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Declining Motor Fuel Tax Revenue Due To Electric Vehicles and Increased Fuel Efficiency

Madeline Melby

DECLINING MOTOR FUEL TAX REVENUE DUE TO ELECTRIC VEHICLES AND INCREASED FUEL EFFICIENCY

Madeline Melby
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ABSTRACT

The emergence of electric vehicles and increased fuel efficiency within traditional, internal combustion automobiles is an important step in combatting climate change. Many state and federal officials have proposed different resolutions to encourage these types of cars and reduce carbon emissions. However, based on the growing number of electric vehicles, hybrids, and overall, more-fuel efficient vehicles, drivers are no longer purchasing fuel at historic levels, and this is effectively curbing the tax revenue once collected at the gas pump on both a state and federal level. Although these vehicles still contribute to the wear and tear associated with driving on roads, bridges, and highways, by not paying any motor fuel tax (MFT), their drivers effectively avoid contribution of funds necessary to maintain, repair, and replace effected infrastructure.

Motor fuel taxes are the primary source of funding both on state and federal levels.[1] The federal government uses these funds to grant state and local municipalities money to maintain the country's highways and mass transit.[2] Prior to 2008, MFT revenue directed at the highway trust fund (HTF) was sufficient to finance the fund's economic outlay.[3] In recent years, however, the trust fund has needed major transfers from the Treasury's general fund to remain solvent. The Congressional Budget Office currently estimates that by 2030, the federal trust will be $195 billion short if tax funding continues at its current rate.[4]

Consumers are affected by a burden placed unequally on drivers who have not yet conformed to an expensive, shifting trend towards electric vehicles. Although raising the motor

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1. NATIONAL ASSOCIATION OF STATE BUDGET OFFICES, 2019 STATE EXPENDITURE REPORT 5, (2019) [hereinafter 2019 STATE EXPENDITURE REPORT].
2. Tax Policy Center, *Briefing Book: Key Elements of the U.S. Tax System,* URBAN INSTITUTE & BROOKINGS INSTITUTION (May 2020).
3. *Id.*
4. *Id.*

fuel tax rate may be an easy solution to provide highway funding, it would be neither effective nor equitable. With the emergence of electric vehicles that use the same roads as traditional vehicles, it is only fair to expect these electric drivers to contribute to the highway fund in some capacity.

This article will first discuss the current funding structure for maintenance and improvement of the nation's roadways and emphasize the importance of the Highway Trust Fund in transportation funding. Part II will identify funding shortages due to diminishing motor fuel tax revenue as a result of rising electric vehicle registrations and increased fuel efficiency. Part III will provide a brief comparison of this problem in the United States to its European counterparts who are further along in the transition to EVs and are beginning to realize diminishing revenue from motor fuel taxes. Part IV will identify potential resolutions to ensure stable transportation funding.

I. CURRENT FUNDING STRUCTURE FOR THE NATION'S ROADWAYS

Traditionally, maintenance and improvement toward the nation's roadways have been funded by federal, state, and local gasoline taxes. Every state currently imposes an excise tax related to transportation to fund highway and road preservation.[5] States have relied most heavily on a motor fuel tax ("MFT") as the primary source of transportation funding in the United States for nearly 100 years.[6] MFTs represent the largest revenue source of transportation funding, contributing 39.8% of these total funds.[7] Other sources include license and registration fees at

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5. Angie Longacre, *Are Electric Vehicles Draining the Motor Fuel Tax System?* AVALARA (Oct. 14, 2021).

6. ED REGAN, THE MOTOR FUEL TAX: A CRITICAL SYSTEM AT RISK, at 4 (CDM Smith 2016).

7. 2019 STATE EXPENDITURE REPORT, *supra* note 1.

19.4%, vehicle sales and use taxes at 7.6%, and tolls at 1.5%.[8] These taxes have remained in place for a long time because they are simple, efficient, and widely accepted by the public.[9] MFTs serve as a form of an indirect user fee based on the amount of fuel consumed. The more a vehicle is driven, the more fuel is consumed, and therefore, a greater road usage tax is paid.[10]

Although state and local governments provide most of the funding for highway infrastructure investment,[11] the federal government finances a significant chunk of this public spending. In 2019, the federal government financed 26.9% of all total spending on roads and highways[12], providing about $46 billion annually to roadway- transportation expenditures.[13] The main source of this federal government spending is the Highway Trust Fund.[14]

In 1956, Congress established the Highway Trust Fund (HTF) to provide a dependable funding source for the federal government to aid in the construction of the interstate highway system.[15] The HTF is comprised of two accounts: (1) the highway account which is devoted to the construction and maintenance of highways and bridges, and (2) the mass transit account that is used to make capital expenditures on buses, railways, subways, ferries, and other modes of public mass transit.[16] The majority of spending from the HTF occurs through federal grants to state and local governments.[17]

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8. *Id.*
9. REGAN, *supra* note 6.
10. *Id.*
11. *The Highway Trust Fund Explained,* PETER G. PETERSON FOUNDATION (2020).
12. 2019 STATE EXPENDITURE REPORT, *supra* note 1.
13. *HTF Explained, supra* note 11.
14. Tax Policy Center, *supra* note 2.
15. *HTF Explained, supra* note 11.
16. *HTF Explained, supra* note 11.
17. Tax Policy Center, *supra* note 2.

Excise taxes on gasoline, diesel, and other motor fuels account for 84% of total revenue to the HTF.[18] This adds up to $36 billion.[19] Other sources of capital include sales tax on tractors and heavy trucks, excise taxes on tires for heavy vehicles, and annual use taxes on such vehicles.[20] The tax of 18.4 cents per gallon on gasoline and ethanol-blended fuel is the largest source of revenue, contributing $26 billion, nearly 60% of total funds.[21] Diesel is taxed at a higher rate of 24.4 cents per gallon and accounts for about 25% of the fund's revenue, totaling $10 billion.[22] However, these taxes on the two most common fuels, gasoline and diesel, have remained stagnant since 1993, never adjusted to account for inflation.[23] Because the federal gas tax is not pegged for inflation, the purchasing power of revenue has eroded over time.[24] To illustrate, $0.18 cents bought 43% less in 2019 than it would have in 1993.[25] If tax rates had been indexed for inflation in 1993, the tax on gasoline would be $0.33 per gallon, and $0.44 on diesel.[26]

Before the financial crisis of 2008, MFT revenue was sufficient to pay the HTF's economic outlay.[27] However, in recent years, there have been reoccurring funding shortfalls due to rising construction costs and the growing needs of an aging highway system.[28] This, in turn, triggers a major strain on the HTF. The trust fund has needed major transfers of general revenue

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18. *Id.*
19. CONGRESSIONAL BUDGET OFFICE, REAUTHORIZING FEDERAL HIGHWAY PROGRAMS: ISSUES AND OPTIONS at 4, (2020).
20. Tax Policy Center, *supra* note 2.
21. *Id.*
22. *Id.*
23. CONGRESSIONAL BUDGET OFFICE, *supra* note 11.
24. *Highway Trust Fund Explained, supra* note 11.
25. *Id.*
26. Tax Policy Center, *supra* note 2.
27. *Id.*
28. *HTF Explained, supra* note 11.

to remain solvent in recent years.[29] Since 2008, Congress has sustained highway spending by transferring $144 billion from the U.S. Treasury's general fund to the HTF.[30] This includes $70 billion authorized in the FAST Act in 2015.[31]

Although the FAST Act provided the United States with transportation funding assurance, long-term security and sustainability of the current transportation structure remain in jeopardy.[32] The Congressional Budget Office (CBO) predicts the Highway Account will be exhausted by 2022.[33] Furthermore, the CBO predicts that the shortfall in funding for the HTF will accelerate to approximately $190 billion over the next ten years.[34] In 2020, the CBO predicted that spending from the HTF will exceed reserves by $134 billion for the highway account and $54 billion for the mass transit account by 2030.[35] If left unaddressed, the shortfalls will only accelerate due to decreasing fuel consumption as a result of higher fuel efficiency from gasoline-powered vehicles in combination with the rise of hybrids and electric vehicles.[36]

II. THE PRESENT DILEMMA: PROJECTIONS FOR FUNDING SHORTAGES DUE TO LACKING MOTOR FUEL TAX REVENUE

In its current form, the motor fuel tax is doomed to fail in the future.[37] The emergence of electric vehicles, enhanced fuel efficiency, and fuel alternatives all mean that less fuel will be consumed in the United States.[38] Although this is great news when it comes to reducing greenhouse gas emissions and U.S. dependency on foreign oil supplies, this is terrible for

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29. Longacre, *supra* note 5.
30. *HTF Explained, supra* note 11.
31. Tax Policy Center, *supra* note 2.
32. REGAN, *supra* note 6, at 3.
33. *HTF Explained, supra* note 11.
34. *Id.*
35. Tax Policy Center, *supra* note 2.
36. *HTF Explained, supra* note 11.
37. REGAN, *supra* note 6, at 4.
38. *Id.*

transportation funding which relies upon motor fuel taxes as a major funding source for infrastructure.[39] The strong relationship between MFTs and highway funding has created a quandary. One of the biggest initiatives in the United States against the war on climate change is increasing fuel efficiency.[40] Meanwhile, the nation is actively discouraging the use of a commodity of which taxation of its consumption is necessary to fund America's roadways.[41]

A. The Trend Towards Electric Vehicles, Increased Fuel Efficiency, & Lost Fuel Revenue

Although global car sales have taken a pandemic-related decline, dropping 16% across the world, electric car registrations were up 41% in 2020.[42] In terms of electric vehicle consumption, the United States falls behind its European counterparts with electric vehicles comprising of only 4% of all new vehicles bought in 2021. However, this is up 2% from 2020, and a dramatic increase is expected in the near future.[43] President Biden recently signed an executive order calling for the sales of electric and hybrid vehicles to account for 50% of all new car and light-truck sales by 2030. The U.S. Bureau of Transportation Statistics has predicted that 10% of all new car sales will be electric by 2025 and 22% by 2030.[44] However, if EVs become more affordable, they predict the percentages will be more in line with President Biden's goal.[45]

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39. *Id.*
40. *Id.*
41. *Id.*
42. Wale Azeez, *5 Things to Know About the Future of Electric Vehicles,* WORLD ECONOMIC FORUM (May 12, 2021).
43. Kristy Hartman and Laura Shields, *Special Fees on Plug-In Hybrid and Electric Vehicles,* NATIONAL CONFERENCE OF STATE LEGISLATURES (Oct. 12, 2021).
44. Bureau of Transportation Statistics, AVERAGE FUEL EFFICIENCY OF U.S. LIGHT DUTY VEHICLES, U.S. DEPARTMENT OF TRANSPORTATION, https://www.bts.gov/content/average-fuel-efficiency-us-light-duty-vehicles.
45. *Id.*

Many states have also taken a progressive approach to encourage electric vehicle sales. The country's most highly populated state, California, has announced that beginning in 2035, it will end all new sales of gas-powered vehicles.[46] This will have a dramatic effect as California currently accounts for over 1 out of every 10 new cars sold in the United States.[47] Although it was the first state to announce such a mandate, California leadership is following the lead of at least 15 other countries including Germany, France, and Norway that have all made similar pledges.[48]

In 2021, at least 25 EV models were available, and as more manufacturers pledge to "go electric," many factors point to the trend of increased EV sales and a corresponding decline in fuel consumption.[49] Without policy change, there will be an inequitable result. Although EV drivers would continue using traditional roadways, because they do not consume gas, they will not pay their fair share in contributing to the nation's main funding source for road maintenance, the MFT.[50]

In conjunction with an increase in EVs across the country, traditional internal combustion engine vehicles are also becoming more fuel efficient.[51] As consumers begin to guzzle less and less gas, this begs the question as to how this will affect fuel tax revenue. In 1980, the average miles per gallon (mpg) for a light-duty vehicle in the United States was 14.9.[52] However, in 2000, that mileage increased to 20 mpg and in 2019, to 22.2 mpg.[53] According to the University

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46. Adam Beam, *California is Ready to Pull the Plug on Gas Vehicles,* ASSOCIATED PRESS (Sept. 24, 2020).
47. *Id.*
48. *Id.*
49. Longacre, *supra* note 5.
50. Hartman and Shields, *supra* note 47.
51. Bureau of Transportation Statistics, *supra* note 48.
52. *Id.*
53. *Id.*

of Michigan Transportation Research Institute, average fuel efficiency of new passenger cars and light vehicles has increased 22% between 2008 and 2014.[54]

The US Energy Information Administration has predicted at least a 19% decline in gas consumption through 2050.[55] However in taking account the accelerated growth of EVs and increased fuel efficiency, CDM Smith, a global engineering firm, has estimated that by 2040, fuel sales will decline by as much as 45%.[56] Either way, there is a diminishing value of fuel tax revenue and a concern that the current state and federal taxation structure will not be able to sufficiently satisfy transportation needs in the long-term.[57] Combined with the fact that gas taxes are set at fixed rates and do not rise with inflation, the HTF is in danger.[58]

For the past five years, the HTF has been on life support as it is.[59] Based on estimations from the Congressional Budget Office, the fund will be $189 billion short by 2030 if taxation continues at current rates while spending for highway and transit programs increases annually to adjust for inflation.[60] This problem is exasperated by the fact that elected officials are reluctant to raise fuel taxes. The federal gas tax has not been increased in more than 20 years and senior congressional staff involved in negotiations on transportation funding have expressed that there may never be an increase in the federal motor fuel tax.[61]Although some states have chosen to automatically adjust tax rates in the future to keep pace with inflation, this index does not

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54. REGAN, *supra* note 6, at 4.
55. U.S. ENERGY INFORMATION ADMINISTRATION, ANNUAL ENERGY OUTLOOK 2020 WITH PROJECTIONS TO 2050 96 (2020).
56. REGAN, *supra* note 6, at 11.
57. 2019 STATE EXPENDITURE REPORT, *supra* note 1 at 70.
58. *Id.*
59. REGAN, *supra* note 6, at 4.
60. CONGRESSIONAL BUDGET OFFICE, *supra* note 11.
61. REGAN, *supra* note 6, at 13.

address the major problem that is overall reduction in fuel consumption due to increased fuel efficiency and the anticipation of an electric vehicle takeover.[62]

B. The Importance of a Remedy

Unless state and local governments begin to utilize an alternative source of transportation funding, agencies will lack resources to maintain the existing network of highways, roads, and bridges, repair already crumbling infrastructure and begin new projects.[63] Maintaining the HTF and our nation's roadways is important for American productivity and competitiveness. The current system is not meeting America's 21st century needs, and safe, efficient infrastructure is key to economic growth and productivity.[64] The United States ranks 17th in road quality and 13th in overall infrastructure quality globally.[65]

The United States is at an economic disadvantage based on the importance of its infrastructure in the transportation of both goods and people.[66] In 2019, American drivers lost on average 99 hours of productivity (totaling $88 billion) lost due to congestion.[67]This costs each driver nearly $1,400 per year.[68] Furthermore, the 20 most congested cities in the world include 4 US cities which is the highest concentration for any county in the grouping.[69]

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62. *Id.*
63. Douglas Shinkle and Jonathan Bates, *NCSL Kicks off Project to Expand Understanding of Road User Charging, NATIONAL CONFERENCE OF STATE LEGISLATURES* (Nov. 17, 2021).
64. *HTF Explained, supra* note 11.
65. Klaus Schwab, *The Global Competitiveness Report-2019*, WORLD ECONOMIC FORUM 582 (2019).
66. *HTF Explained, supra* note 11.
67. *Congestion Costs Each American,* INRX (Mar. 9, 2020)
68. *Id.*
69. *Id.*

III. BRIEF COMPARISON TO EUROPEAN COUNTERPARTS

Through tax and other economic incentives, many federal governments around the world have been promoting the purchasing of new electric vehicles in an effort to reduce the greenhouse effect.[70] These countries that have strongly encouraged consumers to purchase electric vehicles for years are now beginning to experience the effects of diminishing income from MFTs.[71]The way that its European counterparts handle the transition from gas to electric vehicles will be closely watched by the United States while lawmakers attempt to boost electric vehicle sales through tax incentives.[72]

In the United Kingdom, 14% of new vehicles purchased in 2021 were electric and the government plans to ban the sale of new gasoline and diesel cars by 2030.[73] However, fuel taxes have historically accounted for 7% of the UK's annual tax revenue, and the parliamentary transport committee is anticipating a stark drop in fuel tax collection.[74] Huw Merriman, chair of the transport committee stated, "A consequence of the transition to electric vehicles is a potential £40 billion [equivalent to $54.47 billion] annual fiscal black hole…something will have to change."[75]

Norway is also experiencing sharp losses in tax revenue due to the tax incentives of EVs. Norway has the world's highest EV-uptake rate with more than 2/3 of all new cars sold being electric.[76] Between 2013 and 2021, Norway lost 40% of its annual revenue due to car-related

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70. David Hodari, *Electric-Car Shift Drains Fuel Taxes in Some Countries,* WALL STREET JOURNAL (Sept. 23, 2021 10:24 am ET).
71. *Id.*
72. *Id.*
73. *Id.*
74. *Id.*
75. *Id.*
76. *Id.*

taxation which caused lawmakers to suspend exemptions in March of 2021 for electric vehicle owners from the country's motor vehicle tax.[77] A spokesman for Norway's finance ministry claims that this sharp loss in tax revenue was difficult to foresee and would advise other countries to look at what is happening in Norway and be aware that there may be severe consequences to tax losses.[78]

IV. POTENTIAL SOLUTIONS

The motor fuel tax as it is known today is not viable as the primary source of funding for transportation maintenance and it is not so much a matter of "if" but "when" it will become completely unsustainable.[79] As a short-term solution, policymakers should consider raising gas tax rates and coming up with potential new revenue sources to supplement the declining motor fuel tax.[80] However, due to the rapid emergence of electric vehicle growth in combination with vehicles' increased fuel efficiency, this is not practical long-term solution. The implementation of charging drivers not on the amount of gas they purchase, but the amount of miles driven may provide a more equitable solution to the problem while encouraging a new solution to avoid having to constantly raise tax rates on fuel.[81]

A. Raising the Gas Tax

The Joint Committee on Taxation has estimated that raising the MFT by only one cent would raise HTF revenue by $1.5-1.7 billion annually.[82] Also, raising the federal motor fuel tax by $0.15 per gallon would provide the highway trust fund with an additional $329 billion

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77. *Id.*
78. *Id.*
79. REGAN, *supra* note 6, at 17, 24.
80. *Id* at 23.
81. *Id.* at 24.
82. Joseph Kile, *Testimony on the Status of the Highway Trust Fund and Options for Paying for Highway Spending,* CONGRESSIONAL BUDGET OFFICE (2015).

between 2021 and 2030.[83] While this may seem like a simple solution, if governments still want to generate enough revenue to maintain their current infrastructure and keep up with increasing future travel, gas tax rates would actually need to be increased by at least $1.16 per gallon to overcome the effects of increased fuel efficiency and decreased fuel consumption.[84]

The motor fuel tax as we know it today is not a viable long-term solution to the problem of declining motor fuel tax revenue. Cars with high fuel efficiencies are using less gas and contributing less to the highway trust fund than they have in the past. As cars are becoming more fuel-efficient, they are reducing the number of gallons of fuel consumed and more electric/hybrid cars on the road will lead to decreased demand for gasoline, reducing the opportunity to collect taxes on this current primary source.[85] In order to compensate for high-fuel efficiency and electric vehicles, in the short-term, gas rates would need to increase to very high levels.[86]

Although adjusting for inflation would create significantly higher MFT revenue, the downfalls are robust. Raising MFTs would negatively affect businesses, causing them to increase costs, incur lower profits, and decrease employee wages.[87] Furthermore, if businesses make less money, less federal tax revenue would ultimately be collected on the businesses' income, creating a circular problem.[88] Additionally, a simple raise in MFT does not provide an equitable solution that encourages EVs to pay their fair share. "Motor fuel taxes are an imperfect user fee because they do not differentiate among vehicles that cause greater or lesser road wear for the

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83. Longacre, *supra* note 5.
84. REGAN, *supra* note 6, at 16.
85. *HTF Explained, supra* note 11.
86. REGAN, *supra* note 6, at 17.
87. Tax Policy Center, *supra* note 2.
88. *Id.*

same amount of fuel consumed or between travel on crowded and uncrowded roads."[89] Such action would disproportionately affect owners of gasoline-powered vehicles. This includes those with less wealth who are less likely to own EVs as well as those in rural areas where the number of miles driven is greater and electric vehicles are less common.[90]

B. Separate Registration Fee for Hybrid & Electric Vehicles

Currently in many states, separate registration fees for certain hybrid and electric vehicles are imposed in addition to standard motor vehicle registration fees.[91] Proponents maintain that these additional fees bring equity among drivers by ensuring that all drivers pay for the upkeep of the roadways. Currently in Illinois, there is an additional $100 annual fee for the registration of electric vehicles on top of the $148 annual fee for traditional registration of all vehicles.[92] As of November 2020, 28 states mandated additional registration fees for electric vehicles ranging from as low as $50 to as high as $225.[93]

Historically revenue derived from these registration fees was directed towards general state transportation funding. However, some states are beginning to allocate the revenue from these fees to support infrastructure specific to electric vehicles. For example, Alabama allocates $50 of its $200 fee towards building new EV infrastructure.[94] Washington has added an additional $75 fee to support charging stations, and Colorado allocates $20 of its $50 fee to do the same.[95] Although constructing the equipment necessary to support this new technology is important, these fees that were once imposed to account for electric vehicles avoiding the motor

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89. *Id.*
90. *HTF Explained, supra* note 11
91. Hartman and Shields, *supra* note 47.
92. 625 ILCS 5 3-805/SB 1929 (2019).
93. Longacre, *supra* note 5.
94. Hartman and Shields, *supra* note 47
95. *Id.*

fuel tax and therefore fund road maintenance are now being directed elsewhere. Lastly, a flat fee does not account for the relationship between transportation across the nation's roadways and corresponding payment for such road use and those who drive more.[96]

C. Taxation of Electric Vehicle Charging Stations

Many proponents of the taxation of electric vehicle charging stations find it to be a natural parallel to account for declining revenue from MFTs. Currently, there are three options utilized by 43 states which include taxing the purchase price, a flat fee tax, and taxing per kilowatt per hour.[97] However, industry insiders doubt that charging station taxes are a viable solution for transportation infrastructure funding because despite the rapid rise of EV sales, battery-operated vehicles are projected to main a minority on US roads for the foreseeable future.[98]

D. Road User Charges

A Road User Charge (RUC) funding model requires drivers to pay a tax not based on their gallons of fuel consumed, but rather, miles driven.[99] These fees would not supplement, but replace the current gas tax, enabling governments to avoid constantly increasing gas tax rates to make up for losses due to fuel efficiency.[100] The goal of RUCs is to more closely link transportation taxes to the actual use of roadways by a driver, as opposed to traditional fuel taxes which can fluctuate based on the fuel efficiency of the cars guzzling the gas.[101] These fees would

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96. REGAN, *supra* note 6, at 17.
97. Longacre, *supra* note 5.
98. *Id.*
99. Hartman and Shields, *supra* note 47.
100. REGAN, *supra* note 6, at 18.
101. Hartman and Shields, *supra* note 47.

effectively allow federal and state governments to tax drivers directly for using their roads more often.[102]

The idea of road user charges is beginning to gain momentum across the United States. Between 2019-2020, at least 19 states were considering 34 pieces of legislation addressing RUCs.[103] Since 2013, 10 states have implemented pilot programs to test the system's efficiency.[104] The federal government has allocated over $50 Million to pilot programs as part of the 2015 FAST Act through the Surface Transportation System Funding Alternatives grant.[105] Thus far, devices used in testing have plugged GPS technology into a vehicle's "OBD-II" port which is used for computerized vehicle diagnostics and connects to the vehicle's technology systems.[106] This technology could link odometer readings and other useful data to a mileage-based user fee.[107]

Although this may seem complicated, it would be relatively simply as every new vehicle sold in America in the last 20 years has an OBD II port.[108] The port has also been used by auto insurance companies in recent years to install various driver performance monitoring devices.[109] This technology can be used to collect tolls without the need for installation of expensive roadside equipment and electronic tolling.[110] For example, in Germany, trucks from all over

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102. REGAN, *supra* note 6, at 17.
103. Hartman and Shields, *supra* note 47.
104. *Id.*
105. Shinkle and Bates, *supra* note 64.
106. REGAN, *supra* note 6, at 20.
107. *Id.*
108. *Id.*
109. *Id.*
110. *Id.* at 21.

Europe are assessed tolls on the Autobahn system and more than $8 billion each year is collected solely through GPS based units within these vehicles.[111]

This system of road pricing is currently being explored as a solution to lower fuel taxes in the UK, Norway, Australia, and Singapore as well.[112] Some of these trials have implemented congestion-charge zones that use cameras to read license plates and charge drivers accordingly.[113] Analysts have found that it can reduce congestion and serves as a more equitable solution that current fuel taxes that do not account for where or when road users are driving.[114] However, camera networks are not a practical solution across larger areas and it may be unfair for those in rural areas that are more reliant on driving long distances.[115]

A potential concern among RUC opponents in the United States is personal privacy relating to the suggested use of GPS to track movements.[116] The most sophisticated technology options require the installation of GPS on-board units that act similarly to commercially available route mapping devices.[117] Some have argued that these devices would allow governments to track private vehicles through satellite GPS.[118] However, the system would utilize the same technology that is used in cellphones and other endless apps every day.[119] Because of these concerns, most of the pilots performed in the US thus far have centered around overcoming public political anxiety surrounding privacy and skeptical attitudes on RUCs.[120]

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111. *Id.*
112. Hodari, *supra* note 71.
113. *Id.*
114. *Id.*
115. *Id.*
116. *HTF Explained, supra* note 11.
117. REGAN, *supra* note 6, at 19.
118. *Id.*
119. *Id.*
120. *Id.* at 22.

Therefore, recent pilots have offered "non-technology options" such as self-reporting of annual odometer readings.[121] The opposition RUC funding has faced from tax hawks and privacy activists could prevent its adoption, but few viable alternatives truly exist.[122]While it may never be possible to convince everyone that advantages of RUCs outweigh potential privacy concerns, the first step to a successful transition would be to challenge developers to prove there are ways to easily collect road use data in an aggregate while ensuring the government is not tracking its citizens or invading their privacy.[123]

Unlike the motor fuel tax which currently operates at a nearly invisible level to the general public, taxing vehicle miles driven would be more difficult to implement and would likely require the electronic monitoring discussed above or new tolls.[124] There is a fear among Americans that implementing such a new system would be complex and costly because the gas tax is so simple in its current form.[125] However, there is relatively little awareness surrounding the threats to transportation funding because the gas tax is almost invisible to the public and many folks have no idea how little they currently pay in gas taxes.[126] There are also administrative challenges of billing individual drivers given the enormity of the country's vehicle fleet.[127] Successful enforcement would likely call for the establishment of a national framework to facilitate inter-state travel and the transport of out-of-state vehicles.[128]

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121. *Id.*
122. Hodari, *supra* note 71
123. REGAN, *supra* note 6, at 22.
124. Tax Policy Center, *supra* note 2.
125. REGAN, *supra* note 6, at 22.
126. *Id.*
127. *HTF Explained, supra* note 11.
128. REGAN, *supra* note 6, at 23.

While potential challenges exist, industry insiders perceive RUCs as a viable, eco-friendly option to solve the present dilemma of declining MFT revenue.[129] Since RUCs provide a more direct linkage between road usage and fees paid by drivers, these fees could help prioritize investments by allocating the cost of transportation expenditures to those who would actually be of benefit to them.[130] To illustrate, revenue collected on certain routes or certain regions could be directly allocated to those routes and regions.[131] An unfortunate downfall to this system is that RUCs provide little to no incentive for driving more fuel efficient vehicles.[132]

RUCs are the most likely long-term replacement for declining MFT revenue.[133] A gradual transition into more direct user fees may be the ultimate solution to the declining sustainability of the gas tax.[134]In the distant future, states and the country will likely shift from a "per gallon" to a "per mile" basis for taxation in funding transportation and road maintenance.[135]

V. CONCLUSION

As the highway system and roadways continue to age, there must be a stable funding structure established to ensure continued maintenance and improvement to our country's roads. The rise of electric vehicles in conjunction with increased fuel efficiency is a catalyst to the already existing problem of diminishing motor fuel tax revenue. It is important to observe and learn from other countries that are experiencing a similar problem. Because it is not a matter of if, but when, the MFT will become an unsustainable funding mechanism,[136] potential solutions

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129. *HTF Explained, supra* note 11.
130. REGAN, *supra* note 6, at 21.
131. *Id.*
132. Tax Policy Center, *supra* note 2.
133. Shinkle and Bates, *supra* note 64.
134. *Id.* at 17.
135. *Id.* at 18.
136. REGAN, *supra* note 6, at 24.

must be explored. RUCs appear to be the most equitable and likely long-term solution to more closely link transportation taxes to the actual amount of miles driven and wear and tear contributed by each driver.