Electric Vehicles and Montana Highways

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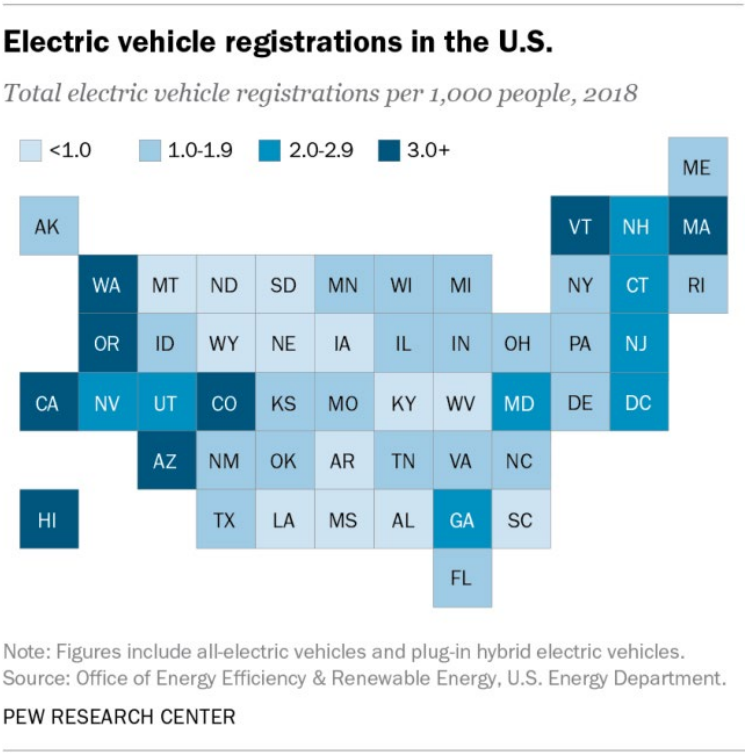
Overview

In the coming years, the number and proportion of electric vehicles (EVs) – including light duty, commercial/heavy-duty, and transit – may increase on Montana's roads. Increased EV adoption rates will have implications for road infrastructure funding, electricity needs and grid impacts, as well as emissions reductions and other environmental factors. A review of Montana's current EV registrations and charging station information is provided here as a baseline. Following are trends that may currently drive electric vehicle adoption and may impact future adoption, and a review of estimated potential impacts to Montana's road funding from electric vehicles.

Montana's Current Electric Vehicle Numbers & Charging Stations

Montana Electric Vehicle Registration

There are currently 1,139 battery electric vehicles and 711 plug-in hybrid electric vehicles registered in Montana, as identified in a January 2021 snapshot (available through Altas Hub EV)[1] of Montana's Motor Vehicle Division data. The counties with the highest registrations include Flathead (487), Missoula (266), and Gallatin (263). To identify the electric vehicles, Atlas Hub EV uses the first eight characters of the VIN number to identify electric vehicles by make, model, and year.



In terms of overall state vehicle registrations, in CY 2020, there were 1,013,150 light vehicles registered in Montana.[2] Using the data above, electric vehicles and plug-in hybrid electric vehicles accounted for 0.18% of light duty vehicle registrations in Montana during the 2020- early 2021 time period.

For comparison to other states, the chart created by the Pew Research Center shows the breakdown of electric vehicle registrations by per 1,000 people in 2018 for each state.[3]

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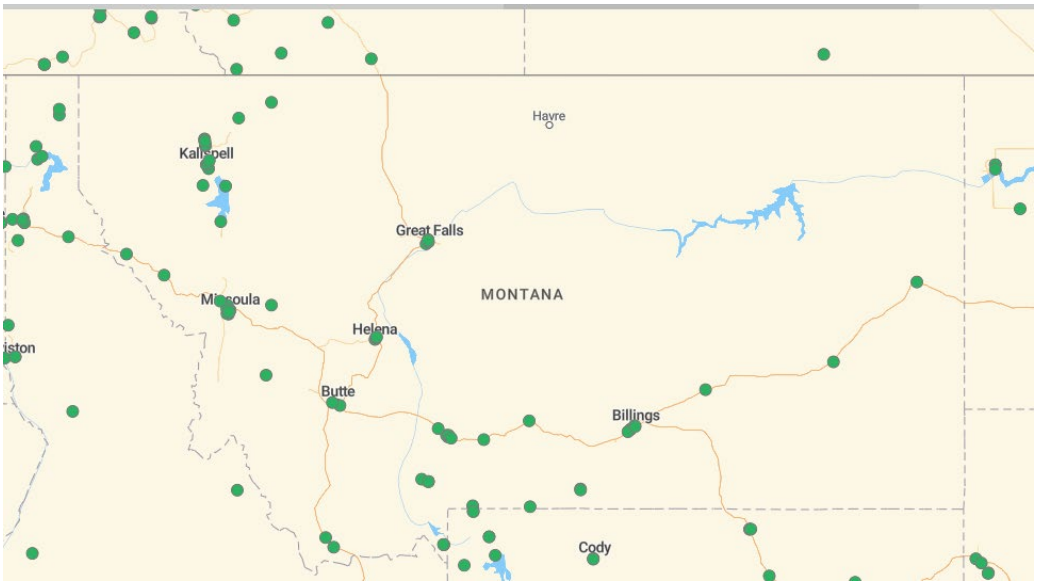
[1] https://www.atlasevhub.com/materials/state-ev-registration-data/#dashboard

[2] https://dojmt.gov/wp-content/uploads/2020-Vehicle-Registrations-Statewide.pdf , registration total above excludes buses and school buses.

[3] https://www.pewresearch.org/fact-tank/2021/06/07/todays-electric-vehicle-market-slow-growth-in-u-s-faster-in-china-europe/ft_21-05-21_electricvehicles_2/

Montana's Electric Vehicle Charging Infrastructure

Charging station availability may decrease driver "range anxiety" and lead to increased electric vehicle adoption. Range anxiety is defined as the worry on the part of a person driving an electric car that the battery will run out of power before the destination or a suitable charging point is reached, and is often cited as the most important reason why many are reluctant to buy electric cars. Current Montana charging station locations and details are available through the Alternative Fuels Data Center.[4] The following map shows the locations of Level 2 and Level 3/DC Fast charging stations in Montana as of Oct. 25, 2021.



The following tables show a breakdown of Montana's charging stations by facility type and by charging network. Tesla charging stations are included; they are built for use by Tesla owners and require an adaptor for non-Teslas to use. There are currently 68 public charging station locations in Montana with 203 charging outlets.

Charging Locations by City	
Missoula	8
Bozeman	6
Billings	5
Great Falls	5
Whitefish	5
Big Sky	4
Helena	4
Kalispell	3
West Yellowstone	3
Butte	2
Red Lodge	2
Babb	1
Belgrade	1
Big Timber	1
Bigfork	1
Cooke City	1
Custer	1
Dell	1
East Kalispell	1
Gardiner	1
Glendive	1
Greenough	1
Lake McDonald	1
Lakeside	1
Lima	1
Livingston	1
Miles City	1
Philipsburg	1
Polson	1
Saltese	1
Superior	1

[4] https://afdc.energy.gov/fuels/electricity_locations.html#/analyze?region=US-MT&fuel=ELEC

Charging Stations By Facility Type	
Unclassified*	23
Hotel/Inn/B&B	20
Car Dealer	7
Hospital	3
Restaurant	3
Shopping Center	2
Electric Cooperative	1
Gas Station	1
Grocery	1
Municipal Government	1
National Park	1
Parking Garage/Lot	3
Utility	1

*Includes facilities that provide multiple functions (such as gas stations that also have grocery store functions) or don't fall into other categories, such as coffee shops.

Charging Stations by Charging Network	
Non-Networked	22
Tesla Destination	17
Tesla	13
ChargePoint Network	8
Electrify America	3
SemaCharge Network	3
EV Connect	1

Electric Transit

Currently, the University of Montana's UDASH and the City of Missoula's Mountain Line are the only transit providers in the state that are using electric buses as part of their fleets. In 2016, the University of Montana became the first student-owned transit agency to operate electric buses. In 2019, Missoula's Mountain Line electric buses first came into service. Since then, additional buses have been added to both fleets with funding from the U.S. Department of Energy, the Federal Transit Administration, and the Volkswagen Environmental Mitigation Trust settlement administered by Montana's Department of Environmental Quality. Per a 2018 Transportation Research Board synthesis report,[5] based on case studies, the average electric bus purchase price was between $700-$800,000; that cost does not include the charging infrastructure, which can vary depending on the type of charging unit. In comparison, a non-electric bus purchased during that time (without options) cost between $450-$660,000.[6]

Montana's Department of Environmental Quality has two funding sources to provide grants to transit operators and school transportation entities to replace diesel-powered buses with electric buses: Volkswagen Environmental Mitigation settlement trust funds and federal EPA funds under the Diesel Emissions Reduction Act (DERA) program. DEQ is currently accepting applications for both programs, and more information is available on their website: https://deq.mt.gov/energy/Programs/fuels

Contributing Factors Potentially Leading to Increased Adoption Rates

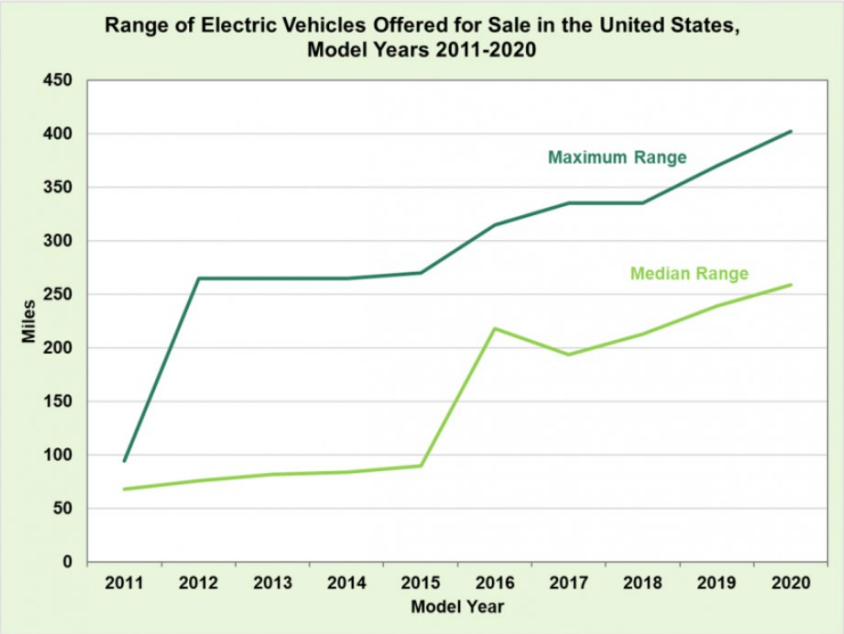
Light Duty Vehicles

[5] https://www.nap.edu/download/25061#

[6] https://ww2.arb.ca.gov/resources/documents/transit-fleet-cost-model

There are several factors that could contribute to a trend of increasing electric vehicle adoption rates for light duty vehicles, including:

- **Increasing electric vehicle driving range due to improvements in battery technology and overall electric vehicle efficiency**. According to Energy.gov,[7] the median EPA estimated range for all EV models offered in the 2020 model year exceeded 250 miles, up from approximately 75 miles in model year 2011. This means that electric vehicles can increasingly drive longer distances without needing to be charged, which can decrease range anxiety experienced by electric vehicle owners. Factors such as climate and geography can affect range; however, as the range increases, that may be less of a concern for drivers.



- **Total ownership costs trending equivalent or cheaper than internal combustion engine vehicles**. With rising demand and improved technology, there is projected to be a downward trend in the cost of electric vehicles. The following table[8] shows a comparison of the total cost of vehicle ownership and projected cost of vehicle ownership of conventional internal combustion engine (ICE) vehicles vs. electric vehicles. For cars, crossovers, and SUVs, the costs of ICE vehicles in the table are compared to battery electric vehicles (BEVs) with ranges from 150 miles to 250 miles with a fully charged battery, as well as plug-in hybrid electric vehicles (PHEV). The costs can be compared by vehicle type, as well as the costs in 2018 vs. the projected costs in 2025. In comparing 2018 BEV prices to projected 2025 prices, the overall total cost of ownership for BEVs are projected to decrease.

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[7] https://www.energy.gov/eere/vehicles/articles/fotw-1167-january-4-2021-median-driving-range-all-electric-vehicles-tops-250

[8] https://theicct.org/sites/default/files/publications/EV_cost_2020_2030_20190401.pdf

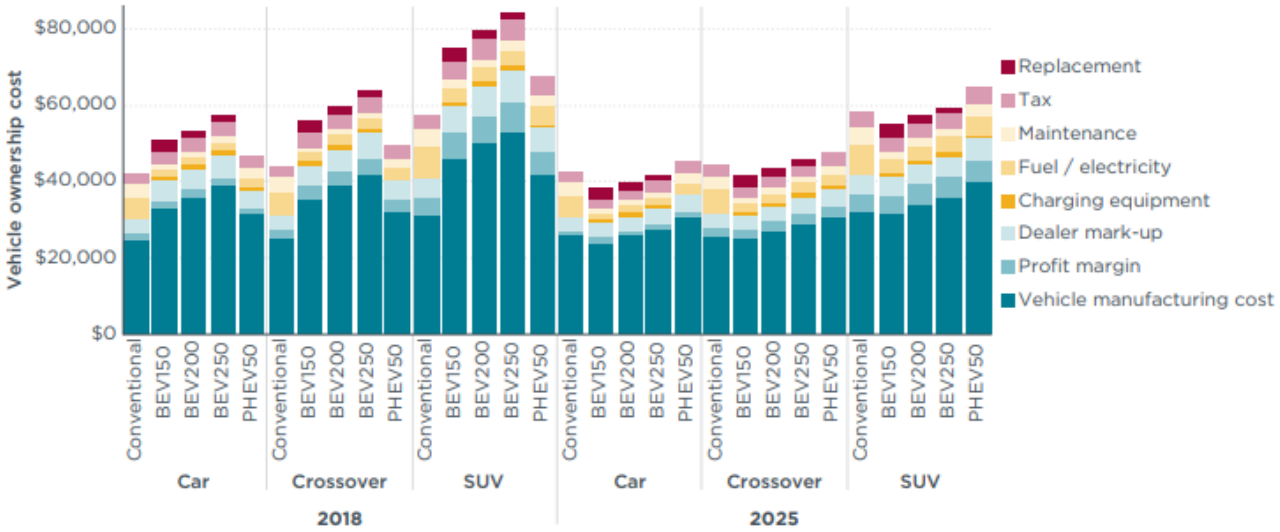


Figure 5. Total vehicle ownership costs for conventional and electric vehicles in 2018 and 2025 for cars, crossovers, and SUVs.

A recent study from the Argonne National Laboratory[9] also looked at total cost of ownership for a variety of vehicles, including: internal combustion engine (ICE) vehicles – with both spark ignition (ICE-SI) and compression ignition (ICE-CI), hybrid electric vehicles (HEV) that run primarily off of gas but that increase mileage with electricity, plug-in hybrid electric vehicles (PHEV) which run primarily off of electricity but supplement with gasoline, fuel cell electric vehicles (FCEV) which convert hydrogen to electricity, and battery electric vehicles (BEV) with 200-mile ranges and 300-mile ranges. In the following table from that study, total cost of ownership is broken down by vehicle type for a small SUV, model year 2025.

[9] https://publications.anl.gov/anlpubs/2021/05/167399.pdf

TABLE B.1 Small SUV, MY2025; Figures 4.1 and ES-5

Lifetime Costs	ICE-SI	ICE-CI	HEV	PHEV50	FCEV	BEV300	BEV200
Vehicle	$26,051	$27,744	$27,419	$34,505	$34,515	$46,031	$37,621
Financing	$2,884	$3,072	$3,019	$3,584	$3,465	$4,672	$3,818
Fuel	$17,488	$15,939	$12,433	$11,981	$18,118	$9,254	$8,770
Insurance	$13,289	$13,357	$13,376	$12,667	$11,495	$12,870	$12,349
Maintenance	$16,302	$15,714	$14,518	$13,968	$9,829	$8,920	$8,920
Repair	$6,990	$7,270	$6,543	$6,959	$5,288	$6,808	$5,694
Tax & fees	$5,244	$5,409	$5,460	$6,356	$6,763	$7,741	$6,991
Total	**$88,248**	**$88,505**	**$82,768**	**$90,020**	**$89,474**	**$96,295**	**$84,164**
Per-Mile Costs	**ICE-SI**	**ICE-CI**	**HEV**	**PHEV50**	**FCEV**	**BEV300**	**BEV200**
Vehicle	$0.1395	$0.1486	$0.1469	$0.1848	$0.1849	$0.2465	$0.2015
Financing	$0.0154	$0.0165	$0.0162	$0.0192	$0.0186	$0.0250	$0.0205
Fuel	$0.0937	$0.0854	$0.0666	$0.0642	$0.0970	$0.0496	$0.0470
Insurance	$0.0712	$0.0715	$0.0716	$0.0678	$0.0616	$0.0689	$0.0661
Maintenance	$0.0873	$0.0842	$0.0778	$0.0748	$0.0526	$0.0478	$0.0478
Repair	$0.0374	$0.0389	$0.0350	$0.0373	$0.0283	$0.0365	$0.0305
Tax & fees	$0.0281	$0.0290	$0.0292	$0.0340	$0.0362	$0.0415	$0.0374
Total	**$0.4727**	**$0.4740**	**$0.4433**	**$0.4822**	**$0.4792**	**$0.5158**	**$0.4508**

There are several variables such as fuel price, amount of taxes and fees, battery replacement, etc. included in the modeling, but the table data shows that a BEV with a 200-mile range could be cheaper in terms of total ownership costs than an ICE vehicle. The purchase price is higher for the BEV, but the fuel and maintenance costs are typically lower.

- **Increased charging station locations**. In April 2019, there were 44 charging locations in Montana, with 110 ports at those locations.[10] As of October 2021, there are 68 public charging station locations in Montana, with 203 charging ports, offering Level 2 (available at 48 of the stations) or Level 3 DC fast charging (offered at 19 of the stations).[11]

  These publicly available charging stations can help ease drivers' range anxiety, especially for driving long distances, thus making electric vehicles a more feasible option. Also, the increasing number of level 3, DC fast charging stations means that these cars can be charged more quickly, as shown in the following graphic:

[10] https://evadoption.com/ev-charging-stations-statistics/charging-stations-by-state/

[11] https://afdc.energy.gov/fuels/electricity_locations.html#/analyze?region=US-MT&fuel=ELEC

Level 1 Charging 2 to 5 miles of range per 1 hour of charging	Level 2 Charging 10 to 20 miles of range per 1 hour of charging	Level 3 Charging 60 to 80 miles of range per 20 minutes of charging
Level 1 Charging is a technical term for charging an electric vehicle at a regular 120-volt outlet found in your home. Depending on the vehicle, it can take 8-14 hours to charge a vehicle at a Level 1 outlet.  J1772 Charge Port	Level 2 charging requires a 240-volt outlet similar to what is necessary for a clothes dryer. Level 2 charging stations are the most common stations found at workplaces and businesses. It typically takes 4-6 hours to fully charge an electric vehicle or PHEV at a level 2 charging station.  J1772 Charge Port	Level 3 charging is also known as fast charging and requires a DC (versus AC for Level 1) to the vehicle. It typically takes no more than 30 minutes to fully charge an electric vehicle at a Level 3 charging station. DC fast charging stations are typically located along highways. On average, Level 3 stations cost between $10,000 and $50,000 to install.  CSS Charge Port CHAdeMO Tesla

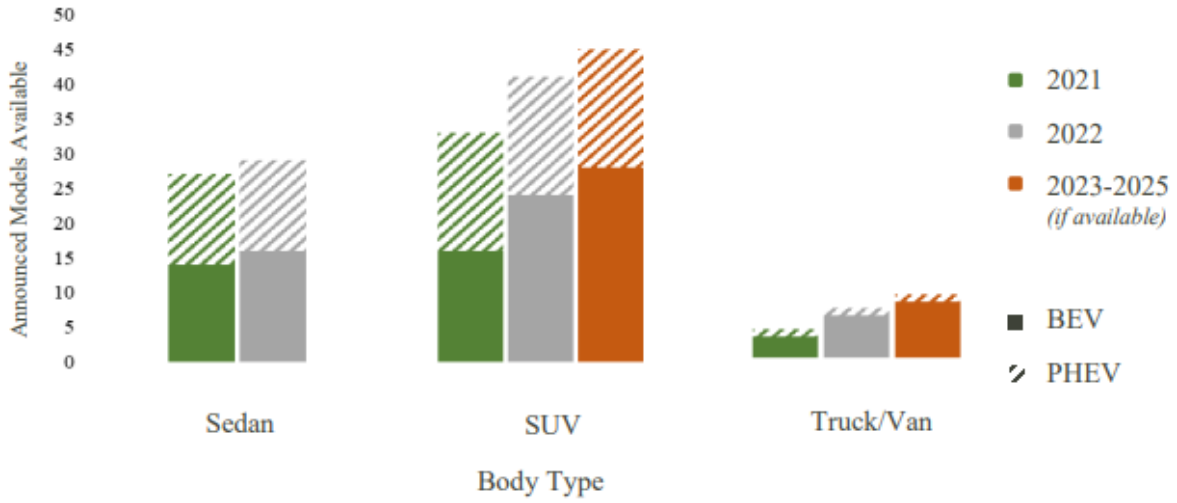
- **Increased truck/SUV model availability**. In Montana's overall light vehicle registrations by type in CY 2020, trucks accounted for the highest percentage of vehicle types at 39%, followed by passenger cars at 29%, and SUVs at 26%. According to the Alternate Fuel Data Center[12], there are currently three plug-in hybrid models of trucks available on the market, 69 models of SUVs, and 132 models of sedan/wagons. According to fueleconomy.gov, there is also a BEV pickup truck available on the market, the MY 2022 Rivian R1T.[13] More models of SUVs and trucks are anticipated from auto manufacturers beginning in

[12] https://tinyurl.com/afdcevtypes

[13] https://www.fueleconomy.gov/feg/Find.do?action=sbs&id=44462

[14] A report from M.J. Bradley & Associates[15] includes the following chart, which shows the models by type that have been announced.

Figure 4 Cumulative Announced U.S. Light-Duty BEV and PHEV Models 2021-2025 by Body Type



This figure only includes U.S. vehicles with an announced model name and model year introduction date and projected or announced purchase price less than $100,000. A complete list of models included in this graph can be found in the Appendix.

As more models become available, especially SUVs and trucks, that may spur an increase in electric vehicle adoption in Montana.

- **Federal incentives**. Under the 2008 Energy Improvement and Investment Act, buyers of qualifying electric vehicles may be able to claim a federal income tax credit of up to $7,500. Limits were established in the Act and revised under subsequent legislation regarding the phase-out threshold for the number of vehicles sold per manufacturer. Some, such as Tesla and GM, have met the thresholds (that is, they've sold the maximum number of cars eligible for credits), and therefore, buyers of those cars cannot claim a tax credit for their purchases. For a listing of eligible and ineligible electric vehicle makes and models, visit: https://www.fueleconomy.gov/feg/taxevb.shtml

  Another incentive available is a federal tax credit of up to $1,000 for qualifying residential charging equipment purchased prior to Dec. 31, 2021. Fueling station owners can also get a tax credit of up to 30% of the cost of the equipment, not to exceed $30,000 and does not include permitting and inspection fees, for equipment installed prior to Dec. 31, 2021.[16]

[14] https://www.consumerreports.org/hybridsevs/2022-ford-f-150-lightning-review-a4084273266/

[15] https://www.mjbradley.com/sites/default/files/EDF_EV_Market_Report_April_2021_Update.pdf

[16] https://afdc.energy.gov/laws/10513

There is currently a reconciliation bill, the Build Back Better Act (H.R. 5376), now under consideration in the U.S. Senate. Included in this package are additional federal tax rebates for the purchase of new and used electric vehicles. There is an income cap included for these additional rebates, however, which did not exist under the current $7,500 rebate.[17] There is an extension of charging equipment tax credit through 2031 and an increase of the credit amount. The bill is still under consideration and its provisions may change.

- In terms of **federal investment**, grant programs and technical guidance have been made available, primarily under the U.S. DOT, U.S. Department of Energy, and the U.S. EPA.[18] In November 2021, the Infrastructure Investment and Jobs Act was passed by Congress and signed into law (P.L. 117-44). This legislation contains new funding that will be available for creating more electric vehicle charging stations nationwide. It creates the National Electric Vehicle Formula Program, under the Federal Highway Administration, that has a $5 billion ($1 billion for the five years authorized under the bill) appropriation to focus on building charging capacity along the national highway system.[19] The federal share for this formula program is 80%, with a required 20% state match.

  The legislation also establishes the Alternative Fuels Corridor Program, which will be administered by the U.S. Department of Transportation and makes available $2.5 billion in grants for additional charging stations along designated alternative fuel corridors. Montana currently has five corridors designated, including I-15, I-90, I-94, US-2, and US-93.[20] These corridors are designated as corridor-pending, meaning that the charging stations along those routes are greater than 50 miles apart and can be more than five miles off the highway. These may or may not be eligible, depending on federal guidance that will clarify the requirements of the program. These grants will be available to states, metropolitan planning organizations, local governments, and other public-sector entities.

  Also under the Alternative Fuels Corridor Program, half of the annual appropriation is to be used for community grants, which do not have to be along a designated alternative fuel corridor and can be on any public road; in publicly accessible locations, such as public buildings; or in publicly accessible parking facilities owned or managed by private entities. Rural areas will be prioritized in the provision of the community grants.

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[17] https://www.atlasevhub.com/materials/the-reconciliation-bill-more-than-34-billion-dedicated-for-evs/

[18] https://www.energy.gov/sites/default/files/2016/07/f33/Guide%20to%20Federal%20Funding%20and%20Financing%20for%20PEVs%20and%20PEV%20Charging.pdf

[19] https://policy.transportation.org/wp-content/uploads/sites/59/2021/09/2021-09-15-AASHTO-Comprehensive-Analysis-of-IIJA-FINAL.pdf

[20] https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/all_corridors/

According to the White House fact sheet for Montana for P.L. 117-44,[21] it is anticipated Montana will receive $43 million over the five-year authorization for expansion of electric charging infrastructure, in addition to being eligible to apply for grants under the Alternative Fuels Corridor Program.

- **State incentives**. Montana has one tax credit concerning electric vehicles: 15-30-2320, MCA allows an income tax credit for up to 50% of the equipment and labor costs (max. $500) for converting vehicles to operate using alternative fuels. That credit was repealed in the 2021 session, under SB 399, effective Jan. 1, 2022. No specific state rebates are currently available.

  Other states, particularly California, Washington and Oregon, offer several different types of incentives including rebates and tax credits/exemptions for electric vehicles. For additional details about other states' alternative fuel incentives and laws, including electric vehicles, visit: https://afdc.energy.gov/laws/state

  Montana's tax credit may or may not have impacted electric vehicle adoption rates; however, as electric vehicle numbers grow in other states, it is possible that tourist and pass-through traffic in Montana from those states may include electric vehicles. Other states' incentives may, therefore, have an impact on the number of electric vehicles driving on Montana's highways.

- In looking at **private sector investment**, some companies may consider converting their fleets to electric vehicles. Hertz recently announced that it would purchase 100,000 Tesla vehicles to add to its fleet.[22] This announcement came as part of a deal that Hertz made to rent up to half of those vehicles to Uber for ridesharing in the U.S. starting November 1. Other companies, including rental car companies, may follow suit.

- **Gas prices**. Operational costs of electric vehicles, in terms of not having to pay for gas, is often cited as an incentive to switch from internal combustion engine vehicles to electric vehicles. While electricity prices also impact operational costs of electric vehicles, researchers at UC Davis' Institute of Transportation Studies[23] found that electric vehicle adoption is greater in areas with higher gasoline prices and that electric vehicle sales respond to gasoline prices at a rate of roughly four to six times greater than the response to electricity prices.

  According to the Energy Information Administration's Gasoline and Diesel Fuel Update[24], gas prices in the U.S. have risen $1.172 per gallon from a year ago, as of October 18, 2021. The following chart shows

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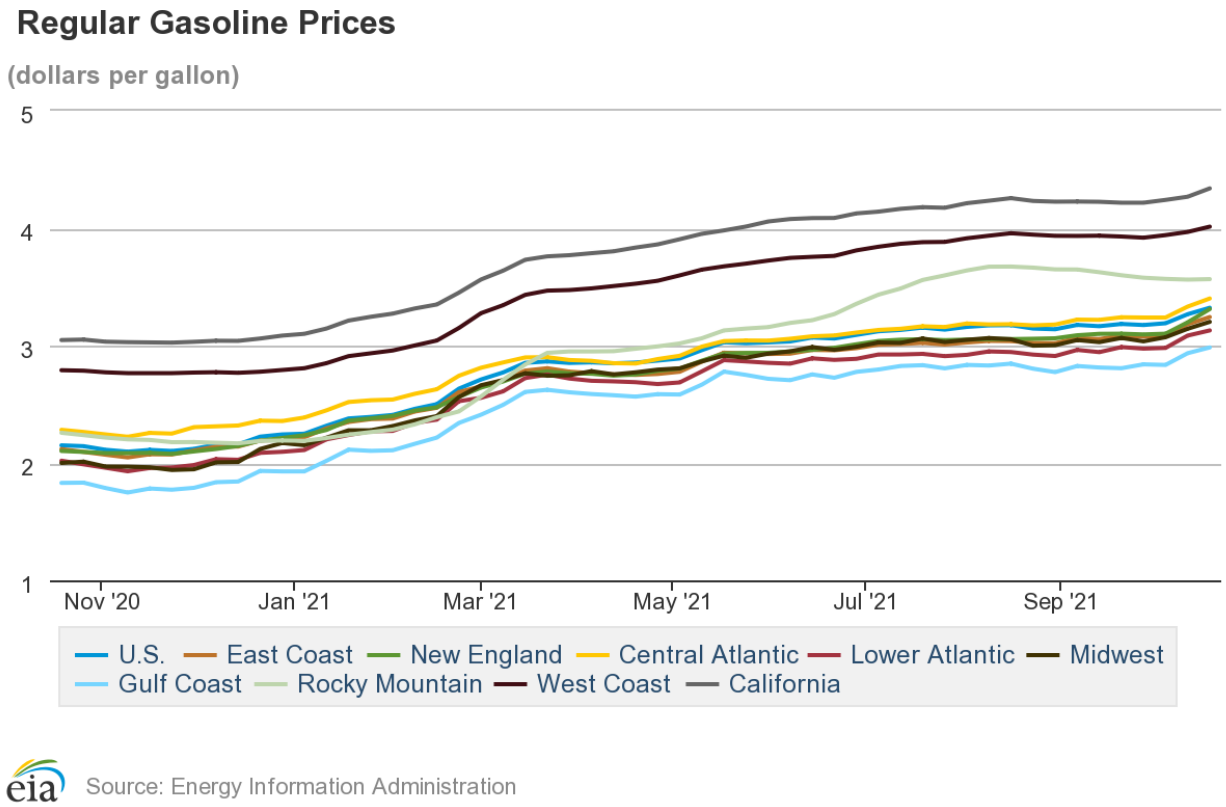
[21] https://www.whitehouse.gov/wp-content/uploads/2021/08/MONTANA_Infrastructure-Investment-and-Jobs-Act-State-Fact-Sheet.pdf

[22] https://www.nytimes.com/2021/10/25/business/hertz-tesla-electric-vehicles.html

[23] https://escholarship.org/content/qt5f80503b/qt5f80503b.pdf?t=qtgzzj

[24] https://www.eia.gov/petroleum/gasdiesel/

the rise in gas prices by region since November 2020. Montana is included in the Rocky Mountain region, and according to the EIA data, gasoline prices have increased by $1.309 per gallon. The prices in this chart include taxes (federal and an average of state taxes), distribution and marketing, refining, and crude oil costs.

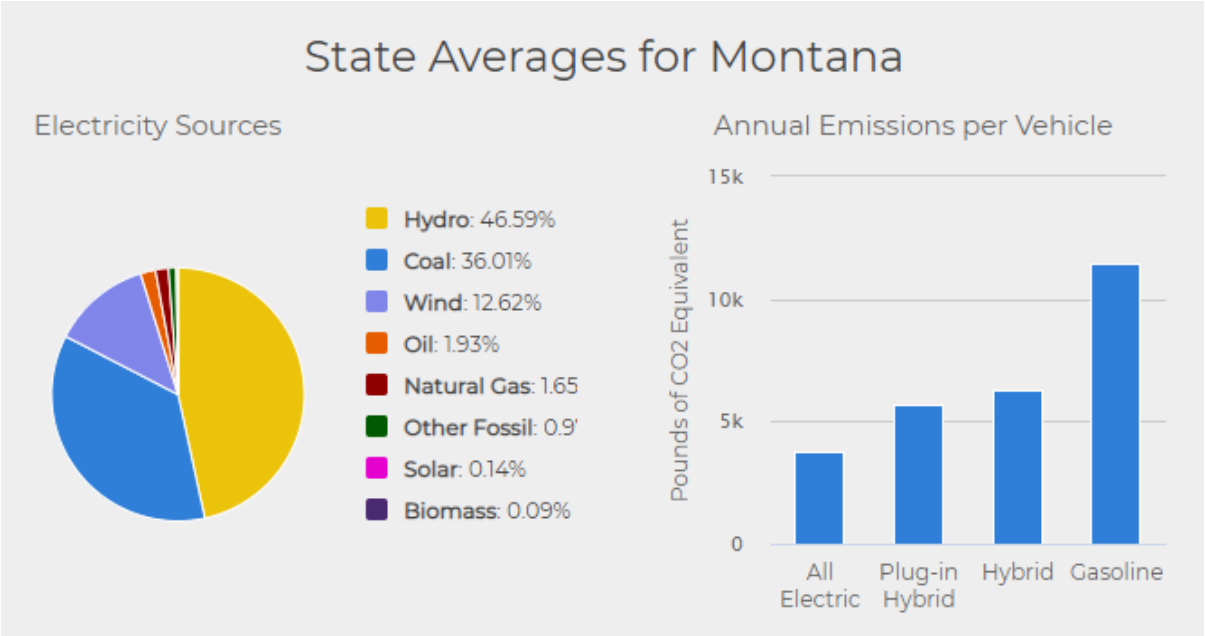


The continuation of elevated gas prices may lead to higher electric vehicle adoption rates.

- **Environmental Benefits**. Electric vehicles are frequently seen a potential alternative to gas vehicles in order to reduce transportation-related emissions. ICE vehicles produce direct emissions through the tailpipe, as well as through evaporation from the vehicle's fuel system and during the fueling process. Battery electric vehicles do not produce these direct emissions, and plug-in hybrid electric vehicles do not produce tailpipe emissions when they are in all-electric mode.

  In looking at well-to-wheel emissions, however, which include all emissions related to fuel production, processing, distribution, and use, the source of electricity is one factor to consider in terms of emissions related to electric vehicles. The following charts show Montana's state average for electricity sources and calculated annual emissions per vehicle, based on that electricity source composition.[25]

[25] https://afdc.energy.gov/vehicles/electric_emissions.html#wheel



Medium & Heavy-Duty Vehicles

In addition to additional electric passenger vehicles (aka light duty vehicles), electric medium- and heavy-duty vehicles may also be on the horizon. In June 2020, California's Air Resources Board (CARB) finalized regulations requiring a percentage of medium and heavy-duty trucks sold in California to be zero emission vehicles, effective starting in 2024. The following tables show California's estimated annual sales per vehicle classification/group and its schedule for the percentage of zero emission sales that will be required per vehicle class.

Table IX-2: Estimated Number of Annual Sales per Vehicle Group

Model Year	Class 2b-3	Class 4-5	Class 6-7	Class 8	Class 7-8 Tractor	Total Sales
2024	53,761	6,436	7,556	1,119	4,686	73,559
2025	54,217	6,531	7,667	1,137	4,769	74,321
2026	54,753	6,649	7,806	1,177	4,918	75,302
2027	55,152	6,786	7,966	1,194	4,993	76,091
2028	55,765	6,904	8,105	1,216	5,075	77,064
2029	56,371	7,024	8,246	1,239	5,161	78,041
2030	56,968	7,147	8,390	1,264	5,263	79,032

Table IX-4: Advanced Clean Trucks ZEV Sales Percentage Schedule

Model Year	Baseline	Class 2b-3*	Class 4-8**	Class 7-8 Tractor
2024	0%	3%	7%	3%
2025	0%	5%	9%	5%
2026	0%	7%	11%	7%
2027	0%	9%	13%	9%
2028	0%	11%	24%	11%
2029	0%	13%	37%	13%
2030 and beyond	0%	15%	50%	15%

*Pickup trucks are excluded from Class 2b-3 requirements until 2027
**Excluding Class 7-8 tractors

Additionally, in the proposed rulemaking notice, the CARB recognized that infrastructure investment will be needed to support California's transportation electrification goals, including for medium and heavy-duty electric vehicles. The notice reported that $686 million of infrastructure investment had been approved for three utilities to invest in supporting transportation electrification over a 5-year period.[26]

In July of 2020, 15 states and Washington D.C. signed a memorandum of understanding (MOU), committing to developing a multi-state action plan to identify barriers and to propose solutions to support widespread electrification of medium- and heavy-duty electric vehicles.[27] Of those states, 10 have adopted California's zero-emission vehicle regulations for passenger cars under Section 177 of the Clean Air Act and may also adopt the medium- and heavy-duty electric vehicle regulations as well.

In terms of private sector commitment, both Amazon and FedEx have announced plans to purchase electric vehicle delivery vans. USPS has also committed to 10% of its new fleet being electric. That percentage may increase depending on the outcome of the federal reconciliation bill, which includes funding for USPS to convert its fleet to electric.

Electric medium- and heavy-duty trucks may be more of a future development than a current trend; however, given that these heavier trucks have greater impact on road infrastructure, it's important to consider them as well when looking at the overall road funding picture for electric vehicles.

Electric Vehicles & Road Funding

Potential Impact to State Fuel Tax Collections

According to the Montana Department of Transportation,[28] the current average annual amount of state fuel tax per gas-powered light-duty vehicle is estimated to be $156, assuming a fuel economy of 25 mpg and 12,000 miles driven per year. Fuel taxes are the primary means of funding the state's road infrastructure; in terms of highways, state fuel taxes are used for road maintenance and as a match to receive federal transportation dollars to fund road construction. Montana currently has no fees or surcharges for road infrastructure usage by

[26] http://ww2.arb.ca.gov/sites/default/files/barcu/regact/2019/act2019/isor.pdf

[27] https://www.nescaum.org/documents/multistate-truck-zev-governors-mou-20200714.pdf

[28] https://leg.mt.gov/content/Committees/Interim/2021-2022/Transportation/21_Nov/MDT_FuelModeling-110421.pdf

electric vehicles. Hybrid vehicle owners pay some fuel tax, as their vehicles use both gas and electricity, but not as much as solely gas-powered vehicles. A portion of the electric utility property taxes collected contribute to city and county road funds. Electric utility property taxes are paid for by utility ratepayers through their monthly electric bill.

In looking at current electric vehicles registered in Montana, as previously stated, there are currently 1,139 battery electric vehicles and 711 plug-in hybrid electric vehicles registered. The following table shows the estimated and projected state fuel tax revenue impact. For plug-in electric hybrids, according to fueleconomy.gov, they use approximately 30-60% less fuel.[29] Both the top and bottom ranges were calculated in estimating state fuel tax impacts.

The 2025 projected registered electric vehicle growth rate was calculated using projected electric vehicle market growth rate calculated from sales projections from Atlas Hub EV. The annual average growth rate from 2021 to 2025 was calculated to be approximately 10%, depending on several factors including vehicle prices, gas prices, and federal incentives.

Estimated Annual State Fuel Tax Revenue Loss for Registered EV's		
2021	**Number of Electric Vehicles Registered**	**Estimated Revenue Impact***
Electric	1,139	$177,684
Plug-In Hybrid Electric Vehicles (PHEV) Using 30% of Gas-Powered Vehicle Fuel Consumption	711	77,641
PHEV Using 60% of Gas-Powered Vehicle Fuel Consumption	711	44,366
*2025 (Projected Using 10% annual growth rate)***		
Electric	1,690	263,628
Plug-In Hybrid Electric Vehicles (PHEV) Using 30% of Gas-Powered Vehicle Consumption	1,055	115,195
PHEV Using 60% of Gas-Powered Vehicle Consumption	1,055	65,826

* Calculated Using $156 Annual State Fuel Tax Contribution for Gas-Powered Vehicles

**https://www.atlasevhub.com/materials/ev-market-forecasts/

These estimates include only the state fuel tax impacts from electric vehicles registered in Montana. Not included are the impacts from electric vehicles registered in other states, passing through Montana or electric vehicle tourist traffic. According to the University of Montana's Institute for Tourism & Recreation Research, in

29 https://www.fueleconomy.gov/feg/phevtech.shtml#:~:text=Plug%2Din%20hybrids%20use%20roughly,greenhouse%20gas%20than%20conventional%20vehicles.

2020, there were approximately 11.1 million non-resident visitors to the state.[30] Likely due to the pandemic, that number was down slightly from 2019, when there were approximately 12.6 million non-resident visitors.[31] According to travel survey data, for both years, gasoline and diesel were the largest expenditure categories for non-resident travelers; total expenditure in 2019 for gas and diesel was approximately $860 million and in 2020 was approximately $717 million. As electric registrations grow in other states, that expenditure may decrease, and there may be more non-resident visitors driving electric vehicles on Montana's highways.

Montana – Electric Vehicle Fees

In recognizing the potential fuel tax impact from electric vehicles, Montana has considered but never enacted some alternative funding sources. In both 2017 (HB 205) and 2021 (HB 188), legislation passed the Montana Legislature to require electric vehicle registration fees, but both bills were vetoed by the respective governors. In the 2019 session, there was also a bill proposed concerning electric vehicle registration fees (HB 764) which was tabled in committee.

HB 205 (2017 session) would have increased the tax rate for other alternative fuels such as propane and compressed natural gas, in addition to creating a fee for electric and hybrid vehicles. According to the fiscal note for the final amended version, 400 electric vehicles were registered in Montana at the end of FY 2016. Net revenue was anticipated to be approximately $110,000 annually.

HB 188 (2021) would have required a registration fee for light duty and heavy vehicles in addition to normal vehicle registration fees paid. The fiscal note identified 985 electric vehicles registered and 11 electric vehicles that were classified as heavy trucks in FY 2021; it also included an assumption of 208 light duty electric vehicles being sold each year. Net revenue was anticipated to be approximately $240,000 in state special revenue in FY 2023, growing to approximately $320,000 in FY 2025.

Other State – Electric Vehicle Fees

In terms of other states' approaches to electric vehicles, according to the National Conference of State Legislatures' December 2020 report, 30 states have enacted laws requiring a special registration fee for plug-in electric vehicles.[32] The report states that revenue from the fees is generally directed to state transportation funds. However, a few states allocate some of the fee revenue for supporting electric vehicles. At least five of the states have structured their legislation for fees to grow over time by indexing the fees to the consumer price index or another inflation-related metric.

A different method for electric vehicle fees/revenue was enacted in Oklahoma's 2021 legislative session. Under HB 2234, the Driving on Road Infrastructure with Vehicles of Electricity (DRIVE) Act,[33] a two-pronged approach was adopted. The DRIVE Act established annual electric vehicle fees ranging from $82 for Class 1 vehicles to

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[30] https://scholarworks.umt.edu/cgi/viewcontent.cgi?article=1421&context=itrr_pubs

[31] https://scholarworks.umt.edu/cgi/viewcontent.cgi?article=1408&context=itrr_pubs

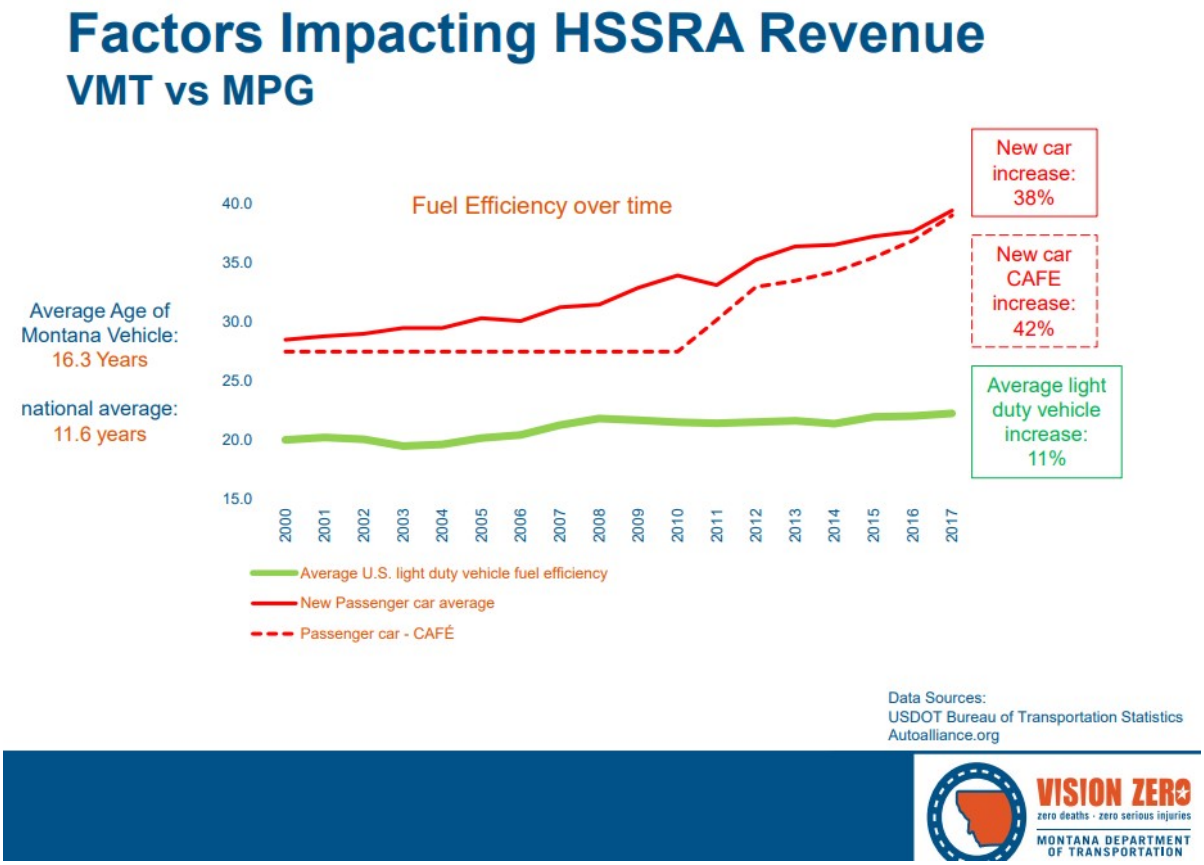
[32] https://www.ncsl.org/research/energy/new-fees-on-hybrid-and-electric-vehicles.aspx

[33] http://webserver1.lsb.state.ok.us/cf_pdf/2021-22%20ENR/hB/HB2234%20ENR.PDF

$1,687 for Class 7 and 8 vehicles. It also established a $0.03 tax per kilowatt hour or its equivalent on the electric current used to charge or recharge the battery or batteries of an electric vehicle, beginning Jan. 1, 2024. The charging tax is not applicable to electric vehicles charged at a private residence. Legacy charging stations (those in operation prior to Nov. 1, 2021 that do not have metering systems in place) and public charging stations that have not previously charged a fee are exempt until Nov. 1, 2041. The statute also allows a credit against the taxes imposed in the amount of electric vehicle charging taxes paid by an individual or lawfully recognized entity, not to exceed the total amount of registration fees for electric vehicles paid by the individual, in order to avoid double taxation.

Vehicle Fuel Efficiency & Road Funding

In looking at factors influencing road funding in Montana, electric vehicles may have an impact as adoption rates increase. Vehicle fuel efficiency also plays a role. MDT reported last interim that taxable fuel gallon growth was approximately 1.2% per year for FY 2004-2021. From 1994 to 2019, vehicle miles travelled in Montana grew approximately 1.6% per year. Due to increasing fuel economy standards for new cars, vehicles can drive farther on average without using as much fuel, resulting in less funding per vehicle mile travelled to maintain roads. The following chart shows the increase in fuel economy standards from 2000 to 2017.



MDT provided the following considerations as far as revenue options to respond to this trend, as well as hybrid and electric vehicle impacts.

Aligning Transportation Revenue Options

Revenue Option	Revenue Generation	Pros	Cons
Fuel Tax Adjustment	$8.5 million ($5.5 million to MDT) per penny per gallon	- Administrative methods already established -Historically have been predictable	Well… it's a tax… -Fossil fuel dependent
Fuel Tax Indexing	$2.8 million ($1.8 million to MDT) for each percentage point	-Administrative methods already established -Historically have been predictable -Keeps better pace with inflation	-Still a tax… -Fossil fuel dependent -Methodologies can be complex
Hybrid/Electric Registration Fees	Suggested $156 to for a full electric vehicle	-Supplement the cost of usage	-Targets minor segment of fleet -Impacts in-state drivers only -Disregards other advances in fuel economy -Discourages environmentally friendly policies/behavior
Charging Station Surcharge	Suggested 4.3 cents per kWh	-Supplement the cost of usage -Captures out of state drivers	-Targets minor segment of fleet -Disregards other advances in fuel economy -Discourages environmentally friendly policies/behavior -Isolating the metering of stations
Road User Charge (mileage based)	Undetermined	-More equitable among various types of vehicles -Not impacted by fuel economy	-Administrative complications -Substantial costs -Privacy Issues -Modeling is unknown

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In terms of road user charges, under the Infrastructure Investment and Jobs Act, Section 13002, a pilot program will be established to demonstrate a national motor vehicle per-mile user fee.[34] States can volunteer to participate. It will include commercial vehicles and passenger cars. The Secretary of the Treasury will establish, on an annual basis, per-mile user fees for passenger cars, light trucks, and medium and heavy-duty trucks, which can vary by vehicle type and class.

Montana has previously participated in a federal pooled fund study, Road User Charge (RUC) West, with other western states to learn more about vehicle miles travelled (vmt) fees. Montana was a tier 3 participant to have access to the research about the fees, rather than to test such programs. Although the study has since ended, the

[34] https://policy.transportation.org/wp-content/uploads/sites/59/2021/09/2021-09-15-AASHTO-Comprehensive-Analysis-of-IIJA-FINAL.pdf

RUCWest website[35] has additional information about road user charges, including rural vmt fees[36] and how to measure miles beyond state borders.[37]

Conclusion

In summary, given potential trends and anticipated federal investment in electric vehicles, there may be more electric vehicles driving on Montana highways in the future, including electric medium and heavy-duty trucks. Higher numbers of electric vehicles, in addition to already increasing fuel economy in gas-powered vehicles, may impact funding available for investment in Montana's highways. Revenue options, such as electric vehicle registration fees, charging station surcharges, and vehicle-miles travelled fees to address this have been enacted in other states. There are pros and cons to each of these options and potential new funding options that Montana might consider in the future in choosing how to address these revenue impacts.

[35] https://www.rucwest.org/about/resources/

[36] https://www.rucwest.org/wp-content/uploads/2018/07/RUC_RuralDrivers_folio_final-LTR.pdf

[37] https://www.rucwest.org/wp-content/uploads/2018/07/RUC_Interoperability_folio_final-LTR.pdf

Resources

Current Studies

SJ 33 – Energy and Telecommunications Interim Committee, 2021-2022. An interim study to examine future electric grid capacity requirements, grid technologies & the roles of regulatory, private-sector, and state government entities in the future of the grid.

Electric Vehicle Registration Fees – Transportation Interim Committee, 2021-2022.

MT DEQ – Study of Electric Charging Station Infrastructure Location Needs & Grid Capacity.

Websites

MT DEQ Alternative Fuels & Transportation: https://deq.mt.gov/energy/Programs/fuels

U.S. Department of Energy, Alternative Fuels Data Center: https://afdc.energy.gov/

Oklahoma's DRIVE Act (HB 2234) Bill Page: http://www.oklegislature.gov/BillInfo.aspx?Bill=hb2234&Session=2100

Federal Tax Credits Electric and Plug-In Hybrid Vehicles: https://www.fueleconomy.gov/feg/taxevb.shtml

IRS Plug-In Electric Vehicles Credits: https://www.irs.gov/businesses/plug-in-electric-vehicle-credit-irc-30-and-irc-30d

Invest in America Act, H.R. 3684 (Infrastructure Bill) Electric Vehicle Funding: https://www.atlasevhub.com/materials/invest-in-america-act-h-r-3684/

Build Back Better Act (Reconciliation Package) Electric Vehicle Funding: https://www.atlasevhub.com/materials/the-reconciliation-bill-more-than-34-billion-dedicated-for-evs/

California Advanced Clean Trucks Regulation: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks

Reports

MT Legislative Services Division, Electric Vehicles: Fees & the Gas Tax in Other States: https://leg.mt.gov/content/Committees/Interim/2021-2022/Transportation/21_Nov/2021ElectricVehicleFees.pdf

NCSL Special Fees on Plug-In Hybrid and Electric Vehicles: https://www.ncsl.org/research/energy/new-fees-on-hybrid-and-electric-vehicles.aspx#:~:text=Because%20the%20state%27s%20EV%20fees,%2450%20for%20hybrid%20electric%20vehicles.

Congressional Research Service, Vehicle Electrification: Federal & State Issues Affecting Deployment: https://sgp.fas.org/crs/misc/R45747.pdf

Congressional Research Service, Plug-In Electric Vehicle Tax Credit: https://sgp.fas.org/crs/misc/IF11017.pdf

MT DEQ Electric Vehicles Programs (presentation from Nov. 2021 Transportation Interim Committee): https://leg.mt.gov/content/Committees/Interim/2021-2022/Transportation/21_Nov/DEQ_EV_Presentation_10_2021.pdf

ChargePoint Charging Information: https://www.chargepoint.com/files/Quick_Guide_to_Fast_Charging.pdf

Pew Research Center Electric Vehicle Registrations in the U.S.: https://www.pewresearch.org/fact-tank/2021/06/07/todays-electric-vehicle-market-slow-growth-in-u-s-faster-in-china-europe/ft_21-05-21_electricvehicles_2/

Transportation Research Board, Battery Electric Buses – State of Practice: https://www.nap.edu/login.php?record_id=25061

Congressional Research Service, Environmental Effects of Battery Electric and Internal Combustion Engine Vehicles: https://sgp.fas.org/crs/misc/R46420.pdf

MDT, Fuel Tax Modeling (presentation from Nov. 2021 Transportation Interim Committee meeting): https://leg.mt.gov/content/Committees/Interim/2021-2022/Transportation/21_Nov/MDT_FuelModeling-110421.pdf

American Association of State Highway Transportation Officials (AASHTO), Comprehensive Analysis of the Bipartisan Infrastructure Bill – Infrastructure Investment and Jobs Act (IIJA): https://policy.transportation.org/wp-content/uploads/sites/59/2021/09/2021-09-15-AASHTO-Comprehensive-Analysis-of-IIJA-FINAL.pdf