two years, only 745 vehicles were participating in the program.

That number is likely to increase soon, as the state has imposed a stiff vehicle-registration fee on electric and other fuel-efficient cars, a fee people can waive if they add their car to the mileage-based fee program. Annual fees for electric cars will go from \$20 to \$153; fees for cars rated to get better than 40 miles per gallon jump from \$20 to \$76 per year.

Although Utah is the only other state that has implemented a mileage-based fee program, other states are looking at it. Last week, Secretary of Transportation Pete Buttigieg endorsed the idea (though unfortunately he calls it a mileage tax), saying that it "shows a lot of promise" as a way of having users pay for what they use. In response, people raised concerns about the impact of such fees on privacy, low-income people, and the environment.



Secretary Buttigieg speaking to CNBC about infrastructure and mileage-based user fees.

Having participated in Oregon's program since 2015, I feel confident that the state cannot invade my privacy and that the fees are extremely reasonable (despite being higher than the gas taxes I would otherwise pay).

Why Mileage Fees?

In 1919, when Oregon became the first state to pay for roads by collecting gas taxes, fuel taxes made more sense than tolls or mileage fees because they were so much easier to collect. In 2019, the states spent about \$313 million collecting more than \$50 billion in fuel taxes, so collections costs were just 0.6 percent of revenues. In contrast, human-staffed toll booths cost close to half of all revenues. Only with the development of cell networks and other radio technologies did low-cost collection methods such as electronic tolling and mileage-based systems become feasible.

The availability of electronic user-fee systems made the disadvantages of using fuel taxes to pay for roads more apparent. First, while income, property, and sales taxes automatically adjust for inflation, fuel taxes as an excise fee do not. Oil prices do not vary in step with inflation anyway, so making the fuel tax a percentage of fuel sales rather than cents per mile would lead to erratic highway funding.

Fuel taxes also fail to adjust for more fuel-efficient vehicles. The average miles-per-gallon of cars and light trucks have both doubled in the last fifty years, which means that revenues are only about half as much, given a level of wearand-tear on the roads, as they used to be. Of course, both of these problems can be overcome by raising gas taxes, but such increases encounter lots of political resistance.

A third problem is that fuel taxes are collected mainly by the states and federal government. But many of the nation's roads and streets are owned by cities and counties. While the states share some of their fuel taxes with cities and counties, it isn't enough. In 2019, local governments received \$23 billion from the states and \$4 billion from the federal government but had road-related expenses of more than \$100 billion. Most of the difference came out of property taxes and other general funds, a subsidy to roads that should be corrected.

The biggest problem with fuel taxes is they do nothing about congestion. Just as supermarkets charge more for filet mignon than for hamburger, true road user fees would charge more for more expensive roads than for less expensive roads. A road network designed to meet the demand for the two or three peak hours of the day costs a lot more than one able to meet just average demand. Higher fees during congested periods can smooth out some of the peaks and troughs of demand, which would reduce congestion, reducing the cost of the system as a whole, and provide funding to build the roads needed to meet growing demands.

Mileage-based user fees can solve all of these problems. When fully implemented, they will completely replace fuel taxes, tolls, and all but the most basic vehicle registration fees. At little cost to themselves, local governments as well as federal and private road owners can piggy-back onto state fee systems, collecting the revenues they need to maintain and improve their roads without resorting to general funds.

Fees can also vary by time of day or the amount of congestion. The increasing number of vehicles that have built-in navigation systems will be able to offer drivers alternate routes to their destinations with the cost and time required for each route.

Implementing Oregon's Fee

As noted above, until recently participation in Oregon's system was strictly voluntary. Giving owners of electric and fuel-efficient vehicles a choice between paying a stiff annual fee or joining the mileage-based fee program should expand participation.

As a next step, ODOT is preparing to ask the legislature to require that all passenger vehicles that get better than 30 miles per gallon join the system or pay a \$400 annual opt-out fee. Someone would have to drive more than 20,000 miles a year to make the opt-out fee worthwhile. The next step, in all probability, is for the state to ask purchasers of all new vehicles to join the system. Applying the program to older vehicles will be difficult as the GPS devices the state uses can only be installed on vehicles newer than 1996.

How the Oregon System Works

Currently, Oregonians who join the mileage-based system are given a choice of three systems. All of them involve installing a device in the automobile's diagnostic port.

Under one system, the device reports the number of miles driven without using GPS to detect or report where that driving took place. This may have the advantage of increasing privacy but requires users to pay for miles they drive out of state. In the long run, this system will also fail to discriminate between state and other roads, making it impossible for city, county, and other road owners to piggy-back on the system.

The other systems use GPS to detect where the driving takes place. No charges are applied to miles driven outside of the state. In all three systems, the devices report not to the state but to private companies that get most of their business from trucking companies that want to monitor where their trucks are. The private companies collect the fees from Oregon drivers and, after deducting their costs, transfer the money to the state. The state receives no information about when and where people drove or even which drivers paid the fees to the private companies.





Oregon's gasoline tax is currently 36 cents per gallon and the mileage fee is 1.8 cents per gallon minus the amount of gas taxes people would have paid at their vehicle's rated miles per gallon. For example, a vehicle rated at 36 miles per gallon would ordinarily pay a penny per gallon gas tax, so that penny is deducted from the mileage fee and they pay only 0.8 cents per mile. A vehicle rated to get only 20 miles per gallon effectively pays no fee because the gas tax deduction cancels the mileage-based fee. Potentially, vehicles that get less than 20 miles per gallon would get money back, but Oregon has excluded such vehicles from the program.

Of course, if someone with a vehicle rated to get 36 miles per gallon drives with a lead foot and they only get 30 miles per gallon, they will pay more in fuel taxes than are reimbursed with the mileage fee. On the other hand, if they manage to squeeze 40 miles per gallon out of their vehicle, they end up paying lower fees.

Eventually, the goal would be to either eliminate the gas tax completely or install transponders in fuel pumps that detect whether vehicles have mileage-fee devices installed and not charge fuel taxes to those vehicles. This would require some protection against people disconnecting the devices as soon as they leave the gas stations.

My own experience with the fee has been positive. I pay a little more than I would have paid in gas taxes, but the amounts are so small anyway they aren't a bother. They certainly don't influence the number of miles I drive. The state once offered me a \$50 credit for permission to let it have access to driving data gathered by the intermediary; otherwise, my privacy has been completely protected.

What about Trucks?

ODOT says that most road damage is caused by heavy trucks. So long as they aren't using chains or studded tires, the differences in road damage caused by say, a Cadillac Escalade or a Toyota Prius are small and the road use charge is mainly for the *use* of the road, not the damage done to it. As a result, Oregon doesn't plan to charge the owners of Escalades more than the owners of Priuses.

For trucks weighing more than 26,000 pounds, Oregon has long been the only state to have a weight-mile tax—essentially a mileage-based fee system that depends on the weight the trucks carried. The light vehicle system fits well with that. What remains, however, are medium-sized trucks—trucks between 8,000 and 26,000 pounds as well as buses, motorhomes, and other large vehicles. The state is currently considering what kind of mileage-based fee should be applied to these vehicles and will probably end up with a mileage-based fee that is more, per mile, than the fee for light vehicles.

The Impact on Low-Income People

As soon as Secretary Buttigieg made his statement last week, people began worrying about the impact of mileage-based fee systems on low-income people. In fact, provided the revenues from those fees were dedicated exclusively to roads, low-income people would only benefit from such fees.

Currently, most of the property, sales, and other taxes used to support city, county, and some state roads are regressive, which means that low-income people are paying disproportionate shares of their incomes on those taxes. Even gasoline taxes are regressive because low-income people tend to drive older vehicles that get fewer miles to the gallon than vehicles driving by higher-income people. Vehicle-registration fees are particularly regressive as they are usually the same fee no matter what the income of the vehicle owner.

Mileage-based fees, however, are not regressive any more than the cost of groceries is regressive. People will pay only for what they use and they won't have to pay for what other people use.

Congestion is also a regressive cost as most working-class people do not have the option of working at home or working flexible hours in order to avoid peak-period traffic. If variable user fees can relieve that congestion, working-class people will be among the greatest beneficiaries.

The Impact on the Environment

The Natural Resources Defense Council opposes Oregon's fee system because "it would penalize the drivers of zero-emission vehicles." It argues that the gas tax is a "price on pollution" and eliminating that tax will make it more difficult for Oregon to achieve its climate goals. The gas tax, however, was not conceived to be a way of curbing pollution and it plays little role in doing so. On the other hand, asking people to pay for the roads they use is not a penalty.

In the 1960s, people willingly paid gasoline taxes to drive cars that got an average of 13 miles per gallon (and less than 10 for light trucks) and that emitted huge amounts of toxic air pollution. That air pollution has been largely eliminated not by increasing the gas tax but by new technologies that made cars cleaner.

Today, the average car on the road gets 27 miles per gallon while the average light truck gets 20 miles per gallon. A fee of 1.8 cents per mile, which is the gas tax currently charged in Oregon for a vehicle that gets 20 miles per gallon, is not going to significantly alter anyone's behavior when that fee is on top of the cost of buying, maintaining, and fueling the vehicle. Oregon's gas tax represents just 12 percent of the average current cost of gasoline in the state; the other 88 percent will give people enough of an incentive to buy more fuel-efficient vehicles.

On the other hand, most electric cars today are owned by high-income people. NRDC is effectively pleading that such high-income people should be able to drive on roads for free while those roads are paid for by lower-income people who can only afford to drive older, less fuel-efficient petroleum-powered vehicles. In short, NRDC is demanding a socially unjust policy in order to achieve negligible environmental gains.

The Impact on Congestion

To me, one of the greatest benefits of mileage-based user fees is that they can make congestion a thing of the past. Before the pandemic, congestion was costing Americans close to \$200 billion, wasted more than 3 billion gallons of fuel, and added more than 30 million tons of carbon dioxide into the atmosphere each year. Congestion will almost certainly return, though perhaps at a slightly lower cost, after the pandemic. Variable road pricing, which can be implemented with mileage-based fees, can greatly reduce these costs.

Few people understand the real reason why roads get congested: roads are the only resource whose supply declines when demand increases. More accurately, throughput declines when use exceeds a certain level.

Actual measurements of the traffic a typical freeway lane can move at various speeds show that the number of vehicles reaches a maximum of about 33 cars or light trucks per minute at free-flowing speeds (the number may vary from 30 to 36, depending on the highway, and larger vehicles may count as two or more cars). If more than that number try to use the lane, then traffic "breaks down," slowing as drivers respond to increased numbers.

The problem is that, as traffic slows, the potential throughput declines, falling to around 18 vehicles a minute at 25 miles per hour and 12 at 20 miles an hour. Once it has slowed down to, say, 20 miles per hour, throughput won't be restored to 33 per minute until the number of vehicles trying to use the lane falls below the lane's 12 vehicle-per-minute throughput at that speed, which may take hours.

Freeway Lane Throughput



Although freeway lanes can typically move up to 33 vehicles per minute, anything above about 30 vehicles per minute risks a breakdown, so variable pricing typically aims to keep numbers below that, which also keeps speeds higher. Based on measurements of freeway capacities collected by the Washington State Department of Transportation.

As a result, a freeway lane might be able to move less than half of its real capacity for most of both morning and afternoon rush periods. In other words, highways lose capacity at just the times of day when people need them the most. If highway managers can keep traffic from breaking down in the first place, then they can greatly increase the ability of highways to move traffic during rush hours.

The only sure way to keep traffic from exceeding a lane's capacity is through variable pricing, either in the form of tolls or as a part of a mileage-based fee program. A large share of vehicles on the road at rush hour are not commuters. Charging a higher fee to use a road during rush hour than at other times of the day will signal people whose schedules are more flexible to use it at another time.

Note that such variable pricing is not curing congestion by pricing people off the road. In fact, it is curing congestion by pricing people onto the road, because it can roughly double the road's capacity to move vehicles during rush hour by making sure that the number trying to use the road never exceeds the road's maximum capacity.

Fees vs. Taxes

As Buttigieg's statement revealed, people often confuse

taxes with user fees. Indeed, a surcharge on gasoline that is dedicated to roads should be a fee, but almost everyone calls it a gas tax. Buttigieg specifically talked about the user-pay principle, but some people see mileage-based user fees as a way to raise funds for non-highway programs.

The difference between a tax and a fee is simple: if you get what you are paying for, it is a fee; if someone else gets what you are paying for, it is a tax. The money we spend on groceries that we eat, homes that we live in, and cell phones that we use are fees. If the government imposes a surcharge on those purchases and spends that money on schools, police, helping the poor, or corporate welfare, those surcharges are taxes.

So what will happen to mileage-based user fees? If the money is spent on roads, then they will be fees. If transit agencies or other special interest groups manage to hijack some of those revenues, that portion will be a tax (and will likely be a regressive tax).

Oregon's constitution requires that fuel taxes be dedicated exclusively to highways, roads, and streets. One-half percent is to be spent on bicycle routes, but those are arguably roads as well. Other states have similar constitutional restrictions on the use of fuel taxes, but as far as I know, no state has a constitutional limit on how mileage-based user fees are to be spent. States should rectify this before imposing such fees on a large scale so people don't feel their money will be wasted.

Mileage-based user fees hold the promise of providing all of the funds needed to keep roads maintained and to pay for new roads as they are needed. Use of variable fees on congested roads can relieve congestion and provide the funds to build more capacity.

It is always possible that some states will implement mileage-based fee systems improperly, but that's not an excuse for retaining the current system, which is both inefficient (due to the congestion it allows) and inadequate to meeting highway needs. Provided privacy is protected and revenues are dedicated to the roads users are driving on, states should adopt mileage-based systems as soon as possible.

Randal O'Toole, the Antiplanner, is a transportation and land-use policy analyst and author of Gridlock: Why We're Stuck in Traffic and What to Do About It. Masthead photo of an electronic toll gantry, the technological predecessor to mileage-based user fees, is from the Virginia Department of Transportation.