The Tennessee Advisory Commission on Intergovernmental Relations

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MEMORANDUM

TO: Commission Members

FROM: Cliff Lippard
Executive Director

DATE: 9 June 2021

SUBJECT: Electric Vehicles and Other Issues Affecting Road and Highway Funding

At the Commission's January 2021 meeting, several members raised concerns that the increased adoption of electric vehicles (EVs) as replacements for gas- or diesel-powered vehicles would reduce state-shared tax revenue—specifically from state fuel taxes—that the state and local governments use to build and maintain roads. They further raised the possibility that this decrease in revenue from one state-shared tax might be at least partially offset by increases from another—the payments in lieu of taxes (PILOTs) made by the Tennessee Valley Authority (TVA)—resulting from the additional electricity used to charge EVs. And they noted growing demand from residents for more EV charging infrastructure. Members asked staff to take a preliminary look at these related issues; this memo and the accompanying research plan are the first steps in response to that request.

Increased EV adoption will reduce state-shared revenue, but the effect is small compared with other factors.

Using an estimate of 100,000 EVs on Tennessee's roads in 2030 and an assumption those vehicles would typically replace gas-powered vehicles with an average fuel economy of 35 miles per gallon, Atlas Public Policy and the Tennessee Department of Environment and Conservation (TDEC) estimate state fuel tax revenue would be $8.8 million less than it otherwise would have been in 2030. Approximately 25% of gas tax revenue is distributed to county aid funds, and 13% goes to municipal street funds. As a result,

Commission staff estimate a $2.2 million decrease in state fuel tax revenue shared with counties and a $1.1 million decrease for cities. [1]

While the increased adoption of EVs would result in greater registration fees for the state because of its existing $100 annual fee on EVs, the revenue from these fees goes entirely to the state highway fund and is not shared with local governments. Atlas and TDEC estimate the state's existing $100 EV registration fee would generate $10.4 million in 2030, more than compensating for the overall loss in state fuel taxes—though as EVs start to replace less fuel-efficient vehicles, the current registration fee may not be enough to offset these losses. However, because registration fees are not shared, the decreases in *local* transportation funding from state-shared fuel taxes would not be automatically offset by increases resulting from EV registration. Please see Attachment A for a Venn diagram of vehicle-related revenue streams for state and local governments and Attachment B for a Venn diagram of taxes and fees vehicle owners pay.

More so than the fuel tax lost to electric vehicles, Atlas and TDEC point to inflation as "the single largest source of revenue loss." Without increases to match inflation, the buying power of Tennessee's current 26-cents-per-gallon fuel tax would be reduced by approximately 15% to 25% in 2030, which is the equivalent of cutting it back to 20 cents today. This loss is shared by the state and local governments alike. Moreover, the costs to design, build, and maintain our transportation infrastructure have been rising much faster than overall inflation: The Federal Highway Administration's National Highway Construction Cost Index grew by 88.2% from December 2003 to December 2019 compared to 39.4% for inflation as a whole.

Additionally, as vehicles fueled by gasoline and diesel become more efficient, less fuel tax is collected per vehicle mile driven. The US Environmental Protection Agency says the average fuel economy for all new vehicles increased from 19.3 mpg in 2004 to 24.9 mpg in 2019, a 29% improvement. Commission staff calculated that a vehicle in Tennessee getting 24 mpg over 12,000 miles per year provides $135 in state fuel tax; at 30 mpg the amount falls to $108 (–20%). Improving to 40 mpg would further reduce revenue to $81. Even if there were no new electric vehicles at all, Atlas projects a 15%

[1] Estimates of future EV adoption in Tennessee vary. The TVA goal of 200,000 EVs in its service area, for comparison, would mean approximately 140,000 EVs in Tennessee. Separately, the "Drive Electric TN" coalition (https://driveelectrictn.org/) hopes to see 200,000 EVs in Tennessee alone by 2028. Regardless of the number of vehicles, the $100 EV registration fee approximates the fuel tax revenue of 12,000 miles driven by a 30 mile-per-gallon gasoline-powered vehicle.

decline in fuel tax revenue by 2030 (not adjusted for inflation), as overall fuel economy increases by 25%.

Tennessee's system to fund its transportation infrastructure shares many common features with other states, though differences exist in how each state addresses EVs and other revenue challenges. Tennessee is one of 30 states to charge a special fee on electric vehicles—an additional $100 registration fee that goes to the state highway fund. In other states, these fees range from $50 to $225, and how they are earmarked varies, with several that distribute revenue from these fees to local governments, and some that use the money to expand vehicle charging infrastructure. Tennessee is one of 25 states that charges a flat-rate for vehicle registration, with all passenger vehicles charged $26.50. The remaining states base their fees on vehicle weight, value, age, or some other metric. Tennessee's gas tax is a fixed, per-gallon amount, and is not automatically adjusted for inflation. The National Conference of State Legislatures lists 22 states with variable-rate taxes that automatically adjust to inflation or other metrics. The federal gas tax of 18.4 cents per gallon has not been increased since 1993. Tennessee was one of only three states in federal fiscal year 2017 to generate enough revenue from state fuel taxes and registration fees to pay 100% of the state's share of transportation spending. The remaining states use revenue from non-transportation-related sources, like sales taxes.

Vehicle charging will remain a small percentage of total electricity consumption, with only a small effect on TVA PILOTs.

In 2019, electric vehicles in the US accounted for just 0.1% of all electricity used. In November 2020, TVA adopted new policies intended to remove barriers to the expansion of EV charging stations and set a target for 200,000 EVs in the region by 2028. This was a significant increase from approximately 14,000 at the time. Commission staff estimate that, if there were currently 200,000 battery-powered EVs in the TVA region, the electricity needed to charge them would only represent 0.6% of TVA's total annual power sales. TVA's *2019 Integrated Resource Plan* considered a projected 750,000 EVs in its baseline 20-year outlook, and with that considered, forecasts annual systemwide growth rates of just 0.1%.

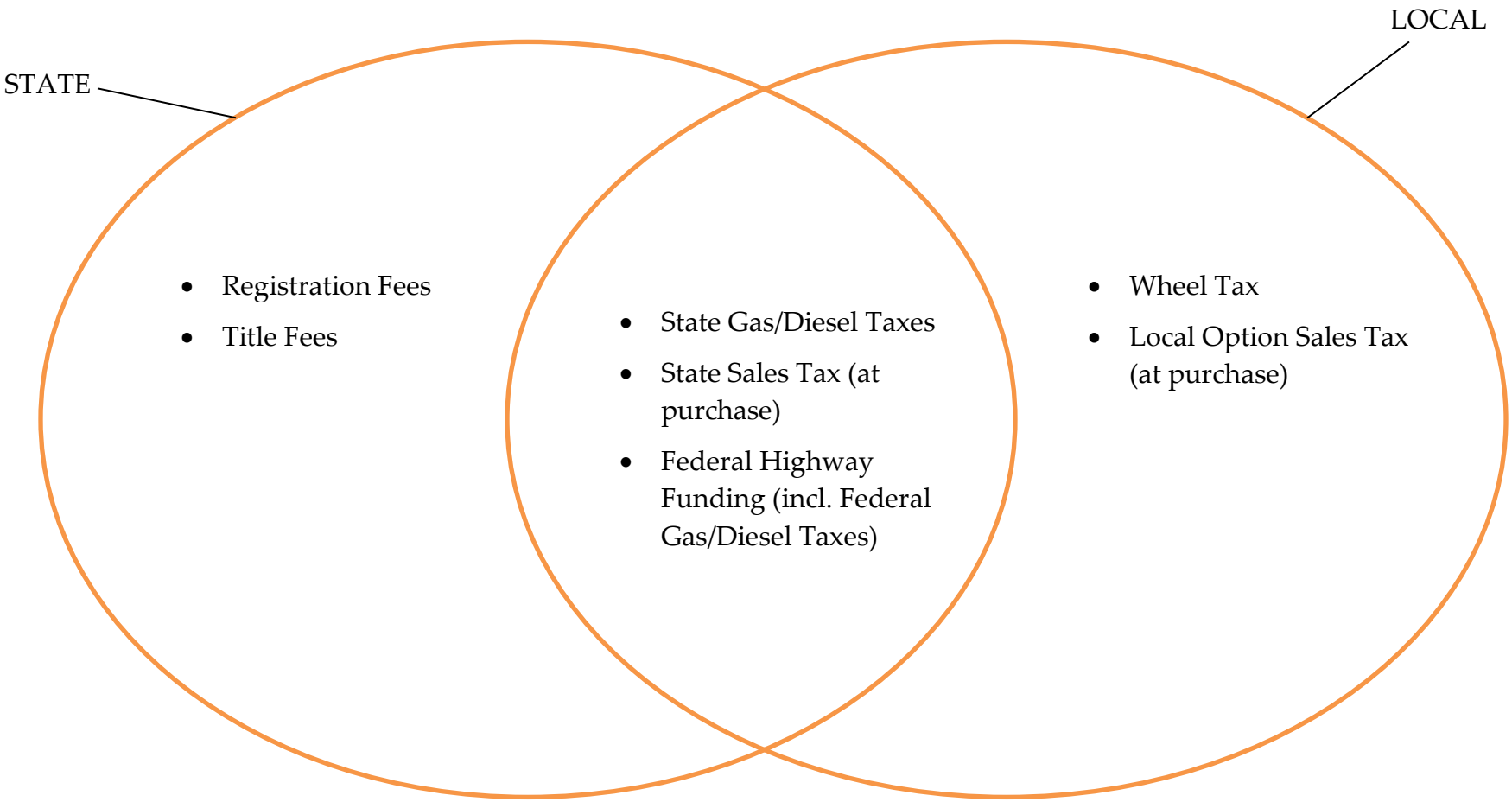
Because the amount of electricity used to charge EVs will remain a small portion of total consumption compared to other residential, commercial, and industrial uses, even as EVs become more common, their effect on TVA PILOT distribution will be minimal. Using TVA's goal of 200,000 EVs in the region, Commission staff estimates the electricity needed to power an additional 186,000 EVs could add about $2.8 million to TVA's total PILOT, assuming all other electricity use remains the same. Tennessee could see $1.9 million of that increase, with approximately $650,000 going to counties and $280,000 to cities, which local governments could use to offset a portion of lost state

fuel tax revenue. However, any increase from EVs would not be distinguishable from typical fluctuations in these payments. And unlike state fuel tax revenue, TVA PILOT revenue is not earmarked for transportation and local governments use their PILOT revenue to fund many different needs.

The state and other stakeholders are working on EV-related initiatives.

While there is, on one hand, concern about the effects electric vehicles will have on revenue for roads, commission members at the January meeting also expressed a desire to provide more support for electric vehicles (e.g. charging stations). TVA's November 2020 policy changes are intended to give local power companies and EV charging providers more flexibility and better rates, to encourage the development of more charging locations. TVA and TDEC are also collaborating to fund a network of fast charging stations every 50 miles along Tennessee's interstates and major highways. Through initiatives like Drive Electric Tennessee and the TN Electric Vehicle Advisory Council, the state is developing its charging infrastructure and has made electric vehicle manufacturing a key part of its economic development strategy.

Attachment A: Vehicle-Related Revenue Streams for State and Local Governments



Note: Local governments often use general funds for transportation.

Attachment B: What Taxes and Fees do Vehicle Owners Pay?