Maintaining the Highway Infrastructure as Alternative Fuel Vehicle Usage Increases

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MAINTAINING THE HIGHWAY INFRASTRUCTURE AS ALTERNATIVE FUEL VEHICLE USAGE INCREASES

Sandy Manche

INTRODUCTION

On July 31, 2014, Congress approved a “stopgap” to provide $10.8 billion of additional funding to the Highway Trust Fund. This additional funding was needed to maintain the Highway Trust Fund through May 2015. Based on projections from the Congressional Budget Office, the Highway Trust Fund will continue to have an average annual deficit of $15 billion through 2020. The Highway Trust Fund provides federal and state funding for road and mass transit projects and it is funded through a tax on gasoline and diesel fuel. Two factors that have contributed to the shortfall are the increases in “fuel efficiency” of automobiles and the lack of an increase in the gasoline and fuels tax since 1993. However, increased consumer usages of electric vehicles are also a contributing factor to this shortfall.

There are two types of “plug in” electric vehicles: hybrid and all electric. Plug-in hybrid electric vehicles (PHEV) “are powered by an internal combustion engine that can run on conventional or alternative fuel and an electric motor that uses energy stored in a battery [and can be] plugged into an electric power source to charge the battery.” Fully-electric or all-electric vehicles (EV/BEV) “use a battery to store the electric energy
that powers the motor [and the] batteries are charged by plugging the vehicle into an electric power source.\textsuperscript{9}

In December 2010, sales of “plug-in” electric vehicles were minimal, with two models, the Chevrolet Volt and Nissan Leaf, reporting that only 345 total vehicles were sold in the U.S.\textsuperscript{10} Sales of “plug-in” vehicles began increasing in 2011 and additional manufacturers began offering fully electric vehicles.\textsuperscript{11} From 2011 through 2013, an increasing number of electric vehicles began using the highways with an additional 17,425 vehicles sold in 2011, 52,581 vehicles sold in 2012, and 97,509 vehicles sold in 2013.\textsuperscript{12} In 2014, twenty-two models of “plug-in” electric vehicles contributed to a reported annual sales volume of 119,710 vehicles in the U.S.,\textsuperscript{13} therefore, sales in 2014 surpassed the 2013 level.\textsuperscript{14} Although electric vehicles account for less than four percent of the sales of light duty vehicles in the U.S.,\textsuperscript{15} the increasing historical sales raise the issue of how future funding of highways will be achieved as sales of gasoline in the U.S. decrease due to the use of electric vehicles by consumers.

The Highway Trust Fund, 26 U.S.C. § 9503, established that the section 4081 taxes of 18.3 cents per gallon\textsuperscript{16} on gasoline and 24.3 cents per gallon on diesel fuels and kerosene\textsuperscript{17} would be transferred into the fund.\textsuperscript{18} By taxing gasoline, the users of the highway are funding the maintenance of the highways.\textsuperscript{19} Fully electric vehicles do not use gasoline; therefore, those users pay no gasoline tax. “Hybrid” vehicles, which operate through both the use of gasoline and a battery, use fewer gallons of gasoline; therefore, the owners of these vehicles pay a reduced gasoline tax. Therefore, it is clear

\textsuperscript{9} Id.
\textsuperscript{11} See id.
\textsuperscript{12} Id.
\textsuperscript{13} Id.
\textsuperscript{14} See id.
\textsuperscript{17} Id.
\textsuperscript{19} Stephen McDonald, Why VEETC is Not Enough: Protecting the National Highway Transportation Infrastructure, 30 WM. & MARY ENVIL. L. & POL’Y REV. 731, 739 (2006).
that the current gasoline tax structure does not "charge" all of the users of the federal highways for the use of the highways. Furthermore, as the number of electric vehicles on the roads increases, the revenues that fund the Highway Trust Fund will decrease.

Decreases in revenues to the Highway Trust Fund affect both the federal government and the state governments. In 2011, "states received anywhere from 14.9 percent (New York) to 58.9 percent (Montana) of their total highway and transit funding from the federal government." 20 Although, over half of the funding for Kentucky road projects is raised by the state motor fuels tax and about a third is received from the state motor vehicle tax, 21 a significant portion of the state revenue is received from the federal Highway Trust Fund. 22 Kentucky receives "about $650 million from the trust fund annually." 23

Increases in electric vehicle usages also reduce the amount of tax collected in Kentucky. The Kentucky motor fuels tax has both a variable and fixed component. The variable component imposes an excise tax of "nine percent (9%) of the average wholesale price rounded to the nearest one-tenth of one cent . . . on all gasoline and special fuel received in [the] state." 24 This tax is imposed on the dealer. 25 Because the tax is based on the average wholesale price, the state receives less funding for road projects when the price of gasoline drops. In January 2015, the Kentucky tax on gasoline fell 4.3 cents to 27.6 cents per gallon. 26 While a tax decrease is

25 Id.
advantageous to Kentucky motorists, the January decrease was predicted to “result in a $129 million loss to the Kentucky road fund . . . totaling about 6 percent of the state highway program.” 27 The Transportation Department noted that this decrease would be “crippling” to the state’s budget for “building, improving, maintaining and repairing [Kentucky] roads, streets and bridges.” 28 Decreases in gasoline taxes collected by the state due to increased use of electric vehicles, therefore, can also contribute to an already constrained Kentucky road fund.

Although electric vehicle sales through 2014 have been relatively small compared to total vehicle sales, electric vehicle sales only began increasing within the past four years and are in the early stage of their life cycle. Additionally, substantial investments have been made by both the federal government and private companies to increase electric vehicle sales. This note will discuss the current state of electrical vehicle sales, the investments that have been made in improving the infrastructure to increase electric vehicle sales, the taxpayer inequalities that will result from maintaining the current “gasoline tax” tax structure and will propose alternatives to the current gasoline tax.

Part I of this Note will discuss the problems with the current taxing structure for funding highway projects. Part II will calculate the impact on tax revenues from the increase in electric vehicles sales. Part III will discuss tax policy issues, including horizontal and vertical equity. Part IV will discuss solutions that other states have proposed for increasing funding of highway projects, and problems with the proposed solutions. Finally, Part V will discuss the current taxing structure for electricity and propose that the current tax structure for electricity usage be amended to capture a tax on electric vehicle usage.

27 Id.
28 Id.
FUNDING OF HIGHWAY PROJECTS

The gasoline tax was initially established as a user fee to subsidize federal road construction. The federal Highway Trust Fund ("HTF") was created to earmark the revenue collected from the gasoline tax for road projects. The current federal gasoline tax of 18.3 cents per gallon has not been increased since 1993. Although the costs of maintaining the highways have increased due to inflation, the gasoline tax has remained constant and has not been adjusted for inflation. If the gasoline tax had been indexed for inflation, motorists in 2014 would have been paying approximately 29.9 cents per gallon for taxes instead of 18.3 cents per gallon (based upon the cumulative rate of inflation of 63.4 percent between 1993 and 2014).

In the U.S. the highway infrastructure is aging. In its 2013 Report Card, the American Society of Civil Engineers gave “roads” a grade of D (poor). Historically, the “HTF” revenues from gasoline taxes have not been enough to meet the increasing expenses for maintaining highways and Congress has had to appropriate additional funds from the General Fund to keep the fund solvent. In a June 2014 report, the Congressional Budget Office reported that “in the past 10 years, outlays from the Highway Trust Fund have exceeded revenues by more than $52 billion . . . [s]ince 2008, lawmakers have addressed those shortfalls by transferring $54 billion, mostly from the general fund of the Treasury, to the Highway Trust Fund.” In August 2014, lawmakers again addressed this shortfall in Public Law 113-159 (“Highway and Transportation Act of 2014”) by appropriating

29 McDonald, supra note 19, at 739.
30 Id. at 739.
32 Id.
35 Id.
$9.765 million from the General Fund and an additional $1 million from the “Leaking Underground Storage Tank Trust Fund.”

Fuel efficiency of automobiles also impacts the revenues collected from the gasoline tax because the price of gasoline can impact whether a driver chooses to purchase an automobile that is fuel efficient or inefficient. The average price of a gallon of gasoline first exceeded $3 per gallon in 2008. As the price of gasoline increased, consumer demand shifted from large vehicles, such as SUVs, toward “hybrids and other fuel-efficient cars.” In 2005, the average miles per gallon (“mpg”) for vehicles increased to twenty-one mpg due to increased sales of more fuel-efficient vehicles. Technological advances by automobile manufactures further increased the average mpg. As of 2013, the average mpg of cars and light duty trucks has risen to twenty-four mpg. Between 2005 and 2013, the annual miles that Americans had driven remained relatively flat with 2.97 trillion miles driven in 2005 compared to 2.96 trillion miles driven in 2013. Logically, if Americans are driving the same number of miles but are achieving a higher mpg, the gasoline tax revenue will decrease because the tax rate per gallon has remained constant. Furthermore, hybrid vehicles “typically achieve better fuel economy and have lower fuel costs than similar conventional vehicles.” Therefore, as sales of hybrid vehicles and fully electric vehicles increase, the taxes collected from the gasoline tax will further decrease. As previously stated, fully-electric vehicle sales have been increasing between 2011 and 2014.

40 McDonnell, supra note 19, at 751-52.
44 See Monthly Plug-In Sales Scorecard supra note 10.
Decreases in the federal gasoline tax collected also affects the funding to the states. Additionally, increases in fuel economy, increases in sales of electric vehicles, and decreases in the price of gasoline will also reduce the tax revenues collected by Kentucky where the state motor fuels tax contributes over half of the funding for road projects. In Kentucky, the tax rate decreases when the average wholesale price of gasoline decreases. As a result of a decrease in the wholesale price of gasoline, the Kentucky gasoline tax decrease of 4.3 cents per gallon on January 1, 2015 was projected to “result in a $129 million loss to the Kentucky road fund — totaling about 6 percent of the state highway program.” Kentucky roads are also aging. In its 2011 Report Card, the American Society of Civil Engineers gave Kentucky’s roads and bridges a grade of D (poor).

II. IMPACT OF ELECTRIC VEHICLE USAGE ON HIGHWAY FUNDING

Increases in sales of fully electric vehicles decrease the revenue collected through both the federal gasoline tax and state motor fuels taxes. For example, in 2014 the average number of miles that Americans drove per year was 13,476. If a person drives a 24-mpg vehicle, then he will purchase approximately 562 gallons of gasoline in a year and pay $102 in federal gasoline taxes ($155 in Kentucky motor vehicles taxes assuming a tax rate of 27.6 cents). But when a motorist purchases a fully electric vehicle rather than a conventional gasoline powered vehicle, the gasoline tax and state motor vehicles tax revenue is not collected. Although this number seems nominal, sales of 120,000 fully electric vehicles would result in a loss of federal gasoline revenue of $12.2 million. Furthermore, electric vehicle sales are predicted to increase. Although the 2014 cumulative sales for electric vehicles were only 287,570, “the 10 year future U.S. cumulative

45 OUR COMMONWEALTH, supra note 21, at 3.
46 Wynn & Gerth, supra note 26.
47 Id.
48 ASCE, supra note 34.
50 Monthly Plug-In Sales Scorecard, supra note 10, at 1.
sales [through 2023] are predicted to be [between] 1.8 to 7.3 million vehicles.\textsuperscript{51}

In his 2011 "State of the Union Address," President Obama stated that "[w]ith more research and incentives, we can break our dependence on oil with biofuels, and become the first country to have a million electric vehicles on the road by 2015."\textsuperscript{52} Attainment of this goal is unlikely by 2015 because only 287,570 electric vehicles had been sold through 2014. However, the federal government and the manufacturing industry are focused on building an infrastructure to achieve increases in electric vehicle sales. In 2011, when the President announced the goal that one million electric vehicles be sold by 2015, a Department of Energy report indicated that "[t]hrough the Recovery Act, the United States made an unprecedented investment to build our domestic manufacturing capacity and secure our position as a global leader in advanced lithium-ion battery technology . . . [the] investment includes . . . $2.4 billion in loans to three of the world’s first electric vehicle factories in Tennessee, Delaware, and California . . . [and] $2 billion in grants to support 30 factories that produce batteries, motors, and other EV components."\textsuperscript{53} A 2012 report from the Congressional Budget Office estimated that the federal initiatives for electric vehicles would cost the federal government $7.5 million by 2019.\textsuperscript{54} This estimate included the U.S. initiative of federal tax credits of up to $7,500 per vehicle (total budgetary cost $2 billion) that was granted under the "The American Recovery and Reinvestment Act of 2009," as well as, a $2 billion in grants under the "Electric Drive Vehicle Battery and

Component Manufacturing Initiative”, and $3.1 billion from loans granted under the “Advanced Technology Vehicles Manufacturing Program.”

Another initiative by the federal government included purchasing electric vehicles for its own fleet and installing charging stations at federal buildings. The U.S. General Services Administration (“GSA”) reported under the “EV Pilot Program” that “one hundred sixteen plug-in electric vehicles [would be] leased to 20 agencies, including the Departments of Energy, the Navy, and the Treasury [in five major cities and that the] GSA [would] work with agencies to install charging infrastructure in federal buildings in the five pilot cities.”

In 2012, the Department of Energy launched an initiative, called the “EV Everywhere Grand Challenge,” with the goal “to be the first nation in the world to produce plug-in electric vehicles that are as affordable and convenient for the average American family as today’s gasoline-powered vehicles within the next 10 years.” A January 2014 report by the U.S. Department of Energy, “EV Everywhere: A Grand Challenge,” reported that its 2013 “Workplace Charging Challenge” initiative, which was aimed at encouraging employers to provide electric vehicle charging stations for use by employees, had resulted in “more than 50 leading employers in the U.S. [pledging] . . . not only to provide PEV charging access to their workforce at more than 150 worksites, but also to share their best practices with other employers through a nationwide network of information exchange.” This report also noted that the Department of Education’s research and development efforts had “reduced the cost of PEV [plug-in electric vehicle] batteries by approximately 50% over the [previous] four years.” Reductions in the cost of electric vehicles due to the reduced cost of creating the electric battery, as well as the ability to charge the vehicle while at work, could increase the demand for electric vehicles.

55 Id. at 4.
59 Id. at 5.
In addition to more employers offering charging stations for their employees, retailers have also been installing charging stations at their retail locations. For example, Walgreen's "offers electric vehicle (EV) charging stations at approximately 400 locations across the country." This demonstrates Walgreen's intention to provide charging stations that "can add 30 miles of range" in ten minutes and that are conveniently located close to customer's homes or work. As the number of retailers offering charging stations increase, the demand for electric vehicles should increase. The ability to charge your vehicle while you shop could improve consumer perception of electric vehicles.

In a November 18, 2014 press release from the White House, the Obama Administration announced "new commitments by more than 120 businesses, non-profits, and schools, including more than 70 Edison Electric Institute utility companies, to purchase electric vehicles and technologies and to install workplace charging stations." The administration stated that "[t]oday's commitments demonstrate that businesses across the U.S. are investing in the technology that will enhance our energy security by reducing our dependence on oil, promoting measures to cut fuel costs for American families and businesses, and helping the U.S. continue to cut carbon pollution." Four of the seventy utility companies that committed to devoting "at least 5 percent of their annual fleet acquisition budgets to purchasing plug-in electric vehicles" were Kentucky utility companies: Kentucky Power, Duke Energy Kentucky, Kentucky Utilities and Louisville Gas & Electric.

In the press release, the Obama administration noted that the number of workplaces providing charging stations was increasing, that the U.S. Department of Energy was undertaking new initiative to "enhance electric vehicle charging stations, WALGREENS.COM, http://www.walgreens.com/topic/sr/sr_electric_vehicle_charging_stations.jsp (last visited Mar. 31, 2015).

Id.

Id.


Id.

Id.
aggregated purchasing "as evidenced by the fact that the federal fleet of electric vehicles had expanded to 4,000 electric vehicles and 16,000 hybrid electric, and that the "Los Angeles Air Force Base became the first federal facility to replace 100 percent of its general purpose vehicle fleet with plug-in electric vehicles (PEVs)." The administration also noted that "eight states have also committed to putting 3.3 million zero-emission vehicles on the road by 2025, in part by including them in their own public fleets." In addition to purchasing cars for their own public fleets, some states are also driving the initiative to increase the sales of electric vehicles. Recently, in September 2014, the Governor of California signed a bill, "The Charge Ahead California Initiative," with the goal to "place in service [in California] at least 1,000,000 zero-emission and near-zero-emission vehicles by January 1, 2023 and to increase access for disadvantaged, low-income, and moderate-income communities and consumers to zero-emission and near-zero-emission vehicles." The federal government, state government, manufacturers, private employers, public utilities, and retailers have made significant investments in establishing an infrastructure to increase electric vehicle sales. Although the electric vehicle sales market has only begun growing within the past four years, these initiatives and increasing numbers of charging stations could increase the sales of electric vehicles in the U.S. and further decrease the tax revenue base for maintaining and improving the highway infrastructure that these vehicles use. The American Society of Civil Engineers has already rated the highway infrastructure "poor" and the Highway Trust Fund has already reached an underfunded level, requiring additional funding from the federal government "General Fund." Furthermore, imposing a "user fee" through a tax on gasoline results in inequality among motorists. Motorists using the highway system that drive a gasoline powered vehicle will be "charged" for their use of the highway through the gasoline tax; however, motorists using the highway system that

66 Id.
67 Id.
69 ASCE, supra note 34.
drive an electric powered vehicle will not be "charged" for their use of the highway system and the price of their electric vehicle will be further reduced by a tax credit.

Currently, the federal government offers a tax credit for purchases of electric vehicles. Additionally, some states offer state credits to electric vehicle purchasers. The federal government began offering a tax credit in 2008 with the passage of the "Energy Improvement and Extension Act of 2008," The tax credits were extended under the "American Clean Energy and Security Act of 2009," and were available in 2014. The federal tax credit allows a tax credit of up to $7,500 for "each new qualified plug-in electric drive motor vehicle placed in service by the taxpayer during [a] taxable year." The calculation of the credit is a base amount of $2,500 plus a battery capacity amount, which is calculated by multiplying $417 by the number of kilowatt-hours the vehicle has in excess of 5-kilowatt hours, but it cannot exceed $5,000. Therefore, the maximum credit that a taxpayer may claim is $7,500.

In 2014, Kentucky did not offer incentives or tax credits for purchasing electric vehicles; however, many states did offer incentives or tax credits. For example, Georgia offers a maximum state tax credit of up to $5,000 for fully electric vehicle (BEV) purchases, and California offers a credit of up to $2,500 for fully electric vehicle (BEV) purchases and $1,500 for plug-in hybrid electric vehicles (PHEV). Other incentives offered for electric vehicle purchasers are "discounted rates for residential vehicle charging during off-peak hours," which are offered by various utilities in California, exemptions from personal property tax in Michigan, and exemptions from sales taxes in Washington.

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75 Id.
76 Id.
78 Id. (scroll over the states of Georgia and California).
79 Id. (scroll over the states of California, Michigan, and Washington).
Many states also offer incentives for electric vehicle infrastructure investments. For example, Maryland, Arizona, Louisiana, Missouri, New York, and Oklahoma offer tax credits for charging equipment and "Utah has made electricity used by vehicles exempt from taxes." Therefore, the current tax policy of both the federal government and many state governments is to encourage investment in the electric vehicle infrastructure and to encourage sales of electric vehicles. If the objective of the current tax policy is to reduce the environmental and national security costs associated with gasoline, then the federal government must also weigh the costs to the highway infrastructure that will result from a reduction in gasoline powered vehicles. Furthermore, the current tax policy of encouraging electric vehicle sales through tax credits but only taxing the users of the highway system that own gasoline powered vehicles, creates inequities among taxpayers.

III. TAX POLICY ISSUES

Tax policy goals are generally aimed at achieving fairness between taxpayers. The two primary ways of measuring fairness are: horizontal equity and vertical equity. Horizontal equity is where taxpayers at equal levels of income pay an equal amount of tax. Vertical equity is where taxpayers at higher levels of income are bearing a higher relative burden of the tax. For example, the federal income tax is a progressive tax where taxpayers with similar incomes pay the same tax rate and taxpayers at higher levels of income pay a higher tax rate. The federal income tax is aimed at creating horizontal equity between taxpayers that have similar incomes and vertical equity by charging a higher tax rate for individuals that are in a higher income bracket and are thereby consuming more public services. However, tax inequality may be allowed if there is a higher policy goal that

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81 See LEONARD E. BURMAN & JOEL SLEMROD, TAXES IN AMERICA: WHAT EVERYONE NEEDS TO KNOW 1, 163-164 (Oxford University Press 2013).
82 Id. at 163.
83 Id. at 164.
84 See 26 U.S.C.A § 1 (West 2014).
the government is trying to achieve, such as lowering environmental costs through tax credits on electric vehicle purchases.\textsuperscript{85}

Horizontal equity is the "idea that, other things equal, the tax burden should not vary much among people at about the same standard of living; in other words, the tax system should not discriminate on the basis of irrelevant characteristics or tastes."\textsuperscript{86} The current tax on gasoline creates horizontal inequity between taxpayers because taxpayers in a similar situation (i.e., driving a car) are taxed at different rates and the tax discriminates on the basis of the vehicle owner's preference for specific types of cars.

Vertical equity is achieved when taxpayers that are consuming more services are taxed at a higher rate than lower income individuals.\textsuperscript{87} The gasoline tax is imposed on the sale of gasoline to offset the cost of maintaining the highway system that the taxpayer is using or consuming; however, taxpayers who drive electric vehicles are not burdened by a tax for their consumption of the highway system. The gasoline tax, therefore, is vertically inequitable because it is taxing some taxpayers at a higher rate even though the taxpayers may not be consuming (i.e., using) more of the highways.

Horizontal and vertical inequity will be allowed if the government is trying to achieve a higher policy goal.\textsuperscript{88} The current tax policy has been to encourage alternative vehicle usage by offering tax credits from federal income tax. The objective of encouraging alternative vehicle usage is to reduce the U.S. dependence on foreign oil and air pollution caused by greenhouse gases.\textsuperscript{89} Historically, the transportation industry has been a significant contributor to greenhouse gases.\textsuperscript{90} Electric vehicles reduce greenhouse emissions; however, these vehicles do not eliminate greenhouse gases completely if the electricity used to charge the vehicle is generated

\textsuperscript{85} See BURMAN & SLEMROD, supra note 81, at 163.
\textsuperscript{86} Id.
\textsuperscript{87} Id. at 164.
\textsuperscript{88} Id. at 163.
\textsuperscript{89} See Amber Mahone et al., Electric Vehicles and Gas-Fired Power, 149 No. 12 PUB. UTIL. FORT. 42, 43 (2011).
from burning coal.\textsuperscript{91} Although the current tax policy encourages the purchase of alternative fuel vehicles, the tax policy should balance the environmental benefits with the costs of maintaining the highways. The optimal solution is a tax system that enables the electric vehicle's operating cost to be lower than a gasoline powered vehicle's operating cost, yet still taxes all of the users of the highways to ensure that funding is available for highway construction and maintenance projects.

IV. SOLUTIONS PROPOSED WITHIN OTHER STATES

Taxing users based upon mileage is the most equitable method of taxing users of the highways because the tax would be directly correlated to consumption of the highway system and would be horizontally and vertically equitable. The issue, however, is the method used for tracking the mileage. A movement toward taxing users based upon mileage has begun. In 2013, Oregon was the first state to "established a road usage charge system for transportation funding."\textsuperscript{92} Oregon's "road usage charge system" is a voluntary program that is set to begin in July 2015 and will be limited to 5,000 residents.\textsuperscript{93} The program will allow volunteers to choose either a GPS enabled monitoring device or a non-GPS monitoring device, will charge a road usage fee of 1.5 cents per mile, and will allow volunteers to obtain a credit for the amount of Oregon state gasoline taxes paid.\textsuperscript{94} One of the critical issues still being discussed by the task force is how to charge non-residents for road usage.\textsuperscript{95} Although the initial program participants will be provided the "mileage reporting device" at no cost,\textsuperscript{96} if the program becomes mandatory, the cost of a mileage-reporting device may have to be
paid by motorists. The mileage-reporting devices are obtained from third-party vendors, who will report the mileage to the state for billing of motorists. Many motorists may be opposed to installing mileage-reporting devices in their vehicles because of privacy issues, and a general perception that the government can track their movements. Oregon tried to address this potential issue in “Senate Bill 810” and stated that “all personally-identifiable information will be destroyed within 30 days of the current billing cycle [and that] [p]articipants in the program will also have the option of choosing a reporting method that does not use any GPS enabled software.”

Following Oregon, the California’s Governor signed “Senate Bill 1077” on September 29, 2014, to create a “Road Usage Charge (RUC) Technical Advisory Committee in consultation with the Secretary of the Transportation Agency” and to report its findings by June 30, 2018. The objectives of this bill were to “guide the development and evaluation of a pilot program to assess the potential for mileage-based revenue collection for California’s roads and highways as an alternative to the gas tax system” and the bill directed the Technical Advisory Committee to consider:

(1) The availability, adaptability, reliability, and security of methods that might be used in recording and reporting highway use. (2) The necessity of protecting all personally identifiable information used in reporting highway use. (3) The ease and cost of recording and reporting highway use. (4) The ease and cost of administering the collection of taxes and fees as an alternative to the current system of taxing highway use through motor vehicle fuel taxes. (5) Effective methods of maintaining compliance. (6) The ease of reidentifying location data, even when personally identifiable information has been removed from the data. (7) Increased privacy concerns when location data is used in

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97 See id. at 9.
100 Id.
101 Id.
conjunction with other technologies. (8) Public and private agency access, including law enforcement, to data collected and stored for purposes of the RUC to ensure individual privacy rights are protected pursuant to Section 1 of Article I of the California Constitution.102

All of the issues identified by California are issues that a state considering the implementation of a road usage fee must consider.

While some states may focus on taxing users based on mileage through GPS tracking, while others may focus on relying on mileage usage reporting, one of the issues with imposing a tax on mileage is interstate travel. Currently, when a motorist is traveling between states, the state selling the gasoline, that the motorist is consuming, collects the revenue for the state gasoline tax. If a state replaces its state imposed gasoline tax with a mileage based tax on its residents, the state would collect no revenue for nonresidents traveling through the state. Furthermore, if a resident works in another state that also imposes a road usage tax, the mileage reporting system would need to be capable of reporting information to each state based on miles driven within each state.

Individual state taxation also does not address the underfunding of the federal Highway Trust Fund. Elimination of the federal gasoline tax would require a national method of revenue collection based upon miles driven. To replace the gasoline tax on a national level, a global tracking and reporting system would be required because self-reporting by taxpayers could be inaccurate and reporting of travel by state would create a burden on taxpayers. Additionally, a central data collection method would be needed so that a taxpayer only receives one invoice and a third-party vendor submits the revenue to all of the states that the motorists traveled within. However, motorists may be opposed to a third-party having information on the GPS locations they traveled to within a given month and billing by state would not be possible without GPS information. To reduce the burden on taxpayers, the states could collect the tax revenue based upon residency in the state. This could be accomplished in the state of Kentucky by adding a state and federal “highway usage” tax to the current state.

102 Id.
property tax on vehicles, which is paid yearly based upon the fair market value of a vehicle. This would require taxpayers to self-report their mileage and, therefore, the reporting could be inaccurate. Also, imposing tax based upon residency would create inequalities among the states because states with higher numbers of motorists and more trucking companies would reap the benefit of the tax even though the motorists and trucking companies would be using roads in other states.

My proposal is to continue to collect the tax at the source of the resource used. Motorists who consume gasoline tax would continue to be charged a federal and state gasoline tax based upon gasoline consumed. Motorists who consume electricity could be charged a federal and state highway usage charge at the source, on the electric utility invoice. This would allow the federal government to continue to allow tax incentives to incentivize the use of alternative fuels. The tax on gasoline could be increased to discourage gasoline consumption, and the tax on electricity usage could be decreased to encourage the use of alternative fuels. Under the highway usage fee systems that are being proposed by the states, all motorists will pay the same rate, regardless of whether they drive a gasoline powered vehicle or an electric vehicle. Although the mileage reporting system addresses the issue of electric vehicle owners not paying tax for the usage of the highways, the system does not differentiate between fuel sources. Therefore, it does not encourage the use of alternative fuels. A method that differentiates between fuel sources but also collects a highway usage tax would address the issue of electric vehicle owners not paying a tax for the use of the highways but it would also enable the state and federal government to further their goals of increasing the usage of alternative vehicles.

Accurate collection of this tax could be accomplished if the electric vehicle is on a separate meter from the taxpayer’s home meter. By placing the vehicle on a separate meter, the electric utility company could more accurately assess the tax. Otherwise, the electric utility supplying the electricity to the home would need a method of separating the electricity used by the vehicle from the electricity used within the taxpayers home.

103 KY. REV. STAT. ANN. § 138.460 (West 2007).
One potential issue with this method is that taxpayers who charge their vehicles at business and retail locations would not incur a tax on that usage; however, the tax could be imposed on the business and retailer.

Businesses and retailers that provide charging stations would already be incurring the cost of the electricity used in the charging station, and the addition of a tax on the electricity would only be an additional cost of providing the service to employees and customers. If the cost of electricity, including the tax, remains lower than the price of gasoline, electric vehicles will remain an attractive alternative for motorists, and that attractiveness could further be enhanced by an increase in the federal and state gasoline tax.

V. CURRENT TAXES IMPOSED ON ELECTRICITY USAGE

In Kentucky, when fuel costs are $2.42, on average, the electricity cost to drive a similar electric vehicle the same number of miles is .99 cents, more than half of the cost. Although this difference varies by state, even in a high electricity cost state, such as California, the cost to drive the same distance is still less with an electric vehicle. One method of ensuring that electric vehicle operational costs remain lower than gasoline costs is to encourage motorists to charge their vehicle during off-peak hours. Many motorists will want to charge their vehicle as soon as they get home from work, to ensure that it is available for use. The evening hours, however, are "peak" hours and the cost of electricity would be higher during these hours. One way of encouraging "off-peak" charging is for utility companies to install smart meters in customer's homes, these meters could allow electric companies to charge a lower rate for charging vehicles during off-peak hours. Generally, the utility company will receive notice that the

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105 See id.
107 Id.
108 Id. at 582.
customer is charging an electric vehicle because the installation of a “high amp wall charger” is typically necessary.\textsuperscript{109} If smart meters are used, then the utility company could collect an additional tax on the electricity used for vehicle charging and this tax could be directed to the federal Highway Trust fund, as well as the state’s transportation fund.

This tax could also replace taxes that are currently assessed on electricity usage within the home. For example, Kentucky Utilities rate for residential service is a basic service charge of $10.75 plus a charge of $.07744 per kilowatt hour (kWh).\textsuperscript{110} Additionally, the utility currently collects a school tax of 3 percent, which is authorized by Kentucky Revised Statute 160.617.\textsuperscript{111} Kentucky Utilities has a pilot rate schedule for Low Emission Vehicles (LEV), which has a basic service charge of $10.75 plus a charge of $.05587 per kilowatt hour during off-peak hours, $.07763 per kilowatt hour during intermediate hours, and $.14297 per kilowatt hours during peak hours, and the utility collects the 3 percent school tax.\textsuperscript{112} Therefore, Kentucky encourages off-peak charging by offering a lower rate per kilowatt-hour. Additionally, utility companies would probably not be opposed to installing smart meters in homes that charge electric vehicles because reducing the amount of electricity that is being used during peak hours could enable the utility company to better manage their supply and costs. Kentucky utility companies already collect school taxes, so an additional tax collection and remittance would not place a burden on the utility company.

During 2014, based on number of units, the Nissan Leaf had the highest sales volume.\textsuperscript{113} The Nissan Leaf requires 30 kWh to operate for 100 miles.\textsuperscript{114} If the Nissan Leaf were charged during peak hours, the highest rate schedule, the cost of driving 100 miles would still be lower than

\textsuperscript{109} Id. at 588.
\textsuperscript{111} KY. REV. STAT. ANN. § 160.617 (West 2005).
\textsuperscript{112} BELLAR, supra note 110.
\textsuperscript{113} Monthly Plug-In Sales Scorecard, supra note 10.
the price of gasoline for a vehicle that averages 25 miles per gallon. Therefore, an additional tax for highway usage could be imposed without increasing the cost of operating an electric vehicle beyond the cost of operating a gasoline-powered vehicle. If the tax were imposed as a percentage of the total cost of electricity, it would further incentivize motorists to reduce their total utility costs by charging during "off peak" hours. Additionally, motorists may perceive an additional tax on electricity as having less of an impact than paying a tax for each mile driven during a month.

CONCLUSION

In conclusion, electric vehicle sales appear to be in the early stage of their lifecycle, with the number of vehicles sold increasing within the past four years. The infrastructure to support electric vehicles is evolving with the assistance and encouragement of the federal government through incentives. As the price of gasoline increases, electric vehicles will become a more attractive alternative for motorists. To make the current "gasoline" tax more horizontally equitable between taxpayers, a similar tax must be imposed upon electric vehicles. Some states have begun to recognize that an alternative taxing method is needed to ensure that there is adequate funding for highway construction and maintenance. The implementation of an alternative method, however, should be addressed on the national level to ensure equality between the states and ensure that the Highway Trust Fund has adequate funding. So far, the proposed solution by the states has been to tax motorists on a per-mile basis. Although this method directly corresponds to the consumption of the highway, it raises issues of privacy. This method does not differentiate based upon the type of vehicle, electric vehicle owners and gasoline powered vehicle owners will pay the same amount of tax on a per-mile basis, therefore, this method does not incentivize motorists to purchase electric vehicles.

States addressing the issue of electric vehicle usage on highways should examine an alternative method, taxing residents based upon the source of energy used to power the vehicle. The usage of electricity for an electric
vehicle could be captured at either the charging station, or a smart meter within the home. By taxing at the source, the tax on gasoline could be independent of the tax on electricity. This method would be directly correlated with the type of resource being consumed and would increase the revenues for highway projects. With independent rates for the taxes, the state and federal government would have the ability to vary the tax rate to encourage alternative fuels. This method would support the long-term goals of reducing dependence on gasoline and reducing emissions into the environment but it would address the issue of electric vehicle owners not paying a “usage” tax to use the federal and state highways.

In Kentucky, the state could examine the possibility of replacing the current school tax on electricity used for motor vehicle charging with a tax for highway usage. Redirecting this tax would better align the revenues with the resources being consumed by the taxpayer. If you assume that school taxes are imposed on residents based on consumption of the public education system, highway taxes should also be imposed on motorists based on consumption of the federal highway infrastructure. Enacting the taxing system now, in the early stages of changing consumer preferences, would ensure that highway tax revenues are not significantly impacted as sales of electric vehicles increase.