



The Impact of Electric Vehicles and Increased Fuel Efficiency on Transportation Funding

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Mary Tyler, AICP
Transportation Director
Illinois Economic Policy Institute

ILEPI
ILLINOIS ECONOMIC POLICY INSTITUTE

EXECUTIVE SUMMARY

Transportation is undergoing a fundamental shift, with electric vehicles (EVs) and increasingly fuel-efficient vehicles becoming more common. While this change offers benefits to individuals, businesses, and communities, through reduced emissions and decreased dependency on oil, it will also impact Illinois' transportation revenues. The following report by the [Illinois Economic Policy Institute](#) examines the expected impact on state and federal transportation funding.

The use of both electric and hybrid vehicles has grown considerably within the last five years.

- EV registrations have increased from 8,200 in 2017 to 49,000 in 2022, growth of 497%.
- Hybrid electric vehicle registrations have increased from 181,000 in 2017 to over 270,000 in 2022, growth of 49%.

EV growth is expected to accelerate as new state and federal policies are adopted.

- Illinois' Climate and Equitable Jobs Act (CEJA) expressly supports electric transportation and aims to have one million battery-powered vehicles on the road by 2030.
- Rebuild Illinois included \$70 million for electrification infrastructure project grants.
- The Reimagining Electric Vehicles in Illinois Act offers incentives to expand in or relocate to Illinois for companies that manufacture EVs, EV parts, and EV charging stations.
- The federal Infrastructure Investment and Jobs Act includes \$18 billion for EV investments; Illinois is expected to receive \$149 million over 5 years and is eligible for other grant programs.
- Federal Corporate Average Fuel Economy (CAFE) standards were increased in March 2022, increasing the fleetwide average by 10 mpg for model year 2026 compared to 2021.

Illinois' current transportation funding methods are directly tied to the use of motor fuel.

- The motor fuel tax (MFT) is the most important source of funding, with MFT revenues making up 52% of Illinois state transportation funding and 82% of the federal highway trust fund.
- The MFT was designed to charge a user fee commensurate with a person's driving habits; because it is a tax per gallon, revenues have fallen as vehicles have become more fuel-efficient.
- Between 2011 and 2019, Illinois vehicle miles traveled increased by 4%, yet MFT revenue only increased by 3%, indicating the impact increased fuel efficiency played on revenue.

State transportation revenue will be negatively impacted as the state aims to have one million EVs by 2030 and fuel efficiency continues to increase.

- Between 2021 and 2030, it is estimated that Illinois will lose \$765 million from transitioning to EVs over traditional vehicles. The combined loss of state and federal revenue is \$1.1 billion.
- Between 2021 and 2030, it is estimated that Illinois will lose \$3.3 billion from increased fuel efficiency of light-duty vehicles, taking into account increased EV and hybrid use. The combined loss of state and federal revenue is \$4.3 billion.

Policy adjustments will be required to minimize the negative impact on transportation revenues.

- A vehicle miles traveled (VMT) fee uses a predetermined fee levied at a per-mile basis for every mile traveled, serving as a more equitable replacement of the motor fuel tax.
- Illinois can consider increasing the existing EV registration fee and adding a hybrid vehicle registration fee; within the Midwest, six other states currently have hybrid vehicle fees.
- A kilowatt-per-hour fee is a user fee directly applied to EVs; while these fees are already used on some chargers and there is a new statewide policy in Iowa, it is difficult to fully capture a person's use of the transportation system as fees are only applied to public charging.

INTRODUCTION

Transportation is undergoing a fundamental shift, with electric vehicles (EVs) and increasingly fuel-efficient vehicles becoming more common. While this change offers benefits to individuals, businesses, and communities, through reduced emissions and decreased dependency on oil, it will also impact Illinois' transportation revenues. Ultimately, a shift to EVs will wipe out the most significant form of transportation funding unless new actions are taken.

The following report by the [Illinois Economic Policy Institute](#) examines the expected effect on state and federal transportation funding, particularly as it relates to recent policies implemented in Illinois. Additionally, the report will provide the context of both state and national policies impacting this shift in transportation and a background on the sources of existing transportation funding and related fees. Finally, various options are presented that could remedy looming transportation funding issues.

ELECTRIC AND HYBRID VEHICLES IN ILLINOS

Electric and hybrid electric vehicles are both designed to reduce fuel consumption. An electric vehicle is defined in Illinois state statute as a vehicle that is exclusively powered by and refueled by electricity, must be plugged in to charge, and is licensed to drive on public roadways (20 ILCS 627). As such, it uses no gasoline.

While hybrid electric vehicles (HEVs) all strive to reduce gasoline consumption, their impact is dependent on the exact type of HEV. A standard HEV combines a conventional motor with some form of onboard electric propulsion. Because the internal combustion engine is still the main power source and the electric motor is a complement, these HEVs provide relatively smaller amounts of fuel consumption savings. Alternatively, a plug-in HEV (PHEV) combines two propulsion modes, and the gas-powered engine serves as a back-up once the battery power is drained. As such, PHEVs are considered to provide greater fuel consumption savings (Xu et al., 2020). Unfortunately, since it is unknown which type of hybrid vehicles are used in Illinois, hybrids are not considered in this analysis. Fuel consumption may vary widely, making any analysis estimating fuel savings likely to be inaccurate.

Figure 1: Electric, Hybrid, and Total Vehicle Registrations in Illinois, 2017-2021

Year	Electric Vehicle Registrations	Annual Growth From Previous Year	Hybrid Vehicle Registrations	Annual Growth From Previous Year	Total Vehicle Registrations	EVs as %
2017	8,255	-	181,399	-	11,658,429	0.07%
2018	12,713	54%	194,478	7%	11,704,038	0.11%
2019	18,769	48%	208,002	7%	11,322,497	0.17%
2020	25,319	35%	221,205	6%	10,794,020	0.23%
2021	36,482	44%	251,266	14%	11,179,214	0.33%

Source: ILSOS, 2022

The use of both electric and hybrid vehicles has grown considerably within the last five years (Figure 1). Electric vehicle registrations have increased from 8,200 in 2017 to 36,000 in 2021, growth of 342%. Year-over-year annual growth has ranged between 35% and 54%. As of August 2022, EV registrations grew another 34% totaling over 49,000. HEV (both standard HEV and PHEV) are also growing in popularity, increasing from 181,000 registrations in 2017 to over 251,000 in 2020, growth of 39%. Year-

over-year growth was smaller, at 7% for 2018 through 2019. However, an annual growth of 14% occurred between 2020 and 2021. As of August 2022, HEV registrations totaled 270,700, an increase of 8% from the previous year.

STATE AND FEDERAL POLICIES

While it's clear that the use of EVs across Illinois has grown, this trend is only expected to accelerate as new policies are adopted. A myriad of state and federal policies have been implemented in recent years to support increased EV use and ownership. The following section summarizes these programs, infrastructure investments, and environmental goals.

Climate & Equitable Jobs Act (CEJA)

Passed in 2021, the Climate and Equitable Jobs Act (CEJA) seeks to tackle climate change, while training a diverse workforce in energy jobs, addressing ethics and transparency reforms, and introducing ratepayer and customer protections. CEJA moves Illinois to 100 percent carbon-free power by 2045, with interim targets of 40 percent by 2030 and 50 percent by 2040. A variety of programs were introduced to aid in reaching these goals, while addressing workforce needs, accountability, and cost-savings.

In terms of transportation, CEJA expressly supports electric transportation, aiming to have one million battery-powered cars and trucks on the road by 2030. To support this goal, rebates for up to \$4,000 were created for customers who buy electric vehicles. Additionally, the Illinois Environmental Protection Agency (IEPA) is required to award rebates to help fund up to 80% of the cost of the installation of charging stations and creates an Electric Vehicle Coordinator within IEPA. It also includes incentives for public transit, school buses, and city-owned vehicles to electrify (State of Illinois, 2021; CUB, 2021).

Reimagining Electric Vehicles in Illinois Act

Incentivizing EV production statewide, the Reimagining Electric Vehicles in Illinois Act (REV Act) was signed into law in 2021. This legislation intends to make Illinois a hub for EV and auto battery production. It offers incentives to expand in or relocate to Illinois for companies that manufacture EVs and EV parts, as well as EV charging stations. The REV Act includes tax credits for income tax withholding, training costs, tax exemptions, and investment credits. Additionally, employers are incentivized to locate new facilities in communities that have been historically left out of investment and the law also requires vendor diversity reporting, diverse hiring plans, and workforce diversity reporting (State of Illinois, 2021; DCEO, 2022).

Rebuild Illinois Capital Plan & Volkswagen Settlement Funds Program

Signed into law in June 2019, Rebuild Illinois is a \$45 billion capital bill for the State of Illinois providing transportation, education, state facilities, and other infrastructure investments over a six-year period. Within the environmental category, the state dedicated \$70 million to the Illinois Environmental Protection Agency for grants related to transportation electrification infrastructure projects. The money is intended to provide grants to low-income communities for EV charging infrastructure and aid in electrifying public transit and school buses across the state (State of Illinois, 2019).

While it is not evident that the Illinois EPA has released this funding yet, similar projects have been funded under the Driving a Cleaner Illinois Program through the Volkswagen settlement funds. Updated guidance was released in April 2021 in which it was proposed that all remaining funding under the VW funds are to support all-electric transit and school buses and light-duty electric charging infrastructure (IEPA, 2021). Most recently, \$4.2 million in grants were announced to provide 17 electric school buses in the Chicago area and Metro-East (IEPA, 2022).

Federal Infrastructure Investment and Jobs Act (IIJA)

The federal infrastructure law – the Infrastructure Investment and Jobs Act (IIJA) – includes \$18 billion for investment in electric vehicle charging, investments for school buses, transit buses, and passenger ferries to transition to electric vehicles, and other electric vehicle programs. Of that, \$5 billion is dedicated to a new formula program for states to install electric vehicle charging infrastructure and establish an interconnected network to facilitate data collection, access, and reliability. Illinois is expected to receive \$149 million over five years. The remaining funding will be eligible to Illinois through competitive grants under various programs for school buses, corridor charging infrastructure, and transit buses (The White House, 2022; ILEPI, 2022).

Federal Inflation Reduction Act

Passed in August 2022, the Inflation Reduction Act included tax credits for both new and used EVs and plug-in hybrids. The law extends the \$7,500 tax credit for new EVs that qualify and includes the addition of \$4,000 tax credit for used EVs that meet certain qualifications. New qualifications that were added included an income cap for those applying, assembly of vehicle in North America, battery component requirements, vehicle price cap, and others. Partial credits may also be available under certain circumstances. The Biden Administration expressed the goal of incentivizing manufacturers to cater to less-affluent customers, thus making EVs within reach for a larger portion of the population (IRS, 2022; Rezvani, 2022).

Federal Corporate Average Fuel Economy (CAFE) Standards

The National Highway Traffic Safety Administration (NHTSA) sets the Corporate Average Fuel Economy (CAFE) standards, which regulate how far vehicles must travel on a gallon of fuel. These standards are set for both passenger cars and light-duty trucks and medium- and heavy-duty trucks and engines.

In March 2022, the NHTSA announced new CAFE standards requiring an industry-wide fleet average of 29 miles per gallon (mpg) for passenger cars and light trucks in model year 2026. As a result, fuel efficiency will increase 8% annually for model years 2024-2025 and 10% annually for model year 2026. The fleetwide average will increase by nearly 10 miles per gallon for model year 2026, as compared to model year 2021.

The new CAFE standards are estimated to reduce fuel consumption by more than 200 billion gallons through 2050, compared to the former standards. As a result, a person purchasing a new vehicle in 2025 will get 33% more miles per gallon as compared to 2021 (NHTSA, 2022).

CURRENT TRANSPORTATION FUNDING

Illinois’ transportation funding is directly tied to motor fuel sales. As Illinois and the federal government continue to implement and promote policies to support the expansion of EVs and improved fuel efficiency, Illinois’ transportation funding will be impacted. To understand the future of transportation funding in Illinois, it is important to first understand the state’s current system for funding transportation.

State Transportation Funding

State transportation funding is generated from a combination of user fees and bonding. The user fees – the motor fuel tax (MFT), vehicle registrations, certificate of title fees, and driver’s license fees – contribute to regular, continuous annual funding. These funding sources generated over \$5 billion in FY2021, with almost \$4.6 billion dedicated to specific transportation funds. The MFT accounts for 52% of total state transportation revenue (Figure 2) in FY21. As such, a decline in revenue due to the increase in vehicle fuel efficiency and EVs will significantly impact the state’s ability to support transportation funding.

Figure 2: Illinois State Transportation Revenues by Source, FY21

User Fee	FY21 Revenues	FY21 Revenue Dedicated to Transportation Funds*	% of Total Transportation Revenue
Motor Fuel Tax	\$2,381,062,185.94	\$2,381,062,185.94	52%
Vehicle Registration Fees	\$2,144,218,284.00	\$1,909,311,466.39	42%
Certificate of Title Fees	\$394,982,223.02	\$270,477,280.80	6%
Driver’s License Fees	\$91,383,084.00	\$32,815,201.50	1%
Total	\$5,011,645,776.96	\$4,593,666,134.63	

* Includes Road Fund, State Construction Account, Motor Fuel Tax Fund, and Transportation Renewal Fund

Sources: Illinois Comptroller, 2021

Federal Transportation Funding

Federal transportation funding is generated from a variety of user fees, including a federal MFT, tire fees, truck and trailer sales tax, and heavy vehicle use fees. These revenues support the federal Highway Trust Fund (HTF), which supports federal surface transportation funding for highway and transit programs that are distributed by formula for states. Of total federal transportation revenues, motor fuel taxes account for 82% of total funding. Consequently, the reduction in MFT revenue will significantly impact federal transportation funding. This has already been felt, with the federal government depending on annual transfers from the general fund since 2008 to support the HTF (CRS, 2021).

Figure 3: Federal Transportation User Fee Revenue for Highway Trust Fund, 2020

Account	Motor Fuels			Other User Fees				Grand Total
	Gasoline	Special Fuels	Total	Tires	Trucks, Buses, and Trailer	Heavy Vehicle Use	Total	
Highways	\$21,317	\$9,220	\$30,537	\$507	\$4,951	\$1,463	\$6,921	\$38,267
Transit	\$3,972	\$1,226	\$5,198	-	-	-	-	\$5,307
Total	\$25,289	\$10,447	\$35,735	\$507	\$4,951	\$1,463	\$6,921	\$43,574
Percent of Total HTF Revenues	58%	24%	82%	1%	11%	3%	16%	100%

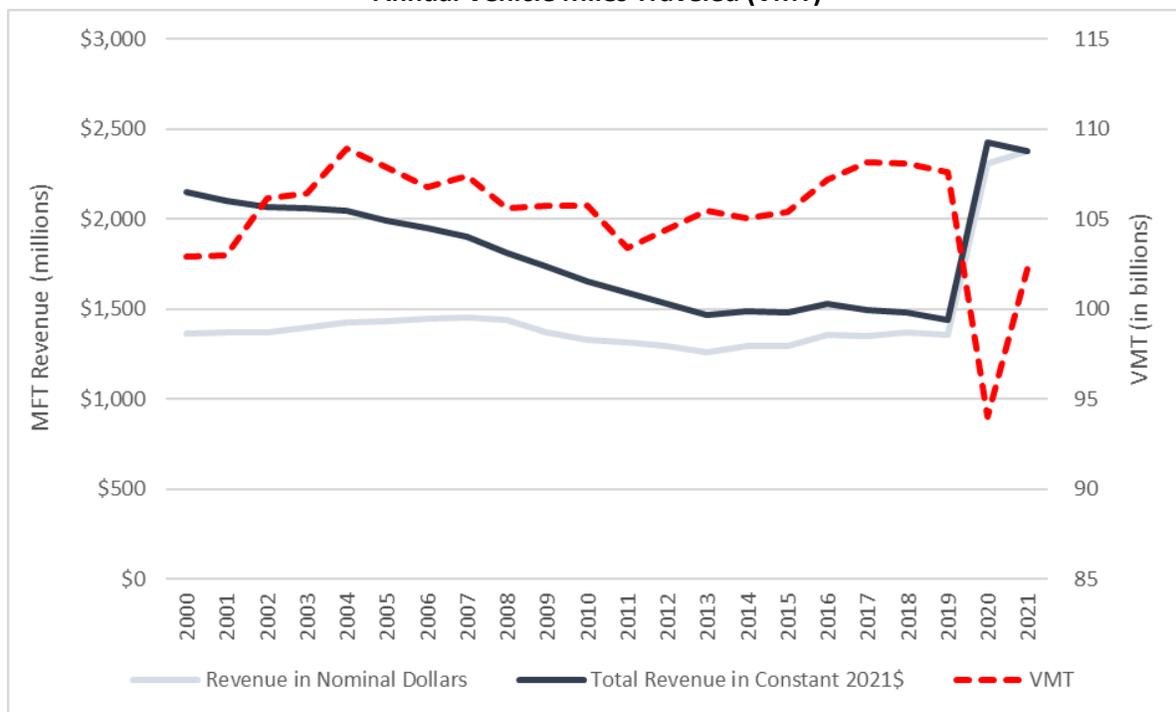
Source: FHWA, 2021a

MFT Revenue Over Time

The MFT was designed to charge a fee commensurate to a person’s driving habits. Initially, this worked as planned, with a person who drives more, paying more. However, due to the nature of the tax – being a tax per gallon as opposed to a tax on the cost – revenues have fallen as vehicles have become increasingly fuel-efficient. Additionally, the state did not increase the MFT between 1991 and 2019, leading to inflation taking a toll on real MFT revenues.

Figure 4 summarizes MFT revenue, in both nominal and inflation-adjusted dollars (constant 2021 dollars), compared to annual vehicles miles traveled (VMT) in the state. First, it is clear that inflation had a large impact, as inflation-adjusted MFT revenues steadily declined between 2000 and 2019. Additionally, MFT revenues not adjusted to inflation remained fairly constant between 2000 and 2019, despite a growth in VMT. Specifically, between 2011 and 2019, VMT increased by 4%, yet MFT revenue only increased by 3%. This indicates the impact that increased fuel efficiency played on revenue. The MFT was increased in 2019 and indexed to inflation, which addresses some of these issues. However, increased fuel efficiency and more EVs will continue to impact revenue for years to come as drivers purchase fewer gallons of fuel.

Figure 4: Illinois Motor Fuel Tax (MFT) Revenue in Nominal and Constant 2021\$ Compared to Illinois Annual Vehicle Miles Traveled (VMT)



Source: IDOR, 2021 (MFT revenue); IDOT, 2021 (VMT)

Current EV Fees

In an attempt to address the revenue shortfalls from EVs, additional state registration fees on EVs were adopted following the passage of Rebuild Illinois. Beginning in 2020, owners of EVs pay an additional \$100 in registration fees annually. While this generates additional revenue, it does not cover the total revenue lost from the EV owner not contributing to the MFT. An average driver travels 11,520 miles

annually (FHWA, 2020). With the average fuel efficiency for light-duty vehicles in 2021 at 24.2 miles per gallon, we can calculate that an average driver uses 476 gallons per year (EIA, 2022). Multiplying this by the current state MFT of \$0.392 per gallon means that the average driver should be contributing \$187 to transportation revenues from motor fuel taxes. As such, the average EV driver is shorting transportation funds by \$87 every year.

FISCAL IMPACTS

As the state continues to see a larger proportion of EVs and increased fuel efficiency in standard vehicles, transportation revenues will feel the impact. The following section estimates the fiscal impact over the 10-year period between 2021 and 2030. Specifically, it estimates the impact if Illinois reaches one million registered EVs by 2030 – a goal of CEJA – and the impact of overall increased fuel efficiency of light-duty vehicles.

Fiscal Impact of Reaching 1 million EVs by 2030

Figure 5 calculates the fiscal impact on state and federal transportation revenues of reaching one million EVs by 2030. First, registered EVs and the average fuel efficiency for light-duty vehicles are used to calculate the number of gallons of fuel that will not be purchased by an EV that would have otherwise been purchased by using a standard vehicle. Illinois had 36,400 registered EVs in 2021 and almost 49,000 as of August 2022. To reach one million EVs by 2030, the state would have to add 119,000 EVs every year, which is assumed in this analysis. The average fuel efficiency is determined by the U.S. Energy Information Administration under the 2022 Annual Energy Outlook Reference Case, which reports estimated future fuel efficiency. Average miles driven is assumed to be 11,520 per vehicle, which is the current national average (FHWA, 2021b).

The number of gallons no longer purchased by EVs is then multiplied by the respective state MFT, state sales tax on motor fuels, and federal MFT rates. The state MFT is assumed to increase by 2.9 cents in 2023 and 1.5% annual growth for every year after. The state sales tax on motor fuels is a per gallon rate calculated every six months depending on the average price of fuel. Since the price of fuel is unknown for future years, the average sales tax on motor fuel rates from the past 12 years was used for this analysis. The state revenue lost from the adoption of EVs is also offset from the \$100 annual fee paid by EV owners.

Between 2021 and 2030, it is estimated that the state will lose \$765 million from the transition to EVs over traditional gas-powered vehicles. When combined with the federal motor fuel tax, it is estimated that total state and federal transportation revenue lost will be \$1.1 billion. It should be noted that this is a conservative estimate as this analysis assumes all EVs will be light-duty vehicles. While the state may ultimately include buses, trucks, or other vehicles in the one million EV count, this analysis assumes all light-duty vehicles (Figure 5).

Figure 5: Estimated Impact of Reaching 1,000,000 EVs (light-duty) by 2030 on Transportation Revenues

		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
EV Registration & Fuel Data	Registered EVs ¹	36,482	48,917	167,802	286,688	405,573	524,459	643,344	762,229	881,115	1,000,000	
	Average fuel efficiency for light-duty vehicles ²	24.2	24.6	25.0	25.4	25.9	26.3	26.7	27.1	27.7	28.0	
	Gallons of fuel no longer purchased ³	17,366,638	22,907,473	77,323,334	130,025,310	180,393,915	229,724,788	277,577,582	324,017,748	366,441,895	411,428,571	
Tax Rates (per gallon)	State gasoline MFT rate ⁴	\$0.387	\$0.392	\$0.421	\$0.427	\$0.434	\$0.440	\$0.447	\$0.454	\$0.460	\$0.467	
	State sales tax on motor fuels rate ⁵	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	
	Federal gasoline MFT rate	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	
Revenue Calculations	Annual state MFT revenue lost	\$6,720,889	\$8,979,729	\$32,553,124	\$55,561,765	\$78,241,301	\$101,131,880	\$124,031,117	\$146,953,896	\$168,687,720	\$192,237,823	
	Annual state sales tax on motor fuels revenue lost	\$2,778,662	\$3,665,196	\$12,371,734	\$20,804,050	\$28,863,026	\$36,755,966	\$44,412,413	\$51,842,840	\$58,630,703	\$65,828,571	
	Annual EV fee offset (\$100 per vehicle)	\$3,648,200	\$4,891,700	\$16,780,238	\$28,668,775	\$40,557,313	\$52,445,850	\$64,334,388	\$76,222,925	\$88,111,463	\$100,000,000	
Total Impact on Transportation Revenues	Total state revenue lost (MFT and sales tax minus annual EV fee offset)	\$5,851,351	\$7,753,225	\$28,144,620	\$47,697,040	\$66,547,015	\$85,441,996	\$104,109,142	\$122,573,811	\$139,206,961	\$158,066,394	
	Annual Federal MFT revenue lost	\$3,195,461	\$4,214,975	\$14,227,494	\$23,924,657	\$33,192,480	\$42,269,361	\$51,074,275	\$59,619,266	\$67,425,309	\$75,702,857	
	TOTAL REVENUE LOST	\$9,046,812	\$11,968,200	\$42,372,113	\$71,621,697	\$99,739,495	\$127,711,357	\$155,183,417	\$182,193,077	\$206,632,270	\$233,769,251	
	10-Year STATE revenue lost	\$765,391,556										
	10-Year TOTAL (state + federal) revenue lost	\$1,140,237,691										

¹ 2021 and 2022 reflect actual registration numbers; later years assume annual growth of 120,000 vehicles to reach 1 million by 2030

² Fuel efficiency projections calculated by the U.S. Energy Information Administration

³ Calculated based on average of 11,520 miles driven annually per vehicle and annual fuel efficiency projections for 2021-2030 by the U.S. Energy Information Agency

⁴ Assuming 2.9 cent increase between 2022 and 2023 and 1.5% annual growth for every year after

⁵ Rate varies based on fuel prices; using average rate over past 12 years at \$0.16 per gallon

Sources: ILSOS, 2022 (EV registrations); EIA, 2022 (fuel efficiency); FHWA, 2021b (miles driven); IDOR, 2022 (MFT rates)

Figure 6: Estimated Impact of Improved Light-Duty Vehicle Fuel Efficiency (taking into account EVs) by 2030 on Transportation Revenues

		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Travel Data	Illinois VMT for light-duty vehicles ¹ (in millions)	89,454	94,942	99,281	102,678	104,305	105,767	107,022	107,987	108,746	109,475
	Average fuel efficiency for light-duty vehicles ²	24.2	24.6	25.0	25.4	25.9	26.3	26.7	27.1	27.7	28.0
Fuel Efficiency Impact on Gallons	Gallons purchased at improved fuel efficiency ³	3,696,446,281	3,859,426,671	3,971,227,048	4,042,445,612	4,027,234,885	4,021,557,460	4,008,308,418	3,984,764,677	3,925,831,420	3,909,825,368
	Gallons purchased at flat 22.9 mpg ⁴	3,906,288,210	4,145,934,328	4,335,400,708	4,483,760,635	4,554,820,241	4,618,644,594	4,673,442,565	4,715,594,879	4,748,713,115	4,780,572,503
	Gallons no longer purchased due to improved fuel efficiency	209,841,929	286,507,657	364,173,659	441,315,023	527,585,356	597,087,134	665,134,148	730,830,203	822,881,695	870,747,134
Tax Rates (per gallon)	State gasoline MFT rate ⁵	\$0.387	\$0.392	\$0.421	\$0.427	\$0.434	\$0.440	\$0.447	\$0.454	\$0.460	\$0.467
	State sales tax on motor fuels rate ⁶	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160	\$0.160
	Federal gasoline MFT rate	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184	\$0.184
Revenue Calculations	Annual state MFT revenue lost	\$81,208,826	\$112,311,001	\$153,317,111	\$188,580,529	\$228,826,814	\$262,856,025	\$297,204,588	\$331,458,220	\$378,805,042	\$406,851,991
	Annual state sales tax on motor fuels revenue lost	\$33,574,709	\$45,841,225	\$58,267,786	\$70,610,404	\$84,413,657	\$95,533,941	\$106,421,464	\$116,932,832	\$131,661,071	\$139,319,542
	Annual federal MFT revenue lost	\$38,610,915	\$52,717,409	\$67,007,953	\$81,201,964	\$97,075,706	\$109,864,033	\$122,384,683	\$134,472,757	\$151,410,232	\$160,217,473
Total Impact on Transportation Revenues	Total state revenue lost (MFT and sales tax)	\$114,783,535	\$158,152,227	\$211,584,896	\$259,190,933	\$313,240,470	\$358,389,966	\$403,626,052	\$448,391,053	\$510,466,113	\$546,171,532
	Annual Federal MFT revenue lost	\$38,610,915	\$52,717,409	\$67,007,953	\$81,201,964	\$97,075,706	\$109,864,033	\$122,384,683	\$134,472,757	\$151,410,232	\$160,217,473
	TOTAL REVENUE LOST	\$153,394,450	\$210,869,635	\$278,592,849	\$340,392,897	\$410,316,176	\$468,253,999	\$526,010,735	\$582,863,810	\$661,876,345	\$706,389,005
	10-Year STATE revenue lost	\$3,323,996,777									
	10-Year TOTAL (state + federal) revenue lost	\$4,338,959,902									

¹ 2021 is actual number reported by IDOT and 2022-2030 are U.S. projections calculated by the U.S. Energy Information Administration multiplied by 3.4% to represent Illinois' share of the nation's VMT

² Fuel efficiency projections calculated by the U.S. Energy Information Administration; these projects include an assumed increase in EVs

³ Calculated based annual fuel efficiency projections for 2021-2030 by the U.S. Energy Information Agency

⁴ 22.9 mpg is the most recently reported national fuel economy for light-duty vehicles in 2020

⁵ Assuming 2.9 cent increase between 2022 and 2023 and 1.5% annual growth for every year after

⁶ Rate varies based on fuel prices; using average rate over past 12 years at \$0.16 per gallon

Sources: IDOT, 2021 (2021 VMT); EIA, 2022 (VMT and fuel efficiency); FHWA, 2010-2019 (IL VMT %); IDOR, 2022 (MFT rates)

Fiscal Impact of Increased Fuel Efficiency for Light-Duty Vehicles

While EVs pose a threat to state and federal transportation funding, overall increased fuel efficiency will have a larger impact. Figure 6 calculates the fiscal impact of increased fuel efficiency for light-duty vehicles. It is important to note that this analysis assumes a level of EV adoption in the fuel efficiency numbers, thus these figures should not be combined with those calculated in the previous section and Figure 5.

First, vehicle miles traveled for Illinois light-duty vehicles was estimated for 2022 through 2030. While 2021 is the actual figure reported by IDOT, the remaining VMT numbers were calculated using U.S. Energy Information Agency projections for the United States multiplied by 3.4%, which is the average of Illinois' share of the national total VMT over the past 10 years (FHWA, 2010-2019).

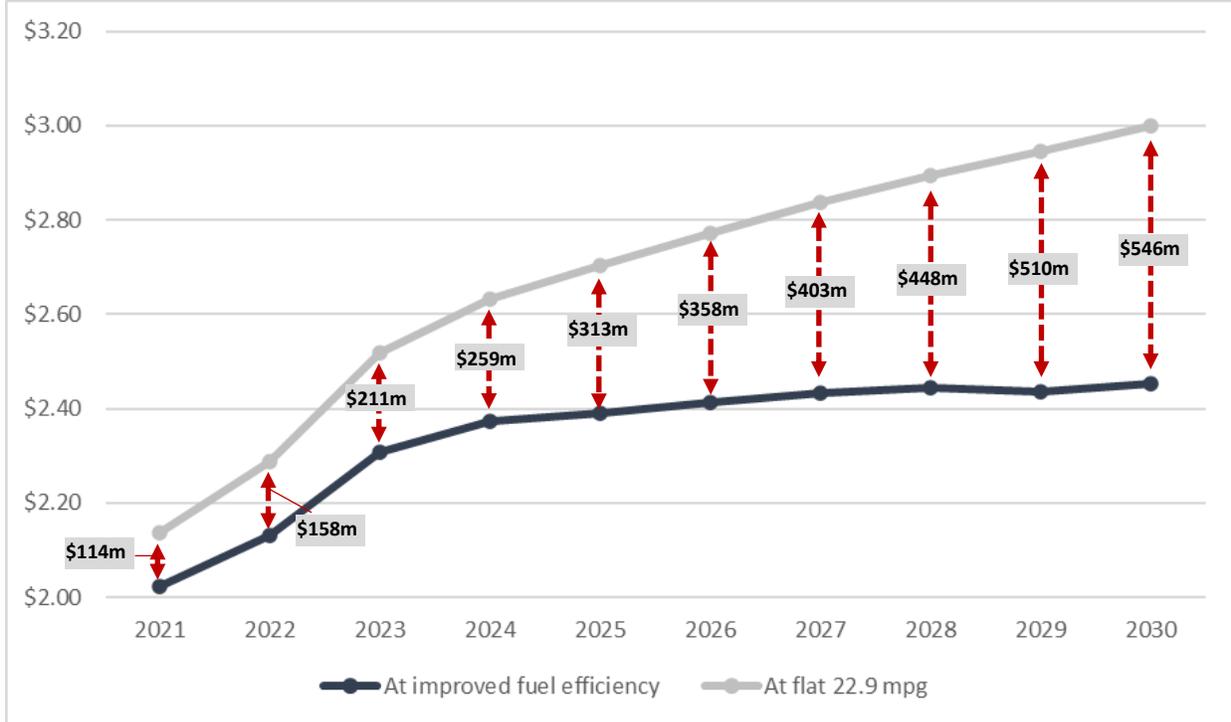
Similar to the previous analysis, the number of gallons purchased under increased fuel efficiency is then calculated using the U.S. Energy Information Administration's estimated future fuel efficiency values under the 2022 Annual Energy Outlook Reference Case, which take into account increased use of EVs over the years. Fuel efficiency of light-duty vehicles is estimated to increase to 28 miles per gallon by the year 2030. These values are compared to gallons purchased at a flat 22.9 miles per gallon, which is the most recently reported fuel efficiency value from 2020 (FHWA, 2021b), to determine the number of gallons no longer purchased due to improved fuel efficiency.

The number of gallons no longer purchased due to improved fuel efficiency is then multiplied by the respective state MFT, state sales tax on motor fuels, and federal MFT rates. The state MFT is assumed to increase by 2.9 cents in 2023 and 1.5% annual growth for every year after. The state sales tax on motor fuels is a per gallon rate calculated every six months depending on the average price of fuel. Since the price of fuel is unknown for future years, the average sales tax on motor fuel rates from the past 12 years was used for this analysis.

Between 2021 and 2030, it is estimated that the state will lose \$3.3 billion from overall increased fuel efficiency of light-duty vehicles compared to average fuel-efficiency in 2020. When combined with federal motor fuel tax, it is estimated that total state and federal transportation revenue lost will be \$4.3 billion (Figure 6).

Figure 7 illustrates the annual loss in state MFT revenues that will be realized as light-duty vehicles become more fuel efficient. Using the data presented in Figure 6, this graph illustrates the difference in Illinois state MFT revenue when comparing projected increased fuel efficiency to the flat rate of 22.9 mpg, which was the most recently reported national fuel economy for passenger vehicles in 2020. The annual loss will top \$500 million beginning in 2029 and reach over \$546 million in 2030.

Figure 7: Comparison of State MFT Revenue* from Light-Duty Vehicles under Different Fuel Efficiencies, 2021-2030



* Includes both state MFT revenue and state sales tax on motor fuels revenue
 Source: Author's analysis using data from EIA, 2022 and IDOT, 2021 and summarized in Figure 7

Long-term Fiscal Impact

Improved fuel efficiency is expected to greatly increase in the coming years with the expanded adoption of EVs and hybrid vehicles, resulting in lost revenue for crucial transportation infrastructure. While Illinois has already experienced lost transportation revenue for this reason, as vehicle fuel economy has steadily improved since 2000, Rebuild Illinois addressed part of the issue by doubling the MFT rate. Up to this point, Rebuild Illinois funding estimates have been adequately met. However, fuel efficiency will only continue to increase at a faster rate in coming years as new technology is developed and reducing CO₂ emissions becomes a higher priority. As such, the long-term fiscal impact will be substantial, once again making adequate transportation funding a priority for policymakers. Changes must be made to ensure Illinois does not again go more than a decade without an appropriately funded capital plan.

POTENTIAL POLICY CHANGES

To minimize the fiscal impact of these transportation changes, policy adjustments on how transportation is funded will be required. Without change, the state will see decreased funding to support crucial infrastructure investments. The following section explores potential policies that could be implemented in Illinois to address future transportation funding shortfalls.

Vehicles Miles Traveled Fee

A vehicle miles traveled (VMT) fee equitably charges the users of the transportation system based on the actual distance they travel. Serving as a replacement of the existing motor fuel tax, a VMT fee uses a predetermined fee levied at a per-mile basis for every mile traveled on a public roadway and provides a sustainable funding source that parallels usage. This is the most straightforward method to solve revenue shortfalls due to EVs and increased fuel efficiency, as it charges a person based on miles traveled, not the number of gallons of fuel purchased. VMT fee programs have been successfully piloted in numerous states and are currently voluntarily used as an alternative to the MFT in Oregon.

The concept of a VMT fee has been discussed by transportation policymakers and state leaders in Illinois for several years. A bill was formerly proposed in 2016, in which the motor fuel tax would be rolled back and a VMT fee would be implemented in its place (Brasuell, 2016). While the bill ultimately did not succeed, the proposal has remained a viable option recently proposed in IDOT's Long Range Transportation Plan (IDOT, 2018), the Chicago Metropolitan Agency for Planning's ON TO 2050 Comprehensive Regional Plan (CMAP, 2022), and by other public policy organizations, including the Illinois Economic Policy Institute (Craighead, 2018).

While not directly comparable, it is worth noting that Illinois already utilizes a mileage tax for a particular type of truck and trailer registration fee. Advertised as an alternative to standard registration fees, the Mileage Weight Tax Registration is a reduced fee for trucks and trailers that travel a relatively low amount of mileage in a year and strictly travel within Illinois. Different fees are offered depending on the weight of the vehicle and estimated mileage traveled in a year, with the maximum mileage being 7,000 miles. There is then an excess rate, ranging from .031 to .150 per mile, if a vehicle travels above the designated mileage for that year (ILSOS, 2022b).

Increase Existing Fees and Consider Hybrid Fees

As previously noted, Illinois currently has a \$100 additional annual registration fee for all EVs. However, this does not adequately cover the MFT revenue that is paid by the average driver of gas-powered vehicle. As such, Illinois can consider increasing the annual EV to at least \$187, which would compensate for the average MFT lost.

Additionally, while not extensively covered in this report, hybrid vehicle fees can also be considered. It is difficult to estimate the exact financial impact hybrids have on transportation revenues. As previously discussed, some hybrids still depend on gasoline-powered engines as the main energy source while others primarily depend on electric engines. As such, fuel efficiency of hybrid vehicles varies widely. One researcher reported that hybrid vehicles "only save limited fuel consumption" in an analysis on the impact of electric and hybrid vehicles in Alabama (Xu et al., 2020). However, the North Carolina Department of Transportation reported that an average hybrid vehicle operating within their state has a fuel efficiency that is 17.6 more miles per gallon than the state's average vehicles (NCDOT, 2020). Overall, it can be expected that hybrid vehicles do result in some fuel savings, leading to less MFT revenue.

Currently, 14 states across the United States have separate hybrid vehicle fees. Looking specifically at the Midwest – considering Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin – all other midwestern states outside of Illinois have an additional EV fee and six of these seven states

have a hybrid vehicle fee. Additionally, four of these seven states have a higher EV fee than Illinois (Figure 8).

Figure 8: Additional Electric and Hybrid Vehicle Fees in Other Midwest States

	Electric Vehicle Fee*	Hybrid Vehicle Fee*
Illinois	\$100	-
Indiana	\$150	\$50
Iowa	\$130	\$65 for plug-in hybrids
Michigan	\$100 EVs up to 8,000 lbs \$200 EVs over 8,000 lbs	\$30 certain plug-in hybrids up to 8,000 lbs \$100 certain plug-in hybrids over 8,000 lbs
Minnesota	\$75	-
Missouri	\$75	\$37.50 for plug-in hybrids
Ohio	\$200	\$100
Wisconsin	\$100	\$75
* Additional fee in addition to standard vehicle registration fees		

Source: NCSL, 2021

Kilowatt-Per-Hour Fee

Alternatively, a kilowatt-per-hour fee is another user fee directly applied to EVs. This fee charges based on the electricity used to charge EVs and plug-in hybrid vehicles. This fee is most similar to an MFT, as it charges based on use and is collected incrementally. However, implementation may be complicated in determining where EVs are being charged and the appropriate tax rate.

Kilowatt-per-hour fees have already been implemented on a limited number of local EV charging stations across Illinois. There are 30 Tesla chargers located in a variety of cities, including Chicago, Bolingbrook, Champaign, Cherry Valley, Effingham, Skokie, Springfield, Aurora, Peoria, Peru, and others, that charge \$0.28 per kilowatt-hour. There are an additional 35 Blink chargers also located in a variety of cities, including Chicago, Quincy, Wheaton, Champaign, Harvard, LaSalle, and others, that charge \$0.49 per kilowatt-hour. While these chargers are operating with fees, the funding is not used to support state transportation funding (DOE, 2022a).

An example of a statewide policy, Iowa recently adopted an Alternative Fuel Tax, in which electricity is subject to the excise tax of \$0.026 kilowatt-hour of fuel delivered into a battery or other energy storage device of an EV. It applies to any location in Iowa other than a residence (DOE, 2022b).

While electric charging station fees are not wholly uncommon, they are not often used to support or make-up for lost transportation funding. The Iowa policy strives to support transportation funding, yet is limited in its effectiveness, as many people may choose to charge their vehicle at home for free. Consequently, additional work would be required to develop a policy that can entirely work to replace lost MFT revenue through a kilowatt-per-hour fee.

CONCLUSION

Transportation is undergoing a fundamental shift. It is expected that the use of EVs and more fuel-efficient vehicles will continue to grow and new challenges will be presented as new technologies become available. As a result, it is imperative that state and federal governments seriously consider how transportation is funded and how these changes will impact existing funding mechanisms. Without

policy adjustments, infrastructure loses viable funding sources and crucial roads, bridges, and transit systems will not be properly maintained to provide a safe and efficient transportation system.

Illinois stands to lose \$3.3 billion in state transportation revenue alone over a 10-year period due to improved vehicle fuel efficiency, including an increased adoption of EVs and hybrid vehicles. This is funding the state does not have to lose. Even with the passage of Rebuild Illinois, Illinois is playing catch-up to address all backlogged maintenance needs accrued due to a lack of funding over previous decades.

EVs and improved vehicle fuel efficiency are both great advancements that lead to many benefits for the state. However, an unintended consequence of these policies is the detrimental impact on transportation funding. This is an issue that can be addressed to minimize impacts if policymakers make it a priority now. It is time for Illinois to stop playing catch-up and proactively address transportation funding to ensure sustainable, continuous funding for decades to come.

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