

## Electric Vehicles in Minnesota

Electric Vehicles,<sup>1</sup> including Battery Electric Vehicles and Plug-in Hybrid Electric Vehicles, are a growing portion of vehicle ownership in Minnesota. As of February 2021, there were EVs registered in every Minnesota county, including more than 11,000 BEVs and 7,500 PHEVs registered statewide. BEVs made up about 0.74 percent of new car sales in the state in 2018.<sup>2</sup>

### National trends

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- EV sales have grown annually, but were still only 1.9 percent of new car sales in 2020.<sup>3</sup>
- BEVs make up about 75 percent of new EV sales.
- Edmunds car shopping analysts anticipate that 30 EV models from 21 makers will be available for sale this year, compared to 17 models from 12 makers in 2020.<sup>4</sup>
- In 2018, 20 percent of Americans said their next car will be electric, up from 15 percent in 2017.<sup>5</sup>
- 80 percent of potential EV-owners cite environmental benefits as the primary motivator and 63 percent said long-term cost savings would influence their decision.
- Globally, EV sales jumped from 450,000 in 2015 to 2.1 million in 2019. Bloomberg forecasts worldwide EV sales will increase to 8.5 million by 2025 as battery prices continue to decrease and more models are available.

### EV impacts to transportation funding

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States have different tax and fee structures used to generate transportation funding. As of November 2020, 28 states have laws requiring a special registration fee for plug-in electric vehicles. Of those, 14 states also assess a separate, slightly lower fee on PHEVs. Fees range from \$50 per year in Colorado and Hawaii to \$225 in Washington. A few states also allocate some fee revenue to support EV charging, including Alabama, where \$50 of the \$200 fee is used to pay for EV chargers.<sup>6</sup>

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<sup>1</sup> For more information on EVs, see [Accelerating Electric Vehicle Adoption: A Vision for Minnesota](#)

<sup>2</sup> 2018 is the most current data available. <https://autoalliance.org/economy/consumer-choice/electric-vehicles/MN/>

<sup>3</sup> <https://www.prnewswire.com/news-releases/us-electric-vehicle-market-poised-for-record-sales-in-2021-according-to-edmunds-301220137.html>

<sup>4</sup> Ibid.

<sup>5</sup> <http://fortune.com/2018/05/08/americans-next-car-electric-aaa-survey/>

<sup>6</sup> <https://www.ncsl.org/research/energy/new-fees-on-hybrid-and-electric-vehicles.aspx>

## Current law

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Transportation funding in Minnesota is from three primary sources: Motor Vehicle Sales Tax, annual motor vehicle registration taxes, and the motor fuel excise tax (gas tax). Currently, fuel taxes are the largest source and make up about 45 percent total transportation revenue in Minnesota. MVST and registration taxes are based on the retail value of the vehicle, which is often higher for EVs than for internal combustion engine vehicles. BEVs also pay an annual \$75 registration tax. By fiscal year 2023, registration fees are forecast to become the largest source of state transportation revenue.

Since EVs don't pay gas taxes, there are questions about their contribution to the Highway User Tax Distribution Fund. The table below compares transportation revenue over 12 years from a Ford Focus that offered a BEV and ICEV versions in model year 2018. The comparison assumes an average of 15,000 miles traveled at 35 miles per gallon. A 12-year time horizon is based on average vehicle life in Minnesota.

## Transportation revenue in Minnesota

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The table below includes two sets of comparisons of HUTD revenue generated over 10 years between two sets of vehicles.

1. 2018 Ford Fusion that has ICE, conventional hybrid (HEV), and BEV powertrain options
2. 2018 models of three comparable luxury vehicles with ICE, PHEV and BEV powertrains

**ICEs, PHEVs and BEVs 10-Year Tax Estimator**

Year	Make/Model	Type	MSRP	MPG	Current Law: 10-year impacts				
					Gas Tax	MVST & Tab Fees	BEV Tax	HUTD Revenue	Relative contribution
2018	Ford Focus	ICE	\$17,950	30	\$1,425	\$2,401	\$0	\$3,826	-
2018	Ford Focus	HEV	\$25,390	41	\$1,043	\$3,396	\$0	\$4,439	116%
2018	Ford Focus	BEV	\$29,120	-	\$0	\$3,895	\$750	\$4,645	121%
2018	Lexus LS 460	ICE	\$75,000	33	\$1,295	\$10,031	\$0	\$11,327	-
2018	Cadillac CT6	PHEV	\$77,000	62	\$690	\$10,299	\$0	\$10,988	97%
2018	Tesla Model S	BEV	\$85,000	-	\$0	\$11,369	\$750	\$12,119	107%

The table shows that EVs currently contribute more revenue to the HUTD fund. If EVs reach price parity with ICE vehicles, the above story could change. It is notable that conventional hybrid vehicles may also disproportionately contribute to the HUTDF under the current tax scheme as the fuel efficiency benefits may not outweigh the added purchase cost.

The vehicles above are just examples but are believed to be representative of the broader market, with a bias towards lower relative cost vehicles to avoid unfairly skewing the analysis. For example, the least expensive Tesla Model S was used, instead of the "Plaid" version with a list price of \$114,000, which would contribute about \$1,500 more to the HUTD than a similar ICE vehicle.

## Future transportation revenue implications from EVs

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MnDOT modeled funding scenarios to evaluate potential future impacts of BEVs to state transportation funding over time if people chose to replace their ICEV with an EV. The analysis begins in 2030 and assumes the following:

- 20 percent of the pickup/passenger vehicle (light duty vehicles) fleet would be EVs
- More than 60 percent of new vehicle sales are EVs
- Revenue impacts are based on the current 10-year tax structure applied to years 2030-2039. This includes MVST, gas tax (\$0.285), and registration taxes, including the \$75 BEV tax.

## MVST, registration and license fees

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MnDOT compared EV prices to ICEVs. EVs generally cost between \$7,000 higher and \$5,000 lower than comparable models. The higher the “EV price premium,” the more an EV will pay in MVST, registration and license fees, not including the \$75 BEV registration fee.

## Gas taxes

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MnDOT also considered the trade-off in gas taxes that would come from replacing a non-EV with an EV, based on the fuel efficiency of the ICEV being replaced. ICEVs with lower miles per gallon (e.g., 26 MPG) pay more gas taxes while higher MPGs (e.g., 50 MPG) pay fewer gas taxes. Therefore, replacing a Toyota Prius (50 mpg) with an EV will have less impact on gas tax revenue than replacing a Dodge Charger (22 MPG) with an EV. PHEVs can operate only on electricity for shorter trips and switch to gasoline power for longer distances. PHEVs have comparable fuel efficiency to higher-mileage internal combustion engine vehicles.

The following table shows the potential revenue impacts for 2030 - 2039 where 20 percent of all light-duty vehicles are BEV under the current funding structure, including the \$75 EV registration fee. For reference, the current national projection for average ICE fuel economy in 2030 is 37 mpg.

**Modeled Funding Scenarios – Percent Change in Revenue Between ICE and BEV**

		Average MPG of non-EVs displaced by EVs						
		25	29	33	37	41	45	49
EV Price Premium	\$7,000	5%	7%	10%	11%	13%	14%	15%
	\$5,000	1%	4%	6%	8%	9%	10%	11%
	\$3,000	(3%)	(1%)	1%	3%	4%	5%	6%
	\$1,000	(6%)	(4%)	(2%)	(0%)	1%	2%	3%
	-\$1,000	(7%)	(5%)	(3%)	(2%)	(0%)	1%	2%
	-\$3,000	(10%)	(8%)	(6%)	(5%)	(3%)	(2%)	(1%)
	-\$5,000	(15%)	(13%)	(11%)	(10%)	(8%)	(7%)	(7%)

- Green colored cells indicate additional transportation revenue with an EV.
- The highest revenue producing scenarios are when there is a high EV price premium and/or where EVs are replacing non-EVs with high MPG ICE vehicles.
- Even a small (\$4,000) EV price premium would keep revenues neutral or positive in all scenarios.

**Future uncertainty/risk**

The higher purchase price of EVs is the primary contributor to the higher HUTD revenue of EVs compared to ICEVs. Some forecasts suggest that EVs could become less expensive than their ICEV counterparts by 2025 if the cost of batteries continues to fall. If ICE vehicles cost the same or more than EVs, transportation revenues could be negatively affected.