Maryland Department of Transportation
The Secretary's Office

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

James T. Smith, Jr.
Secretary

January 20, 2015

The Honorable Edward J. Kasemeyer
Chair
Senate Budget and Taxation Committee
Miller Senate Office Building, 3 West Wing
11 Bladen Street
Annapolis MD 21401

The Honorable Maggie McIntosh
Chair
House Appropriations Committee
House Office Building, Room 251
Annapolis MD 21401-1991

The Honorable Sheila E. Hixson
Chair
House Ways and Means Committee
House Office Building, Room 131
Annapolis MD 21401-1991

Dear Chair Kasemeyer, Chair Conway, and Chair Hixson:

Please see the attached report regarding *Electric Vehicles and Recharging Equipment – Rebates and Tax Credits*. This report is in response to terms set forth in Senate Bill 908 and House Bill 1345, Chapters 359 and 360, Acts of 2014. The language directs:

> *"...That, on or before January 1, 2015, the Maryland Energy Administration and the Maryland Department of Transportation shall report to the Senate Budget and Taxation Committee, the House Appropriations Committee, and the House Committee on Ways and Means, in accordance with § 2-1246 of the State Government Article, on:*
>
> 1. *The amount of Transportation Trust Fund revenue that is paid by owners of electric vehicles to the Transportation Trust Fund for the construction and maintenance of roadways in the State; and*
>
> 2. *A plan for owners of electric vehicles to contribute to the Transportation Trust Fund for the construction and maintenance of roadways in the State."*

If you have additional questions or concerns, please do not hesitate to contact Mr. Donald A. Halligan, MDOT Office of Planning and Capital Programming Director, at 410-865-1275 or by email at dhalligan@mdot.state.md.us.

Sincerely,

James T. Smith, Jr.
Secretary

cc: The Honorable Thomas V. "Mike" Miller, President, Maryland Senate
The Honorable Michael E. Busch, Speaker, Maryland House of Delegates
Members of the Senate Budget and Taxation Committee
Members of the House Appropriations Committee
Mr. Fred Hoover, Division Director, Energy Programs, Maryland Energy Administration
Mr. Donald A. Halligan, Director, Office of Planning and Capital Programming, MDOT

Report to the Maryland General Assembly

Senate Budget and Taxation Committee

House Appropriations Committee

House Ways and Means Committee

regarding

Electric Vehicles and Recharging Equipment – Rebates & Tax Credits

(SB 908/HB 1345, Chapters 359 and 360, Acts of 2014)

The Maryland Department of Transportation
and
The Maryland Energy Administration

January 2015

Electric Vehicles and Recharging Equipment – Rebates & Tax Credits

(SB 908/HB 1345, Chapters 359 and 360, Acts of 2014)

This document was created in response to reporting requirements found in SB 908/HB 1345, Chapters 359 and 360, Acts 2014, *Electric Vehicles and Recharging Equipment – Rebates & Tax Credits*. The language directs

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> *(1) the amount of Transportation Trust Fund revenue that is paid by owners of electric vehicles to the Transportation Trust Fund for the construction and maintenance of roadways in the State; and*
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> *(2) a plan for owners of electric vehicles to contribute to the Transportation Trust Fund for the construction and maintenance of roadways in the State."*

This report provides a summary of Maryland's activities and accomplishments in promoting increased Electric Vehicle (EV) adoption. In an effort to balance Maryland's overarching goal of achieving widespread EV adoption with the concerns regarding EVs' impacts to the Transportation Trust Fund (TTF), this report recommends delaying implementation of an annual EV fee or other preferred revenue mechanism until the total number of EVs registered in Maryland reaches at least 1.25 percent of the State's total fleet of passenger vehicles.

OVERVIEW AND SCOPE

There are many benefits to be realized by expanding the use of EVs and further developing charging station infrastructure throughout Maryland, such as reducing emissions that adversely affect air quality and climate, reducing dependence on foreign oil, and creating new jobs in the manufacturing sectors. For the past three years Maryland's Electric Vehicle Infrastructure Council (EVIC), created by legislation introduced by Governor O'Malley in 2011, has met regularly to develop, plan, and implement various programs and policies to support the EV industry around the State.

The Maryland Department of Transportation (MDOT) and the Maryland Energy Administration (MEA) understand the concerns of the budget committees and recognize the potential transportation impacts of increased alternative fuel vehicle use on the State's TTF.

In exploring the different approaches available for addressing the EV issue, it is important to keep in mind that Maryland currently has in place three popular incentive programs to promote increased EV adoption: (1) an excise tax credit at the point of purchase of a new EV; (2) a rebate for costs associated with the purchase and installation of EV charging station equipment; and (3) HOV lane use decal. In addition, it is important to recognize the total number of EVs currently registered in Maryland within the larger context of the State's overall passenger vehicle fleet: out of the 4.8 million conventional automobiles currently registered in Maryland, as of November 1, 2014 there are approximately 5,000 EVs, or .11 percent.

Through the development of the EVIC's work, it has become clear that the future of electric vehicles in Maryland will depend on many factors, including continued collaboration among the public and private sectors. To that end, many of the EVIC's recommendations should be pursued within the context of an overarching goal of widespread EV adoption and are intended to provide sufficient support to reach an ambitious goal of 60,000 EVs on the road in Maryland by 2020.

ELECTRIC VEHICLE INITIATIVES IN MARYLAND

The EVIC is comprised of representatives of automobile manufacturers and dealers, manufacturers of electric vehicle charging equipment, utilities, electrical workers, State and local governments, and environmental and energy experts. As required by its enabling legislation, the EVIC's 2012 report included the following:

- An Action Plan to expand the adoption of plug-in electric vehicles (PEV);
- An Infrastructure Plan to help guide the development of a statewide charging infrastructure network; and
- Various policy and programmatic recommendations to help coordinate State and local policies that will continue to make owning an electric vehicle convenient and economical, help create green jobs, achieve a cleaner, healthier and more energy independent Maryland as well as a self-sustaining vibrant industry.

Presently the EVIC is focusing on the following efforts:

- Engage more extensively with local counties and municipalities on education, outreach and planning initiatives.
- Study issues and opportunities for workplace and urban charging and continue the development of solutions and best practices.
- Establish goals for the State vehicle fleet to increase the number of its zero-emission vehicles through the normal course of fleet replacement, so that at least 10 percent of fleet purchases of light-duty vehicles are zero-emission by 2020 and at least 25 percent of fleet purchases of light-duty vehicles are zero-emission by 2025.
- Explore the potential for the leasing of EVs, bulk purchase agreements with local governments, and bulk purchase or lease agreements with the other North East corridor states to reduce purchase costs.

- Implement an Education and Outreach plan, that includes
    - A State website for Maryland-specific plug-in electric vehicle (PEV) information and resources;
    - Educational workshops and webinars for developers, property managers and homeowner associations about the benefits of providing charging for residents;
    - Guidance documents for local governments (Infrastructure Planning Guide for Local Governments; Urban and Multi-unit dwelling charging solutions and best practices for local governments, etc.)

The goal of MEA's Electric Transportation Program is to reduce Maryland's dependence on petroleum fuels by facilitating the development of the electric vehicle industry. MEA created the Electric Vehicle Infrastructure Program (EVIP) in early 2010 to aid the installation of electric vehicle recharging stations. MEA issued two grants under that program totaling $594,000. Eighty-one (81) public EV Recharging stations were installed.

In addition, MEA secured $1 million in FY 2014 for the installation of charging infrastructure at transit stations. Currently underway is a collaborative planning process between MDOT and MEA that will result in the installation of additional charging infrastructure at selected transit stations throughout Maryland. *EVnomics*[1], a commuter cost comparison web portal developed by MEA, allows consumers to value electric vehicles as a commuter choice.

A third program being administered by MEA is a $1 million competitive grant program with the goal of facilitating the development of a network of Level 3 or DC Fast-Charge stations across Maryland in accordance with the Council's Statewide Infrastructure Plan recommendations. Fast-Charge stations can provide a full charge for an all-electric vehicle in approximately 30 minutes. This program is funded by settlement proceeds from a Clean Air Act enforcement action by the State. This grant program is intended to seed private investment in the build-out of a statewide fast charging network to facilitate travel to and through the State, enabling the flow of people and goods throughout the region.

IMPACT TO THE TRANSPORTATION TRUST FUND (TTF) - ANALYSIS

The following analysis provides greater detail and context to the concerns raised by the budget committees. Specifically, it estimates the annual contribution of conventional vehicles (both older and newer, more fuel efficient models) and electric vehicles (both pure and plug-in hybrid electric vehicles) to Maryland's TTF. To conduct such an analysis, several assumptions were made and are outlined below.

[1] http://energy.maryland.gov/evnomics

Assumptions:

- Current Plug-in Hybrid Electric Vehicles (PHEVs) have miles-per-gallon (MPG) equivalents between 73 and 115 MPG. This analysis used 107 MPG (based on Ford eFocus) for the purpose of calculating gas tax.

- All-electric vehicles do not pay any gas tax.
    - However, in addition to the gas tax, other vehicle contributions to the TTF include the six percent excise tax of the purchase price, annual registration fees ($50.50 per year), and the $100 title fee, which both all-electric and PHEVs are assessed.

- All calculations are based on an average Vehicle Miles Traveled of 12,000 miles/year.

- Future trends for gasoline powered vehicles will be toward more fuel efficient models, so for this analysis the EVs and PHEVs have been compared to model year 2013 vehicles, with improved fuel economy, for the estimated contribution to the TTF.

- On average, conventional vehicles consume approximately 510 gallons per year and contribute approximately $137 to the TTF when traveling 12,000 miles/year. Three of the most fuel efficient gasoline powered vehicles manufactured in 2013 were selected for this analysis and the average MPG calculated is approximately 46.6 MPG. On average these vehicles consume 257 gallons annually and contribute approximately $69 to the TTF when traveling 12,000 miles per year. A typical PHEV would consume approximately 112 gallons annually and contribute $30 to the TTF for the same 12,000 miles, while an all-electric-vehicle would not pay any gasoline tax.

Vehicle Categories Paid	MPG[2]	Tax
Conventional gasoline powered sedan	23.5 MPG	$137
2013 improved fuel economy vehicle	46.6 MPG	$ 69
PHEV	107.0 MPG equivalent	$ 30
All electric Leaf	0.0 MPG for tax purposes	$ 0

Of the current count of electric vehicles in Maryland, approximately 76 percent are PHEV and 24 percent are all-electric. In this scenario, 4,213 vehicles would pay a total of $124,410 this year in gas tax and 1,326 vehicles would not pay any gas tax. However, in addition to the gas tax, other vehicle contributions to the TTF include the 6 percent excise tax of the purchase price, registration fees ($50.50 per year), and the $100 title fee. If those 5,473 total vehicles were instead new fuel efficient vehicles, they would have paid $377,637; representing a loss to the TTF of $253,227. Looking ahead at the overarching target goal of 60,000 EVs by 2020, there would be an annual loss to the TTF of $4.1 million if the tax remained at $0.27.

[2] www.fueleconomy.gov

Maryland's State Highway Administration (SHA) also worked with MDOT and MEA to develop an analysis of EVs' estimated cost of damage to the roadways. The analysis is as follows:

Cost of Damage

- If the average electric vehicle is approximately 3,000 pounds, it will take at least 10,000 EVs to cause $1 of damage on 1 lane-mile of pavement;
- In comparison, just one 80,000 pound. truck would cause approximately $4.50 in damage.
- If instead the electric vehicle weighs 4,000 pounds, then 10,000 EVs will cause approximately $3 worth of damage.
  Because pavement damage is caused by heavier vehicles, there is really no analysis for sedans on pavement damage.
- It should also be noted that the cost of damage increases exponentially with weight (hence the jump from $1 to $3 when the weight increased to 4,000 pounds).

Thus, 10,000 EVs would need to drive approximately 13,000 miles per year to cause $13,000 in TTF-funded roadway damage costs.

VARIOUS APPROACHES / OTHER STATE EXAMPLES

Several states have enacted policies to collect transportation revenues from electric vehicle owners, including an Annual Fee (which seems to be the growing trend), a tax on the electricity and further study of a Vehicle Miles Traveled fee. An overview of what other States have enacted follows:

Colorado - Colorado requires EV owners to pay an annual fee of $50.

Nebraska - $75 registration fee for an AFV that operates on "any source of fuel not otherwise taxed under the state motor fuel tax laws."

New Hampshire – The Taxation of Alternative Fuel and Electric-Powered Vehicles Commission was created to "study the taxation of alternative fuel and electric-powered motor vehicles for the purpose of funding improvements to the state's highways and bridges." Recommendations have not yet been released.

North Carolina – The Legislature approved a proposal to enact a $100 annual registration fee for electric vehicles.

Oregon – The state has agreed to a 5,000-vehicle opt-in program beginning in 2015 that allows drivers to pay a fee based on miles driven rather than gallons of fuel purchased.

The Road Usage Charge System adopted in Oregon has the potential to separate transportation revenues from gasoline consumption

Pennsylvania - Implemented a $0.0093 per kilowatt-hour (kWh) tax on electricity to power vehicles, which is paid through an annual alternative fuel tax report. Pennsylvania taxes the electricity used to power vehicles and electric vehicle (EV) drivers self-report by completing tax forms and remitting taxes at the end of the year.

Vermont - Conducted an Alternative Fuel Vehicles User Fee Study in 2012 that made various recommendations, including a $146 annual registration fee, a $0.036 per kWh fee for electricity to power electric vehicles based on metering or smart grid data, and a $0.013 per mile traveled fee based on data collection.

Virginia - Alternative fuel and all-electric vehicles are subject to a $64 annual license tax for road maintenance and improvement, paid for at the time of registration renewal.

Washington – A $100 per year vehicle registration renewal fee for EVs, will expire if a vehicle miles traveled (VMT) fee is instituted. Additionally, a Road Usage Charge Feasibility Assessment is being conducted using U.S. and international road use charging programs in order to asses a vehicle miles traveled fee.

RECOMMENDATIONS

The analysis above indicates that the current rate of EV adoption in Maryland results in nominal impacts to the TTF over the short term. However, when looking ahead at the overarching goal of reaching 60,000 EVs in Maryland by 2020, the impacts start to become more meaningful over the long term. Similarly, at this time the costs of damage resulting from EV use on State roadways is minimal and would remain so unless or until there is significant use by EVs and/or there is a dramatic increase in vehicle weights.

During this initial period of EV industry innovation and deployment, Maryland should avoid sending conflicting messages to the public whereby the State encourages consumers to buy less polluting vehicles through monetary and non-monetary incentives but then implements a different tax or fee to be paid instead. It is also important to consider the fact that EV owners are not receiving a "free ride" any more than the conventional vehicle owner. Addressing pollution costs money and MDOT provides funding for Transportation Emission Reduction Measures (TERMS) and the TTF covers a portion of the costs incurred in meeting the water quality targets mandated by the federal government's Chesapeake Bay Total Maximum Daily Load (TMDL) pollutant requirements. An all-electric vehicle contributes significantly less air emissions over its life than a comparable conventional vehicle, let alone an older model that does not achieve increased fuel efficiency. Maryland continues to realize benefits resulting from its efforts to promote EV's: General Motors made significant upgrades to its White Marsh facility in order to

provide critical parts for the GM all-electric vehicle, the Spark. These types of economic activities and jobs provide tax revenues to the State.

In an effort to balance the concerns raised by the budget committees with the State's current incentive programs, extensive EV initiatives and overarching goal to promote widespread EV adoption, the most balanced approach for Maryland involves determining a cap (i.e. when a certain percentage of the overall passenger fleet is reached) whereby a revenue mechanism (i.e. an annual fee[3] or other preferred option) would be implemented. ***Given the fact that there are only 5,473 EVs currently registered in Maryland (.114% of the State's current passenger fleet), and there is an overarching goal of reaching 60,000 EVs by 2020, the State could elect to implement an appropriate annual fee once the number of EVs reaches 1.25 percent of the State's fleet.***

CONCLUSION

The issue of transportation funding is an important component in the overall discussion on increasing EV use in Maryland.

MDOT and MEA remain committed to working together and with the Maryland General Assembly to determine the most appropriate path forward. At this time, it is imperative to find the proper balance between incentivizing EV adoption and sustaining consistent funding for the safety, operation and maintenance of Maryland's roadways.

[3] An annual fee administered at the point of registration renewal could provide the least amount of administrative burden when compared with trying to collect a KWh tax on the electricity used.