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REPLACING LOUISIANA'S MOTOR FUEL TAXES

by Robert W. Poole, Jr.

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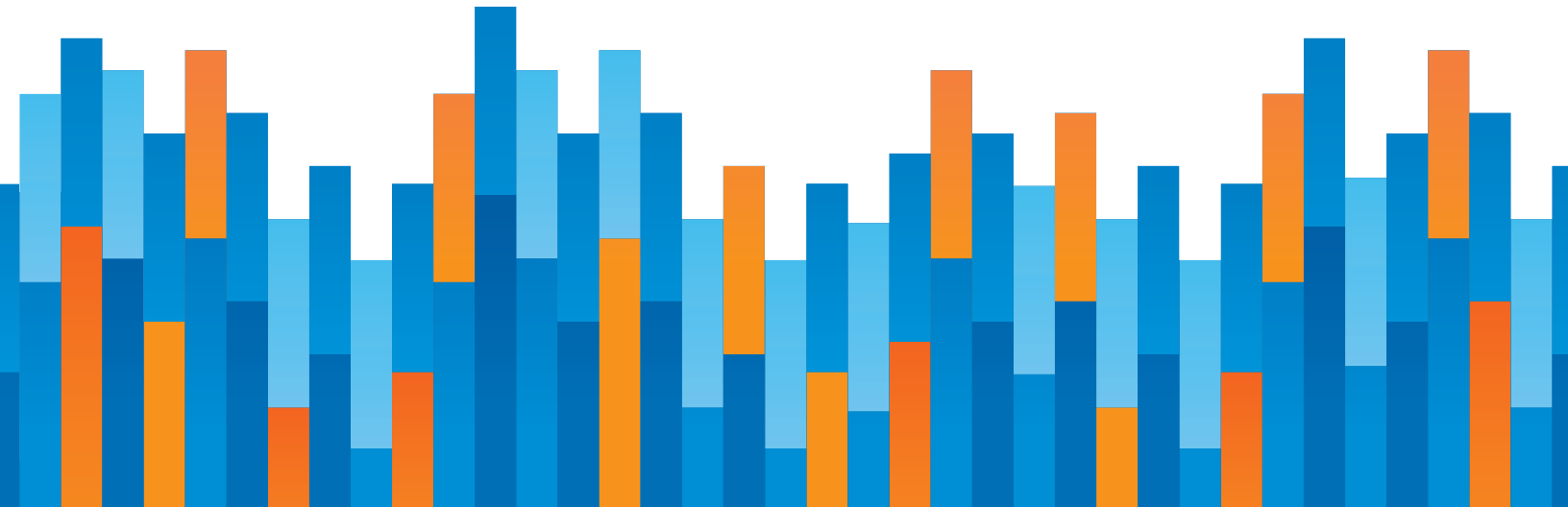

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PART 1

INTRODUCTION

Roads in Louisiana and across the nation are primarily funded by per-gallon fuel taxes. Unlike many other states in the eastern half of the United States, Louisiana has no actual toll roads. Three tolled bridges are the Highway 1 Bridge, the Avery Island Toll Bridge, and the Lake Pontchartrain Causeway.

Two current trends threaten the long-term viability of per-gallon fuel taxes. One is ongoing revisions of federal miles per gallon (mpg) requirements for new vehicles (both personal vehicles and commercial trucks). The other is the trend toward replacing petroleum-fueled vehicles with electric vehicles. Both of these trends are being driven by federal policy: federal Corporate Average Fuel Economy (CAFE) requirements and an array of mandates and subsidies for electric vehicles. Auto and truck producers have nearly all announced plans to phase out petroleum-fueled vehicles and replace them with electric vehicles in coming decades.

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This policy study estimates plausible declines in Louisiana's gasoline and diesel tax revenue over the next several decades. It next explains the growing interest, nationwide, in shifting from per-gallon taxes to per-mile charges (referred to as mileage-based user fees, or MBUFs). While three states have begun phasing in MBUFs (also referred to in some states as Road User Charges—RUCs), a growing number of states have run pilot projects in which volunteer car and truck drivers test simulated MBUF systems, and important lessons have been learned from those pilot projects. Louisiana is planning a pilot project as this study is being written.

Switching from fuel taxes to MBUFs would be a major change, and the politics of making such a large change need to be considered. This study explores those challenges and suggests ways of addressing them.

PART 2

A BRIEF HISTORY OF THE FUEL TAX

The mass-market Ford Model T began production in 1908, with Ford producing one million of the vehicles between 1913 and 1927. The $850 price made it the first vehicle affordable to the middle class. The surge in vehicles was soon followed by the first gasoline tax. In 1919, Oregon—which had 103,418 registered automobiles and trucks on its roads by 1920—imposed a gasoline tax of one cent per gallon "for the repair of the damage done to said highways by such vehicles, machines and engines traveling thereon." By 1932 all states and the District of Columbia had a gas tax, levied at rates ranging from two cents to seven cents per gallon. Louisiana's gas tax began in 1921, at a rate of one cent/gallon; by 1930 it had been increased to five cents per gallon.[1]

Federal fuel taxes began in 1932 with a one cent per gallon gas tax aimed at federal revenue shortfalls during the Depression. Federal fuel taxes were not dedicated to highways, however, until the Federal Aid Highway Act of 1956, which launched the Interstate Highway System specifically to fund building that system. That law also created the federal Highway Trust Fund to safeguard these dedicated fuel tax revenues.

As the Interstate system neared completion in the 1970s, Congress did not repeal or reduce federal fuel taxes. Instead, it increased the tax rates and expanded the uses of the revenue,

[1] Jeff Davis, "The History of the Gasoline Tax, Part 1," *Transportation Weekly*, Vol. 11, Issue 24, 20 April 2010.

first to many other kinds of highways beyond the Interstates, later to mass transit, then to sidewalks and bike trails. In effect, the federal Highway Trust Fund became a de-facto transportation fund.

The last increase in the federal gas tax took place in 1993, when it was set at 18.4 cents per gallon. It is not indexed to inflation. According to the U.S. Bureau of Labor Statistics' Consumer Price Index Inflation Calculator, a dollar in April 2022 had half the buying power of a dollar in October 1993. Further, Congress has spent far more than the gas tax brings in and has regularly "bailed out" the Highway Trust fund from the general fund, most recently in November 2021 when, through the Infrastructure Investment and Jobs Act, $118 billion in general revenue was transferred to the Highway Trust Fund.

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Making matters even worse for fuel tax revenues, in recent years federal policies have focused increasingly on eliminating fossil fuel use, including reducing the use of petroleum-fueled vehicles. This will decrease future federal and state fuel-tax revenues, making them insufficient to fund the future needs of the nation's highway transportation infrastructure.

Even before this, however, the diminishing returns were obvious. Despite the increase in the number of automobiles, fuel efficiency requirements hurt revenues. The federal government implemented Corporate Average Fuel Economy (CAFE) Standards in 1975, after the Arab oil embargo. These regulations, aimed at improving fuel economy of cars and light trucks (pickup trucks, vans, and SUVs) produced for sale in the United States, have become ever more stringent.

- For the 1975 model year, data from the federal Environmental Protection Agency (EPA) show that about 10.2 million vehicles were produced with "real-world" average fuel economy of 13.1 mpg. Real-world means actual driving conditions.
- For model year 2019, 16.1 million vehicles were produced, with average fuel economy at 25.9 mpg.[2]

Given the pandemic-related aberration in automotive production in 2020 and 2021, a comparison between 1975—the first year of CAFE Standards—and 2019 figures (before COVID-19 hit) better demonstrates the impact of fuel economy standards. While annual vehicle production for 2019 was almost 58% higher than for 1975, the average mpg was a whopping 90% higher in 2019 than in 1975. Essentially, new cars in 2019 could go twice as far on a gallon of gas as 1975 cars.

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Meanwhile, auto manufacturers continue to increase their focus on hybrid and all-electric vehicles, which use less or no petroleum. This heralds a further decline in the revenues generated by taxing fuel even as vehicle-miles traveled (VMT) continue to increase.

The looming highway funding challenge has long been anticipated. In 2005, a special committee of the Transportation Research Board of the National Academies of Sciences concluded that fuel taxes would not remain viable as the primary highway funding source for the 21st century.[3]

2 The various impacts of COVID-19 reduced auto production.

3 *The Fuel Tax and Alternatives for Transportation Funding*, Special Report 285, Transportation Research Board, 2006. The author of this study was a member of the committee generating this special report.

Congress responded by appointing a National Surface Transportation Infrastructure Financing Commission to consider approaches to longer-term funding for surface transportation. The Commission considered a large number of alternatives, concluding that:

(1) The original users-pay/users-benefit principle of fuel taxes should be retained; and,

(2) The best way for users to pay would be to charge by miles driven rather than by gallons of fuel consumed.

Importantly, the Commission recommended that mileage-based user fees (MBUF) should be the *replacement* for fuel taxes rather than motorists being charged in addition to them.[4]

In the aftermath of the Commission's recommendations, Congress authorized federal funding for state departments of transportation (DOTs) to carry out a number of pilot projects in which motorists and truckers operate their vehicles under a simulated MBUF charging mechanism.

Until recently, most of these took place in western states, plus Minnesota. Nearly all pilot projects in the eastern half of the country have been carried out by The Eastern Transportation Coalition (TETC), formerly known as the I-95 Corridor Coalition. TETC is a partnership of 17 states and the District of Columbia. It has carried out several multi-state pilot projects, including several that focused on commercial trucks.

Three states have used findings from their pilot projects to design and implement a first stage of transition to MBUFs: Oregon, Utah, and Virginia.

- **Oregon:** As of 2022, the OReGO program is open to all owners of vehicles getting at least 20 mpg. The charge is 1.9 cents per mile, to raise the same average revenue per vehicle as current state fuel tax. The law calls for adjusting the per-mile charge to keep pace with increases in fuel tax rates for as long as state fuel taxes remain in effect. During the (likely lengthy) transition period, each vehicle will pay either the state fuel tax or the state Road Usage Charge but not both.[5]
- **Utah:** Utah's Road User Charge Program is voluntary for electric vehicle (EV) owners, who may opt to pay a per-mile charge instead of the annual alternative fuel vehicle

[4] *Paying Our Way: A New Framework for Transportation Finance*, National Surface Transportation Infrastructure Financing Commission, February 2009.

[5] "OReGO, Oregon's Road Usage Charge Program," Oregon Department of Transportation, https://oregon.gov/odot/progams/pages/orego.aspx (accessed 4 May 2023).

fee adopted by the state legislature in 2018. The per-mile fee is one cent per mile, comparable to the average yield of the gasoline tax in Utah.[6]

- **Virginia:** Virginia's Mileage Choice Program is similar to Utah's (and is operated under contract by the same company, emovis). It is open to drivers of EVs and other alternative fuel vehicles. It allows eligible motorists to pay a per-mile charge instead of the annual fee for alternative-fuel vehicles. The program began in July 2022.[7]

[6] "Welcome to Utah's Road Usage Charge Program," Utah Department of Transportation, https://roadusercharge.utah.gov (accessed 4 May 2023).

[7] "Virginia's Mileage Choice Program," Virginia Department of Motor Vehicles, https://dmv.virginia.gov/general/#va_mileage_choice.asp (accessed 4 May 2023).

PART 3

THE PREDICTABLE DECLINE IN U.S. MOTOR FUEL USE

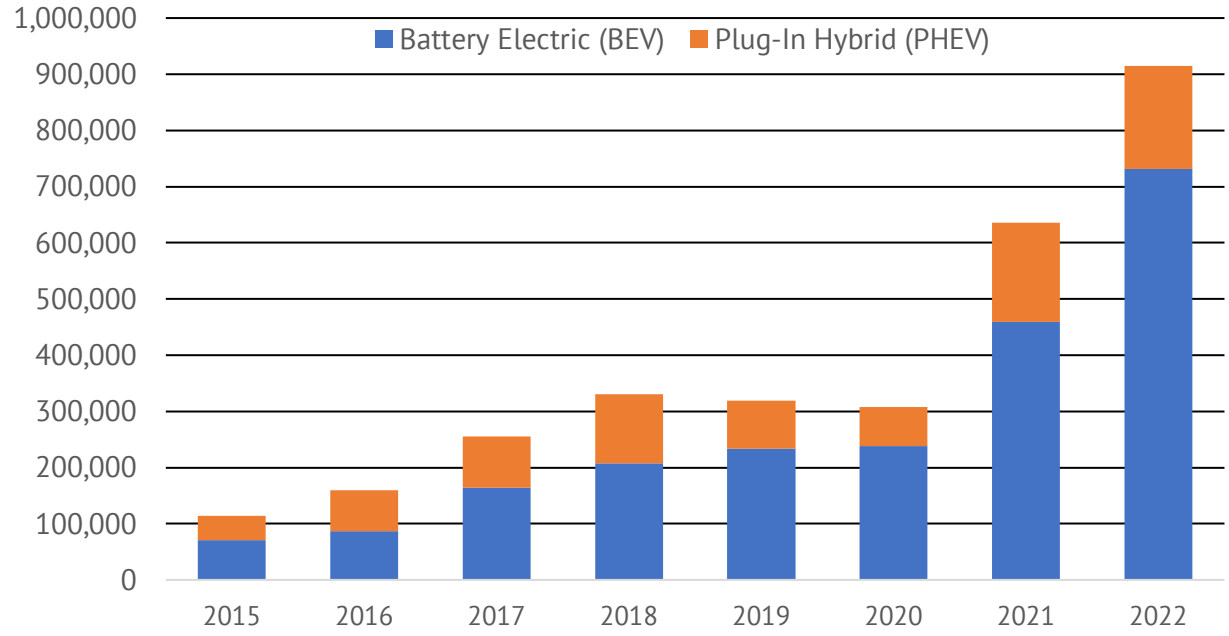
Estimates of future fuel consumption and fuel tax revenues used in this policy study were prepared by transportation consultant Ed Regan. He is a 45-year veteran of revenue forecasting for transportation and has written and spoken extensively on the emerging challenges to the viability of the motor fuel tax.

Fuel sales in the United States, including both gasoline and diesel, reached a peak of 190.7 billion gallons in 2019. As a result of travel reductions induced by COVID-19, fuel consumption in 2020 dropped by about 12% to 167.9 billion gallons. By 2021, fuel sales rose to about 185 billion gallons, a significant recovery from pandemic-depressed 2020 levels. Fuel consumption in the U.S. in 2022 is estimated at about 186 billion gallons. That's an increase of less than 0.2% over 2021 levels, in spite of an increase of almost 2.8% in national vehicle-miles traveled (VMT) in 2022. Total annual VMT essentially fully recovered to 2019 pre-pandemic levels by the end of 2022, but total fuel consumption still lagged 2019 by almost 2.8% due to increased fuel efficiency and the emerging shift to electric vehicles. In fact, the nation may have already reached "peak fuel" levels, and may not ever achieve levels seen in 2019 again.

The U.S. Energy Information Administration (EIA) produces an annual long-range projection of fuel sales in its *Annual Energy Outlook* report. The 2023 version was released in March 2023, and included a slightly higher future electric vehicle penetration than its previous forecast, but still well below other estimates. It assumed higher increases in overall fuel efficiency than the 2022 *AEO* forecast, resulting in lower fuel consumption estimates. Total fuel sales, including gasoline and diesel, are projected to decline to less than 169 billion gallons by 2030 and about 155 billion gallons by 2040, a decline of almost 20% from 2019 despite an estimated increase in overall travel of 14%.[8]

The emergence of electric vehicles is a significant factor in the expected decline in fuel sales in the future. As shown in Figure 1, EV sales have dramatically increased in the U.S. over the last two years. Between 2017 and 2020, new EV sales averaged just under 300,000 per year, or less than 2% of all new vehicle sales. In 2021, EV sales doubled to over 600,000, and by 2022 total EV sales, including battery electric (BEV) and Plug in Hybrid (PHEV), reached more than 900,000, or 6.7% of total new vehicle sales. EV sales in the first quarter of 2023 have increased another 35%, suggesting annual EV sales of about 1.2 million in 2023, or close to 8% of total light vehicle sales.

FIGURE 1: U.S. ELECTRIC VEHICLE SALES, 2015–2022



Source: Energy Information Administration, 2023.

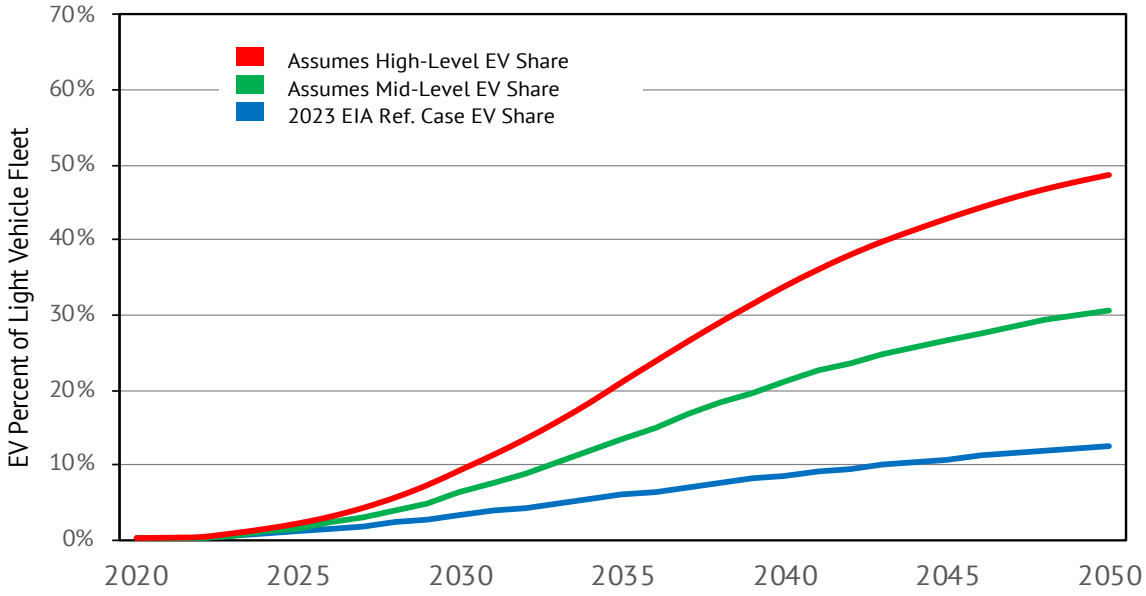
[8] *2023 Annual Energy Outlook*, Energy Information Administration, 16 March 2023

Clearly, future penetration of electric vehicles in the U.S. light vehicle (LV) fleet will be a major factor in the decline of fuel consumption. The 2023 EIA report assumes the EV share of on-the-road light vehicle fleet in the U.S. will increase from just over 1% in 2022 to almost 16% by 2050. However, as shown in Figure 2, the EIA projection of EV share is well below other forecasts. This study estimates future fuel consumption and fuel tax revenue under three alternative scenarios:

- The EIA 2023 reference case,
- A "high EV" scenario and,
- A "mid-level EV" scenario, halfway between the EIA and "high EV" scenarios.

Adapted for this study from a recently updated projection developed by Bloomberg New Energy Finance that expects electric vehicles to comprise 50% of new light vehicle sales in the U.S. by 2030,[9] the red curve in Figure 2 represents the high EV case. As a share of the total light vehicle fleet on the road, the high EV case estimates about 15% EVs in 2030, increasing to 48% by 2040 and about 60% by 2050. Under the mid-level scenario, the EV share would reach about 30% by 2040 and over 38% by 2050.

FIGURE 2: ALTERNATIVE ESTIMATES OF FUTURE U.S. LIGHT VEHICLE FLEET EV SHARES



Source: Calculations by Ed Regan based on projections from Energy Information Administration (EIA) and Bloomberg New Energy Finance (BNEF).

[9] "More Than Half of U.S. Car Sales Will Be Electric by 2030," *Hyperdrive Newsletter,* Bloomberg New Energy Finance, 20 September 2022.

Under the mid-level EV scenario, fuel sales in the U.S. would decline to less than 134 billion gallons by 2040 and about 133 billion gallons by 2050. That is about 17% lower than the EIA 2023 reference case projection and more than 30% lower than a hypothetical case in which there was no increase in EV sales or fuel efficiency. Under the high EV case, fuel sales would drop to just 114 billion gallons in 2040 and less than 107 billion in 2050. That is almost 87 billion gallons less than in 2019, even with a 25% increase in vehicle-miles traveled.

Table 1 compares approximations of total fuel tax revenue, including both federal and state levels, for 2050 under four scenarios. Including both federal and state levies, the weighted average gasoline tax in the U.S. is about $0.533 per gallon in 2023, and $0.628 per gallon for diesel fuel. If there were no change in today's fuel efficiency or EV fleet shares, 2050 total fuel tax revenue would likely exceed $128 billion. Even with modest EV penetration assumptions, the 2023 EIA reference case forecast shows a reduction in fuel tax revenue of 30.8%. If the nation achieves the high EV light vehicle share, a net revenue reduction of over 52% can be expected. The sustainability of the motor fuel tax as the primary source of transportation funding in the U.S. is clearly in doubt.

TABLE 1: ALTERNATIVE PROJECTIONS OF U.S. FUEL TAX REVENUE DECLINE

Scenario	Est. 2050 Annual Fuel Tax Revenue ($B)	Annual Revenue Impact ($B)	Percent Change
No change in current mpg	$128.6		
2022 EIA Ref. Case	$89.0	-$39.6	-30.8%
With Mid-Level EV Share	$75.0	-$53.6	-41.7%
With High-Level EV Share	$61.1	-$67.5	-52.5%

Source: Calculations by Ed Regan based on data from DOTD, EIA, and BNEF.
Note: Annual revenue based on current federal and state fuel tax rates without any future increases. Total (federal + average state) rates: Gasoline $0.533; Diesel $0.628.

PART 4

THE LIKELY DECLINE IN LOUISIANA'S FUEL TAX REVENUE

Data for the Louisiana Department of Transportation and Development (DOTD) are maintained on a fiscal year basis—the 12-month period ending June 30 of each year. Between FY 2014 and FY 2019, fuel consumption in the state increased from 2.9 billion gallons to almost 3.2 billion gallons, an average annual increase of 1.7% per year. Sales of both gasoline and diesel fuels declined by about 8% in FY 2020 due to pandemic impacts. By FY 2022, fuel sales had returned to 3.1 billion gallons, still 2.2% below the FY 2019 peak level of 3.2 billion gallons.

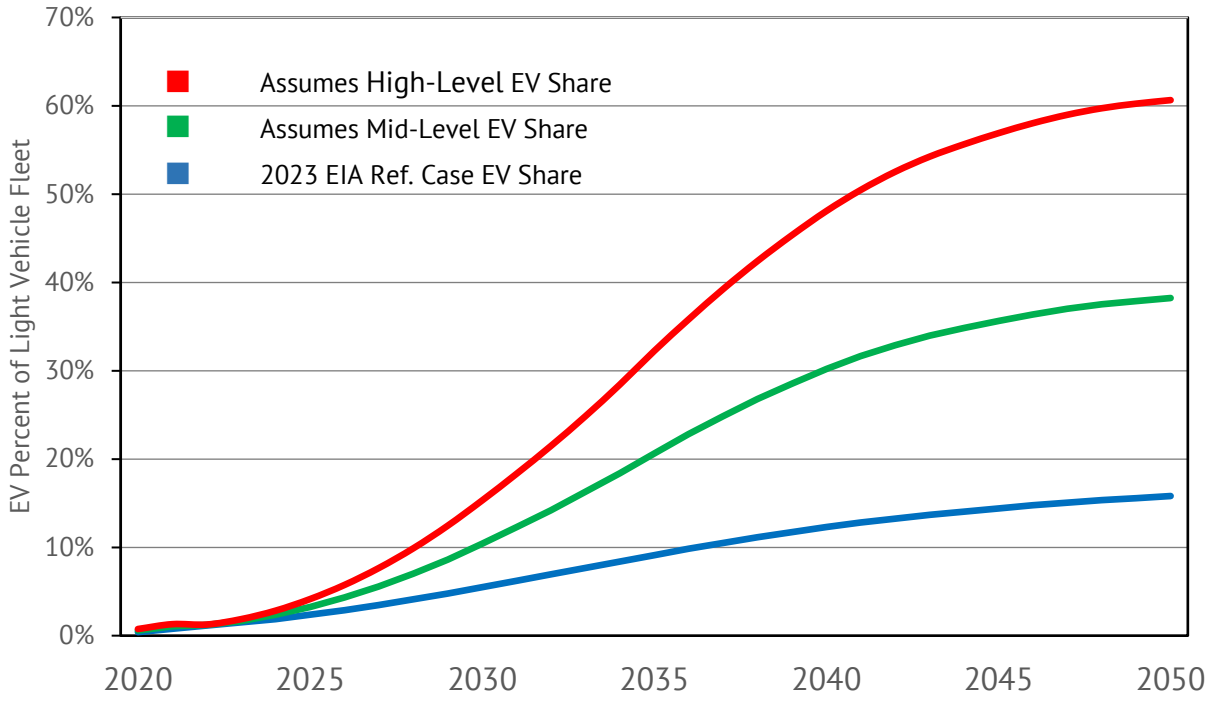
Fuel tax revenue in Louisiana followed a similar trajectory as fuel consumption, increasing from just under $590 million in FY 2014 to $636.4 million in FY 2019, based on data provided by Louisiana DOTD. The current tax rate for both gasoline and diesel fuel is $0.20 per gallon and is not currently indexed to inflation. Only $0.16 per gallon is dedicated to the Transportation Trust Fund (TTF); the remaining $0.04 per gallon is dedicated to a transportation debt service program referred to as "TIMED."[10] In FY 2020, total fuel tax revenue in the state declined by 8%, to about $585 million, as travel declined due to

[10] "Sufficiency of the Transportation Trust Fund in Meeting the State's Transportation Network Needs," Louisiana Performance Audit Services, 1 September 2022.

pandemic impacts. By FY 2022, fuel tax revenue grew back to $622.4 million, still slightly below the peak level recorded in FY 2019.

While still below nationwide trends, sales of electric vehicles in Louisiana increased in 2021 and 2022. Between 2018 and 2020, new EV sales in the state averaged less than 700 vehicles per year. In 2021 EV sales almost tripled to 1,841 and reached 2,782 in 2022, more than four times sales in 2020. By the end of 2022, battery electric and plug-in hybrid vehicles represented about 0.25% of light vehicles on the road in the state, as compared to just over 1% nationwide. Looking forward, Figure 3 shows estimated light vehicle EV shares in Louisiana for the three scenarios discussed above. While significant increases in EV share are assumed, all scenarios remain somewhat below the national levels shown previously in Figure 2. By 2040, the EV share of the Louisiana light vehicle fleet is expected to reach almost 9% under the low EV case (adapted from the EIA 2023 reference case), and about 33% under the high EV case. Under the high case, just under half of light vehicles could be electric by 2050.

FIGURE 3: ALTERNATIVE ESTIMATES OF LOUISIANA LIGHT VEHICLE FLEET EV SHARES



Source: Calculations by Ed Regan based on data from EIA and BNEF.

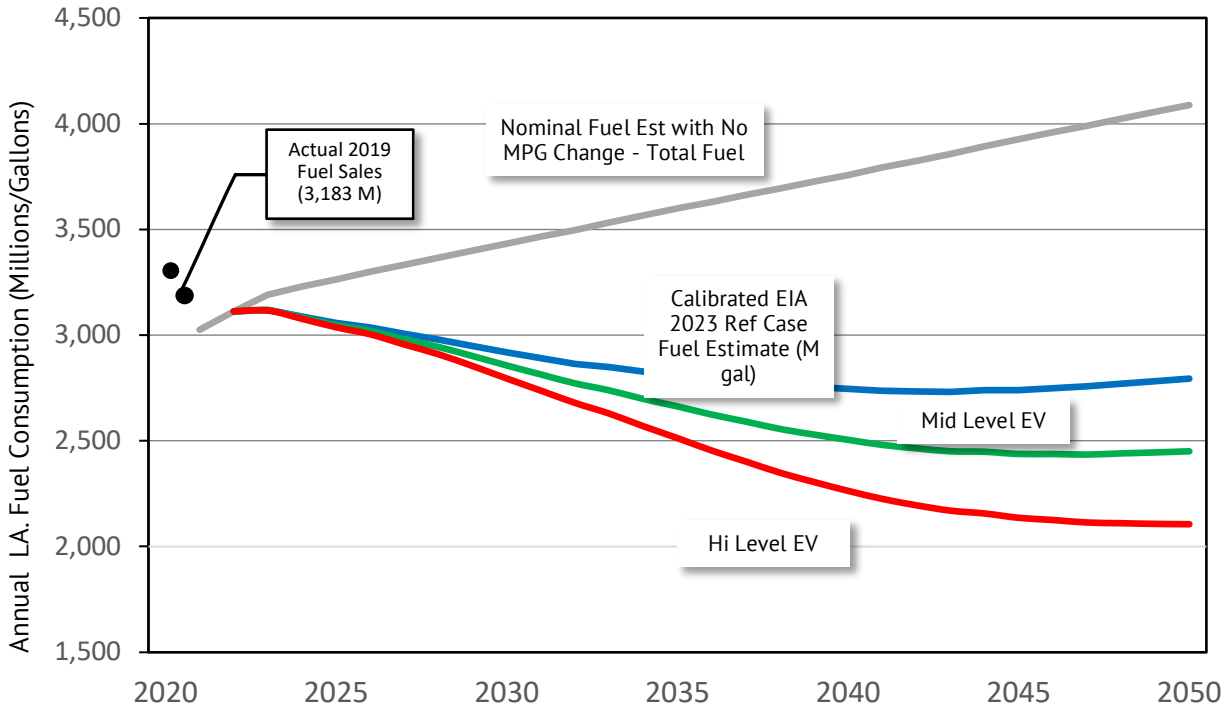
Figure 4 shows projected Louisiana fuel sales through 2050 under each of the three EV scenarios. The hypothetical forecast (the gray line) assumes no future increases in fuel

efficiency or EV sales. This is for purposes of comparison only; it is very unlikely that mpg and EV sales will not increase significantly over the next three decades.

If there were no increase in fuel efficiency, fuel sales in the state would be expected to increase from about 3.2 billion gallons in 2023 to almost 4.1 billion gallons in 2050, an overall increase of 28%. Under all three forecast scenarios that include increases in EV sales, future fuel sales are expected to never again reach the 3.2 billion gallons sold in 2019.

Under the most optimistic case, based on the EIA 2023 reference case assumptions, fuel sales decline to 2.7 million gallons by 2042 before increasing slightly in later years. By contrast, under the high EV scenario, total fuel sales would decline to 2.3 billion gallons by 2040 and 2.1 billion gallons by 2050.

FIGURE 4: COMPARISON OF FUTURE LOUISIANA ANNUAL FUEL SALES

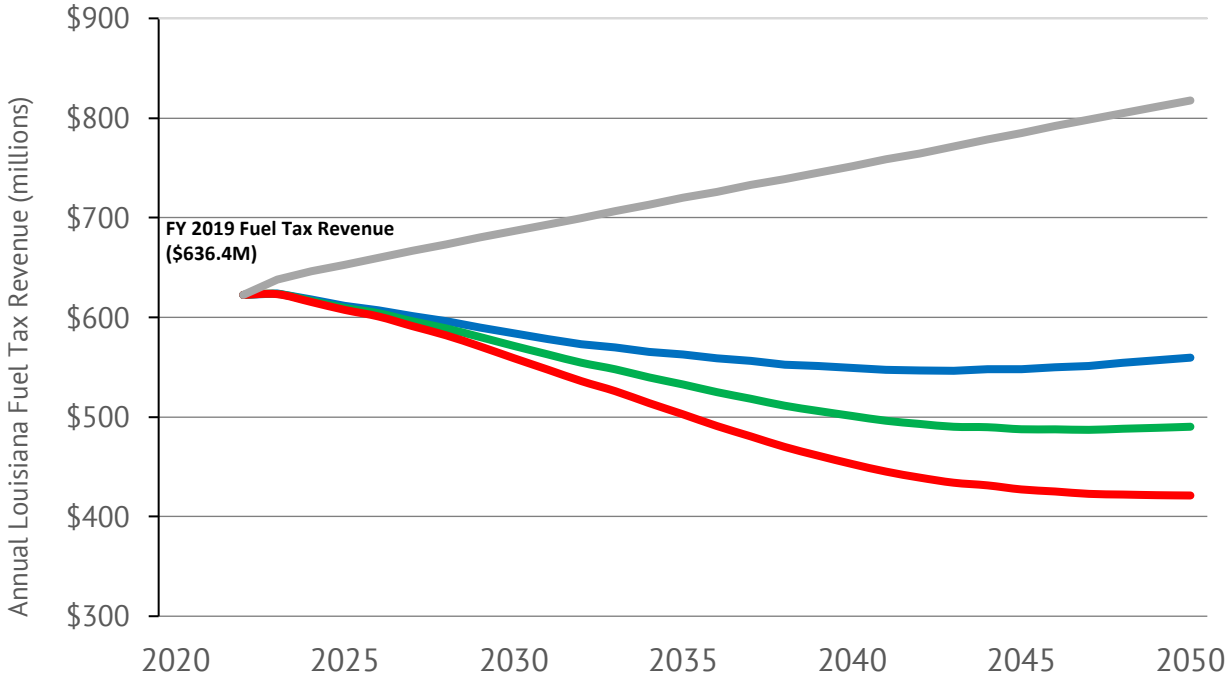


Source: Calculations by Ed Regan based on data from DOTD, EIA, and BNEF.

Figure 5 displays estimated Louisiana fuel tax revenue through 2050 under the hypothetical "no mpg change condition" and the three alternative scenario forecasts.

Significant reductions can be expected, even with the more optimistic EIA reference case forecast. In that case, by 2030 annual tax revenue (at the full $0.20 per gallon rate) would decline by more than $102 million. Between 2023 and 2030, a cumulative decline of more than $470 million could be expected.

FIGURE 5: COMPARISON OF LOUISIANA FUEL TAX REVENUE FORECASTS



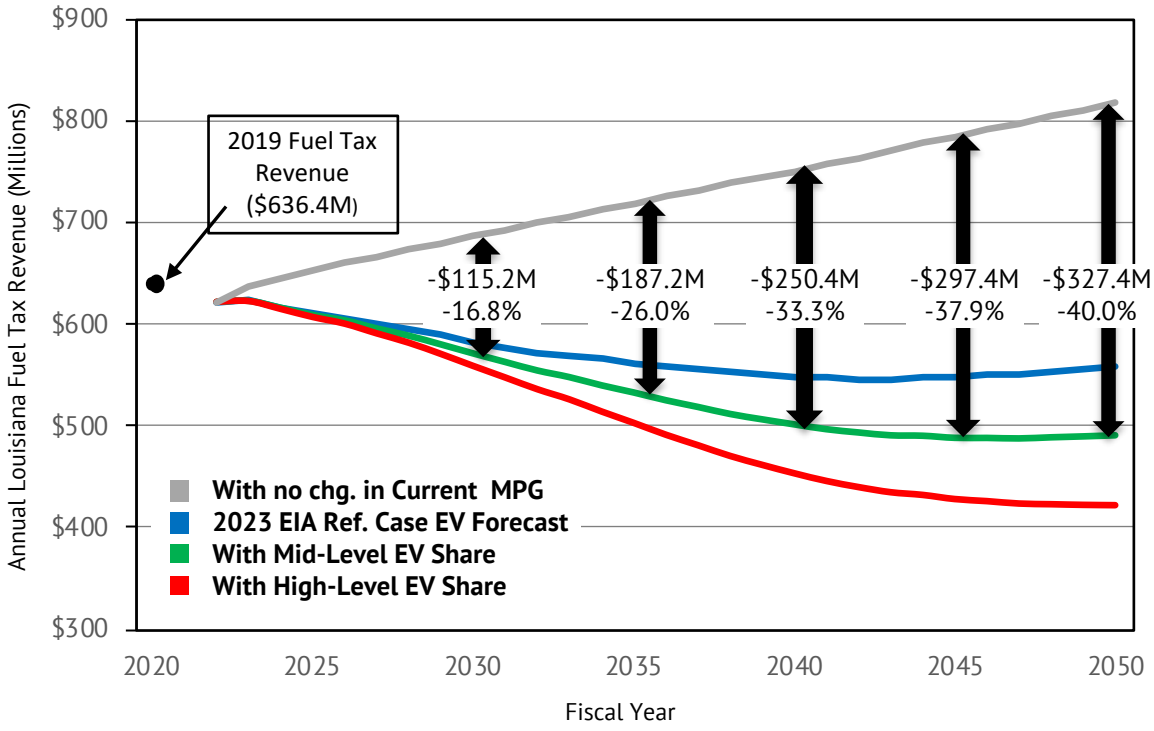
Source: Calculations by Ed Regan based on data from DOTD, EIA, and BNEF.

Under the worst case, in which a high level of shift to electric vehicles is assumed, potential fuel tax revenue in Louisiana would be reduced by almost 40% by 2040 and almost 49% by 2050. With a mid-level electric vehicle shift, Louisiana could anticipate a decline in fuel tax revenue to about $500 million by 2040 and slightly less per year through 2050.

It is quite likely that EV sales will be higher than levels anticipated in the 2023 EIA *Annual Energy Outlook*. The recent upsurge in EV sales over the last two years, both nationally and in Louisiana, suggests a higher level is most likely. By contrast, the high EV scenario could prove optimistic, given constraints on battery materials and challenges with building a nationwide charging network. The mid-level scenario may prove most reasonable. As shown in Figure 6, under that case, Louisiana annual fuel tax revenue would be reduced by $250 million by 2040 and over $325 million by 2050. Again, all revenue impact figures

reflect the full $0.20 per gallon gas tax—not just the $0.16 per gallon share dedicated to TTF.

FIGURE 6: ESTIMATED LOUISIANA FUEL TAX REVENUE WITH MID-LEVEL EV PENETRATION



Source: Calculations by Ed Regan based on data from DOTD, EIA, and BNEF.

Anticipating a future problem due to EVs, Louisiana recently established supplemental vehicle registration fees for electric vehicles ($110 per year) and hybrid electric ($60 per year). The current level of supplemental registration fees would generate $110 million to $175 million in annual revenue by 2050, depending on the level of EV penetration. This is well short of the decreases in total revenue but would cover a significant part of the impacts associated with electric vehicles alone. However, those fully electric vehicles would no longer be assessed charges based on the amount of travel on Louisiana roads.

PART 5

WHAT AMERICANS THINK ABOUT MILEAGE-BASED USER FEES (MBUFS)

Many Americans have a negative impression of per-mile charges. In surveys about possible future highway funding sources, only about one-quarter of the public sees per-mile charges as a good idea.

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Across the nation, one reason for this resistance to MBUFs may be privacy concerns amid media hype over government tracking: “Big Brother in your car.” Few drivers consider how closely they already are tracked by their own vehicle’s electronics (including the GPS) as well as their insurance companies, their smartphones, laptops and tablets, and Tile and Apple Airtag trackers stowed in their purses and backpacks.

Also, suspicious taxpayer groups seem certain that a per-mile charge would become yet another tax instead of *replacing* the fuel tax. They can hardly be faulted for mistrusting government, given the steady increase in federal fuel taxes through the decades, and the diversion of those revenues from roads and bridges.

Furthermore, anti-automobile/anti-highway activists, seeking to discourage driving, would like any per-mile charge to include additional taxes on emissions, noise, and other impacts of driving, real or imagined. And Americans who appreciate the freedom and flexibility of the automobile and the nation's wide-open spaces are inclined to see the switch to per-mile charges as a threat to their mobility and independence.

The MBUF concept is not new, however, and Louisiana benefits from the experiences of the many state pilot projects already completed or under way. These have improved understanding of what an MBUF system would actually look like. Nearly all the pilot projects:

- Gave participants a choice of several methods to record their miles traveled, and for how those miles would be reported to the government.
- Did not "track" or report the time and place of every trip made.
- Used private, third-party companies to handle the reporting of miles to the government.
- Calculated what participants would have paid and compared that to the state gas tax they had actually paid for the miles driven during the test.
- Made clear that a state MBUF would *replace* the state fuel tax, not be charged in addition to it.
- Made use of stringent privacy protections for the mileage information collected.

Several pilot projects actively recruited public officials to be among the participants, which gave those officials first-hand experience with how it worked. In general, most participants in the pilot projects came away with a positive view of the case to switch to per-mile charges.[11]

[11] Kathryn Jones and Maureen Bock, "Oregon's Road Usage Charge: The OReGO Program, Final Report," Oregon Department of Transportation. April 2017, Chapter 8.

> *In general, most participants in the pilot projects came away with a positive view of the case to switch to per-mile charges.*

What is increasingly clear is that a strong, consistent, and positive public education component is essential to the success of such a program. It may be counterproductive for state DOTs to focus on MBUFs as a way to address their looming revenue shortfall instead of focusing on the overall benefits to the driving public of such a change. When average people hear the government needs more revenue, they tend to dig in their heels and tighten the grip on their wallets. While the revenue shortfall is indeed real and worrying, motorists and trucking companies deserve to see a genuine value proposition in making a major switch in highway funding.

In a 2019 Reason Foundation policy paper,[12] the author of this study suggested two elements of such a value proposition:

1. Fix all the shortcomings of the 100-year-old gas tax, not just its coming revenue shortfall; and,
2. Begin the transition with something that offers large, visible benefits to highway users.

The next two sections of this study expand upon those ideas.

[12] Robert Poole, "How a State Could Transition from Per-Gallon Taxes to Per-Mile Charges," Reason Foundation, September 2019.

PART 6

FIXING ALL THE FUEL TAX'S SHORTCOMINGS

Most proposals to replace fuel taxes with per-mile charges focus only on the declining revenues. But fuel taxes have four other shortcomings. If Louisiana and other states replace the fuel tax with a better funding source (a challenging undertaking), a sensible approach would be to consider whether the MBUF can be designed to fix the other shortcomings, too.

#1 FUEL TAXES DON'T KEEP PACE WITH ROADWAY NEEDS.

Louisiana's motor fuel tax has not been adjusted since 1990. Although Louisiana grew by only 2.2% between 2010 and 2020, the costs of highway construction and maintenance have escalated significantly in the years following the pandemic. The U.S. Department of Transportation maintains a Highway Construction Cost Index, which is updated regularly. Between 2020 and 2022, this index increased by 50%.[13] That means rebuilding and modernizing Louisiana's aging highways over the next several decades will cost far more than anticipated. Highway user fees should include periodic adjustments to keep pace with highway costs.

[13] Jeff Davis, "Highway Construction Costs Have Risen 50% in Two Years," Eno Center for Transportation, 18 April 2023.

#2 FUEL TAXES ARE NOT TRANSPARENT.

For other vital infrastructure (electricity, water, telecommunications, etc.), consumers receive a bill from the provider. It reports how much the customer used, the rate per unit of use, and the total the customer owes. Customers see what they used and the basis for the charges, and they also know who the provider is. With highways and other roads, how much the customer paid and the identity of the provider are obscure. In his book, *Rethinking America's Highways*, the author of this study included a table showing that several years ago the average U.S. household paid just $46 per month in federal plus state gas taxes, far less than for any of the other utilities[14] (e.g., for electricity the national average was $107 per month). Further, Americans have no idea who provides which roadways and therefore whom to hold accountable for problems. Many people even believe the federal government owns the Interstate highways, when in fact the states own and operate them.

#3 FUEL TAXES NO ARE LONGER FULLY DEDICATED TO USER BENEFITS.

The original state gas taxes were based on the premise that highway users paid and highway users benefitted. Gas tax revenues were accounted for in highway trust funds and used solely to build, maintain, expand, and rebuild highways. The same principle was followed in 1956 when the federal gasoline and diesel taxes were authorized and the dedicated Highway Trust Fund was established, solely to help states build the new Interstate highways. But over the last 40 years, that principle has been seriously breached. Today, about 23% of the federal Highway Trust Fund is used for non-highway purposes.[15] Fortunately, Louisiana diverts less than 1% of its state fuel tax revenue (to mass transit).[16]

[14] Robert Poole, *Rethinking America's Highways: A 21st Century Vision for Better Infrastructure,*" University of Chicago Press, 2018.

[15] Robert W. Poole, Jr. and Adrian T. Moore, "Restoring Trust in the Highway Trust Fund," Reason Foundation, August 2010.

[16] Baruch Feigenbaum and Joe Hillman, "How Much Gas Tax Money States Divert Away from Roads," Reason Foundation, 20 June 2020.

#4 FUEL TAXES ARE A ONE-SIZE-FITS-ALL METHOD OF CHARGING.

In Louisiana, motorists pay an average of one cent per mile driven (based on gas tax revenue of $474.3 million and 2022 VMT of 46 billion). That is the same whether someone drives solely on local streets and roads or mostly on freeways and other major highways. The cost of building and maintaining freeways is several times as much as for local streets, but one cent per mile is far more than is needed for local streets and two-lane rural roads. With this way of paying for roads, the people who use rural and local roads pay more than those roads cost, while those who use expressways pay less than they cost. That is not fair.

Instead, imagine starting with a clean sheet of paper to design a per-mile charge system that addresses all the above shortcomings, making it more like paying a utility bill than the current tax. It would have the following attributes:

- A true user fee, paid only by those who use roadways and spent only on roadways;
- Equitable to all users, with different rates for major highways (Interstates and expressways) compared to other roadways;
- Transparent, making it clear which provider is responsible for which roadways; and,
- Subject to periodic increases, when justified by increased operating and capital costs, via a public process similar to rate-setting for other utilities.

PART 7

ADDING VALUE FOR CUSTOMERS: STARTING THE TRANSITION VIA MAJOR HIGHWAY IMPROVEMENTS

Louisiana's DOTD and legislature are aware of the coming decline in fuel tax revenue, as indicated by their support for launching a state MBUF pilot project. But policymakers should steer clear of making revenue shortfalls the primary rationale for a transition from shrinking per-gallon taxes to more-equitable per-mile charges. Instead, the focus should be the need for major investment in the state's aging and heavily used highway system, which must be prepared for projected population growth over the next three decades.

> *"... the focus should be the need for major investment in the state's aging and heavily used highway system, which must be prepared for projected population growth over the next three decades."*

The core of Louisiana's highway system is limited-access highways: long-distance Interstates and urban expressways. The Interstate system was authorized in 1956, and most of its corridors were built in the 1960s and early 1970s. That makes most of the system 50 years old or older, well beyond its original design life. Some of these corridors will likely need widening as growth continues, and the older ones will need to be reconstructed.

In the 2015 FAST Act, Congress asked the Transportation Research Board to convene an expert committee to study the future of the nation's Interstate system. The committee's 596-page report was released in December 2018.[17] Among its main findings were the following:

- Much of the Interstate pavement is wearing out and needs to be replaced.
- The system has numerous bottleneck interchanges that are obsolete and should be replaced.
- There are not enough lanes in many corridors for projected growth in motorist and truck travel in coming decades.
- The system could benefit from dedicated truck lanes in some key freight corridors, but there are none—and none planned.

In its major report to Congress, the TRB committee suggested a repeat of the original 90% federally funded Interstate highway program, which it estimated would require raising and spending an extra $57 billion per year for the next 20 years (totaling about $1.1 trillion), all of it dedicated to Interstate modernization. Doing so would necessitate a massive increase in federal gasoline and diesel taxes, which is highly unlikely. The committee's report also discussed the possibility of long-term financing this huge set of projects based on projected toll revenues, which would require amending the 1956 federal law to permit the use of tolls on the 90% of the Interstate system where tolling is not allowed.

A 2019 Reason Foundation policy study responded to the TRB committee's report, recommending the toll-financed approach to rebuilding and selective widening.[18] It also proposed expanding an existing three-state pilot program to allow any state that decided

[17] Norman Augustine (Chair), *Renewing the National Commitment to the Interstate Highway System*, Transportation Research Board, December 2018.

[18] Robert Poole, "The Case for Toll-Financed Interstate Replacement," Reason Foundation, March 2019.

to take this approach to use it to begin the transition from per-gallon taxes to per-mile charges.

In Louisiana, this could be done along the following lines. DOTD would develop a 20- to 30-year plan to reconstruct and modernize all its limited-access highways—the Interstate highways and urban freeways without Interstate numbers. It would decide on the order in which each corridor would be modernized, and it would explain that the modernization of each would be financed by new per-mile charges (MBUFs), with fuel tax *refunds* for miles driven on the corridors converted from fuel taxes to MBUFs.[19]

> *As each corridor was equipped and re-opened to traffic, motorists and truckers would pay new per-mile fees instead of state gasoline and diesel taxes.*

As each corridor was equipped and re-opened to traffic, motorists and truckers would pay new per-mile fees *instead of* state gasoline and diesel taxes. The MBUF charging system (using the existing GeauxPass transponder technology) would not only compute the charge based on the miles driven but also calculate the fuel tax refund based on that same number of miles and the vehicle's EPA highway mpg rating. This would demonstrate to people that the new per-mile charge replaces the fuel tax.

Since limited-access highways handle about 33% of all vehicle-miles traveled (VMT) in Louisiana, that same 33% of VMT would be shifted from fuel taxes to MBUFs over a decade or so. No users would be paying both fuel taxes and per-mile charges for the same roadway.

Starting with limited-access highways (where there are only a few places to get on and get off) means that the transition to per-mile charging can begin by making use of technology already in use around the country and widely accepted. Within this decade, Louisiana's

[19] Robert Poole, "Fuel-Tax Rebates for Newly Tolled Interstates: A Quantitative Assessment," Reason Foundation, November 2021 (https://reason.org/policy-brief/fuel-tax-rebates-for-newly-tolled-interstates-a-quantitative-assessment)

GeauxPass will likely be made interoperable with electronic tolling systems nationwide, the largest of which is the 19-state E-ZPass system. This will avoid the need for near-term decisions about any new technology that would be needed in cars and trucks to enable per-mile charging for open-access roadways such as state-numbered highways and local streets. Equipping all those other roadways for charging via GeauxPass or another transponder would require many thousands of gantries to record vehicles' passage, which would be far too costly (and unsightly). The initial program outlined here—for limited-access highways only—would build public confidence that per-mile charges would indeed *replace* per-gallon taxes, as each corridor was modernized and opened with the new charges *and* refunds of the fuel tax paid for driving those miles.

> *Highway user-tax refunds are not simply a theory; they are in actual practice in two states.*

Highway user-tax refunds are not simply a theory; they are in actual practice in two states. Highway user tax refunds like this are already being provided to trucking companies that use the Massachusetts Turnpike and the New York Thruway, both of which are tolled Interstates. The refund process has been automated by trucking service provider Bestpass, which offers trucking companies a 48-state universal toll transponder and consolidated billing service.[20]

[20] Bestpass: https://bestpass.com/solutions/trucking-fleets

PART 8

HOW TO TRANSITION ALL OTHER ROADWAYS TO PER-MILE CHARGES

Ultimately, as fuel tax revenue continues to decline, Louisiana and other states should expect to phase out this tax altogether and plan for replacing it with per-mile charges statewide. Converting limited-access highways first will provide breathing room, because as each segment of an Interstate or other limited-access highway is converted to per-mile charges, that portion of the state's overall highway system will become self-supporting and will no longer consume a portion of the declining revenue from fuel taxes. Fuel tax revenues will no longer have to cover the ongoing maintenance of the converted corridors and, more importantly, fuel tax revenues will not have to be used to rebuild and modernize the corridors that have been converted.

As noted previously, the GeauxPass-type transponder system would not be practical for the open-access state highways (which include critically important urban arterials). Nor would it work for local streets and roads. But if limited-access highways are converted first, Louisiana will have many years to learn from other states' pilot projects and to experiment with customer-friendly ways for roadway users to record and report their other miles travelled.

Here is a brief summary of key features that have been well-received by participants in MBUF pilot projects elsewhere:[21]

- Keep it simple and understandable: a user fee to pay for roads.
- Replace the state fuel tax, rather than adding the fee on top of that tax.
- Make it fair to both rural and urban users, including lower per-mile charges for rural roads.
- Make it transparent and self-explanatory, as with utility bills.
- Use private firms, selected competitively, to handle collecting, processing, and protecting miles-traveled data.
- Legislate strict privacy protections for miles-traveled data.

Among the options for recording miles traveled that have been offered to participants in state pilot projects are the following:

1. Annual odometer readings at the time of vehicle registration renewal;
2. An all-you-can-drive option under which the annual charge would be the equivalent of what the vehicle would owe for driving twice the average number of miles driven per vehicle in that state; this would mean no technology in the vehicle and no need to report miles.
3. An on-board unit that plugs into the OBD-II port beneath a vehicle's dashboard and records miles driven, and if certain location information is needed (e.g., if some miles are driven across a state or county border), those miles are identified using cell-tower data; and,
4. An on-board unit that uses GPS to provide more-precise location data than is available by using cell-tower data.

It is important to understand that the GPS system of satellites does not "track" anyone. GPS signals permit the vehicle's computer or its operator to know where the vehicle is at any given time. That information can be stored on the vehicle, but it would only be uploaded if that is what the customer signed up for. It would operate much like the GPS receiver in a smartphone, which lets the phone's owner know his or her device location at any time but

[21] Peter J. Basso, "Long-Term Solvency of the Highway Trust Fund: Lessons Learned from the Surface Transportation System Funding Alternatives Program," Testimony Before the Senate Committee on Environment and Public Works, 14 April 2021.

does not transmit that information to anyone else without the owner's permission. Regardless of which method of reporting miles is used, stringent privacy protection for that data must be ensured by statute.

Assuming Louisiana begins the transition to per-mile charging using the Geaux-Pass system on all the limited-access highways, that system will handle the revenue collection for all *those* miles traveled. That would be one third of all the VMT in the state, as shown in Table 2.

TABLE 2: LOUISIANA VEHICLE-MILES TRAVELED BY TYPE OF ROADWAY (2020)

Category	VMT (millions)	Percent
Limited Access Highways		
Interstates, rural	6,436	
Interstates, urban	8,496	
Other freeways and expressways, urban	1,160	
Other freeways and expressways, rural	124	
Subtotal:	16,216	33.5%
State Highways & Arterials		
Other principal arterials, rural	2,349	
Other principal arterials, urban	6,301	
Minor arterials, rural	2,834	
Minor arterials, urban	6,226	
Major collectors, rural	3,431	
Subtotal:	21,141	43.7%
Local Roadways		
Major collector, urban	3,797	
Minor collectors, urban	1,191	
Minor collectors, rural	1,270	
Local roads, urban	2,234	
Local roads, urban	2,527	
Subtotal:	11,019	22.8%
Total Louisiana VMT	48,374	100.0%

Source: FHWA Highway Statistics, Table VM-2

The next challenge is how to charge for the remaining VMT, driven on two different categories of roadway: those with state highway numbers that are managed and

maintained by DOTD and the remaining roads that are the responsibility of cities and counties. These categories are listed in Table 2 by roadway provider.

Since it would be desirable to include greater roadway-provider accountability to highway customers in the new roadway payment system, ideally the MBUF system would be able to calculate how many miles each vehicle traveled on state roads and how many on local roads. Unless all vehicles used a very precise system such as GPS that could distinguish between these road types, that would not be a realistic goal. But a second-best approach is available.

A state agency—either DODT or the Office of Motor Vehicles—could identify all the VMT in each county and subtract the amount driven and already paid for on the limited-access highways. For simplicity, just divide the balance between state highways located in that county and the remaining city/county roads. DOTD would prepare its annual budget for the state highways and calculate the rate per mile needed for the coming year, subject to regulatory approval. That budget could then be divided proportionately, as is done today. A similar process would take place eventually at the county level.

The aim is to provide a transparent system where roadway customers know who provides which set of roads they use, what they charge per mile traveled, and therefore what they must pay, like the utility bills everyone is familiar with. Figure 7 provides a hypothetical Roadway Utility Statement. This concept assumes an annual statement comparable to property tax bills, but it would also be possible for people to pay their highway bills in quarterly or monthly installments.

This statement shows the annual amount due to the state for state and local roadways. The charge for “Limited Access Providers” would be billed directly to their customers. Those providers may be one or more toll agencies or roadway utility companies operating under long-term franchises.

FIGURE 7: HYPOTHETICAL LOUISIANA ROADWAY USER FEE STATEMENT

SAMPLE ROADWAY USER FEE BILL

2035 LOUISIANA ROADWAY UTILITY STATEMENT

ACCOUNT INFORMATION

Account Number

Name

Address

ROADWAY USE AND CHARGES

Providers	Per-Mile Rate	Miles Driven	Amount
County Agency	1.5 cents/mile	3,192	$47.88
Louisiana DOT	2.0 cents/mile	6,118	$122.36
Limited Access Providers (billed separately, so omitted from amount due on this bill)	4.5 cents/mile average	4,690	$211.05
Total		14,000	$381.29
Amount Due for State and Local Roads			**$170.24**

ROADWAY USAGE

AMOUNT DUE: $170.24

PART 9

CONCLUSION AND RECOMMENDATIONS

Louisiana's transportation policy has not yet addressed the impending decline in revenue from per-gallon gasoline and diesel taxes. It was not until 2022 that the state began to hold EVs and hybrid vehicles somewhat accountable, imposing flat annual fees on both. Louisiana is planning to take its first step toward introducing MBUFs by planning a state pilot project, as a growing number of other states have done.

> *Louisiana's objective should be not merely to replace the revenue that fuel taxes have traditionally provided but to remedy the other shortcomings of fuel taxes.*

This study has argued that a transition from per-gallon taxes to per-mile charges will be necessary over the next several decades. It has also recommended that in designing such a program, Louisiana's objective should be not merely to replace the revenue that fuel taxes have traditionally provided but to remedy the other shortcomings of fuel taxes. These

include lack of transparency, lack of accountability of road providers to road users, and the fact that the fuel tax is a tax rather than a true user fee like utility bills.

Any switch-over from gas taxes to mileage-based user fees will necessarily be gradual. This study recommends beginning the transition with limited-access highways. The charging method is an electronic transponder, with which some Louisiana motorists are already familiar thanks to the GeauxPass system. The charges to use the limited-access system would be stated on a per-mile basis. Customers who pay these new electronic per-mile charges would be given refunds for the amount of fuel taxes they have incurred for the miles driven on the per-mile-charged limited-access system. When this step is completed, about one-third of Louisiana's vehicle-miles traveled will have been transitioned from paying per gallon to paying per mile. Customers will receive regular statements documenting the miles driven and amounts charged via mileage-based user fees.

Once success has been sufficiently demonstrated by the conversion of limited-access highways, Louisiana should move to the next step: planning the transition of state and local roadways to a per-mile charging system. As success is shown in other states—including Oregon, Utah, Virginia, and others—Louisiana can learn and benefit from their experiences. By the time serious implementation planning is underway for state and local roadways, many of the details will have been worked out elsewhere. The U.S. Department of Transportation has agreed with the Government Accountability Office's recommendation that the FHWA establish criteria to assess the scalability of MBUF pilot projects in the states. Road-user-charging technology will have advanced, and a number of states that have participated in MBUF pilot projects will by then be "paving the way" with statewide systems in the early stages of implementation.

In the near term, state transportation policymakers should prioritize one important next step, in addition to the MBUF pilot project: DOTD should do an assessment of all its freeways and Interstates to determine which corridors will need reconstruction and which may need additional lanes over the next 20 years. The study should result in a 20-year plan to leverage the new per-mile charges to finance a 20-year modernization program for those vitally important highways.

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ABOUT THE AUTHOR

Robert Poole is director of transportation policy and the Searle Freedom Trust Transportation Fellow at Reason Foundation.

His 1988 Reason policy paper proposing privately financed toll lanes on congested freeways directly inspired California's landmark private tollway law (AB 680), which led directly to the world's first express toll lane facility, added to the SR 91 freeway in Orange County. Today more than 60 express toll lane facilities are operational nationwide. In 1993 Poole managed a Reason policy study that introduced and named the term High-Occupancy Toll (HOT) lanes.

In 2005 Poole served as a member of a special committee of the Transportation Research Board (TRB) that assessed the long-term viability of fuel taxes as the primary source of highway funding. The report, *The Fuel Tax and Alternatives for Transportation Funding,* concluded that fuel taxes would eventually need to be replaced.

Since 1988 Poole has advised the Federal Highway Administration, the Federal Transit Administration, the White House Office of Policy Development and National Economic Council, the Government Accountability Office, and the state DOTs of California, Florida, Georgia, Indiana, Michigan, Texas, Utah, Virginia, and Washington State. He served 18 months on the Caltrans Privatization Steering Committee overseeing the implementation of AB 680. He served on California Gov. Pete Wilson's Commission on Transportation Investment in 1995-1996. In 2008 he served as Gov. Rick Perry's appointee on the Study

Committee on Private Participation in Toll Roads. In 2010 he was a member of Washington State DOT's Expert Review Panel on the I-405 express toll lanes project. In 2010 he also served on the transportation transition team of Florida Gov.-elect Rick Scott.

Poole is a long-time member of the board of the P3 Division of the American Road & Transportation Builders Association. He has served as a member of TRB committees on Congestion Pricing and Managed Lanes, and is currently a member of the P3 Subcommittee of TRB's Economics and Finance Committee.

His sixth book, *Rethinking America's Highways*, was released in 2018 by the University of Chicago Press and reissued in paperback in 2021. He edits and publishes the monthly Reason Foundation newsletter, *Surface Transportation Innovations*, and writes a monthly column on transportation policy for *Public Works Financing*. His op-eds have appeared in national newspapers including the *New York Times*, *Washington Post*, *The Wall Street Journal*, and *USA Today*.

Poole received his B.S. and M.S. degrees in mechanical engineering from MIT and did graduate work in operations research at New York University.