

BENEFITS AND COSTS

A COMPARISON OF THE VEHICLE MILES TRAVELED AND GASOLINE TAXES

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American politicians often struggle to find a politically acceptable way to fund infrastructure projects throughout the country. This piece compares the historical, economic, and social aspects of the vehicle miles traveled (VMT) and gasoline (gas) tax systems. An increase in the gas tax would be the most direct and effective way to raise the much-needed funds for state and federal infrastructure budgets. However, raising the gas tax has been taboo since the late 1920's, creating a difficult hurdle to overcome. VMT tax systems have their limitations, but with a shift in public perception and a staged implementation, a VMT system may be the answer to America's infrastructure needs.

The United States is currently facing crumbling transportation infrastructure and growing environmental concerns. This presents state and federal government officials with two challenges. First, they must decide which tax program will best serve as a transportation infrastructure funding mechanism. Second, they must create a tax policy tool that encourages more environmentally conscious driving behavior while also producing social equity. The popular question is whether a new vehicle miles traveled (VMT) tax will perform better than an increased gas tax. The feasibility and potential success of these tax models are vigorously debated today given the implications of raising the gas tax and the unknown effects of a potential VMT tax.

The gas tax was implemented in 1919 and has the benefit of simplicity: it is a per-gallon tax that gasoline consumers pay and the collection of the tax is done by gas station owners. An increase in the gas tax can also help to further environmental goals by encouraging a change in driving behavior. However, Americans are strongly against any increase in the gas tax. This makes it difficult for politicians to propose raising the gas tax even given its benefits.

The VMT tax was proposed as an alternative way to raise much-needed funds. This tax may be easy to implement, especially as new cars with Global Positioning System (GPS) installed saturate the market. A VMT tax presents an interesting opportunity to raise funds for infrastructure and influence positive environmental changes.

HISTORY

Some states implemented a gas tax starting as early as 1919, such as Oregon, New Mexico, North Dakota, and Colorado (Tax Foundation, n.d.). Before the gas tax was implemented, federal and state governments used property taxes and bonds to fund road projects. State legislatures increased the gas tax as needed throughout the 1920s to address the growing costs of roadway construction and maintenance, with the support of motor clubs and many oil and automobile companies. Starting in the 1920s, and rapidly increasing during the Great Depression with the Revenue Act of 1932, state and federal governments started passing proposals to increase the gas tax to pay for programs not related to roadway construction or repairs, mainly unemployment assistance. This started a movement largely led by the highway lobby toward halting any increase in the tax, and eventually began calls to lower the tax. This opposition to gas tax increases persists today, resulting in officials taking general fund monies to maintain the legally required amount of highway funding (Brown, 2001). This need for funding prompted states to research alternative taxation methods.

Today, U.S. roads and highways are increasingly falling into disrepair, with an estimated \$3.6 trillion investment needed by 2020 to ensure that roads and highways are in good condition (American Society of Civil Engineers, 2013). Roads are not the only concern; with increasing public acceptance of climate change, and the movement toward environmentally friendly practices, government officials are seeking to implement a tax model that will also help to reduce vehicle miles traveled while increasing vehicle fuel economy.

GAS TAX

The gas tax is a tax on the amount of gas consumed. The tax is included in the price paid by consumers at the pump. The tax is convenient for its relatively low administrative costs because it is collected from distributors (Brown, 2001). The gas tax is simple to understand as a flat-rate excise tax at both the state and federal levels. The gas tax is based on the benefit principle, which means that the people who drive more, and theoretically use more gas, pay more than those who drive less

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(Duncan, 2013). Also, fuel has a relatively low price elasticity, making the tax an effective tool for raising funds even as fuel prices continue to fluctuate (Parry and Small, 2005).

At its current level, the gas tax fails to produce enough funds to cover the costs of road and highway maintenance and construction. Research has shown that the optimal gas tax for the United States is around one dollar per gallon, approximately 50 cents more than the current average tax (Parry and Small, 2005; Mankiw, 2006). Raising the tax could address issues such as environmental concerns, road congestion, fuel efficiency, funding deficiencies, economic growth, and national security (Mankiw, 2006). The environment can benefit from a higher gas tax, which would decrease the

amount of carbon pollutants released into the air. Each cent-per-gallon increase in the price of gasoline reduces the equilibrium gasoline consumption by about 0.2 percent (Bento et al., 2009). This increase would incentivize driving less, thus decreasing congestion on roads and highways (Mankiw, 2006). It would serve the same goals as the Corporate Average Fuel Economy (CAFE) legislation.

The U.S. Congress enacted CAFE in 1975 for the purpose of increasing the fuel economy standards for vehicles. CAFE is intended to reduce daily energy consumption by drivers. However, increased fuel economy due to CAFE standards encourages more driving as fuel-efficient vehicles replace older models. These more fuel-efficient vehicles allow people to drive more miles with the same amount of gas that they consumed with their old vehicles. As a result, CAFE does not achieve its goal because people are driving more than they did before. Increasing the gas tax, however, could encourage fuel economy standards to increase without the negative side effect of encouraging more driving. Automakers would still be encouraged to make all vehicles more fuel-efficient in order to remain competitive in the market. At the same time, people would be less inclined to change their driving behavior because more driving results in a higher cost. This means drivers would be paying a similar amount to fill up their fuel-efficient vehicles as they did for their old vehicles, which would prevent a change in their driving behavior (Austin, 2004).

Increasing the gas tax to one dollar per gallon would raise around \$100 billion a year in revenue. Increasing the gas tax is a better solution than a potential increase in income

tax to collect revenue and promote investment in research on gasoline alternatives (Mankiw, 2006). In terms of national security, the tax can lessen the United States' dependence on oil, a key component in Middle Eastern affairs (Mankiw, 2006; Li, 2012). Though there are many benefits of raising the gas tax, the current socio-political environment strongly resists any tax increases, making a tax hike difficult to pursue.

VEHICLE MILES TRAVELED TAX

The vehicle miles traveled tax is based on the number of miles traveled via automobile. Currently there are 14 pilot programs throughout the United States (Duncan, 2013). Three prominent approaches are being considered by economists, researchers, and politicians as potential implementation methods.

The first method involves every vehicle having a GPS device. Using this device, the government could track the number of miles a person drives on a daily basis. This method also has the potential to include congestion pricing by tracking and taxing based on the time of day and the use of specific roads traveled. A downside of this method is that it is costly to implement. Purchasing and installing GPS devices, as well as providing the manpower needed to track individual driving behavior on a daily basis, creates a high cost barrier. However, this barrier is diminishing as more automobile manufacturers are making GPS systems standard in their vehicles. However, cost is not the only barrier to this method as there is also the potential for pushback due to the invasion of privacy. Many Americans will not want the government to have the ability to track their movements on such a fine scale (Duncan, 2013).

Through the GPS method, there are three different ways to administer the tax. These include a payment to the government on a monthly, quarterly, or annual basis; the current method of paying at gas stations; or, paying the tax at the time of vehicle registration renewal. However, the pay-at-the-pump method as proposed would mean that gas station owners would need to purchase technology to read GPS data. This would also require more equipment and staffing in order to properly implement the program (Duncan, 2013).

The second option for implementation is a self-reporting method with visual inspection. Drivers could report the number of miles traveled, similar to how income taxes are filed. Other possibilities include recording mileage during vehicle registration renewal or during times of vehicle service. The benefit of this method is that it does not require any new technology to be added to older vehicles that do not have a GPS. However, it can be susceptible to fraud through tampering with the odometer. This can be counteracted by comparisons of the vehicle's mileage history report to determine if the odometer is accurate, as well as odometer inspections for evidence of tampering. Profiles can be held and maintained by the government to compare reported versus expected miles traveled. Finally, auto service centers could be required to record and report VMT to the government, which would be less burdensome than other methods because the information is already collected when vehicles are serviced. Additionally, to avoid fraud, an audit mechanism would need to be implemented that triggered inspections and also required random inspections (Duncan, 2013).

The third option is third party reporting. This method requires insurance companies to

read GPS data and send a VMT statement that includes the tax liability. The driver would then send the statement and tax payment to the Internal Revenue Service. This method is likely more acceptable to Americans when it comes to privacy, as it is to be completed by a third party and not the government. It would also be more difficult for drivers to commit fraud because the GPS is installed in the vehicle. This method would require investment in technology that could read GPS data.

If these programs are implemented they may face many setbacks. These programs may result in variation between state tax structures and federal tax structures, and a different structure based on the vehicle weight would result in a complicated final tax bill. Within these structures, there may also be specifics about driving during peak times and driving on specific roads or other infrastructure (Duncan, 2013). As the system gets more complicated it becomes costlier to implement. In order for this system to be successful, the current variation between states' tax structures would need to be removed.

Like the gas tax, a VMT tax is based on the benefit principle. The consumer drives on the road and pays a fee to help maintain it. The VMT tax withstands CAFE standards because it is unaffected by changes in gas consumption, and could counteract the effects of increased fuel-efficiency has on travel behavior. However, this also means that the VMT tax does not encourage improving fuel efficiency, which has its own environmental benefits (Parry, 2005). The levy is beneficial for the environment though, as it discourages unnecessary trips, thus decreasing pollution. Unlike the gas tax, a VMT tax would be more visible, and therefore

1 GAS TAX



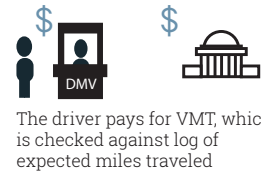
The driver pays a tax for gas purchased at the pump

2 VMT TAX

TRACKING METHODS

COLLECTION METHODS

ODOMETER



GPS PRIVACY CONCERNS

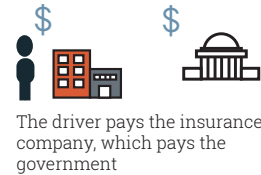


FIGURE 1
THE DIFFERENCES BETWEEN IMPLEMENTING A GAS TAX AND A VEHICLE MILES TRAVELED TAX

would likely have a strong effect on driving behaviors. Thus people would likely adjust their driving habits to an optimal level (Duncan, 2013).

SOCIAL EQUITY

A major concern with both tax methods is equity for low-income and rural families. Various studies have focused on different

aspects of each method, with conflicting results. While the results vary, it is known that both tax methods are regressive. Some studies have shown that the gas tax may affect high-income families more than low-income families when it comes to total fuel expenditures. This is because higher-income families would be less likely to adjust their behavior if a tax were to increase (West, 2002). When income is used to measure the regressivity of the gas tax, it has a larger impact on low-income groups as these families use a higher percentage of their income on the tax. However, this conclusion does not take into account the possible negative effects on accessibility for low-income families that an increase in the tax may cause. The impact of changing from the gas tax to a VMT tax is slightly more regressive, but the difference is small. In fact, a change to VMT has potentially positive outcomes for rural families because on average they own vehicles with lower fuel-efficiency (McMullen, 2010). Studies have shown low-income families also tend to drive less, making a VMT tax, when compared to lifetime income, less regressive than the gas tax (Walls, 1996).

However, the studies mentioned do not account for the benefits of these policies. To get a true sense of the nature of these methods, another study should be done looking at the potential benefits of a cleaner environment, less dependence on foreign oil, and better roadways as a result of the increased funding. There are also potential programs that could be developed in conjunction with the implementation of the different methods to help lessen the negative impacts of these taxes. An example of this could be an exchange program that allows families to replace their old vehicles for those with better fuel efficiency, which would help with the negative effects of gas tax increases.

CONCLUSION

Considering the different goals and obstacles involved with each tax method, the best option for the United States today is a VMT tax that is administered by manual reading of the odometer. This could be done at regular vehicle maintenance appointments by mechanics, or during vehicle registration. It would be fairly inexpensive to implement because it does not require new technology to be successful, and the implementation only requires a limited amount of extra administrative work.

This model is more socially acceptable than the gas tax, which constantly faces resistance to increases. It is also more favorable than a

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VMT tax, which involves detailed readings of GPS data and would face resistance based on privacy concerns. Increasing fuel-efficiency standards for vehicles does not hinder the success of this tax model, which means that CAFE standards can continue to increase for the benefit of the environment. Along with being unhindered by increasing fuel efficiency, this model also helps to counteract the induced travel effect of higher fuel efficiency. The tax would be more visible than a gas tax because a change in the odometer with each trip is easily measured; the cost of each trip is more apparent through this method. The tax will also be good for the environment, as people are encouraged to drive less and limit unnecessary trips, thus reducing pollution.

The execution of this model is fairly simple compared to that of the other VMT models, and it does not cause drivers any extra effort. Auto owners likely have to go to auto service shops for an oil change every few months. Since the shops already record mileage during these tune-ups, it does not add much extra effort to send those records to a government agency. In many states auto owners also already have to renew vehicle registration on an annual basis. Officials will be able to collect the VMT tax when they are collecting the registration fees.

Due to the resistance towards increasing the gas tax and the high cost and privacy concerns that come with other methods of implementing

a VMT tax, the best option is to administer a VMT tax manually. This can be done by measuring the odometer, or if a state has online registration it can be done at regular vehicle appointments by mechanics. This method will affect personal driving behavior, raise much-needed funds, and is comparatively easier to implement than other VMT taxing methods. This method could serve as a precursor for the gradual implementation of a more sophisticated tax. This tax could slowly be implemented as older vehicles phase out, newer models with GPS already included proliferate in the market and privacy preferences become more relaxed. This method can provide the funds needed to maintain important infrastructure. ■

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