Rate-setting and Impact Analysis for the Vermont Mileage-based User Fee

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Executive Summary

This report outlines recommended rate setting methods for Vermont's BEV pleasure car mileage fee as an interim step towards implementing a statewide mileage fee. We interpret pleasure cars as any light-duty vehicle (gross vehicle weight rating less than 10,000 lbs according to the FHWA).

We recommend a mileage fee approximately equivalent to what current gas and diesel pleasure car vehicle owners pay in state motor fuel taxes: **1.4 cents per mile**. To preserve purchasing power, we strongly recommend indexing the mileage fee to a measure of inflation that captures changes in transportation system costs for the largest transportation budget items (e.g., wages, construction materials, or equipment). Rather than incorporating the mileage fee administrative costs into the per-mile rate, we recommend increasing registration or inspection fees to cover any ongoing administrative costs. This approach better reflects how administrative costs will scale with the total number of vehicles enrolled in the mileage fee program rather than vehicle use.

Overall, we find that a mileage fee set at a gas or diesel equivalent rate will, on average, increase BEV pleasure cars costs from the $89 per year fee at registration to an average of $158 per year (+ $69 annual increase). For comparison, the average Vermont light-duty gas or diesel vehicle pays $142 in state gas taxes annually. BEVs are expected to pay slightly more with a mileage fee than gas or diesel vehicles because, on average, they are currently driven more miles per year.

While a mileage fee for BEVs begins to address transportation revenue decline, it does not account for the decline due to fuel economy improvements of gas and diesel vehicles. For this reason, we strongly recommend a quick transition to a statewide mileage fee program for all light-duty vehicles. We find average cost differences under a mileage fee for gas and diesel vehicles will be very small: on average, + $10 per year (due to rounding the fee from 1.36 cents per mile to 1.4 cents per mile). We also find many rural households will see cost savings by paying a mileage fee, as they are currently paying closer to 1.8 cents per mile on average in state gas taxes.

Finally, for a statewide mileage fee program we recommend keeping the state gas tax in place to collect revenue from out of state vehicles. Under this construct, vehicles registered in Vermont would pay or be refunded for the difference between estimated state gas tax payments and mileage fees. Note that with this policy design, future increases in the state gas tax to account for the increasing fuel economy of out of state vehicles would *not* raise costs for vehicles registered in Vermont.

1 Introduction

Revenue from motor fuel taxes (colloquially, gas taxes) are declining due to drivers purchasing more fuel-efficient vehicles (less gas consumed per mile), electric vehicle adoption (less gas consumed overall), and inflation (reducing the purchasing power of all revenue). To recover some of this revenue, the State of Vermont intends to charge BEV pleasure cars per mile travelled using odometer readings recorded at annually required vehicle inspections. This mileage fee for BEVs is intended to serve as an interim step to implementing a statewide mileage fee program for all pleasure cars[1].

2025 Transportation Bill (Act 43, Sections 17-18)

It is the intent of the General Assembly that:

(1) the mileage-based user fee for a BEV pleasure car be approximately equivalent to the average amount collected by the State in fuel tax revenue from the use of a non-PEV pleasure car registered in Vermont and the average amount collected by the State in fuel tax revenue and Electric Vehicle Infrastructure fee from the use of a PHEV pleasure car; and

(2) that the mileage-based user fee for BEV pleasure cars will be an interim step towards gradually expanding the mileage-based user fee to all motor vehicles upon elimination of the State fuel taxes for motor vehicles.

At the direction of the Vermont Agency for Transportation, we evaluate methods and make recommendations for setting a mileage-based user fee (colloquially, mileage fee) for pleasure cars[2] registered in Vermont. We evaluate how a shift from the motor fuels tax (colloquially, gas tax) to a mileage fee will affect the costs that Vermont households pay and how changes in costs are distributed across different communities and household income groups. We also project revenues for maintaining the status quo, replacing the flat fee for BEVs with a mileage fee, and replacing the gas tax for all light-duty vehicles[3] (LDVs).

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[1] https://legislature.vermont.gov/Documents/2026/Docs/ACTS/ACT043/ACT043%20As%20Enacted.pdf

[2] Vermont pleasure cars are defined in Section 4 of Vermont Laws (28): “Pleasure car” shall include all motor vehicles not otherwise defined in this title and shall include plug-in electric vehicles, battery electric vehicles, or plug-in hybrid electric vehicles as defined pursuant to subdivision (85) of this section.” Based on our reading, this excludes buses operating on regular routes, trucks used primarily to transport property, 2- or 3-wheel motorcycles, tractors, trailers, and motor-powered building equipment.

[3] We evaluate light duty vehicles (vehicles weighing less than 10,000 lbs) as a close approximation of the state’s definition of “pleasure cars”.

2 Rate Setting Comparative Review

We evaluated mileage fee rate-setting recommendations from the 2024 legislative report[4] as well as reports and studies from other states considering or currently operating mileage fee programs. Below, we summarize the rate-setting methods used in these efforts and discuss implications for Vermont's mileage fee program.

2.1 Review of 2024 Legislative Report Recommendations

The 2024 Legislative report recommends a $0.018 per mile fee for LDVs. This rate is calculated by dividing Vermont's current state gasoline tax rate by an estimated average fuel economy for LDVs driven in Vermont in 2013. The resulting rate is then increased to account for estimated recurring administrative costs associated with operating the program.

Rate calculations

$$MBUF\ Rate = \frac{State\ Gas\ Tax}{2013\ Average\ LDV\ Fuel\ Economy} = \frac{\left(\frac{\$\ 0.3261}{gallon}\right)}{\left(\frac{19\ miles}{gallon}\right)} = \$0.0172\ per\ mile$$

$$Adjusted\ MBUF\ Rate = MBUF\ Rate\ x\ 1.036 = \$0.0178 \cong \$0.018\ per\ mile$$

In the above calculation, the state gasoline tax rate reflects the state portion of the Vermont gasoline tax in effect during the first quarter of 2024. The 2013 average LDV fuel economy represents the average of two estimates; each obtained from data in the 2021 Transportation Energy Profile[5]:

1) The harmonic average fuel economy of LDVs registered in Vermont in 2013, and
2) The realized average fuel economy of vehicles operating in Vermont during 2013

The **harmonic average fuel economy estimate** was calculated using U.S. Environmental Protection Agency (EPA) fuel economy ratings for all actively registered LDVs listed in the Vermont Department of Motor Vehicle's 2013 registration records. Therefore, the fuel economy only applies to vehicles registered in Vermont, not all vehicles travelling on Vermont roads.

[4] 2024 Report to the Legislature

[5] Vermont Transportation Energy Profile 2021: https://vtrans.vermont.gov/sites/aot/files/planning/documents/planning/2021%20Vermont%20Transportation%20Energy%20Profile.pdf

This approach has several limitations. First, it does not calculate the average fuel economy of all vehicles driven on Vermont roads. Vehicles registered in Vermont may have a different fuel economy distribution than those of out-of-state drivers who travel in Vermont. In addition, it does not account for the actual fuel economy of vehicles. EPA fuel economy ratings are based on standardized test conditions that do not consider Vermont-specific conditions and individual driving behavior. On-road fuel economy is expected to vary from EPA fuel economy ratings[6]. Finally, the type of average used in this method assumes that all vehicles are driven equal distances, which does not account for real differences in mileage. For example, vehicles with higher fuel economies may be driven more than those with lower fuel economies.

The **realized average fuel economy estimate** was calculated by dividing the Federal Highway Administration's estimate of total LDV miles traveled on public roads in Vermont in 2013[7] by the Vermont Legislative Joint Fiscal Office's[8] reported taxable gasoline sales in Vermont for the same year. This approach captures fuel economy under real-world driving conditions and includes mileage and fuel consumption associated with out-of-state drivers.

However, this method also has limitations. Gasoline consumed by vehicles traveling in Vermont may have been purchased outside the state, while gasoline purchased in Vermont may be used for travel elsewhere. This misaligns the mileage fee with real Vermont roadway usage and wear-and-tear. In addition, the Joint Fiscal Office gasoline sales data reports all gasoline sold, including fuel purchased for motorcycles, tractors, off-road vehicles, and medium- and heavy-duty vehicles[9]. These factors introduce an unknown amount of uncertainty into the realized average fuel economy estimate.

Finally, a key concern with the $0.018 per mile rate is its reliance on 2013 average fuel economy. Fuel economy has increased from 19 mpg in 2013[10] to 23 mpg in 2023[11], so a

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[6] Lin, Z., & Greene, D. (2011). Predicting Individual Fuel Economy. *SAE International Journal of Fuels and Lubricants*, *4*(1), 84–95. http://www.jstor.org/stable/26267417; Ran Tu et al. (2022). Real-world emissions and fuel consumption of gasoline and hybrid light duty vehicles under local and regulatory drive cycles. *Science of The Total Environment, 805*. https://doi.org/10.1016/j.scitotenv.2021.150407

[7] Data from FHWA 2013 Highway Statistics Series (tables VM-2 and VM-4): https://www.fhwa.dot.gov/policyinformation/statistics/2013/

[8] Joint Fiscal Office: https://ljfo.vermont.gov/search/filter/keywords/gallons+taxable

[9] Although most medium-duty and most heavy-duty vehicles use diesel fuel, some operate on gasoline. Mileage from medium- and heavy-duty is estimated to be 12% of all Vermont vehicle traffic (https://www.fhwa.dot.gov/policyinformation/statistics/2013/vm4.cfm).

[10] As estimated by the 2024 Report to the Legislature

[11] As estimated by this report and detailed in the methods below.

rate based on 2013 fuel economy will result in EV owners paying disproportionately higher fees relative to the fuel taxes currently paid by ICEV drivers.

2.2 Review of Rate Setting Methods in Other States

Four states have active mileage fee programs, but many others are studying or have proposed mileage fees.

Methods for setting mileage fee rates vary. The most common approach is using a fuel tax equivalent: this calculation method takes a state gas tax and divides it by the average fuel economy of vehicles (typically LDVs) in the state. States using this method for their mileage fee rate setting include Oregon, Utah, and Hawaii, as well as California's proposed program. The key question for using this approach is how to calculate average fuel economy. Oregon, Utah, Hawaii, and California employed varying methods, but they consistently used the most recently available fuel economy data for their state.

There are a few alternative approaches to calculating a mileage fee rate. For example, proposed mileage fees in Pennsylvania and Minnesota calculate a realized fuel economy: they take their total state motor fuel tax revenue and divide it by the total state VMT from the Federal Highway Administration (FHWA) Highway Statistics.

Virginia uses an entirely different scheme. Rather than adjusting how vehicles contribute to transportation taxes from a revenue-neutral perspective, they employ a revenue-increasing tactic to recover lost gas tax revenues from high-efficiency vehicles (25+ MPGe). This Highway Use Fee (HUF), paid at registration, is equal to 85% of the difference between the average annual fuel tax payments and an estimate of each driver's fuel tax payments, assuming all vehicles travel an average of 11,600 miles per year. Their "Mileage Choice" program is an alternative to the flat fee where drivers can pay their HUF per mile. This is not a true mileage fee. If drivers travel less than the 11,600 miles used to calculate their HUF, they pay less; but if they travel more, they never pay more than the HUF.

Similar to the 11,600 mile "cap" used in Viriginia, Utah and Hawaii also set a cap on annual mileage fee payments to incentivize more drivers to join the mileage fee program. While it is not a true cap, Oregon offers a $340 flat fee alternative to drivers who participate in their mileage fee program.

Beyond program enrollment, long-term revenue stability is also a concern with mileage fees. As of now, no program explicitly indexes their mileage fee to inflation. More commonly, states index their gas taxes to inflation: 12 states use the Consumer Price

Table 1 · State Mileage Fee Rate Setting Review

State	Program Status	Eligible vehicles	Rate Setting Method	State Gas Tax [$ / gal]	Mileage Rate [$ / mi]	Mileage rate adjustments [$ / year]	Other Notable Features
Oregon	Active / Voluntary	EVs & high-MPG (20+ MPG)	5% of the state gas tax; Equivalent to gas tax ÷ avg MPG	**~$0.40**	**~0.02**	Alternative annual $340 flat fee	Credits against gas tax in lieu of flat EV surcharge; flexible reporting options (device, odometer, smartphone); optional $340 flat fee alternative.
Utah	Active / Voluntary	EVs	Transportation Commission sets rate under state code; no strict formula, aims to recuperate projected fuel tax revenue; indexed to CPI.	**~$0.39**	**~0.0111 (2025), ~0.0125 (2026), ~0.015 (2032+)**	Maximum annual payment set at $143.25 (2025), increases scheduled	Annual max tied to comparable flat EV fees; inflation adjustments.
Virginia	Active / Voluntary	EVs & high-MPG	Per-mile equivalent derived from Highway Use Fee (HUF) ÷ typical annual miles.	**~$0.42**	Varies (based on HUF)	Maximum annual payment set at HUF amount	Mileage reporting optional; ensures no one pays more than existing HUF.
Hawaii	Active / Voluntary (Mandatory for EVs by 2028)	EVs	Gas tax ÷ avg MPG	**~$0.19**	**~0.008**	Alternative annual $50 flat fee; per-mile annual payments capped at $50	EV owners choose flat fee or per-mile; flat becomes mandatory on EVs by 2028.
California	Pilot	EVs & other pilots	Five-year average gas tax ÷ avg MPG; testing multiple options.	**~$0.71**	Varies (pilot)	—	Not yet statutory — pilot exploring approaches, privacy, devices.
Colorado	Study / Proposed	—	RUC feasibility research often uses gas tax ÷ average MPG modeling in reports.	**~$0.29**	$0.012 (proposed)	—	State DOT received federal grant for research; no enacted rate.

State	Program Status	Eligible vehicles	Rate Setting Method	State Gas Tax [$ / gal]	Mileage Rate [$ / mi]	Mileage rate adjustments [$ / year]	Other Notable Features
Pennsylvania	Study / Proposed	—	Total revenue ÷ total VMT	**$0.58**	$0.081 (proposed)	—	Fee is modeled to replace the current flat EV/PHEV fee
Washington	Study / Proposed	—	Proposed Gas tax ÷ avg MPG	**$0.59**	$0.025 - $0.026 (proposed)	Credits for gas tax paid	Legislature considering a voluntary RUC starting 2025-2027 with phased mandatory rollout; gas tax credits
ETC Consortium	Pilot / Multiple States	—	Pilots generally used gas tax ÷ avg MPG, others reference total gas tax revenues ÷ total vehicle mileage.	**Varies by member state**	Varies by state —~1.0–2.4¢/mi (passenger vehicle pilots) or higher in truck pilots	—	Member states include AL, CT, DE, DC, FL, GA, KY, ME, MD, MA, NJ, NY, NC, PA, RI, SC, TN, VT, VA, WV; Research and demonstration partnership, not a legal program.
Minnesota	Study / Proposed	—	Under study; some proposals reference gas tax ÷ avg MPG in models, others reference total gas tax revenues ÷ total vehicle mileage.	**~$0.32**	—	—	Considering variable rates by income, GVWR, time-of-day; no enacted rate.
Kansas	Pilot / Study	Pilot partners	Gas tax ÷ avg MPG used in multi-state pilot modeling/reporting.	**~$0.25**	—	—	Pilot research funded with federal support; collaborating with MN DOT on Midwest RUC topics.
Missouri	Pilot / Study	Pilot partners	Gas tax ÷ avg MPG used in multi-state pilot modeling/reporting.	**~$0.30**	—	—	Participating in shared RUC research.

State	Program Status	Eligible vehicles	Rate Setting Method	State Gas Tax [$ / gal]	Mileage Rate [$ / mi]	Mileage rate adjustments [$ / year]	Other Notable Features
Nevada	Study / Proposed	—	Legislative study committee; feasibility work often uses gas tax ÷ avg MPG in analysis.	**~$0.24**	—	—	Panel reviewing options; may lead to pilots.
Wyoming	Pilot / Study	—	Participates in RUC America and federal grant research; modeling uses gas tax ÷ avg MPG.	**~$0.24**	—	—	Focus on feasibility given rural conditions.
Texas	Pilot / Study	—	RUC feasibility research with federal support; modeling uses gas tax ÷ avg MPG.	**~$0.20**	—	—	No enacted program.
Ohio	Pilot / Study	—	FHWA/STFSA grant research; modeling often uses gas tax ÷ avg MPG.	**~$0.39**	—	—	Early planning.

Index (CPI), 2 states (Alabama and Mississippi) use the National Highway Construction Cost Index (NHCCI), and Minnesota uses a state-specific transportation cost index[12]. States that calculate mileage fees using a gas tax indexed to inflation are indirectly indexing their mileage fee. Other states suggest periodically increasing their mileage fees with legislative action.

3 Rate Setting Recommendations

Our recommended mileage fee rate is designed to approximate the amount that drivers of gasoline and diesel pleasure cars on average currently pay in Vermont motor fuel taxes. We calculate the mileage fee as the Vermont gas tax rate divided by the Vermont average fuel economy for light-duty vehicles. The state average fuel economy is estimated from the most recent vehicle registration records for Vermont using EPA's combined city-and-highway fuel economies for specific vehicles.

$$ICEV - Equivalent\ Mileage\ Fee = \frac{5 - year\ Average\ VT\ Gas\ Tax}{2023\ Distance - weighted\ Average\ LDV\ Fuel\ Economy}$$

Using a five-year average of the state gas tax accounts for quarterly changes in fuel price that affect any single quarters gas tax. Using a distance-weighted average of fuel economy accounts for how vehicles are driven different amounts and consume different amounts of fuel.

Applying this approach yields a **$0.014 per mile fee**. In the statutory language, we recommend indexing a rate of $0.014 per mile for BEV pleasure cars to inflation. This will allow the mileage fee to maintain its current value or "purchasing power" without future legislative intervention. We also suggest avoiding flat fee alternatives or weight-based adjustments to the rate.

3.1 Rate Calculation

The State requested a mileage fee be set to roughly match the motor fuels tax paid by drivers of gasoline and diesel pleasure cars in Vermont. We use a rate setting method that is simple and consistent with how other states are calculating mileage fees.

The mileage fee rate method we recommend takes the average Vermont gasoline tax and divides it by the average fuel economy of pleasure cars registered in Vermont adjusted for each vehicle's annual mileage. We interpret "pleasure cars" as gasoline and

[12] https://www.ncsl.org/transportation/variable-rate-gas-taxes

diesel vehicles with a gross vehicle weight under 10,000-pounds, consistent with the Federal Highway Administration's definition of light-duty vehicles (LDVs).

The formula:

$$Mileage\ Fee = \frac{5-year\ Average\ VT\ Gas\ Tax}{2023\ Distance-weighted\ Average\ LDV\ Fuel\ Economy} = \frac{\left[\frac{\$}{gal}\right]}{\left[\frac{mi}{gal}\right]} = \left[\frac{\$}{mi}\right]$$

This approach is similar to the method recommended in the 2024 Legislative Report, with four important refinements:

1. We use a five-year average gasoline tax, rather than a single quarter
2. We use recent fuel economy data, rather than fuel economy from 2013
3. We use only LDV data to estimate the fuel economy, rather than data that includes mileage and fuel purchased by medium- and heavy-duty vehicles
4. We use a weighted average fuel economy to account for differences in how vehicles are used. Weights are based on the estimated annual vehicle miles travelled (VMT) of each vehicle.

2024 REPORT **RATE =** 1.8 ¢ / mile	**OUR REPORT** **RATE =** 1.4 ¢ / mile
STATE GAS TAX	STATE GAS TAX
State gas tax from the most recent quarter	5-year average state gas tax
FUEL ECONOMY	FUEL ECONOMY
Data from 2013	Most recent data (2023)
Averages two measures of fuel economy	Only use one measure of fuel economy
Includes some data from medium- and heavy-duty vehicles in average	Only uses data from light-duty vehicles in average
Uses a harmonic average	Uses a distance-weighted harmonic average
RATE ADJUSTMENTS	RATE ADJUSTMENTS
Recommend increasing per mile fee to cover administrative costs	Recommend increasing vehicle registration or inspection fees to cover administrative costs
No inflation adjustment	Recommend indexing to inflation

3.1.1 Multi-Year Average Vermont Gasoline Tax

Vermont's gasoline tax changes quarterly. It includes a fixed tax of $0.131 cents per gallon (including a $0.01 per gallon petroleum cleanup fee) and two variable fees (MFTA

and MFTIA[13]), equal to 4% and 2% of the average retail price of gasoline in the prior quarter.

Since the variable fees lead to fluctuations in any single quarter's gas tax, we recommend using a five-year average gasoline tax. This accounts for unpredictable gasoline market prices and is consistent with California's proposed mileage fee.

We do not include the $0.01 per gallon petroleum cleanup fee when calculating the mileage fee because (1) it does not apply to EVs since they do not use petroleum fuels and therefore do not contribute to fuel leaks and (2) the fee funds a program focused on cleaning up and preventing fuel leaks from all petroleum fuels (e.g., home heating oil) and is unrelated to financing the surface transportation system.

3.1.2 Average Fuel Economy Estimate

The 2024 Legislative Report recommended using a 2013 Vermont average fuel economy, but vehicles have become substantially more efficient since 2013. Using a 2013 fuel economy would result in a mileage fee that is higher than the average fuel taxes paid by today's drivers.

To avoid setting an inequitable rate for BEV drivers, we recommend using the most recent fuel economy estimates available. We match year 2023 Vermont vehicle records[14] to EPA-reported combined city and highway fuel economies using unique vehicle attributes (such as make, model, year, axles, and gross vehicle weight). These EPA fuel economy estimates come from standardized driving tests that mimic real-world driving conditions, such as city driving, highway driving, aggressive and high-speed driving, and hot and cold temperatures. While the fuel economies are not specific to Vermont, they provide consistent and nationally recognized estimates.

We calculate the average (i.e., mean) fuel economy with two key considerations. For one, fuel economy is a rate (miles per gallon), so we use a harmonic mean instead of an arithmetic mean.[15] Secondly, vehicles are not all used the same. To reflect actual vehicle fuel consumption more accurately, we calculate a weighted average. Vehicles that are driven more miles (higher VMT) receive more weight in the average, reflecting

[13] MFTA = Motor Fuel Tax Assessment; MFTIA = Motor Fuel Transportation Infrastructure Assessment
[14] We use 2023 data because calculating annual vehicle mileage requires both prior-year and next-year inspection records, and complete inspection data are available for this period.
[15] In accordance with how the U.S. EPA calculates fuel economy averages (§40 CFR 600.510-12).

their greater contribution to fuel consumption. The VMT weights are unique to each vehicle based on the odometer readings at their annual vehicle inspections.[16]

The formula:

$$Distance-weighted\ harmonic\ average\ fuel\ economy = \frac{\sum_i (VMT)_i}{\sum_i \left(\frac{(VMT)_i}{(Fuel\ Economy)_i}\right)}$$

$$where\ i = each\ LDV\ registered\ in\ Vermont$$

3.1.3 Final Values Used

Using the methods described above, we estimate:

- 5-year average Vermont gasoline tax: $0.314 per gallon of gasoline sold
- Distance-weighted harmonic average 2023 fuel economy: 23 miles per gallon

By dividing these estimates, we get our recommended mileage fee of $0.014 per mile for BEV pleasure cars. This recommendation is not designed to raise additional revenue today, although it does increase future revenues by avoiding losses due to increasing vehicle fuel efficiency and electric vehicle adoption.

3.2 Other Rate Calculation Methods

In addition to the method above, the 2024 Legislative Report also estimated average fuel economy by dividing total LDV mileage on Vermont roads by the total gallons of gasoline and diesel sold in Vermont. We do not use this approach because it overestimates fuel consumption for LDVs by including fuel sold to medium- and heavy-duty vehicles. Using this approach would therefore overestimate a revenue-neutral mileage fee for LDVs.

3.3 Rate Adjustment: Administrative Costs

As with any program, implementing a mileage fee program will involve ongoing administrative costs. These costs may increase as more vehicles are enrolled in the program, but they do not vary with the number of miles a vehicle is driven. A vehicle that

[16] Methods Note: We calculate calendar year 2023 VMT for a given vehicle using the difference between every consecutive odometer reading for that vehicle. We filter for overlap with the calendar year and adjust for the time elapsed between inspections.

travels 50 miles per year will cost the State the same to administer a mileage fee as a vehicle that travels 50,000 miles per year.

Administrative costs are more appropriately recovered through a per-vehicle or payment transaction fee rather than a per-mile fee. Options include incorporating administrative costs into existing vehicle registration or inspection fees, which better reflect how ongoing mileage fee program costs are incurred.

3.4 Rate Adjustment: Vehicle Weight

Typical gross vehicle weights for LDVs range from 2,700 pounds for small cars to 6,500 pounds for larger SUVs and pickups. While roadway damage increases non-linearly with vehicle weight, these differences are negligible within the range of LDV weights[17]. In contrast, medium- and heavy-duty vehicles differ in weight by many tens of thousands of pounds, and their damage to roadways varies significantly.

For this reason, we do not recommend varying a mileage fee for LDVs based on vehicle weight. As Vermont's mileage fee program evolves to include heavier vehicle classes, the Legislature should reconsider this approach.

3.5 Rate Adjustment: Flat Fee Alternatives

Flat fee alternatives are commonly used in states where mileage fees are voluntary, primarily as a mechanism to encourage program enrollment. In those contexts, increased enrollment generally leads to higher overall revenue, regardless of whether participants choose a flat fee or a per-mile charge. Offering a flat fee alternative under Vermont's mandatory program would likely reduce total mileage fee revenue. High-mileage drivers would be incentivized to opt for the flat fee to lower their overall payments, weakening the revenue base and undermining the efficiency of the system.

More broadly, the purpose of a mileage fee is to directly link transportation system user fees to actual system use. A flat fee alternative breaks this connection by charging the same amount regardless of miles traveled, reducing both equity and price signals related to roadway use. For these reasons, a flat fee alternative is inconsistent with the core objectives of a mileage fee program.

3.6 Rate Adjustment: Indexing to Inflation

To preserve the purchasing power of mileage fee revenue, we strongly recommend indexing the mileage fee to inflation in statutory language. This will relieve the State of

[17] Low, J.M., Haszeldine, R.S., Harrison, G.P., 2023. The hidden cost of road maintenance due to the increased weight of battery and hydrogen trucks and buses—a perspective. Clean Techn Environ Policy 25, 757–770. https://doi.org/10.1007/s10098-022-02433-8

the responsibility of adjusting the mileage fee manually with new legislation to maintain purchasing power over time.

There are many measures of inflation. We recommend choosing an index that reflects the majority of costs in the current Transportation Fund budget.

Table 2 · Inflation Measures and Descriptions

Purpose	Index	Calculated by	Description
Transportation materials and labor (if primary cost is maintenance and construction)	National Highway Construction Cost Index (NHCCI)	U.S. Federal Highway Administration (FHWA)	Measures changes in highway construction costs using price data from winning federal-aid highway contracts. Reflects transportation-specific inputs such as asphalt, concrete, steel, equipment, and construction labor, making it well suited for capital and maintenance-heavy programs.
	Producer Price Index (PPI) for Streets and Highways	U.S. Bureau of Labor Statistics (BLS)	Tracks changes in prices received by producers of street and highway construction services. Similar to NHCCI but excludes contractor markups, profit margins, and bid-related costs, which may understate actual state expenditures.
Consumer costs (if primary cost is wages and administration)	Consumer Price Index (CPI-U)	U.S. Bureau of Labor Statistics (BLS)	Measures average changes over time in prices paid by urban consumers for a broad basket of goods and services. Widely used for indexing taxes and fees, simple to administer, but less reflective of transportation-specific cost pressures
Public-sector labor costs (if wage growth is a key driver)	Employment Cost Index (ECI) – State and Local Government	U.S. Bureau of Labor Statistics (BLS)	Measures changes in wages and benefits for public-sector employees. Useful when personnel costs represent a large share of program expenditures but does not capture materials or construction cost inflation.

Example Implementation of an Inflation Adjustment Calculation

Beginning July 1 following the initial implementation of the Vermont mileage-based user fee, and annually thereafter, the per-mile rate shall be adjusted to reflect changes in construction and maintenance costs. The adjustment shall be based on the annual percentage change in National Highway Construction Cost Index (NHCCI) from the most recent 12-month period ending December 31, compared to the base year average, which is the average for the 12-month period ending December 31, 2025, and rounded to the nearest tenth of a cent using the following calculation:

$$Mileage\ Fee_{year} = Mileage\ Fee_{2025} + \left(1 + \frac{NHCCI_{year} - NHCCI_{2025}}{NHCCI_{2025}}\right)$$

Where,

$Mileage\ Fee_{year}$ is the inflation adjusted mileage fee rate,
$Mileage\ Fee_{2025}$ is the base year mileage fee rate,
$NHCCI_{year}$ is the most recent calendar year average NHCCI, and
$NHCCI_{2025}$ is the base calendar year average NHCCI.

The maximum annual increase or decrease in the mileage fee rate shall not exceed $0.01 per mile travelled.

4 Mileage Fee Impact

This analysis uses all actively registered LDVs with in-state addresses in the 2023 Vermont registration and inspection data[18]. We provide a summary of these vehicles, including fuel economies, vehicle age, typical vehicle mileage, and household travel patterns. We then analyze the implications of mandating a mileage fee for only Vermont BEV LDVs and, separately, a statewide mileage fee for all LDVs in place of gas tax revenue.

4.1 Vermont Vehicle Use Summary

The fuel economy of the Vermont gasoline and diesel LDV fleet, using EPA city and highway combined estimates, vary between 9 mile-per-gallon equivalents (MPGe) and 107 MPGe, with most vehicles achieving between 20 and 28 MPGe (**Table 3, Figure 1**). The state-wide average fuel economy for LDV gasoline and diesel vehicles is 23 MPGe. Not including differences based on fuel type (BEV, gas, diesel, etc.), LDVs are driven an average of 10,804 miles per year.

Table 3 · Average Vermont LDV ICEV (Gas and Diesel) Mileage and Count by Fuel Economy Range

Fuel Economy Range	Percent Vehicles	Estimated Total Vehicles	Average Annual Mileage [mi]
Less than 11 mpg	0	0	2,328
11 - 13 mpg	0.2	1,059	5,917
13 - 15 mpg	1.9	10,060	8,094
15 - 17 mpg	5.9	31,239	9,330
17 - 19 mpg	11.5	60,889	10,518

[18] We use 2023 data because calculating annual vehicle mileage requires both prior-year and next-year inspection records, and complete inspection data are available for this period.

Fuel Economy Range	Percent Vehicles	Estimated Total Vehicles	Average Annual Mileage [mi]
19 - 21 mpg	12.5	66,184	10,715
21 - 23 mpg	13	68,831	10,743
23 - 25 mpg	9.7	51,358	10,797
25 - 26 mpg	10.2	54,006	11,409
26 - 27 mpg	4.8	25,415	11,090
27 - 28 mpg	5.2	27,532	11,319
28 - 29 mpg	6.3	33,357	11,062
29 - 30 mpg	7.3	38,651	11,209
30 - 31 mpg	2	10,589	10,297
31 - 32 mpg	1.6	8,472	10,390
32 - 33 mpg	2.7	14,296	11,091
33 - 34 mpg	0.7	3,706	11,118
34 - 35 mpg	0.4	2,118	11,001
35 - 36 mpg	0.4	2,118	14,697
36 - 37 mpg	0.1	529	11,147
37 - 38 mpg	0.2	1,059	11,903
38 - 39 mpg	0.4	2,118	13,467
39 - 40 mpg	0.2	1,059	12,527
40 - 41 mpg	0.8	4,236	13,715
41 - 42 mpg	0.2	1,059	11,130
42 - 43 mpg	0.1	529	11,877
43 - 44 mpg	0	0	15,146
44 - 45 mpg	0	0	10,683
More than 45 mpg	1.6	8,472	11,523

[1] Assumes there are 529,469 total (gas, diesel, hybrid, and electric) LDVs registered in Vermont

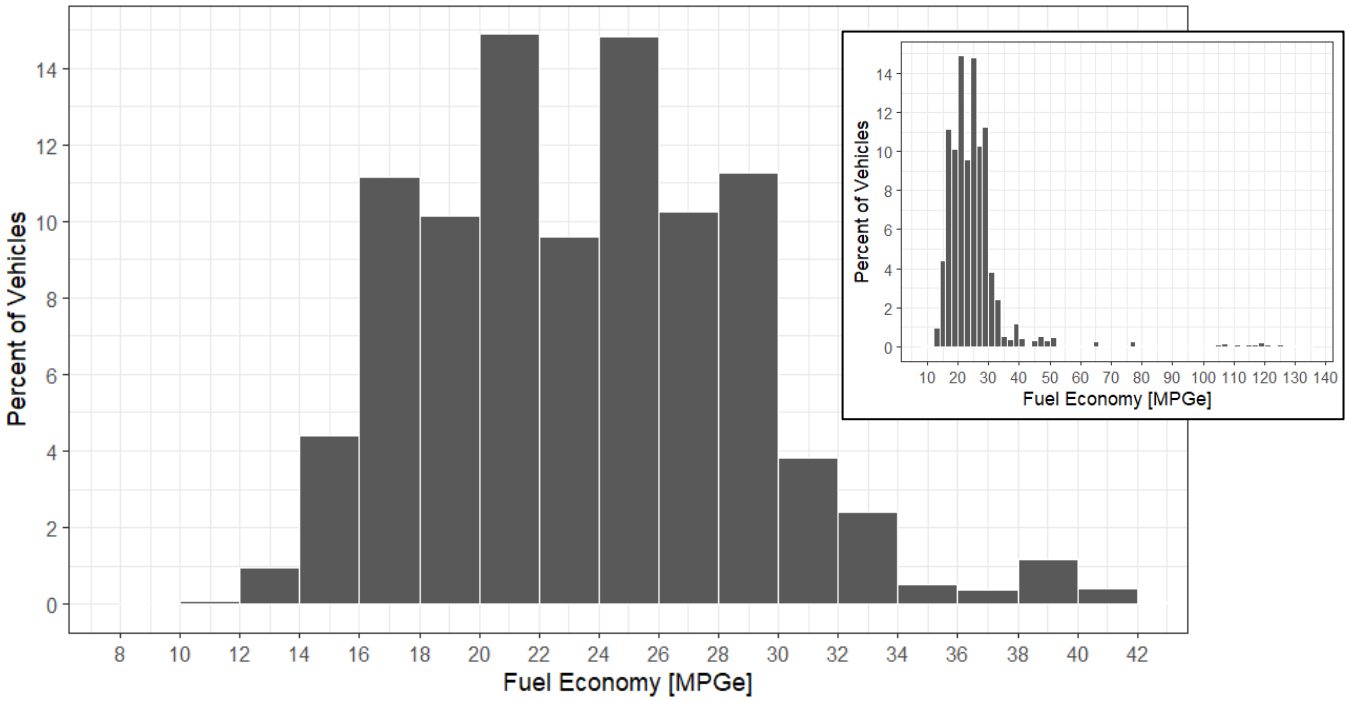


Figure 1 · Vermont LDV ICEV (Gas and Diesel) Fleet Fuel Economy Distribution

Full fuel economy distribution shown in top right corner, zoomed in distribution shown in main image

Vehicles are also driven differently depending on their age. The average age of a vehicle in Vermont is 9.2 years old. Newer vehicles are driven signficantly more than older vehicles (**Table 4, Figure 2**). Most EVs are newer, so EVs tend to be driven more than the average (i.e., 9.2 year old) gasoline or diesel vehicles. However, EVs are typically driven less miles than vehicles of their same age.

Table 4 · Average Vermont LDV Mileage and Count by Vehicle Age Range

Vehicle Age Range	Percent Vehicles	Estimated Total Vehicles	Average Annual Mileage [mi]
More than 21 yrs old	3.6	19,061	5,082
19 - 20 yrs old	2.4	12,707	6,858
17 - 18 yrs old	3.3	17,472	7,347
15 - 16 yrs old	4.0	21,179	7,812
13 - 14 yrs old	6.0	31,768	8,736
11 - 12 yrs old	8.7	46,064	9,433
9 - 10 yrs old	12.2	64,595	10,430
7 - 8 yrs old	14.3	75,714	11,459
5 - 6 yrs old	16.8	88,951	12,347
3 - 4 yrs old	14.7	77,832	12,551
1 - 2 yrs old	13.1	69,360	12,619
Less than 1 yr old	1.0	5,295	12,072

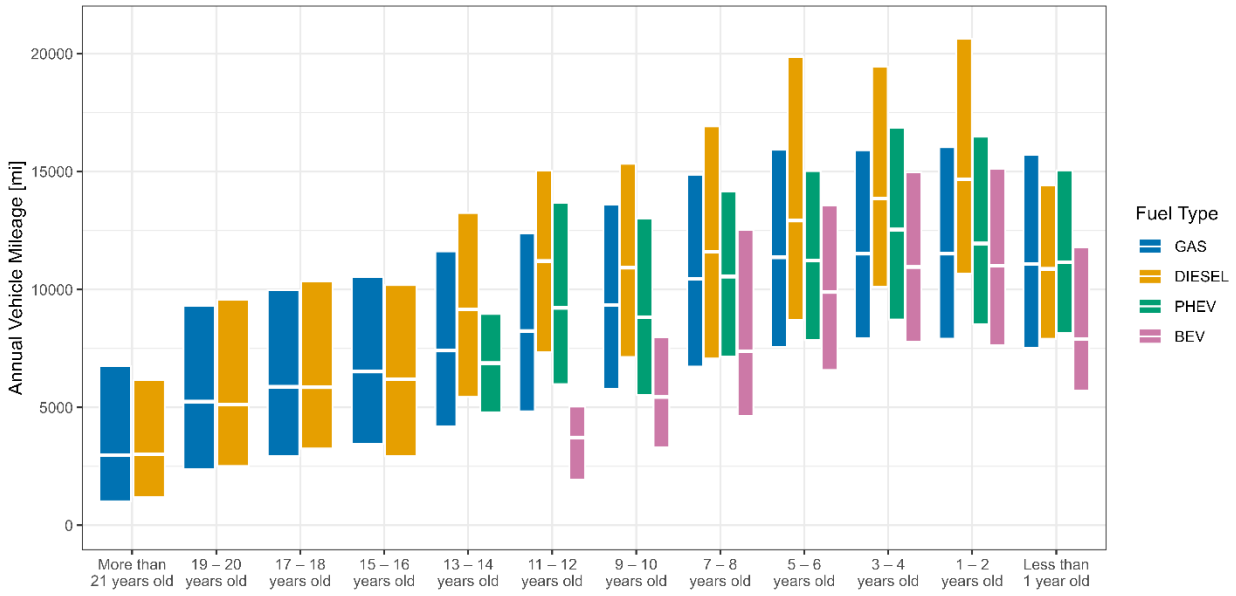
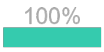
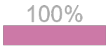
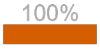
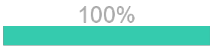
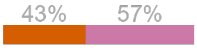
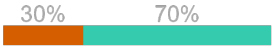


Figure 2 · Annual Vermont LDV Mileage Distribution by Vehicle Age and Fuel Type

Note: Plot only shows central 50% of mileage distribution, since mileage varies so widely. Median (middle) values are shown as the white line within each bar.

Vehicles are used differently in household settings. The following tables show common combinations of vehicles owned by households, which we call “common household types”. Approximately half of Vermont households have just one registered ICEV (a gas or diesel vehicle), with a state average of 1.7 registered cars per household. Households with one registered car travel an average of 10,934 miles per year; two car-households average 21,420 miles per year (**Table 5**). However, annual vehicle mileage varies based on the number, type, and age of vehicles in the household.

Table 5 · Average Vermont LDV Use by Common Household Types

Household Vehicles	Average Household Mileage [mi / year]	Average Household Mileage by Fuel Type [mi / year]	Average ICEV Fuel Economy[1] [MPGe]
	11,407		--
	11,958		--
	10,918		25
	24,145		--
	21,603		26
	22,289		26
	21,388		24
	31,298		26
	31,295		25
	33,860		25
	32,095		23

[1] Distance-weighted harmonic average

Household costs for current Vermont fuel-based vehicle fees also vary. There are taxes for internal combustion engine vehicles ($0.32 and $0.28 per gallon of in-state purchased gas and diesel fuel, respectively), and the flat fees for electric vehicles ($44.5 and $89 per PHEV and BEV, respectively).

Annual gas tax costs vary based on fuel economy and vehicle mileage, but the flat fees for electric vehicles are paid annually at registration regardless of vehicle use. On average, PHEV and BEV owners pay less per mile than gas or diesel vehicles due to the difference in the structure of Vermont's fuel-based fees (i.e., per gallon or per vehicle) (**Table 6**).

Table 6 · Vehicle Taxes for Common Vermont Vehicles, Assuming They are Driven 11,000 Miles per Year

Vehicle	Current Tax Cost per Mile	Fuel Economy [MPGe]	Current Taxes [$ / year]	Mileage Fee [$ / year]	Annual Cost Difference [$ / year]
Battery Electric Vehicles (BEVs)					
 Nissan Leaf	0.8 ¢ / mi	109.0	$89	$154	+$65
 Chevrolet Bolt EV	0.8 ¢ / mi	118.8	$89	$154	+$65
 Tesla Model 3	0.8 ¢ / mi	124.1	$89	$154	+$65
Hybrid Electric Vehicles (HEVs)					
 Toyota Rav4	0.8 ¢ / mi	37.7	$93	$154	+$61
 Toyota Prius	0.7 ¢ / mi	49.1	$72	$154	+$82
Internal Combustion Engine Vehicles (ICEVs): Gas or Diesel					
 Chevrolet Silverado	1.8 ¢ / mi	17.5	$201	$154	- $47
 Toyota Tacoma	1.6 ¢ / mi	19.8	$178	$154	- $24

	Vehicle	Current Tax Cost per Mile	Fuel Economy [MPGe]	Current Taxes [$ / year]	Mileage Fee [$ / year]	Annual Cost Difference [$ / year]
	Subaru Outback	1.3 ¢ / mi	24.3	$145	$154	+$9
Plug-in Hybrid Electric Vehicles (PHEVs)						
	Toyota Rav4 Prime	0.9 ¢ / mi	65.0	$99	$154	+$55
	Chevrolet Volt	0.9 ¢ / mi	70.5	$94	$154	+$60
	Toyota Prius Prime	0.8 ¢ / mi	78.0	$90	$154	+$64

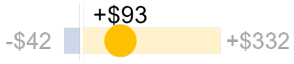
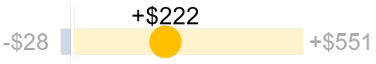
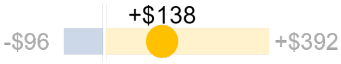
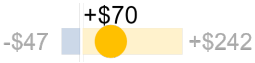
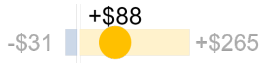
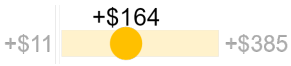
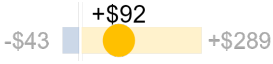
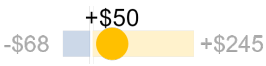
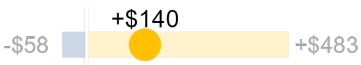
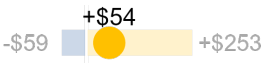
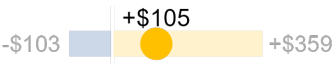
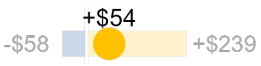
4.2 Mileage Fee Impact: BEV-Only

Vermont is currently planning to implement a mandatory per mile fee for BEV LDVs to replace the infrastructure fee ($89 per BEV per year) paid at vehicle registration. We recommend a mile rate of 1.4 cents per mile to be approximately equivalent with the average fuel taxes paid by owners of ICEV (gas and diesel) LDVs in Vermont.

First, we note the existing $89 flat fee is substantially lower than the typical state fuel tax payments from gas or diesel LDVs: typically, $142 per year. As a result, the 1.4 cents per mile fee will mean annual cost increases in state fees for most BEV owners. Note, that as there is currently no federal mileage or flat highway use fee program in effect, BEVs will continue to see savings from federal gas taxes.

On average, BEV owners can expect an approximately $69 annual cost increase per vehicle, although this varies based on whether the BEV is registered in an urban or rural area due to differences in geographic vehicle mileage (**Table 7**). Low mileage BEV drivers may see cost savings of up to $42 annually, while high mileage BEV drivers may see up to $332 increases in annual costs. This will further vary with how BEV owners adjust their mileage under the new fee structure.

Table 7 · Average Household State Fee Costs by Common Household Types

Area Type[1]	Household Vehicles	Average Current Fees[2] [$ / year]	Average Mileage Fees[3] [$ / year]	Expected Cost Differences[4] [$ / year]
Rural		$89	$182	
Rural		$178	$400	
Rural		$232	$322	
Rural		$298	$436	
Rural		$358	$428	
Suburban		$89	$177	
Suburban		$178	$342	
Suburban		$224	$313	
Suburban		$297	$478	
Suburban		$359	$451	
Urban		$89	$139	
Urban		$178	$318	
Urban		$204	$259	
Urban		$288	$393	
Urban		$323	$377	

[1] Derived from Rural Urban Commuting Area (RUCA) Codes, with codes 1, 4, and 7 interpreted as "urban", code 10 interpreted as "rural", and codes 2, 3, 5, 6, 8, and 9 interpreted as "suburban".
[2] Fees include BEV $89 flat infrastructure fee and/or gasoline tax
[3] Based on $0.014 per mile fee
[4] Covers 95% of households

4.3 Mileage Fee Impact: All LDVs

The Vermont General Assembly has stated its intent to implement the BEV-only mileage fee as an interim step towards a statewide program where all LDVs are charged a per mile rate upon elimination of fuel taxes[19]. In theory, this statewide mileage fee would substitute for current LDV gas taxes and the flat fees for PHEVs and BEVs. As the Legislature considers this future transition, we have provided some analysis of how the proposed rate might impact households besides those who currently drive BEVs.

We examine the annual household cost implications for a 1.4 cents per mile fee applied to all LDVs in Vermont. We do not account for any additional fees at registration or at the pump.

Under this scenario, we find households with one gas or diesel vehicle will on average see their costs increase from $142 to $152 (+ $10 annually) (**Table 8**). Households with two gas or diesel vehicles will see comparably small cost increases (on average, + $12 annually) (**Table 9**). This overall increase is due to rounding the revenue-neutral mileage fee from 1.36 cents per mile to 1.4 cents per mile. As with the BEV-only fee, EV owners will see annual costs increase by closer to $69 annually.

Replacing the motor fuels tax with a mileage fee will also, on average, reduce the difference in costs between urban and rural households. Rural households pay more in motor fuels taxes than urban households on average for two reasons. First, rural households tend to drive more than urban households[20]. Second, rural households tend to drive vehicles with lower fuel economies, so they pay more motor fuels tax per mile than households with more fuel-efficient vehicles[21]. A mileage fee will reduce costs for households with less fuel-efficient vehicles while increasing costs for households with more fuel-efficient vehicles. Overall, this will result in a more equitable geographic

[19] https://legislature.vermont.gov/Documents/2026/Docs/ACTS/ACT043/ACT043%20As%20Enacted.pdf

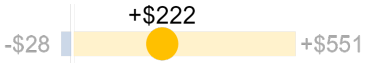
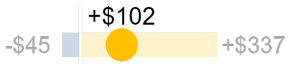
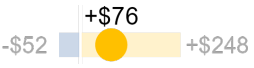
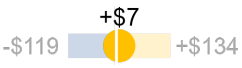
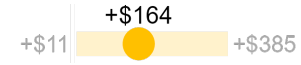
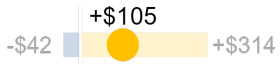
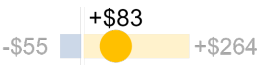
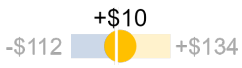
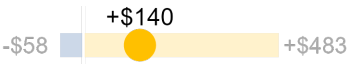
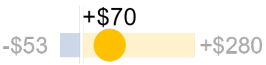
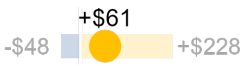
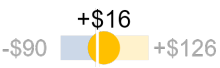
[20] Nelson, C., Quallen, E., Rowangould, G., 2025. Defining rural: Inconsistencies in observed travel behavior across rural and urban classifications in Vermont. Journal of Transport Geography 128, 104357. https://doi.org/10.1016/j.jtrangeo.2025.104357
[21] Nelson, C., Rowangould, G., 2023. Data-Driven Analysis of Rural Equity and Cost Concerns for Mileage-Based User Fees in Vermont. Transportation Research Record 03611981231206167. https://doi.org/10.1177/03611981231206167

distribution of costs to support roadway operation, maintenance and construction (**Figure 3**).

Table 8 · Average Household Cost Differences by Common Household Types

Household Vehicles	Average Current Fees [$ / year]	Average Mileage Fees [$ / year]	Expected Cost Differences (covers 95% of households)
	$89	$158	+$69 (-$59 to +$281)
	$113	$166	+$53 (-$28 to +$189)
	$142	$152	+$10 (-$73 to +$90)
	$178	$336	+$158 (-$43 to +$491)
	$216	$303	+$87 (-$50 to +$310)
	$242	$313	+$70 (-$52 to +$242)
	$287	$299	+$12 (-$106 to +$131)

Table 9 · Average Household Cost Differences by Common Household Types and Residential Area Type (Rural or Urban)

Area Type	Household Vehicles	Average Current Fees [$ / year]	Average Mileage Fees [$ / year]	Expected Cost Differences (covers 95% of households)
Rural		$178	$400	
Rural		$232	$334	
Rural		$269	$345	
Rural		$318	$325	
Suburban		$178	$342	
Suburban		$224	$329	
Suburban		$258	$341	
Suburban		$310	$320	
Urban		$178	$318	
Urban		$204	$274	
Urban		$221	$282	
Urban		$253	$269	

[1] For other area types (suburban and urban) see Appendix.

[2] Derived from Rural Urban Commuting Area (RUCA) Codes, with codes 1, 4, and 7 interpreted as “urban”, code 10 interpreted as “rural”, and codes 2, 3, 5, 6, 8, and 9 interpreted as “suburban”.

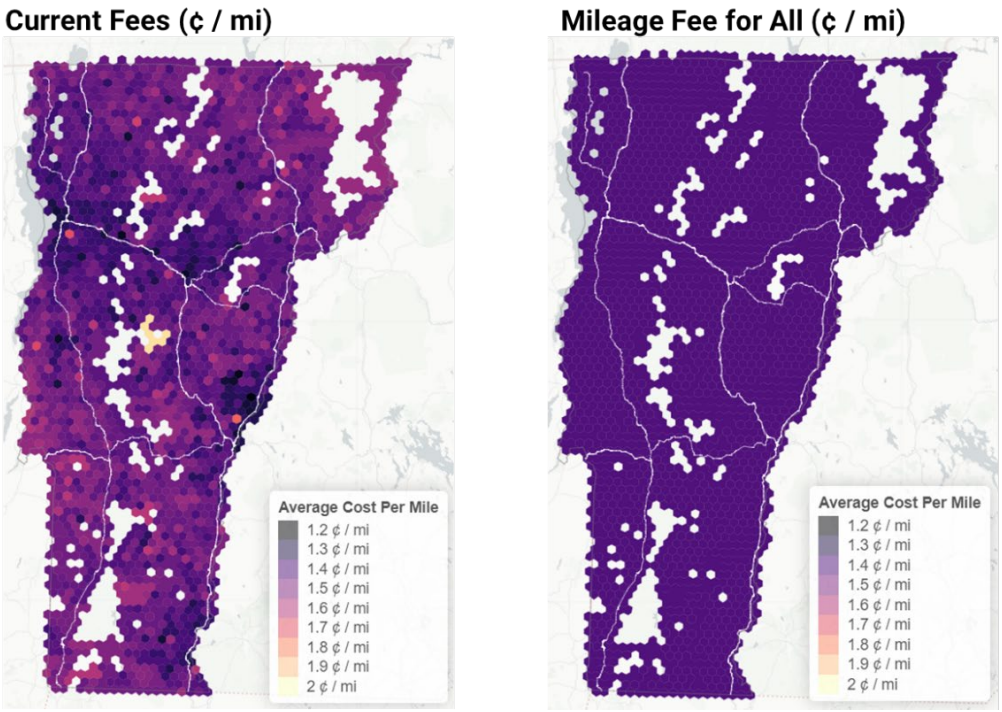


Figure 3 · Vehicle Cost Per Mile Map Comparing Current Fees to Mileage Fees
Each hexagon contains at least 50 vehicles. Average values per hexagon are shown.

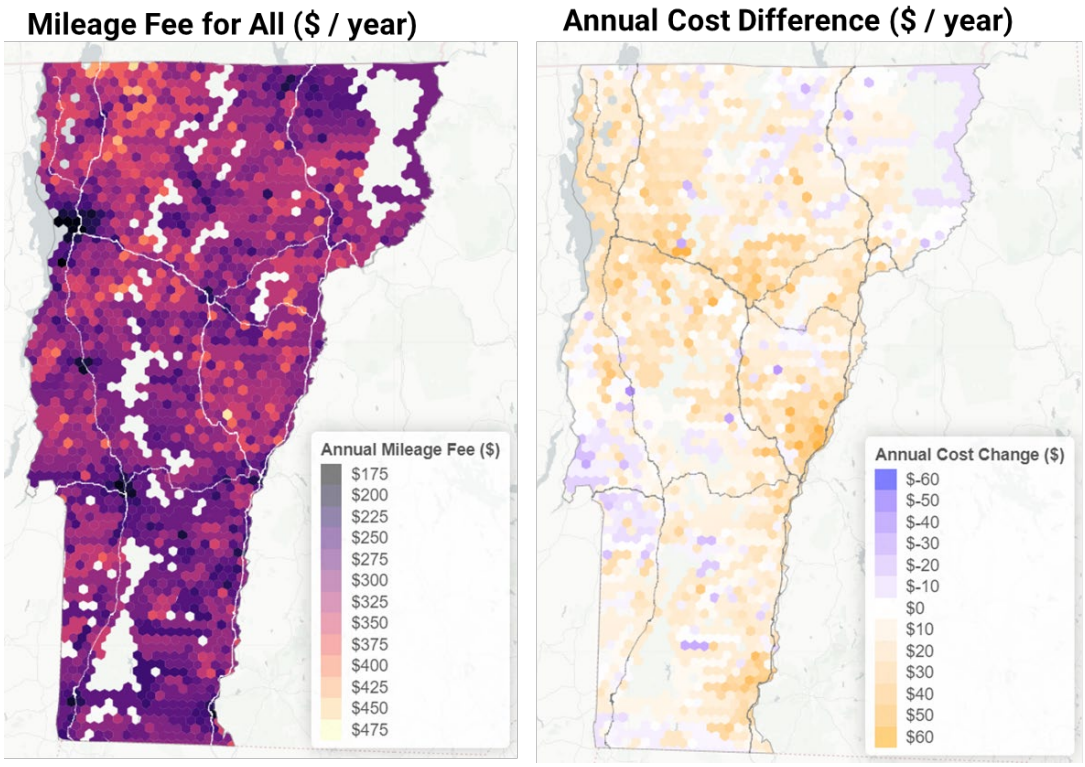


Figure 4 · Household Annual Cost Maps
Each hexagon contains at least 50 households. Average values per hexagon are shown.

4.4 Revenue Projection

We examine the revenue implications of the options for fuel and use-based transportation fees: a) the current gas taxes and flat fees for BEVs and PHEVs, b) the proposed BEV LDV mileage fee with continued reliance on the gas tax and flat fees for PHEVs, and c) a state-wide LDV mileage fee with no additional per gallon or per vehicle fees. We project current revenues to the year 2050 including their revenue-generating potential with-and-without-inflation adjustments.

We find the State's current plan (a mileage fee applied only to BEVs) can prevent further decline in fee revenue only when indexed to inflation. More importantly, a state-wide mileage fee indexed to inflation and applied to all LDVs would generate substantially more revenue over the long term without increasing the base tax rate.

4.4.1 Revenue Projection Methods

We use the U.S. Environmental Protection Agency's Mobile Vehicle Emission Simulator (MOVES). This software includes national models that forecast vehicle adoption using state-provided data while accounting for federal policies impacting vehicle sales and emissions. We use MOVES version-4.0[22]. Vermont provided data for this model in 2020[23], including vehicle counts, vehicle mileage estimations, and vehicle age distributions. Therefore, the Vermont county data in MOVES 4.0 reflects a relatively up-to-date Vermont vehicle fleet.

One limitation of using MOVES is that we cannot examine how hybrid vehicle adoption may impact fuel tax revenues. While we expect reductions in fuel consumption from hybrid vehicle adoption to be small[24], it is worth noting that our revenue forecasts may be slightly (~0.5%) inflated since MOVES includes HEVs and PHEVs as gasoline vehicles. If hybrid vehicle ownership rises, we'd expect our overestimation of fuel tax revenue to be greater.

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[22] We use MOVES 4.0 (released in 2023) instead of the more recent MOVES 5.0 (released in 2025). MOVES 5.0 vehicle forecasts use Biden-era policies that influenced the adoption of BEVs and have since been partially rolled back by the Trump administration. (https://github.com/USEPA/EPA_MOVES_Model/milestone/7). This affects EV and fuel-efficient vehicle adoption assumptions, so MOVES 4.0 is a better fit for realistic current day vehicle forecasts.

[23] https://gaftp.epa.gov/air/nei/2020/doc/supporting_data/onroad/2020_Documentation_of_CDB_Input_Data_20230118.xlsx

[24] PHEVs only constitute 1.5% of the Vermont vehicle fleet as of 2025 (https://www.driveelectricvt.com/uploads/media/Documents/Maps/vt_ev_registration_trends.pdf). While there are few robust studies about PHEV use and travel behavior, we know PHEVs are irregularly plugged in, have relatively small battery ranges, and some have built-in systems to turn on the gasoline engine even when using electricity (e.g., during quick accelerations).

Using the output from MOVES, we calculate revenue from three scenarios: 1) No mileage fee, 2) a BEV-only mileage fee, and 3) a statewide mileage fee. We use the following formulas:

Fuel Type	No Mileage Fees[1]	BEV-Only Mileage Fee	Statewide Mileage Fee
Gasoline	\$0.32 / gal x gal fuel	\$0.32 / gal x gal fuel	\$0.014 / mile x gas miles
Diesel	\$0.28 / gal x gal fuel	\$0.28 / gal x gal fuel	\$0.014 / mile x diesel miles
BEV	\$89 x number of BEVs	\$0.014 / mile x BEV miles[2]	\$0.014 / mile x BEV miles[2]
All Vehicles	(Gasoline Revenue) + (Diesel Revenue) + (BEV Revenue)		

[1] No Mileage Fees: Current motor fuels taxes and 1-year infrastructure fees for PHEVs and BEVs at registration. Since MOVES outputs include PHEVs as gasoline vehicles, we only separate out BEVs.
[2] Future year discount rates calculated from the NHCCI do not apply to the mileage fee, which we assume will be adjusted annually according to NHCCI inflation

We adjust the total revenues for future years into 2023 dollars using the National Highway Construction Cost Index (NHCCI) produced by the Federal Highway Administration[25]. The NHCCI is a robust measure of inflation for transportation revenue though other inflation indexes could be considered. For one, it only includes price changes for transportation-specific purchases such as asphalt, concrete, traffic controls, equipment and labor. Secondly, the NHCCI takes price data from winning project bids, reflecting real state budgeting decisions.

To determine how much costs are rising each year, we look at the overall trend of the NHCCI index (**Figure 5**). By analyzing the quarterly data, we find an average growth rate of 0.98% per quarter[26]. When we compound that growth over a full year, it totals roughly 4% annually. We use this 4% "inflation rate" to adjust future costs back to 2025 dollars, ensuring our long-term budget estimates remain accurate and comparable over time.

[25] More information on the NHCCI: https://www.fhwa.dot.gov/policy/otps/nhcci/
[26] The annual growth rate is derived from a linear regression of the NHCCI (seasonally adjusted) using a log-transformation to improve model fit. The model follows the formula $\ln(y) = B_0 + B_1 x$ where y is the index value and x is the time elapsed in quarters ($x = 1$ at 2003 Q1). Model results:

- Equation = $\ln(y) = 0.103 + 0.0098x$
- Goodness of fit (R^2) = 0.80
- Interpretation: The slope ($B_0 = 0.0098$) represents the quarterly growth rate. This is converted to an annual effective rate using$(e^{(0.0098 \times 4)}) - 1 \approx 4\%$.

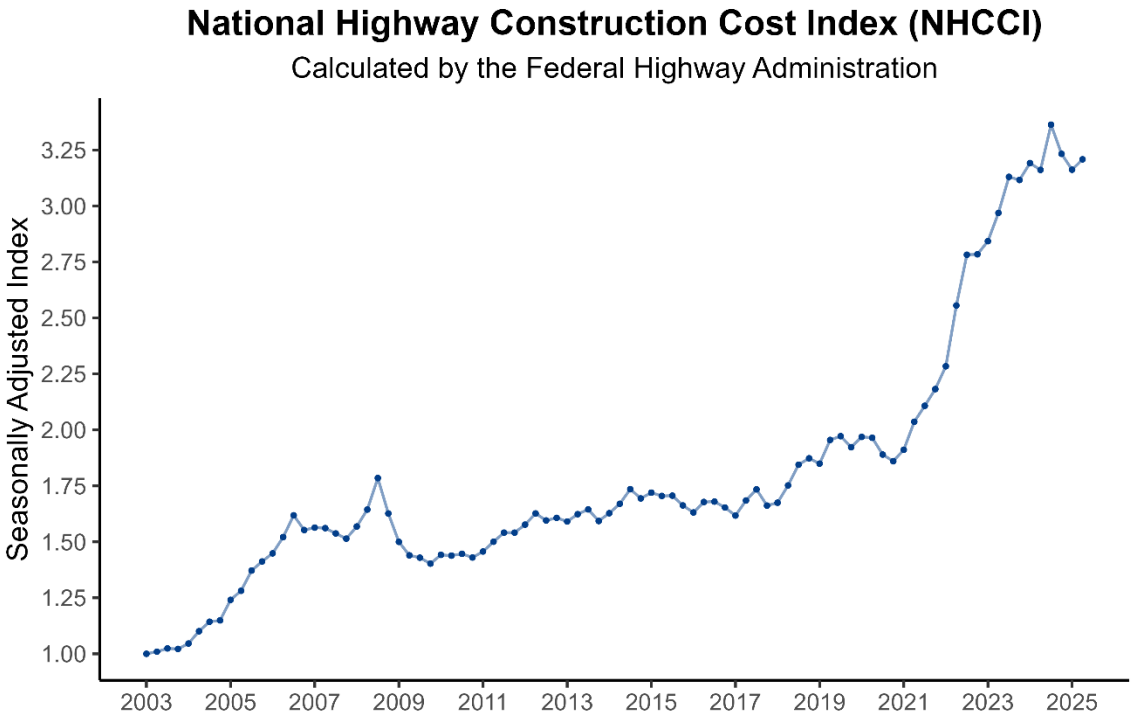


Figure 5 · Trends in the National Highway Construction Cost Index (NHCCI) since 2003

4.4.2 Revenue Projection Results

By running MOVES, we obtain vehicle counts, vehicle miles travelled, and gallons of fuel consumed every 5-years out till 2050. We see expected trends. Vehicle sales will increase for BEVs and decrease for gasoline and diesel vehicles. Similarly, we will see increasing distance traveled by BEVs (**Figure 6**).

True motor fuel tax revenue from light-duty vehicles is uncertain: taxable gallons of fuel sold are reported by fuel distributors who do not know how much of their fuel is being sold to semi-trucks versus SUVs. MOVES estimates 2023 motor fuel tax revenue from Vermont's light-duty vehicles at $81.2 million. We estimate, using Table 3, this revenue is likely closer to $78.6 million dollars[27]. Both are within the ballpark of what we'd expect[28]. To account for the fact that MOVES outputs do not exactly match the true

[27] We estimate light-duty gas and diesel revenue from Table 3 in this report using the following formula:

$$2023\ VT\ Light-Duty\ Vehicle\ Motor\ Fuel\ Tax\ Revenue = \sum_i \frac{(Mileage)_i}{(Fuel\ Economy)_i} \times \frac{\$0.32}{mi} \times (\#\ Vehicles)_i$$

where i is each row in the table, with the fuel economy set at the average of the fuel economy range.

[28] Vermont Joint Fiscal Office 2026 January Economic Review and Revenue Forecast reports total motor fuel tax revenue in Vermont is $91.4 million (https://ljfo.vermont.gov/assets/Subjects/Consensus-Revenue-Forecasts-Legislative-Economic-Outlook/2026-January-Economic-Review-and-Revenue-Forecast.pdf). Federal Highway Administration's 2023 Highway Statistics estimate light-duty vehicles travel somewhere between 83% and 92% of miles on roads, with rural roads closer to 83% LDV mileage

2023 Vermont vehicle fleet travel behavior, we apply a few adjustments including scaling the MOVES motor fuel tax revenues to match our $78.6 million dollar estimate. While our estimate is also imperfect, it is well equipped to demonstrate the relative revenue differences for motor fuel taxes, mileage fees, and fees indexed to inflation.

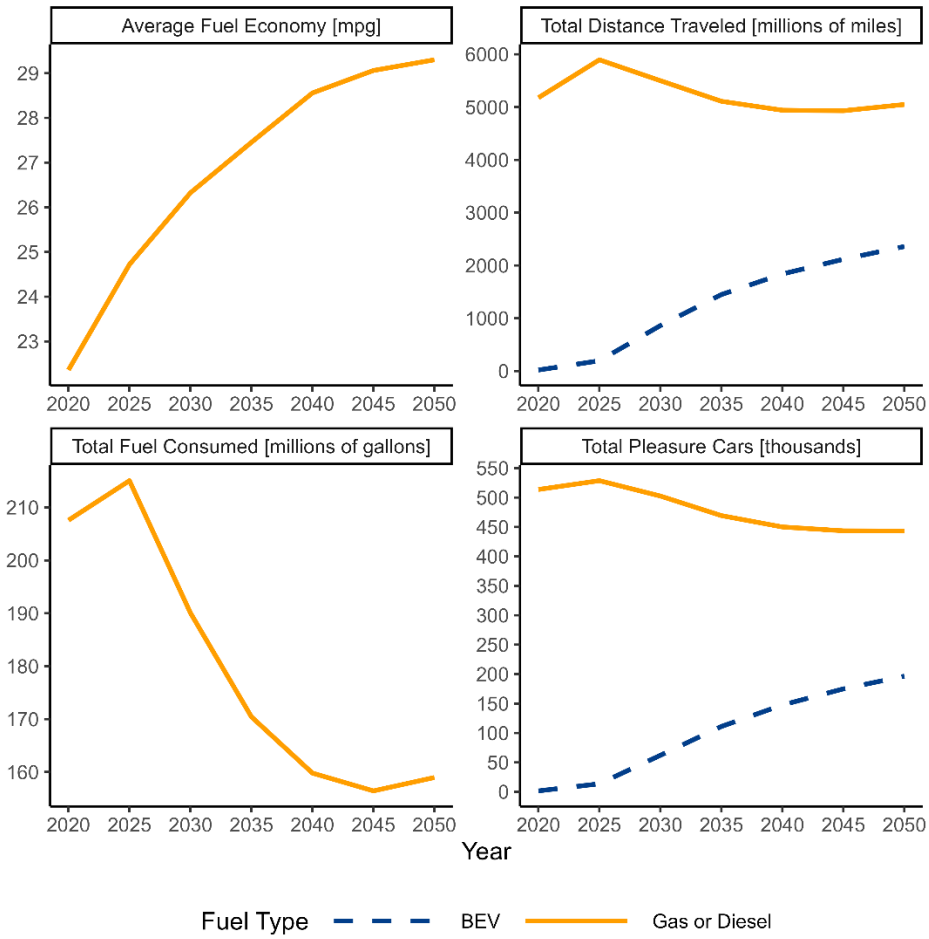


Figure 6 · MOVES Forecasted Vehicle Use and Counts for Vermont LDVs
Note: The sudden 2025 drop in fuel consumption and total distance traveled for gas and diesel vehicles is due to default MOVES 4.0 assumptions about spiked electric vehicle adoption beginning in 2025.

Using the revenue adjustment described above, revenue projections for the scenarios are shown below (**Figure 7**). These trends clearly demonstrate the three key elements to the declining revenue without a mileage fee: 1) more fuel-efficient gas and diesel vehicles using less fuel per mile, 2) more electric vehicles not consuming fuel, and 3) less purchasing power due to inflation. Implementing a mileage fee for BEVs only

and urban roads closer to 91% LDV mileage (Table VM-1 - Highway Statistics 2023 - Policy | Federal Highway Administration). A back-of the envelope calculation shows 86% of total Vermont motor fuel tax revenue is approximately $78.6 million: the light-duty vehicle revenue estimate from Table 3.

addresses the issue of electric vehicles not contributing equal amounts to transportation revenue as gas and diesel vehicles. Equally important is indexing the mileage fee for BEVs to inflation to address overall reductions in purchasing power. Similarly, a speedy transition to a statewide mileage fee program will address the declining revenue from increasing gas and diesel engine efficiency. Otherwise, revenue projections show an increasingly large gap between revenue from a BEV-only program and a mileage fee program for all Vermont pleasure cars.

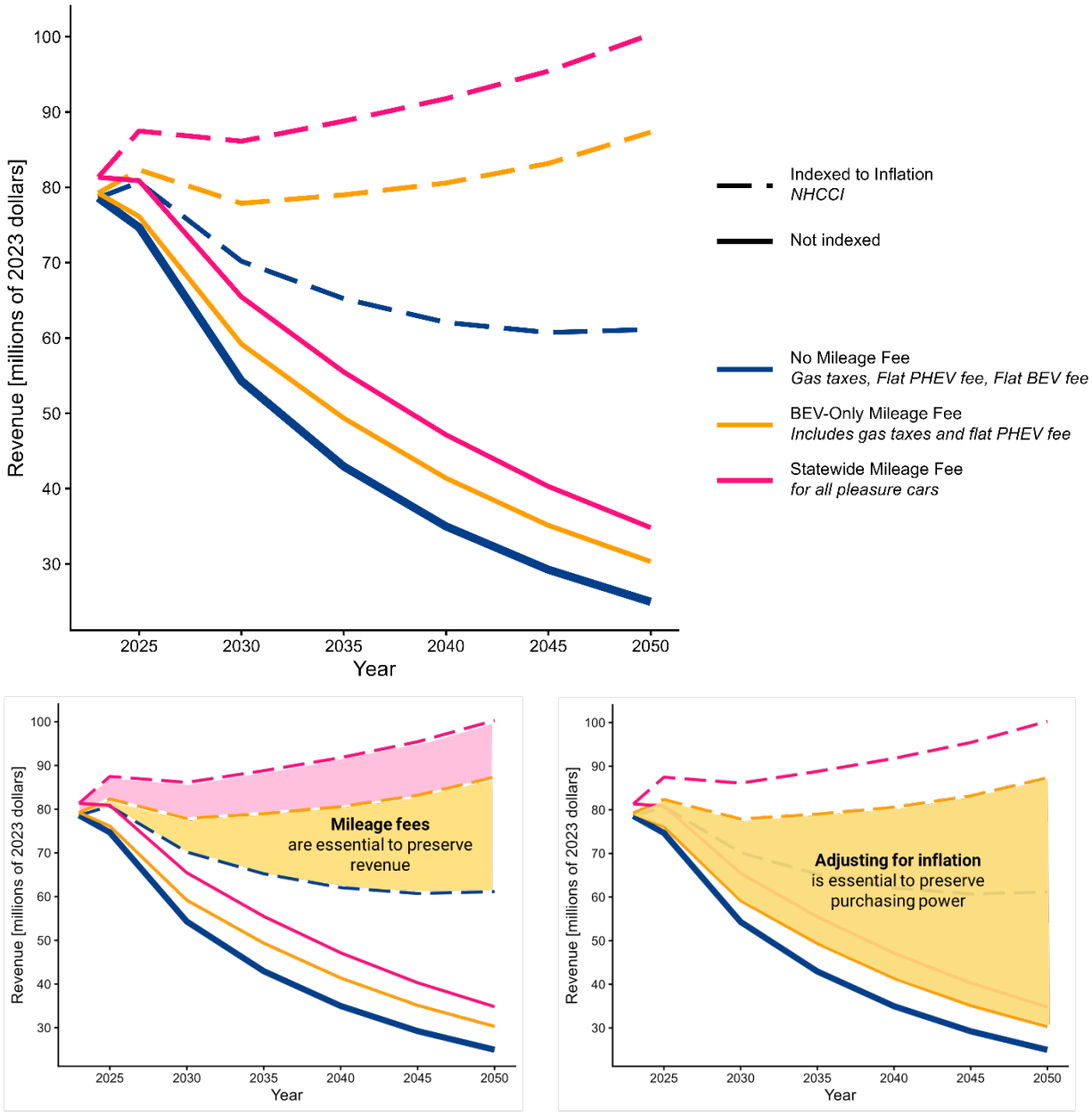


Figure 7 · Forecasted revenue from proposed Vermont vehicle fees. Revenue adjusted using annual NHCCI discount rate of 4%.

5 Key Considerations for Mileage-Fee Program Expansion

A mileage fee program for LDVs is an alternative to the current fuel tax and flat BEV infrastructure fee system that more directly assesses transportation costs incurred from roadway use and damage. As suggested in prior years, there may be some interest in tying a mileage fee to other policy goals such as increasing the purchase and use of more fuel efficient and electric vehicles. However, adjusting a mileage fee based on vehicle fuel efficiency would, in essence, be re-creating the gas tax and the revenue challenges it presents. Other policy strategies exist to encourage adoption of more fuel-efficient vehicles.

The rate setting method we recommend is designed to be approximately revenue neutral in the first year of the program. Over time ICEVs are expected to become more fuel efficient and a gap will grow between what ICEV and BEV drivers pay on average for road user fees. Absent other policy changes, BEV drivers will pay an increasing share of road user costs over time. However, adjusting the mileage rate to account for changes in ICEV fuel economy over time should not be considered as this would also effectively reproduce the gas tax and the revenue challenges it causes. There are two solutions to avoid widening the revenue gap: 1) transition the BEV-only mileage fee to a statewide program that charges a per mile rate to all LDVs, or 2) continuously increase the gas tax rate to compensate for decreasing fuel use per mile. If the MBUF is indexed to inflation as we recommend, the gas tax could also be indexed to avoid an even larger gap.

Transitioning the BEV-only mileage fee to a statewide program has additional considerations. Most importantly, Vermont will need to consider how to capture revenue from vehicles with out-of-state registrations that travel and purchase fuel in Vermont. With no gas tax, this revenue will be lost. Options may include raising “tourist taxes” such as certain sales or lodging (hotel and AirBnB) taxes. However, one option is to leave the current gas tax in place and refund or charge Vermont vehicle owners the difference between their annual mileage fee and their estimated annual gas tax payments. As demonstrated in this report, annual gas tax payments can be estimated using existing state data: mileage can be taken from odometer readings using the same methods the state plans to calculate mileage fees, and fuel consumption can be estimated by decoding the VIN of each registered vehicle and looking up the EPA estimated combined city and highway fuel economy.

Example Calculations for Reimbursing Vermonters

Annual Mileage Fee = *($0.014 / mile) x (10,000 miles) = $140*

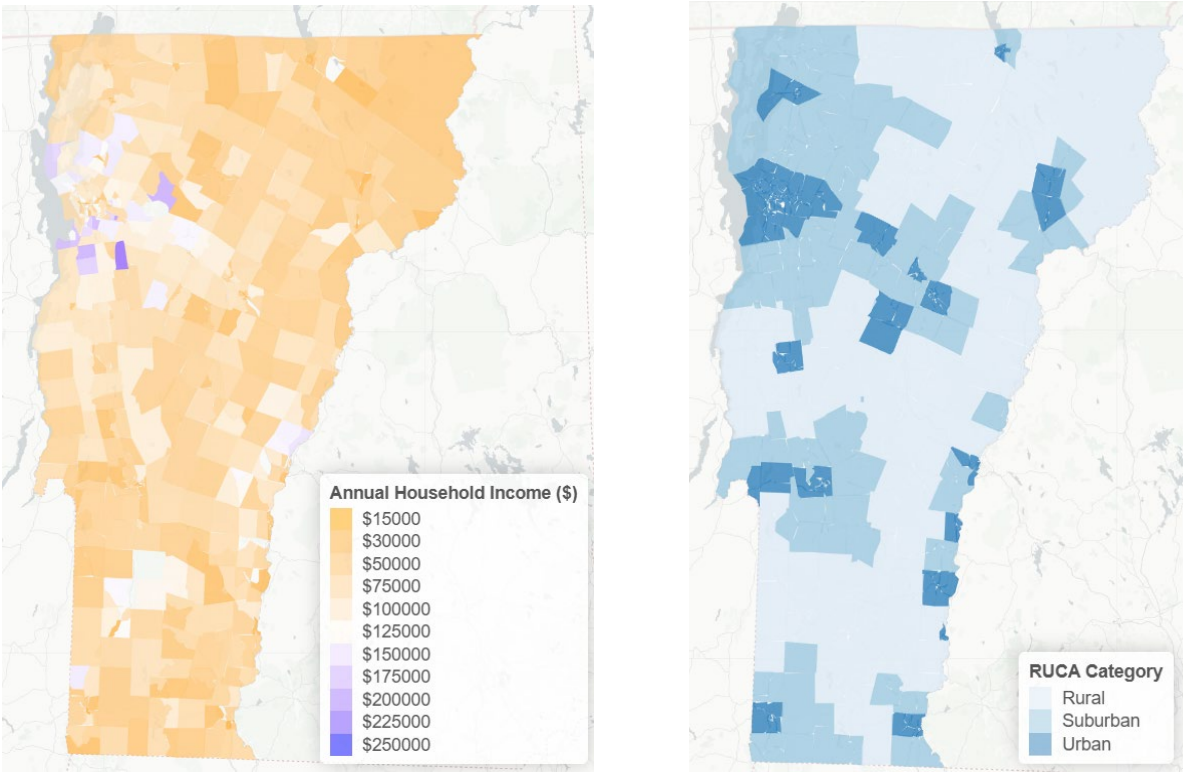
Annual Fuel Taxes = *($0.32 / gallon) x (10,000 miles) / (26 miles / gallon) = $123*

State Owed Taxes = *(Annual Mileage Fee) – (Amount Paid in Annual Fuel Taxes)*

= *($140) – ($123)* **= + $17**

In the transition to a statewide mileage fee, the state could also consider raising the current gas tax rate to account for the increasing fuel economy of out-of-state vehicles and out-of-state BEVs. If Vermonters are being reimbursed for their annual gas tax payments, an increase in the gas tax would not have a net impact on Vermont households.

6 Additional Figures



A B

Figure 8 · Vermont characteristics: A) Census block group median annual household income from the 2023 ACS and B) Census tract Rural Urban Commuting Area (RUCA) codes from the 2016 EPA (last available data)
Note: B) RUCA categories derived from RUCA codes, with codes 1, 4, and 7 interpreted as "urban", code 10 interpreted as "rural", and codes 2, 3, 5, 6, 8, and 9 interpreted as "suburban".

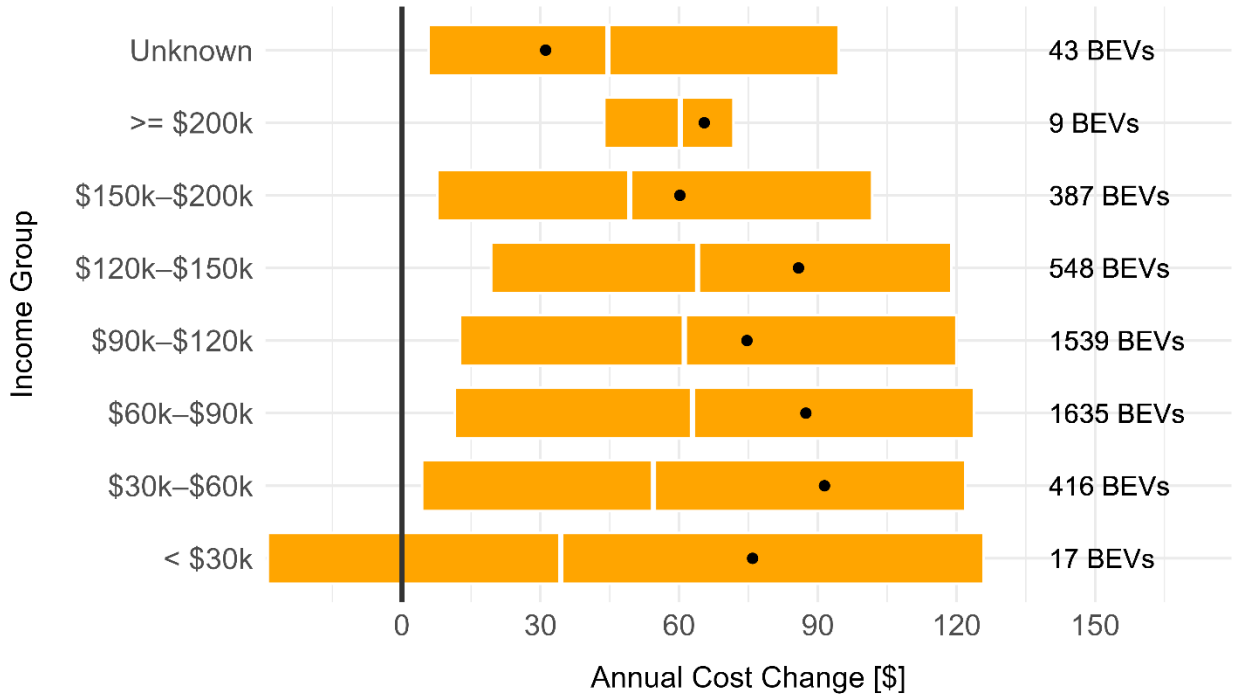


Figure 9 · Average Costs and Cost Differences by Income Groups for a BEV-Only Mileage Fee Program

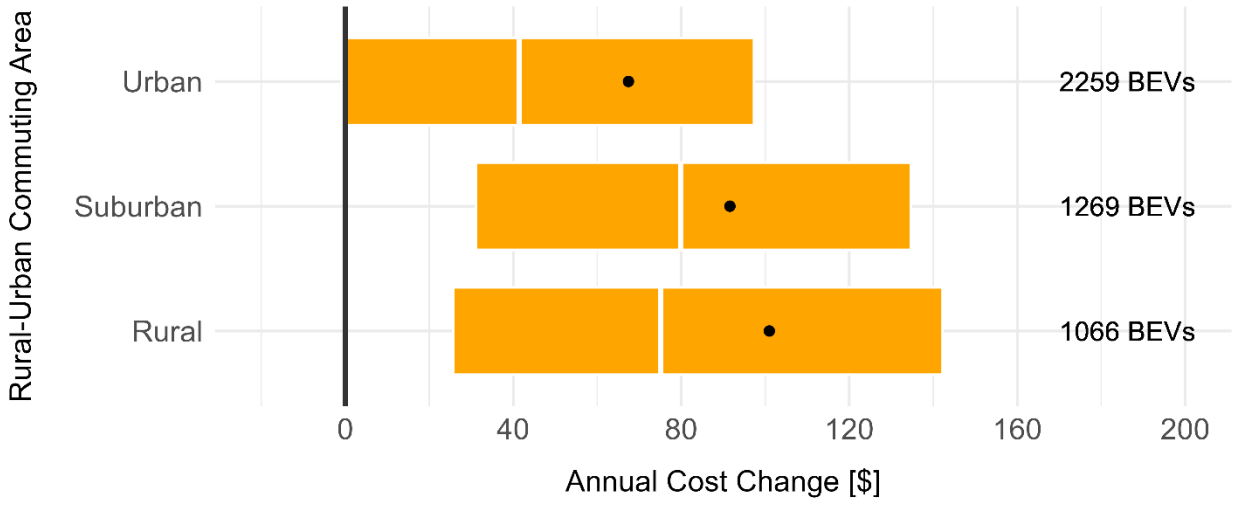


Figure 10 · Average Costs and Cost Differences by Rural-Urban Community Types for a BEV-Only Mileage Fee Program

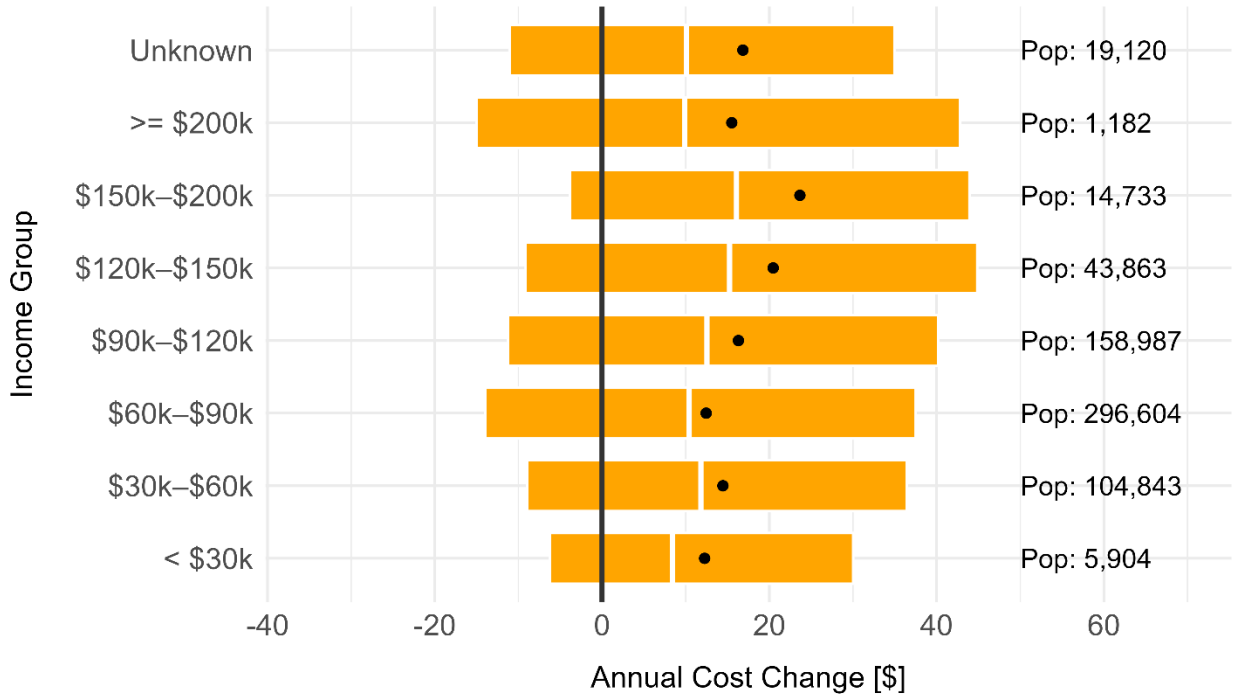


Figure 11 · Average Costs and Cost Differences by Income Groups for a Statewide (All LDV) Mileage Fee Program

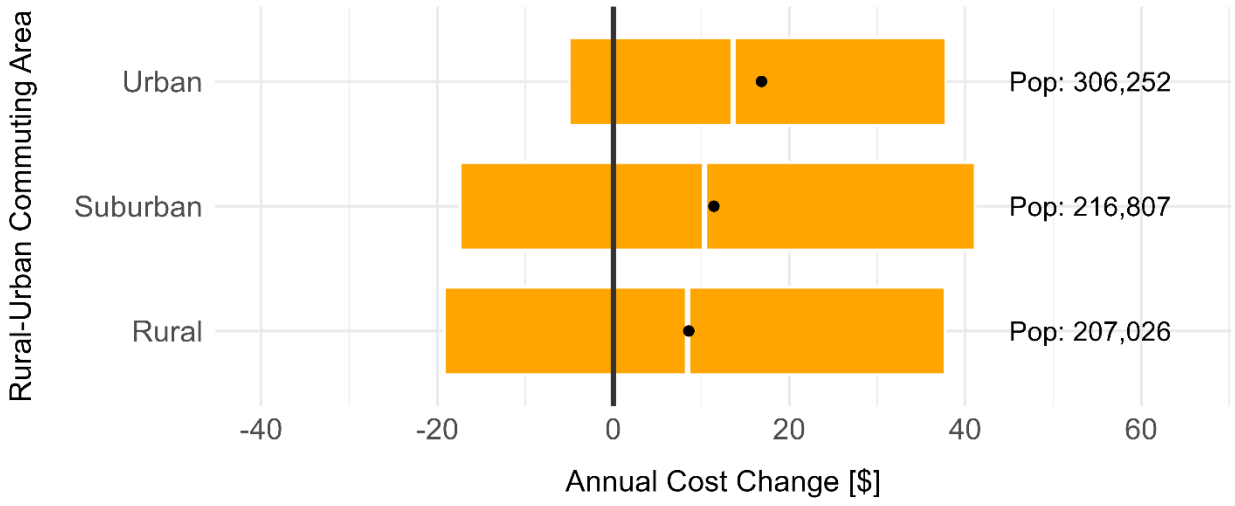
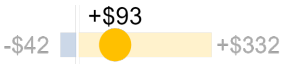
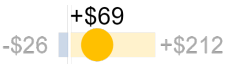
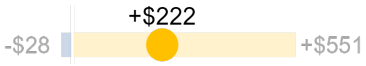
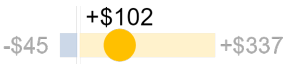
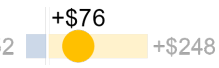
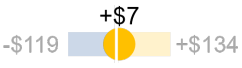
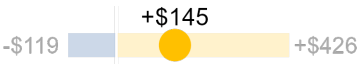
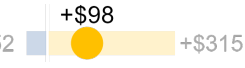
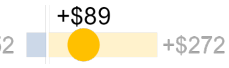
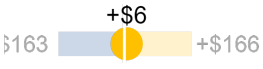
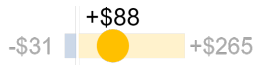
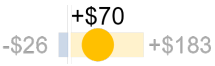
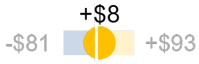
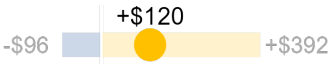
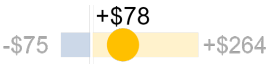
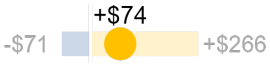


Figure 12 · Average Costs and Cost Differences by Rural-Urban Community Types for a Statewide (All LDV) Mileage Fee Program

Table 10 · Common Household Type Cost Differences for a Statewide (All LDV) Mileage Fee Program by Residential Area Type

Area Type	Household Vehicles	Average Current Fees [$ / year]	Average Mileage Fees [$ / year]	Expected Cost Differences (covers 95% of households)
Rural		$89	$182	
Rural		$124	$193	
Rural		$164	$170	
Rural		$178	$400	
Rural		$232	$334	
Rural		$269	$345	
Rural		$318	$325	
Rural		$298	$443	
Rural		$358	$456	
Rural		$443	$532	
Rural		$474	$480	
Suburban		$89	$177	
Suburban		$124	$195	
Suburban		$159	$167	

Area Type	Household Vehicles	Average Current Fees [$ / year]	Average Mileage Fees [$ / year]	Expected Cost Differences (covers 95% of households)
Suburban		$178	$342	+$164 +$11 +$385
Suburban		$224	$329	+$105 -$42 +$314
Suburban		$258	$341	+$83 -$55 +$264
Suburban		$310	$320	+$10 -$112 +$134
Suburban		$297	$495	+$198 -$28 +$518
Suburban		$359	$482	+$122 -$40 +$342
Suburban		$410	$503	+$93 -$102 +$315
Suburban		$460	$473	+$13 $146 +$172
Urban		$89	$139	+$50 -$68 +$245
Urban		$104	$145	+$41 -$30 +$161
Urban		$123	$136	+$13 -$58 +$86
Urban		$178	$318	+$140 -$58 +$483
Urban		$204	$274	+$70 -$53 +$280
Urban		$221	$282	+$61 -$48 +$228
Urban		$253	$269	+$16 -$90 +$126

Area Type	Household Vehicles	Average Current Fees [$ / year]	Average Mileage Fees [$ / year]	Expected Cost Differences (covers 95% of households)
Urban		$288	$408	
Urban		$323	$401	
Urban		$355	$428	
Urban		$392	$411