Balancing EVs & the Highway Fund

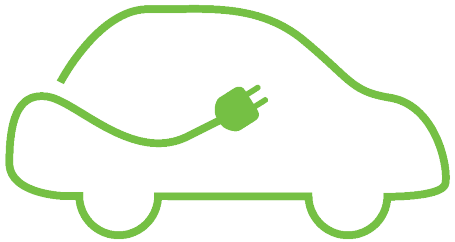
Maui Energy Conference
March 15, 2018

ulupono INITIATIVE

What's Wrong with the Gas Tax?

Single largest source of funding for State highways

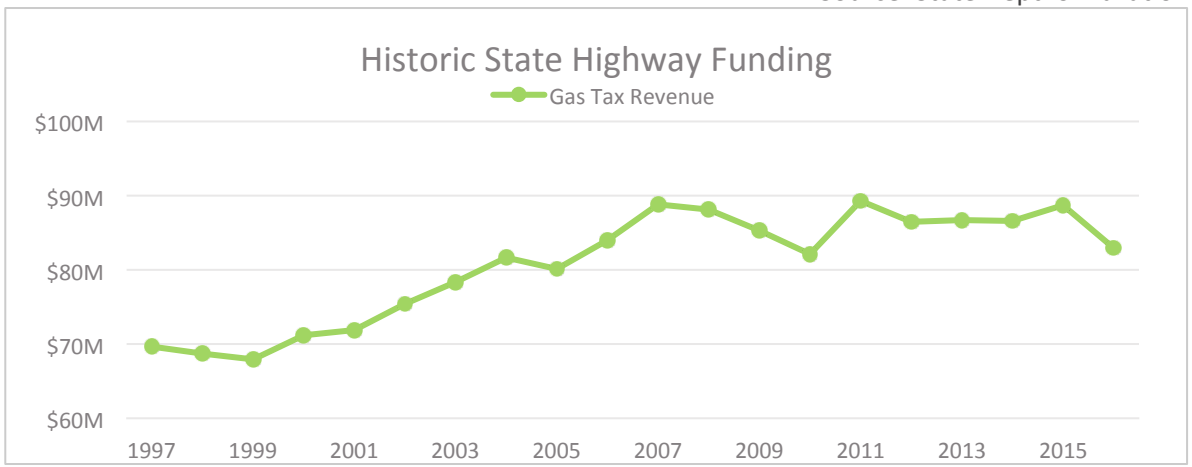
Electric vehicles do not pay any gas tax

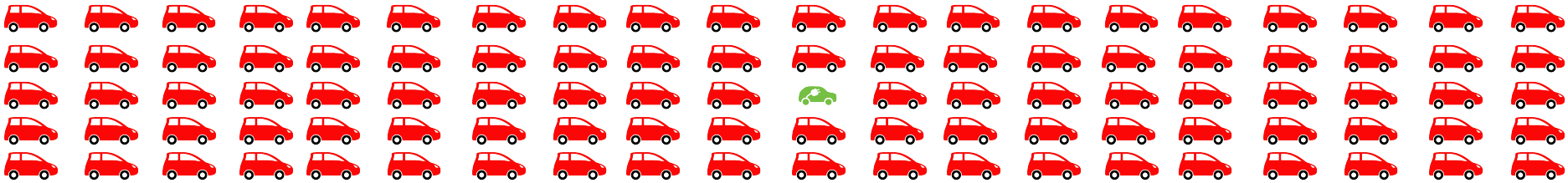


As EVs increase, highway funding will go down

Is It Really a Problem Now?

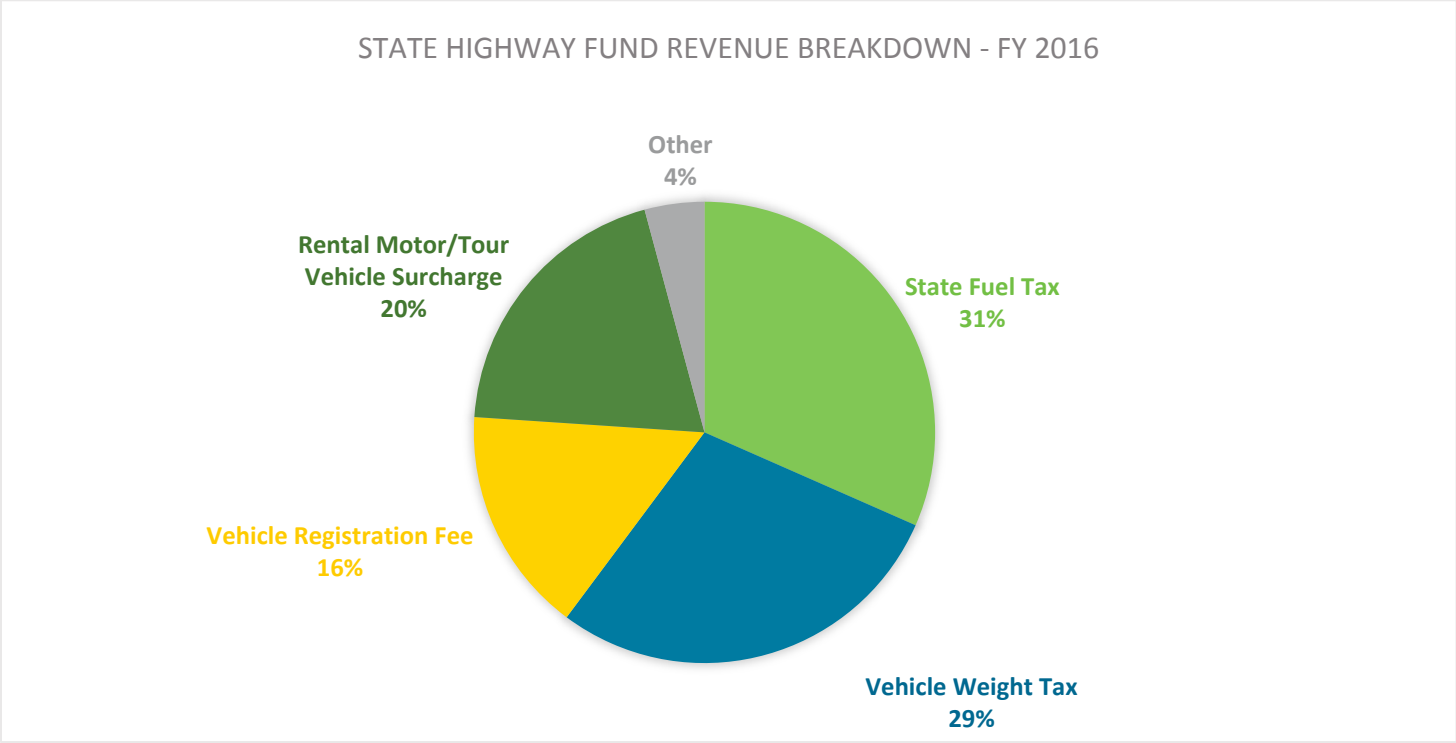
Source: State Dept. of Taxation





EVs account for only 0.63% of Hawai‘i’s 1.061M passenger vehicles
(Source: DBEDT, December 2017)

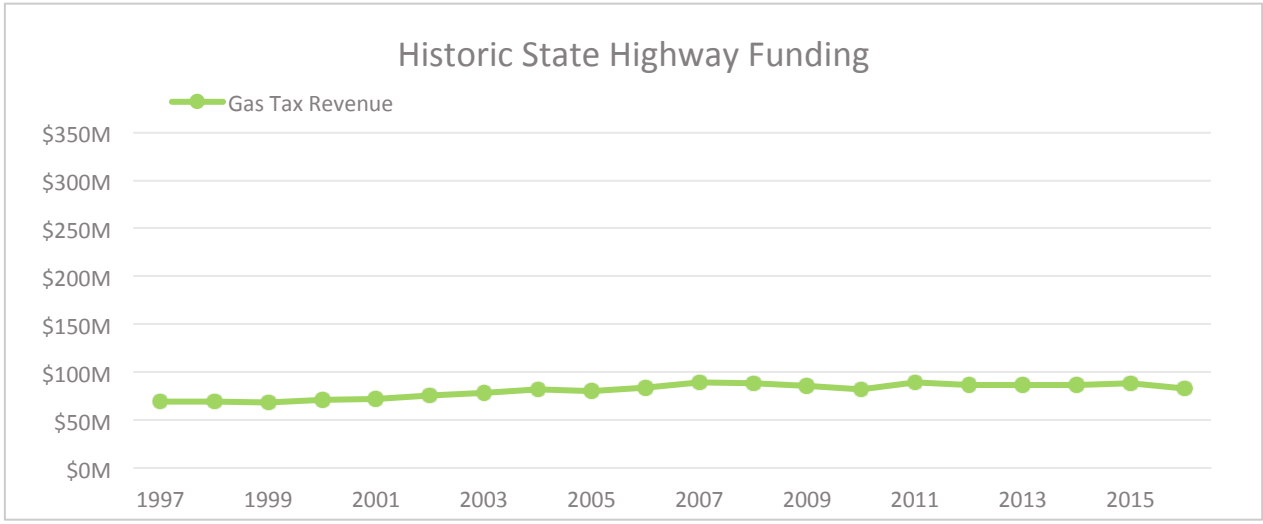
How are Highways Funded?



Source: Hawai'i Dept. of Transportation Highways Division – 2016 Financial Statements

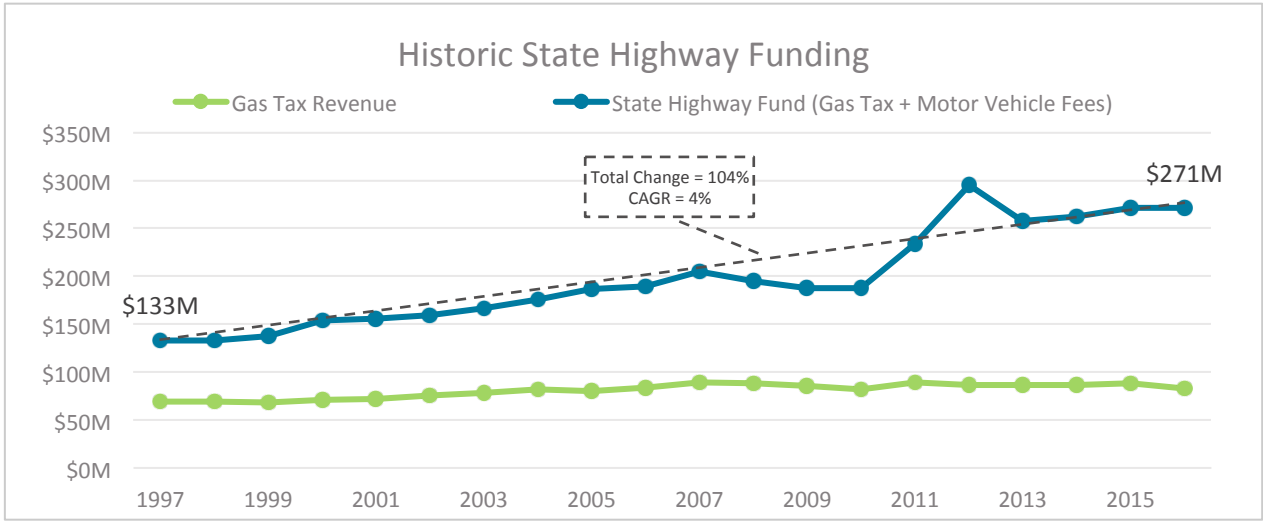
State Highway Fund – Harmed by EVs?

Source: State Dept. of Taxation



State Highway Fund – Harmed by EVs?

Source: State Dept. of Taxation



In terms of total funding, times have never been better

What is a VMT Tax and Why is DOT Studying It?

- VMT = Vehicle Miles Traveled
- Also known as “Road User Fee”
- Charges per mile driven
- No linkage to fuel consumption
- A simple Pay-As-You-Go system
- Drivers pay for how much road they use rather than how much fuel they burn
- DOT deserves credit for planning ahead in looking for solutions to problems that will be coming
- Most transportation planning experts and the academic literature have VMT taxes as the correct answer

What's Wrong with a VMT Tax?

DOT Study: Same VMT tax on all roads and for all vehicle types

- ✓ Transportation
- ✗ Energy
- ✗ Environment

One of These Things is Not Like the Other

Under the presently studied VMT tax, all of these vehicles would pay the same rate per mile

EVs ARE Different

More energy efficient:

- EVs are 59-62% efficient compared to Internal Combustion Engine (ICE) cars which are only 17-21% efficient
  (Source: U.S. Dept. of Energy, Office of Energy Efficiency & Renewable Energy)

More easily powered by renewable energy:

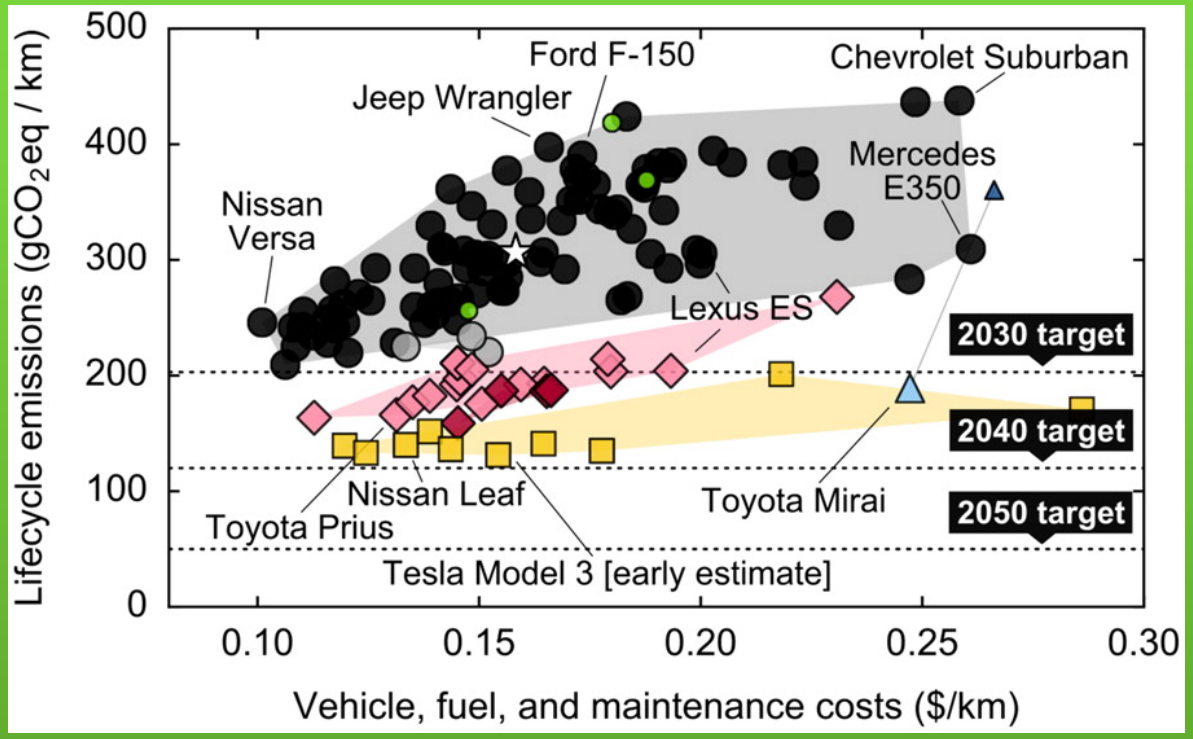
- Renewable electricity is ahead of biofuels in terms of large-scale production at competitive rates
- Easiest way to make transportation renewable is to electrify it

Can enable the integration of more renewables with smart charging/ discharging technology and rate structures

Zero-emission vehicles at the “tail pipe”

- What about the total lifecycle emissions?

Lifecycle Emissions



Source: "Personal Vehicles Evaluated Against Climate Change Mitigation Targets," Environmental Science & Technology, Sept. 27, 2016.

Includes:

1) Fuel combustion
2) Production, distribution and storage of fuel
3) Production, shipping and disposal of vehicles

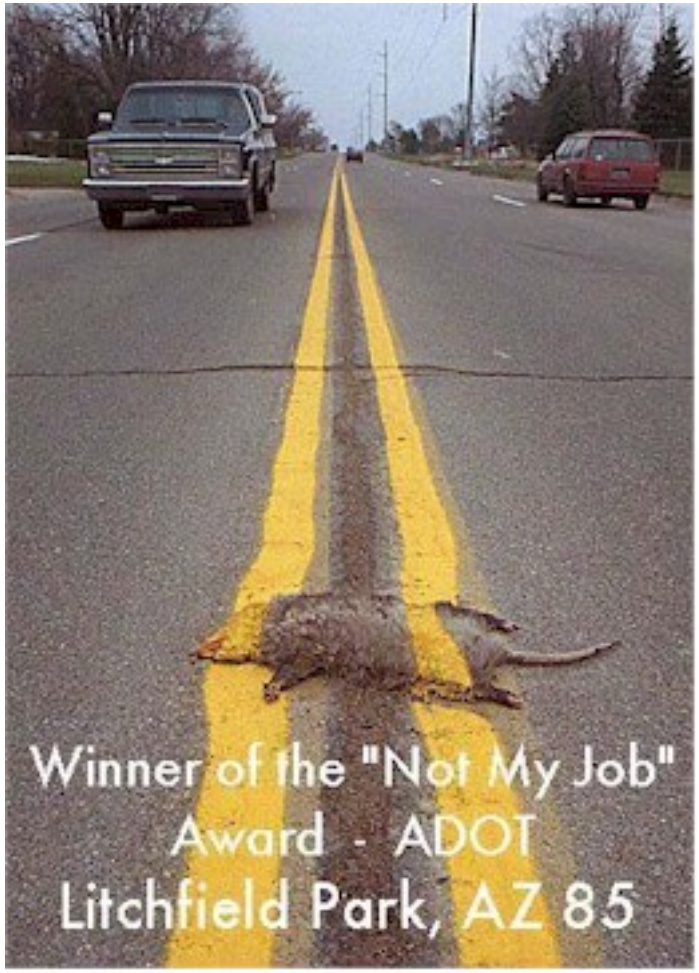
When full lifecycle emissions are considered, Nissan Leaf has half the GHG emissions of an average ICE car and 38% fewer than a compact ICE car

Fundamental Disconnect

Transportation	Energy	Environment

DOT is doing its assigned job, but transportation heavily impacts energy and environment

State Office of Planning



We can do better than this

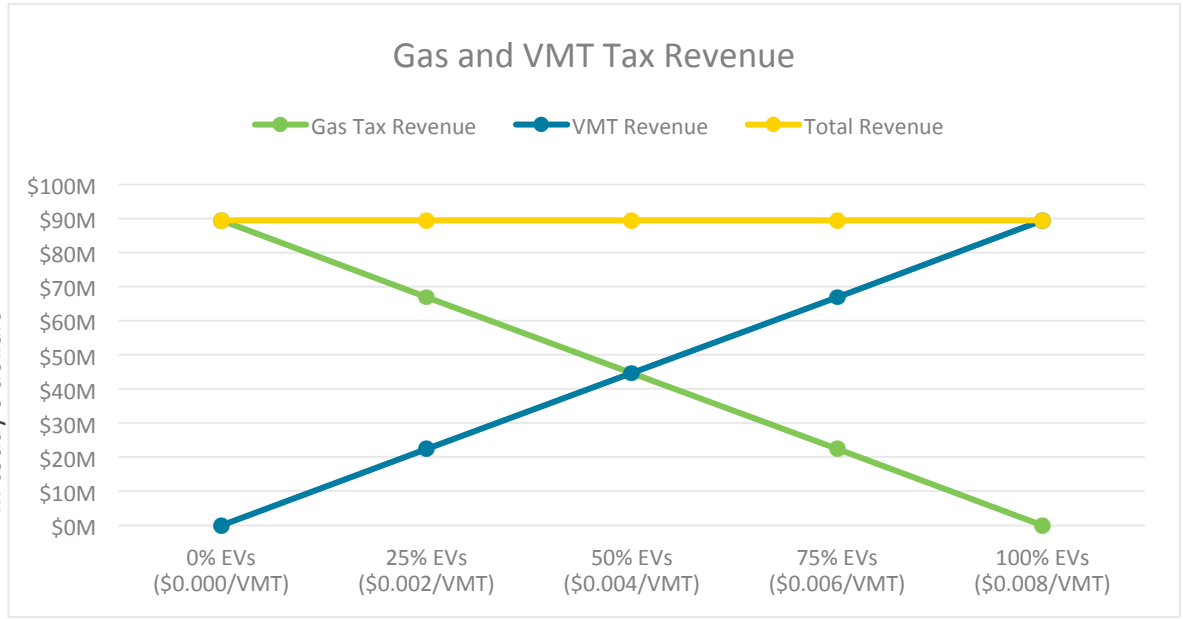
…by working together and across functions

VMT Tax – Part of the Answer

- With EVs being such a small share of passenger vehicles, there is no need to switch over completely
- Should not discourage energy efficiency and environmental protection so early in the EV adoption curve
- The simple fix of swapping the gas tax for a flat, across-the-board VMT tax is simply bad policy

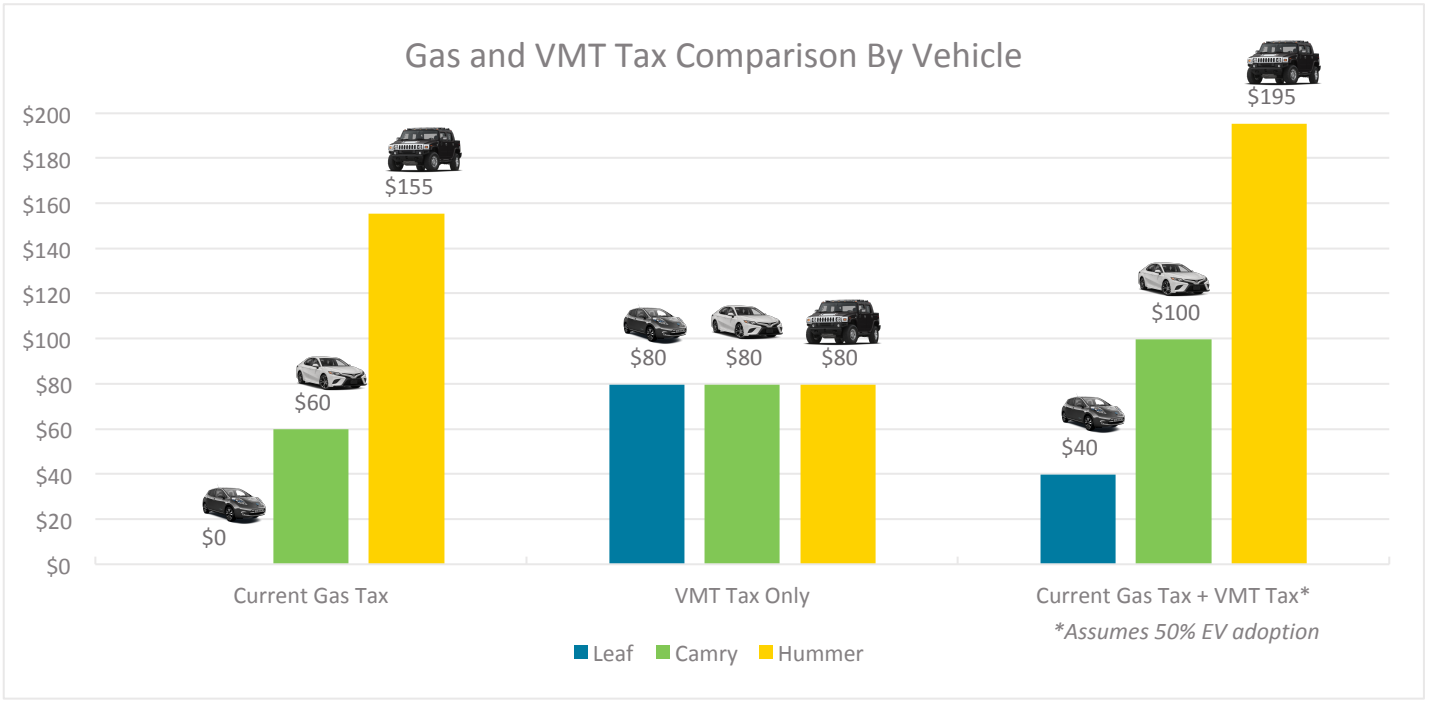
Potential Solution:

Move Gradually from Gas Tax to VMT Tax as EV Share Increases



- VMT can slowly be increased over time to make up for gas tax shortfalls
- This incentivizes energy efficiency and reduced emissions until such incentives are no longer needed

Policy Comparison by Vehicle Type



Under our proposed policy, everyone pays something for using the roads, yet there is still an incentive to be more fuel efficient and have less emissions

Other Solutions to a Declining Gas Tax: Aggressive Options

No VMT, just increase gas tax rate over time to make up the shortfall

- ✅ Heavily incentivizes energy efficiency and lower emissions
- ❌ Would become extremely punitive as EV % increases; Too aggressive; Probably not politically feasible

"Feebates" - Tax more heavily on less efficient, higher emission vehicles to provide incentives to zero-emission or more efficient vehicles

Norway:
Aggressive incentives have resulted in highest per capita EV ownership in the world

Other Solutions to a Declining Gas Tax: Carbon Tax and Varying Rates

Carbon Tax

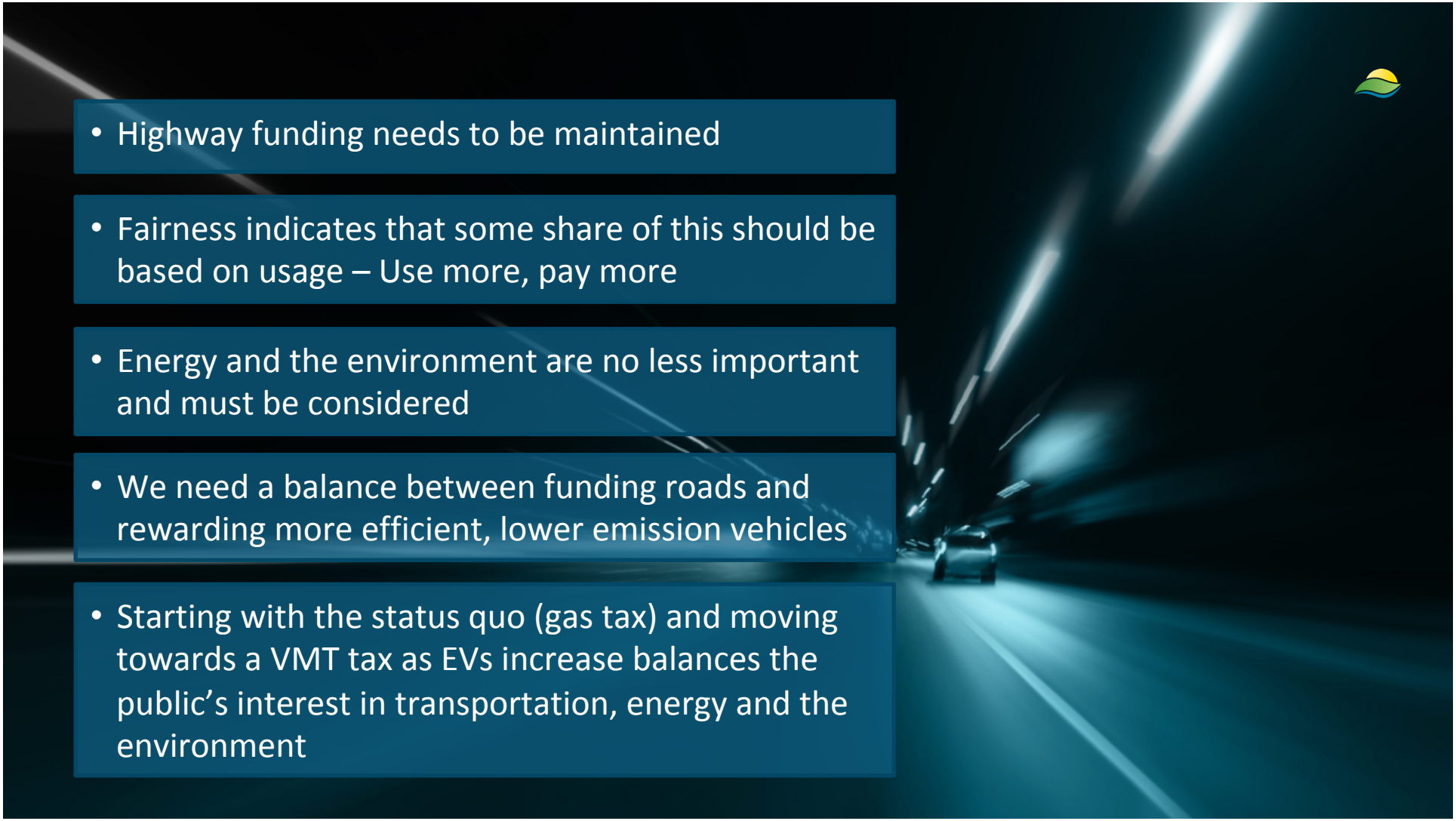
- ✓ Instead of paying per mile driven, pay per unit of emissions

Congestion pricing – Higher VMT taxes during peak hours

- ✓ Provides incentive for off-peak driving, reduces congestion and emissions, follows economic logic of higher prices for higher demand
- ✗ Will need policy and technology to support this

Varying VMT tax rates – Provide lower rates for EVs and high efficiency vehicles

- ✓ Everyone pays per mile while still rewarding efficiency and lower emissions
- ✗ Expect vigorous debate over what the "fair" rate is by vehicle class


• Highway funding needs to be maintained
• Fairness indicates that some share of this should be based on usage – Use more, pay more
• Energy and the environment are no less important and must be considered
• We need a balance between funding roads and rewarding more efficient, lower emission vehicles
• Starting with the status quo (gas tax) and moving towards a VMT tax as EVs increase balances the public's interest in transportation, energy and the environment

Mahalo!

www.ulupono.com

Murray Clay
Managing Partner
mclay@ulupono.com

Greg Gaug
Vice President
ggaug@ulupono.com

ulupono
INITIATIVE