

THE CLASS OF 1964 POLICY RESEARCH SHOP

MILEAGE-BASED USER FEES



VERMONT STATE SENATE, COMMITTEE ON TRANSPORTATION

Rebecca White, Vice Chair

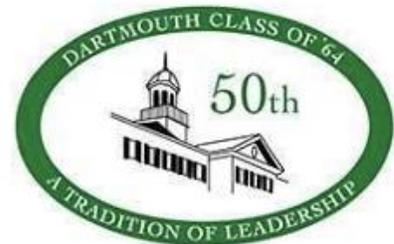
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EXECUTIVE SUMMARY

Usage of electric vehicles (EVs) has risen in states across the country. This trend, coupled with the increasing fuel efficiency standards of gas cars, means that states are suffering from the resulting decline in revenues from gas taxes, which are intended to pay for the maintenance of roads and transportation infrastructure. This research explores options Vermont could implement to ensure a fair, feasible, and effective mileage-based user fee (MBUF) system to replace declining gas tax revenues as electric vehicle adoption grows. MBUFs are fees that are collected in proportion to the amount of miles driven by an individual. While Vermont plans to enact an MBUF in 2027, the state is in the process of determining the best method for tracking miles, ensuring the policy generates sufficient revenue, and addressing equity concerns.

The Vermont State Senate Committee on Transportation is interested in learning about the implementation, prospective revenue, and equity of a mileage-based user fee. To inform these decisions, this project reviews existing research, carries out case studies of Oregon, Utah, and Virginia—three states with operational MBUF programs—and conducts interviews with Vermont EV drivers to assess public opinion on different tracking options. This report provides Vermont policymakers with evidence-based recommendations on the most practical and equitable approach to MBUF implementation. These recommendations include using odometer inspections and/or app-based methods to track miles, considering the enactment of a kWh tax on charging stations, and exercising caution with the use of third-party account managers.

1 INTRODUCTION: MILEAGE-BASED USER FEES

The advent and adoption of electric vehicles (EVs) have created a multitude of regulatory and infrastructure issues related to public policy. One such issue is the loss of transportation funding driven by falling gas tax revenues as EV use expands. Since EV cars create wear and tear on public infrastructure, just as gas cars do, policymakers must come up with a fair and feasible way to ensure EV drivers contribute their fair share to the maintenance of roads and bridges.

There are several policy options available to states to supplement their declining revenues. The first is an increased annual registration fee for EVs. Vermont, among many other states, currently employs this

approach. While logistically simple, concerns about equity have been raised as the fee amount does not respond to an individual's usage of public infrastructure as the gas tax does.

A second option is a Kilowatt-Hour (kWh) tax at charging stations. Currently, 8 states charge these “at the pump” taxes varying from the low of 1.72 cents per kWh in Pennsylvania to the highest at 3 cents per kWh in 5 different states.¹ This policy accounts for road usage to some degree but misses home chargers, a significant source of EV charging for many users. In fact, in the United States, 83 percent of EV charging occurs at the home.²

A third option is mileage-based user fees (MBUFs). MBUFs charge EV owners an established fee based on the number of miles they drive in a year. This policy charges users based on their own usage of road infrastructure – thus avoiding the equity issue of flat increased annual registration fees and including revenue from home chargers which are lost under a kWh tax system. However, implementing MBUFs requires more logistical consideration relative to the other two options, namely, in how miles are tracked. There are multiple possibilities for tracking mileage, such as odometer readings at annual inspections, tracking devices installed in vehicles, or mobile phone apps that track mileage. Four states – Hawai'i, Oregon, Utah, and Virginia – use MBUFs nationwide, and Vermont is set to enact them in 2027.^{3,4} This brief investigates the MBUF programs currently operating within the US as well as Vermont public opinion to find important equity and revenue considerations on the implementation of MBUF in Vermont.

2 PROBLEM STATEMENT: IMPLEMENTATION, REVENUE, AND EQUITY

Vermont has already selected MBUFs as the way forward for transportation funding in the state for a variety of reasons, namely, its alleviation of fairness and logistical issues featured in other road usage charge policies.⁵ However, implementation of the policy was recently delayed until at least January 1, 2027 for further research and briefings to be provided for the design of the MBUF.⁶

The question of how to track and charge for mileage remains unanswered for Vermont. The four states with a currently operational MBUF use three distinct methods for tracking mileage. Both Virginia and Utah require the installation of a mileage-tracking device in the vehicle.^{7,8} Hawai'i tracks mileage through odometer readings taken at annual inspections.⁹ Oregon offers drivers the choice between regularly uploading photographs of their odometer to a mobile app, a mileage-tracking device, or in-vehicle telematics for some vehicles.¹⁰ Each method contains unique advantages and disadvantages to consider.

Vermont’s current plan for mileage reporting is through the state’s preexisting annual vehicle safety inspections. This is similar to the implementation process in Hawai’i. However, this method charges drivers for all miles, including those driven outside of the state. While interstate driving is not a major concern for the island state, this is a drawback for EV drivers in small, landlocked Vermont. The difference in the geographical makeup of Vermont and Hawai’i means reporting via annual inspections may not be the best option for Vermont, and thus further research on the varying methods of operationalizing and implementing MBUFs is necessary.

In addition to mileage-tracking, questions of both equity and revenue are important to consider with regard to MBUFs. Since MBUFs intend to replace “lost” gas tax revenues, it is important that the policy will generate sufficient funding. Further, since MBUFs change how electric vehicle users are charged for road usage, it is important to ensure that any policy distributes costs equitably. This report seeks to determine and evaluate the best options for implementing mileage tracking in Vermont, equitably distributing costs of road maintenance, and generating appropriate revenue

3 BACKGROUND INFORMATION

This section explains the declining revenues of the Federal Highway Trust Fund and the state-level policies being implemented to supplement this decline. Furthermore, this section examines social science research on the implementation of MBUFs.

3.1 Highway Trust Fund

The federal Highway Trust Fund (HTF) serves as the primary mechanism for funding the nation’s highway infrastructure. The HTF is funded via the collection of excise taxes from fuel producers and importers and federal taxes on gasoline (\$0.184 per gallon) and diesel (\$0.244 per gallon). Gasoline and diesel taxes generate approximately \$34.2 billion annually, or about 70 percent of the HTF.¹¹

The HTF distributes revenue to states through eight core formula-based programs, including the National Highway Performance Program and Surface Transportation Block Grants.¹² States must provide matching funds of 10 percent for Interstate projects and 20 percent for other eligible roads, with an equity adjustment ensuring states receive at least 95 percent of their contributions back.¹³

3.1.1 Declining Gas Tax Revenues

The HTF’s revenue crisis stems from a recent undermining of the gas tax model. Gas tax rates have remained frozen since 1993, resulting in a loss of about 50 percent of purchasing power due to

inflation.¹⁴ Although Congress has authorized \$275.5 billion in general fund transfers to the HFT, the Highway Account balance is projected to reach zero in fiscal year 2028.¹⁵ This loss of purchasing power severely inhibits the federal government's ability to fund transportation infrastructure, and political obstacles make such an increase unlikely, leaving states to address funding gaps independently. Other factors include the increase in fuel efficiency and sales of EVs (16.3 percent of new vehicle sales in 2023, up from 12.9 in 2022).¹⁶ These factors are minimal compared to the inflation-caused loss of purchasing power.

3.2 State-Level Solutions

Faced with declining federal highway funding and their own state-level gas tax erosion, states have pursued various strategies to replace lost revenue from fuel-efficient vehicles and EVs. As of January 2025, 39 states currently impose special registration fees on EVs, hybrid vehicles, or both.¹⁷ These fees vary dramatically nationwide, ranging from \$50 annually in Colorado to \$400 for new EV registrations in Texas.¹⁸ For states with MBUF programs in place, EV fees are clustered in the \$100-\$200 range, with Oregon at \$115, Vermont at \$89, Virginia at \$128.14, and Utah at \$130.25.¹⁹ To maintain purchasing power over time, 14 states index EV fees to inflation through Consumer Price Index adjustments.²⁰ Flat registration fees represent the most common approach; in fact, only four states have implemented permanent, operational MBUF programs: Utah, Oregon, Virginia, and Hawai'i.²¹ Below we describe the current programs within Utah, Oregon, and Virginia. Hawai'i's program acts as the model for Vermont's proposed MBUF plan and does not have distinct differences and thus was not a subject of our examination.

3.2.1 Utah

On January 1, 2020, following legislative direction from Senate Bill 136 passed in 2018, Utah launched the voluntary MBUF program known as the Road Usage Charge (RUC) program.²² Participation has grown substantially from 3,895 vehicles in July 2021 to 7,200 vehicles by 2024-2025, with participants collectively driving over 17.8 million tracked miles.²³ The per-mile rate is adjusted annually at the same percentage as the state fuel tax, currently at \$0.0111 per mile.²⁴ Participants have the option to pay a flat fee or pay per mile up to the value of the flat fee. Therefore, per-mile drivers can only ever break even or save money.²⁵ The RUC interfaces through a mobile app on which users can submit odometer photos for manual reporting or use telematics for automatic records and reports. No GPS or location data is collected to ensure the privacy of users.²⁶

3.2.2 Oregon

On July 1, 2015, the Oregon Department of Transportation (ODOT) launched its pioneer MBUF program OReGO. OReGO is a voluntary program that in 2020 reported approximately 700 participants.²⁷ Oregon incentivizes participation in the program by waiving the supplemental vehicle registration fees required by the state.²⁸ EV and high-efficiency vehicle (40+ MPG) drivers pay less in registration fees when enrolled in OReGO. Eligibility has extended over the life of the program and now is broadly open to electric, hybrid, diesel, and gas-powered vehicles rated at 20 mpg or better and weighing under 10,000 pounds.²⁹ A fuel tax credit is allocated to gas-powered vehicles to ensure they aren't double-charged.

Starting in 2026, OReGO members will pay \$0.023 per mile, and by the end of 2028, all electric and hybrid vehicles must enroll in OReGO with an option of a flat fee or per-mile charge, shifting from a voluntary to a mandatory program.³⁰ Mileage can be reported via manual odometer photos, in-vehicle telematics, or a plug-in GPS device.³¹

3.2.3 Virginia

On April 22, 2020, the Virginia General Assembly implemented the highway use fee to make up for HFT shortfalls. Virginia imposed mandatory annual fees on EVs, hybrids, and all fuel-efficient vehicles rated at 25 mpg or greater.³² For the 2025-2026 period, EVs pay \$131.88 annually, while fuel-efficient vehicles pay graduated amounts ranging from \$6.86 for a 25 mpg vehicle to \$100.63 for a 100 mpg vehicle, calculated as 85 percent of what a 23.7 mpg baseline vehicle would pay in state gas tax when driving Virginia's average of 11,600 miles annually.³³

Virginia offers the optional Mileage Choice Program as an alternative to the mandatory flat fee, with the per mileage fee working out to \$0.0114 per mile up to an annual cap.³⁴ The program enrolled its first participants on July 1, 2022, and reached 21,000 participants as of December 2023.³⁵ The program does not differentiate between Virginia miles and out-of-state miles or between public roads and private property—all miles driven are charged equally, representing a simpler but potentially less precise approach than Oregon's GPS-based state border recognition.³⁶

3.2.4 Vermont

In 2021-2022, the Vermont Agency of Transportation conducted a comprehensive Road Usage Charge study with consultant Milestone Solutions.³⁷ An additional University of Vermont study found that an MBUF would be more progressive than the gas tax, shifting the tax burden from lower-income drivers.³⁸

Starting on January 1, 2027, Vermont will implement a mandatory MBUF for battery EVs. The current framework suggests plug-in hybrids will continue to pay increased flat registration fees. The mileage measurement will be done through odometer readings collected during mandatory annual vehicle inspections. No technology will be required to increase accessibility across all demographics. System design, federal grant funding arrangements, and legislative establishment of the precise fee amount are still to be determined.³⁹

Until implementation of the MBUF, Vermont collects temporary EV infrastructure fees effective January 1, 2025: \$89 annually for battery-EVs and \$44.50 annually for plug-in hybrids. The Vermont Agency of Transportation projects a \$33.4 million state match deficit in fiscal year 2027, potentially threatening the state's ability to match \$163 million in federal highway funds and leaving approximately \$150 million in federal funds unclaimed.⁴⁰ The successful implementation of an MBUF program will unlock a potential way to fairly include EVs in funding for the Vermont Legislature, addressing the funding deficit without discouraging EV adoption.

3.3 The Benefits of Mileage-Based User Fees

MBUFs can potentially offer significant advantages over traditional fuel taxes and flat registration fees as a sustainable transportation funding mechanism. Gas taxes put the burden of funding on vehicles with worse fuel efficiency, since they require more gas to travel, and simply do not apply to EVs. Flat fees ignore actual road usage patterns and can result in overcharging. MBUF systems restore the user-pays principle by ensuring all vehicles contribute proportionally to road usage regardless of fuel efficiency or propulsion technology.⁴¹

Sophisticated MBUF implementations offer technical capabilities unavailable with fuel taxation. When GPS-enabled devices are used, MBUF systems can distinguish between in-state and out-of-state miles, ensuring states charge only for use of their own infrastructure.⁴² This represents a significant fairness improvement for residents of border regions who frequently travel to adjacent states. Additionally, low-mileage drivers benefit substantially from MBUF compared to flat fees: in Virginia's first year of operation, 49 percent of participants saved 50-100 percent of their Highway Use Fee amount.⁴³ Distance-based charging can thus more equitably distribute costs according to actual road usage.

MBUF systems create sustainable long-term transportation funding independent of vehicle technology transitions, fuel consumption patterns, or federal policy changes.⁴⁴ As the vehicle fleet

transitions toward electric propulsion and improved efficiency, gas tax revenues will continue eroding regardless of tax rate adjustments. MBUF provides a viable equitable revenue mechanism across all propulsion technologies and efficiency levels, ensuring transportation infrastructure can be maintained despite future fleet composition.

Implementation approaches can be tailored to address privacy concerns while achieving policy goals. Vermont's odometer-based approach requires no specialized devices, smartphone apps, or technology adoption, making it accessible to all vehicle owners regardless of digital literacy or income.⁴⁵ Similarly, privacy-protective implementations using odometer readings or non-GPS devices can achieve MBUF benefits without location tracking. This flexibility in implementation methods allows states to balance policy objectives with public concerns.

However, administrative costs represent a significant challenge. Oregon's DOT noted that in the short and medium-term, the administration of OReGO will be more expensive than the gas tax, given the collection and analysis of data, maintenance of technology, and other administrative tasks.⁴⁶

4 METHODOLOGY

This section outlines our methodology for this study, aimed to identify effective, equitable, and revenue-conscious implementation methods for MBUFs in Vermont. We first conducted background research – including a literature review and expert interviews – on the implementation, prospective revenue, and equity concerns of MBUF in Vermont as it is currently projected. We then conducted a case study of three states that have enacted MBUF programs, specifically assessing varying implementation methods. Finally, we conducted in-depth interviews of EV drivers in Vermont in order to understand public opinion on the proposed implementation methods for MBUFs.

4.1 Background Research: Literature Review and Expert Interviews

Background research is needed to understand the current implementation method proposed for MBUF and the expected state revenue gain in Vermont. We conducted a literature review to fully conceptualize the distributive impacts of an MBUF program. Guided by interest in implementation, revenue, and equity, the literature reviewed advances our expertise in MBUFs to create a more informed approach to making recommendations to Vermont.

In addition to a literature review, we conducted interviews of administrators and policymakers in Vermont, Oregon, Utah, and Virginia knowledgeable on the literature and research surrounding

policy and economics of MBUFs (see Appendix A). Our questions revolved around state decision-making in selecting a given MBUF implementation method, expected and unexpected challenges to its implementation, expected and demonstrated revenue generated, and public perception of the MBUFs (see Appendix B).

4.2 Case Studies: Comparing State Methods

Our second method is a comparative case study of states that have enacted MBUFs to address the lack of state revenue from gas taxes. Of the four states that have active MBUFs, we will focus on three – Oregon, Utah, and Virginia – because of their similarities to Vermont and their variety in MBUF implementation methods. We excluded Hawai'i from our case studies due to its limited comparability to Vermont geographically, and because Vermont's proposed MBUF system is based on Hawai'i's model. It is also important to note the MBUFs in these three states are voluntary programs. Our rationale for each state is provided:

Utah was chosen for its utilization of an app for reporting mileage through odometers. Furthermore, Utah and Vermont share similar mountainous terrains and low population densities.⁴⁷

Virginia was chosen because drivers in the state have the ability to choose between a GPS and a non-GPS tracking device to be installed in the car.⁴⁸ Virginia's plug-in device mileage tracker allows for consideration of out-of-state drivers who may travel to Delaware and Maryland, a similar characteristic to Vermont and New Hampshire drivers.

Oregon provides multiple options to voluntarily record mileage, or drivers can opt to pay a flat fee. Oregon also shares a similar left-leaning political demographic with Vermont, so understanding the effects of Oregon's voluntary system provides valuable insight into how it might work in Vermont.

To compare states, each case study examined and compared mileage tracking approaches for MBUF programs in each state. The next comparison was of revenue gained from MBUFs in each state in order to determine which generated the most. Finally, we examined the distributional effects of MBUF as it relates to applying an equitable fee to road usage. To compare public opinion, we analyzed the popularity of MBUF in each state, and if that state offers multiple options for tracking, the popularity of each option. Noting popularity is a key consideration when making policy recommendations for the best implementation option for Vermont. This research first took place with the examination of state documents and reports on MBUF procedures, as well as published literature reviews.

4.3 In-Depth Interviews: Assessing Public Opinion

Following state analysis, we analyzed public support for each method through six in-depth interviews with EV drivers in Vermont. The goal for these interviews was to hear opinions from a portion of Vermont EV drivers on different options for MBUF mileage tracking. We aimed for licensed EVs that drive primarily in the state of Vermont, and utilized the network of each researcher, our mentor, and project supervisor, in order to find six willing participants.

5 RESULTS

In this section we present our results organized around the three guiding principles of implementation, equity, and revenue based on our in-depth interviews.

5.1 Implementation

Issues surrounding the implementation of mileage-tracking systems for MBUFs can be grouped into four main categories: privacy, coverage of out-of-state miles, administrative burden of data collection, and potential for fraud.

Privacy emerges as the dominant concern in both the literature and our interviews.^{49, 50, 51, 52, 53}

Authoritative studies on MBUF implementation have argued that protecting driver privacy may outweigh the need for auditability, particularly given the relatively small financial burden of an MBUF. Another study similarly finds that public trust in MBUF programs declines when GPS-based tracking methods are introduced, as drivers tend to prefer simpler and more privacy-preserving approaches.⁵⁴

A large-scale review of MBUF pilot studies identifies privacy as a concern in virtually all cases and notes participants' frequent invocation of "Big Brother" when discussing GPS-based systems.⁵⁵ This pattern is reflected in our interviews with Vermont EV drivers, where privacy was consistently raised as the most significant issue.⁵⁶ One EV driver similarly characterized GPS tracking under an MBUF as "Big Brother."⁵⁷ It is thus reasonable to separate mileage-tracking options into GPS-based systems and non-GPS systems for the issue of privacy, with strong public preference for the latter. Odometer-based methods and self-reported apps therefore perform best on privacy grounds, while telematics, plug-in devices, and GPS apps generate substantially more resistance.

Coverage of out-of-state miles is a secondary but still relevant concern. In the same review of MBUF studies, out-of-state mileage is reported as a lesser issue than privacy, which aligns with our interviews: while nearly all respondents emphasized privacy, fewer expressed strong concern about being charged for miles driven outside Vermont.^{58,59} Authoritative studies on MBUFs similarly find that most MBUF pilots do not identify out-of-state mileage as a primary driver concern, though they note recurring fairness concerns about whether out-of-state EV drivers should contribute to road funding.⁶⁰

The issue of fairness arose in our Vermont interviews as well. One of the Vermont EV drivers interviewed expressed support for a kilowatt-hour tax at public charging stations, arguing that it would ensure tourists and other non-resident drivers contribute to Vermont's road maintenance.⁶¹ Among implementation methods, annual odometer inspections are the most susceptible to out-of-state mileage issues, as they cannot distinguish where miles are driven and must rely on an honor-based reporting system.

Administrative burden is a significant concern for policymakers in states with active MBUF programs. In interviews with state officials, respondents emphasized that contracting with private service providers reduced direct government involvement in data handling, but introduced new challenges related to cost and vendor oversight.⁶² Odometer inspections and self-reported apps impose the lowest administrative burden, while plug-in devices and telematics systems require substantially more administrative capacity.

Finally, the potential for fraud appears limited across all major options. Under telematics or plug-in systems, fraud would be virtually impossible. App-based systems or honor-based reporting introduce slightly more room for manipulation, but expected revenue losses are marginal. A Utah policymaker dismissed fraud as a serious concern, stating that for individual drivers, "it would require a lot of work to save a couple bucks."⁶³

5.2 Equity

Our research found that mileage-based user fees for electric vehicles and hybrids were the most equitable road usage fee in the opinion of the state officials we interviewed.⁶⁴ Furthermore, we found that our sample of Vermont EV drivers, regardless of their level of prior knowledge of MBUF systems, perceived the MBUF to be an equitable fee.⁶⁵ A major factor in this positive perception of MBUFs is their resemblance to the gas tax which is applied in direct proportion to road use.⁶⁶ Simply, the more you drive, the more you pay.

An important feature of MBUF programs in Utah, Virginia, and Oregon is the fee cap which is equal to the flat additional registration fee.^{67,68,69} The fee cap enables drivers to enroll in the MBUF program, even if they are uncertain they will drive less miles than the flat fee, without a fear of being overcharged.

A source of minor contention was the discounting of out-of-state miles driven which correlates to a greater question of how states will coordinate fee collection. Some of the Vermont EV drivers expressed concerns with miles driven outside of Vermont being taxed by Vermont; however, Virginia officials pointed out the gas tax does not draw distinctions between state jurisdictions.^{70,71} It is important to note that the gas tax allocates revenues to the state where a car fills its tank, while MBUFs are based on the state where a car is registered. As states continue to scale these programs, increased coordination between states to ensure revenues are being equitably distributed and drivers are not being double-taxed in two or more states because of commutes or travel.

Different states saw equitable outcomes manifest in different forms. Utah officials noted that one of the initial concerns they received from citizens was that rural drivers would be negatively impacted; however, it is estimated that rural households in Utah pay 5.5 percent less when enrolled in the RUC program.⁷² Virginia's Highway Use Fee utilizes a calculation that addresses the disparity between taxes paid by low-to-medium fuel-efficiency vehicle drivers and those of high fuel-efficiency and alternative fuel vehicle drivers.⁷³ Oregon's OReGO program, as of now, is strictly for electric vehicles, with exception for high fuel-efficiency drivers that were enrolled before the scope change, which enables Oregon DOT to close the gap in tax burden between EV drivers and gas vehicle drivers.⁷⁴

5.3 Revenue

From our interviews and case studies, it is clear that MBUF programs within these three states have prioritized navigating program logistics over maximizing revenue. We've found limited profitability from all programs, but this finding has been met with state transportation leaders emphasizing this as an intentional aspect of their piloting. While the end goal is to forge a new funding mechanism to pay for road maintenance and infrastructure, the approach of states to this end has been focused on examining the best way to carry out these programs. This is reflected in the voluntary nature of the programs that relies on willing participants for its functionality. The best example of this is in our interview with OReGO officials, where they state their view of the program as in a beta development stage.⁷⁵

In our interview with UDOT directors, they acknowledged limited revenue as a function of the small scope of the program, and argued that a fully scaled system would have balanced revenues and administrative costs.⁷⁶ Following this logic, each program essentially only charges up to the tax an average car would pay if subjected to the gas tax. This emphasizes a crucial barrier that administrative costs have on the ability of the program to generate revenue. Once administrative costs are reduced, they argue the program has the potential to generate revenue as much as the gas tax when fully scaled to reach all EV drivers.

Utah's Road Usage Charge program projects \$800,000 in revenue for its current year, with operative costs at \$440,000. This was the highest amount we've found among the analyzed states – the result of the higher number of drivers (12,000) enrolled in the program. By comparison, the state's flat fee generates the state \$11.3 million per year.⁷⁷ This illustrates the low profitability of the program in Utah, as a result of low enrollment.

Virginia's Mileage Choice Program, according to Virginia's DMV Commissioner, they project revenue from their mileage choice program at \$100,000 a month, while incurring costs around \$200,000.⁷⁸ This revenue arises from the 25,000 enrolled in the program compared to \$100m gained from their highway use fee (HUF). Virginia has shown steadily increasing revenue through the use of this fee.⁷⁹ This increase is explained by the increase in the eligible population that is forced to pay HUF as well as the characteristic of the HUF being indexed to inflation.

Despite not having publicly available figures, Oregon officials reported in their interviews with us that the program does not have ideal profit-generating potential.⁸⁰ The program was explicitly designed to be revenue-neutral and "has collected little revenue by design," with approximately 700 enrolled drivers.⁸¹ In this report, officials explain their design of the program was to be "revenue neutral," which includes fuel tax credit for vehicles that receive less than 20 MPG and the voluntary nature of the program. Considering other goals of equity and proper implementation, the program does not focus on generating revenue as it stands.

Low enrollment is the primary driver of limited revenues. However, as discussed earlier, small enrollment is expected – these are pilot programs. Participation remains optional in all three states, resulting in low profitability and raising questions about the costs of scaling these programs to mandatory participation. Optional participation has resulted in a pattern of higher popularity with the flat tax option over enrollment within the MBUF program. This can be explained for many individual level reasons, including lack of knowledge about MBUF, suggesting the importance of education on MBUF for a successful transition. Virginia's experience is particularly enlightening on this point,

illustrating a limitation to scaling their mileage choice program stemming from the lack of fiscal incentive.⁸² They generate more revenue from drivers choosing a flat fee, reducing the department's incentive from actively promoting Mileage Choice as an alternative. This illustrates a tradeoff between revenues and equity, where flat fees may result in higher revenues but pose equity concerns that MBUFs solve.

A reason for the limited enrollment within the MBUF programs and why they generate low revenues is due to the high administrative costs associated with popular methods of mileage tracking. All three states utilize third-party account managers and a physical tracking system that carry significant administrative expenses. In the case of Utah, their account manager contract involves monthly reporting and expensive tracking methods (physical trackers and telematics).⁸³ This greatly explains that administrative costs represent a large obstacle to the program. In Virginia, their contractual agreement with Emvois amounts to an \$85,000 monthly systems fee, in addition to a \$5 fee per vehicle fee and an additional fee depending on the tracking method (\$5 for OBD devices and \$3 for telematics).⁸⁴ These represent steep administrative costs for the state, which are only offset by their federal transportation grant. Oregon, as well, experiences high administrative costs resulting from their operating and commercial account manager.⁸⁵ Things that drive these administrative costs have been compensation for third-party account managers, including price breakdowns for the amount of vehicles registered.⁸⁶

States are now beginning to renegotiate deals with contact managers to reduce these administrative costs. In Utah, they are moving to reduce costs by phasing out physical devices, opting for cheaper implementation methods.⁸⁷ In Oregon, they are negotiating charges, reducing the amount paid for a new vehicle that's enrolled. Currently, they share profits with their OAM, but they've committed to fixing payments per account.⁸⁸

6 RECOMMENDATIONS

Overall, our findings suggest that privacy is the dominant concern for EV drivers, while administrative burden and cost are the primary concerns for state agencies. Out-of-state mileage is a secondary issue, and fraud is not viewed as a major barrier by either policymakers or participants.

Mileage-tracking through annual odometer inspections, Vermont's current plan, is a strong option. It maximizes privacy and performs well in terms of administrative feasibility, since Vermont already maintains an inspection system. Its main drawback is the treatment of out-of-state miles: a self-

reported adjustment introduces some potential for overreporting, though the effect of this overreporting is likely marginal.

App-based reporting systems are another promising option. Like odometer inspections, they collect only aggregate mileage and therefore perform well on privacy grounds, with slightly higher but still manageable administrative burden. A few Vermont EV drivers expressed a preference for app-based reporting over annual inspection, because they felt inspections should be less frequent and not required for the first year for new vehicles.

A kilowatt-hour tax at public charging stations could serve as an effective complement to mileage-based systems by improving fairness and capturing revenue from out-of-state drivers. Because most Vermont EV drivers charge at home, this policy would have limited impact on in-state residents.

Plug-in devices and telematics-based systems are less attractive overall. Although they eliminate out-of-state mileage issues and virtually remove the possibility of fraud, they perform poorly on privacy and impose significantly higher administrative burden. Given that privacy is consistently the most important concern for drivers, and fraud is not viewed as a major issue by policymakers, these systems appear inferior to odometer- and app-based alternatives.

Based on our findings, we recommend that Vermont implement an MBUF system centered on annual odometer inspections and/or self-reporting apps, supplemented by consideration of a kilowatt-hour tax at public charging stations to improve revenue capture from non-resident drivers.

Additionally, our findings support Vermont's current plan to avoid physical trackers, telematics, and third-party account managers. This approach will significantly decrease administrative costs, which is highly crucial considering the mandatory nature of MBUF in the Vermont plan. To maximize revenue, it is possible to have a system where EV drivers can choose between MBUF and odometer inspections or paying an annual flat fee. More research is needed to determine the administrative effects of having multiple options.

7 CONCLUSION

In this brief, we have shown how Vermont could proceed in implementing a fair and feasible MBUF system. After extensive research, case studies, and EV driver interviews, we found evidence to support the implementation of MBUFs in Vermont and answered key questions about three important factors of the program. Firstly, the evidence supports the utilization of odometer inspections to track mileage

and offers an app-based method of reporting as a viable and constituent supported alternative option. Additionally, this system seems to be equitable and perceived equitably among Vermont EV drivers interviewed, which is important for the popularity and compliance with the program. The rise of electric and highly fuel-efficient vehicles has undermined the effectiveness of the gas tax; however, flat fees fail to recreate the “pay for what you use” ethos of the gas tax. Finally, avoiding third parties and physical tracking devices can reduce administrative costs and allow the program to generate sustainable and scalable funds.

ENDNOTES:

1. As of 2025, eight U.S. states have implemented per-kilowatt-hour (kWh) taxes on electric vehicle charging. These include: Pennsylvania (1.72¢/kWh); Georgia (approximately 3.0¢/kWh); Iowa (2.6¢/kWh); Kentucky (3.0¢/kWh); Montana (3.0¢/kWh); Oklahoma (3.0¢/kWh); Wisconsin (3.0¢/kWh); and Utah (12.5% of kWh charge). Rates and policy structures vary slightly by state and may be subject to change. See Samuel Labi and Deepak Benny, *Revenue Recovery Assessment Framework and Tool* (College Park, MD: University of Maryland Build America Center, January 2025), https://bac.umd.edu/wp-content/uploads/2025/03/White-Paper_RRAFT_032025-1.pdf.
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APPENDIX A: Interviewees

State Policy Officials (Case Study States)

- Gerald F. Lackey, PhD (Commissioner at Virginia Department of Motor Vehicles)
- Scott Cummings (Assistant Commissioner for Finance at Virginia Department of Motor Vehicles)
- Maureen Bock (Chief Innovation Officer at Oregon Department of Transportation)
- Lyle McMillan (Director at Utah Department of Transportation)
- Nathan Lee (Director at Utah Department of Transportation)

Vermont State Policy Official

- Patrick Murphy (Sustainability and Innovations Project Manager at Vermont Agency of Transportation)

Vermont EV Drivers

- Chip Stone
- Jennifer Ranz
- Brian Carroll
- Ned Andrews
- Sami Saydjari
- Geneva Smith