

# PROPOSED MODIFICATIONS TO THE ZERO EMISSION VEHICLE REGULATIONS

## e-VMT Concept

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# Overview

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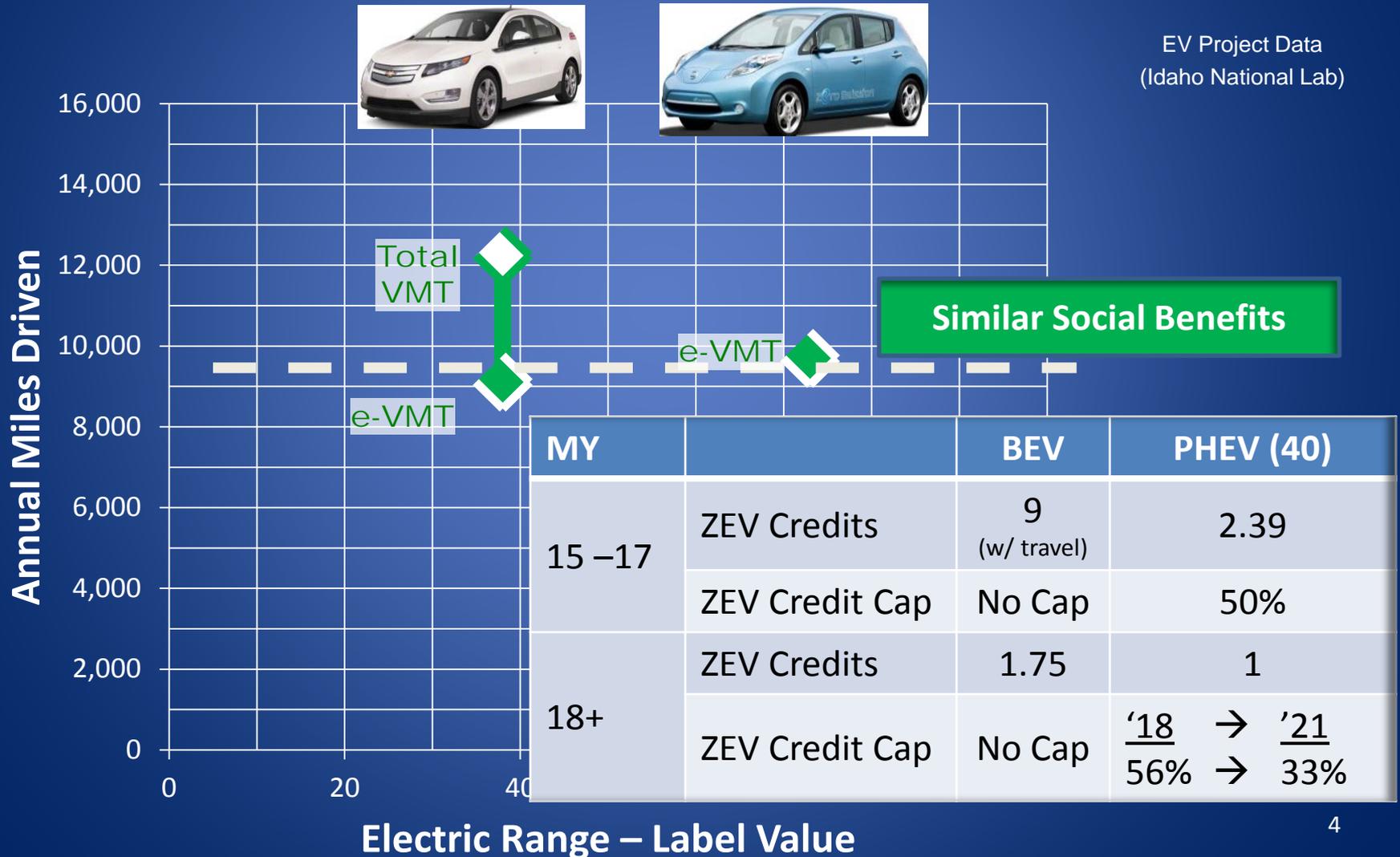
- What is e-VMT?
- Why Consider e-VMT as a rationale for adjustments to ZEV Credits?
- Anticipating Staff Concerns
- Northeast Credit Imbalance OEM Concerns
- Previous Board Support For e-VMT
- The Urgency For e-VMT Adjustments to ZEV

# e-VMT Definition

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- e-VMT means “electric Vehicle Miles Travelled”
- Refers to the average annual vehicle miles travelled attributable to energy from the grid or other off-board energy sources
- e-VMT primarily compares the electric miles driven annually between various PEVs.

# Why Consider e-VMT as a rationale for adjustments to ZEV Credits?



# More e-VMT Data is coming

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## Estimated data sets – OEM data being supplied to INL

- Honda – 190 Accord PHEV (13 miles)
- Honda – 500 Fit EV (82 miles)
- Toyota – 1,500 Prius PHEV (11 miles)
- Ford – 5,400 Fusion PHEV (20 miles)
- Ford – 5,400 C-Max PHEV (20 miles)
- Ford – 2,400 Focus EV (76 miles)

In addition to the existing INL data sets

- GM – 1,867 Volt EREV (38 miles)
- Nissan – 4,039 Leaf EV (73 miles)

***Over 20,000 vehicles from across the U.S.A.***

# Anticipated Staff Concerns with e-VMT

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- A. Consumer Risk
- B. Infrastructure Risk
- C. PHEV Technology Risk
  - Battery Technology
  - Emissions Technology
- D. Scale & Volume Risk

# Staff Concerns: A. Consumer Risk

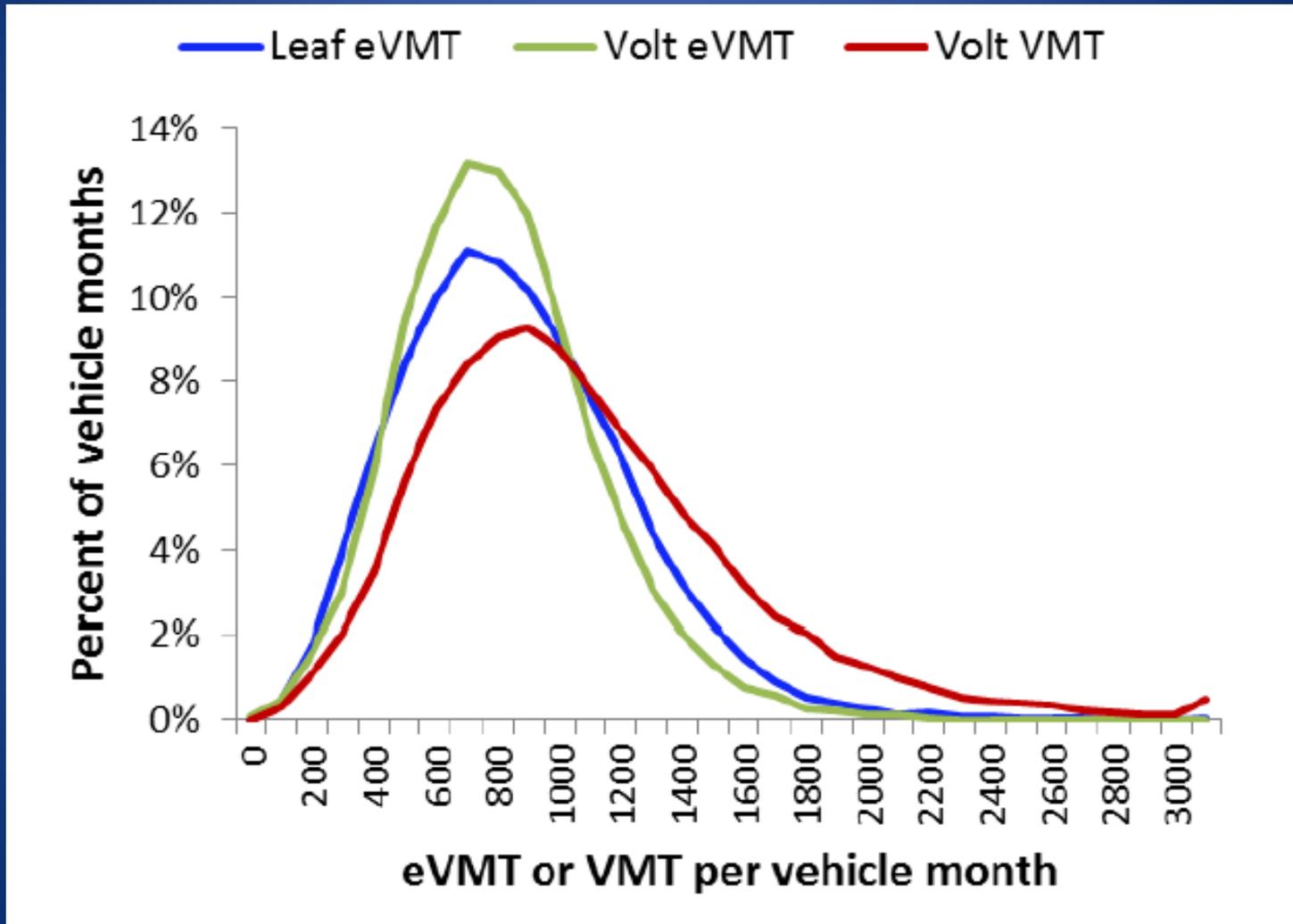
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1. Early Adopters – It is possible that early drivers are maximizing e-VMT in ways that more typical users will not.

## Response:

- If early adopters are different from other customers, than these concerns apply to all PEVs (BEVs, EREVs, PHEVs)
- High volume of users and geographic diversity will be shown in INL data.
- Existing INL data shows narrow distribution of VMT, indicating good consistency.

# Distribution of INL's e-VMT Data



# Staff Concerns: A. Consumer Risk

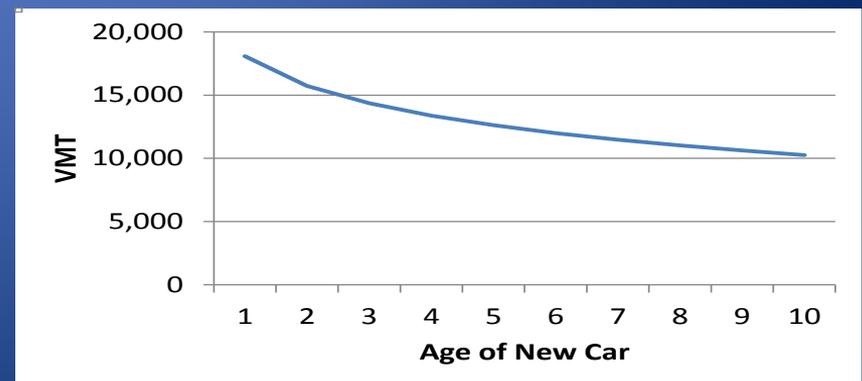
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2. Owner Risk (2<sup>nd</sup> & 3<sup>rd</sup> Owners)– customers who buy a used PHEV might not “bother to plug-in”

## Response

- Data does not exist that 2<sup>nd</sup> & 3<sup>rd</sup> owners will not “bother to plug-in”
- Volt ticker remains constant, even as age of cars increases, and 2<sup>nd</sup> owners are added to the pool.
- First owners have higher VMT

EMFAC 2011, SCAB Data



# Staff Concerns: B. Infrastructure Risk

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1. eVMT data is based on high infrastructure:user ratios that are not sustainable.

## Response

- Geographic diversity of EV Project includes a variety of infrastructure ratios
- Affects e-VMT of PHEVs, BEVs and EREVs equally
- Increasing gas prices will increase the incentive to continually plug-in.
- Regulators, OEMs and others must work together to increase the infrastructure in order to achieve long-term success. (CA ZEV Implementation Plan, States ZEV Action Plan)

# Staff Concerns: C. Technology Risk

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## 1. Battery Issues

- If the PHEV range decreases significantly (or fails), the consumer might not plug in as much and drive the car as an ICE (unlike a BEV)

## Response

- PHEVs are warranted for 150,000 miles (BEVs have no similar warranty).
- Failing or deteriorating batteries are problematic for the entire ZEV program.

# Staff Concerns: C. Technology Risk

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2. Emissions Technology – Blended PHEVs can have multiple cold starts, evaporative emissions, etc.

## Response

- This can be addressed by keeping the catalyst hot (or other strategies)
- PHEVs are zero-evap vehicles.
- ARB's emissions targets are addressed through LEV III, not ZEV in the near- to mid-term.

# Staff Concerns: D. Scale & Volume Risk

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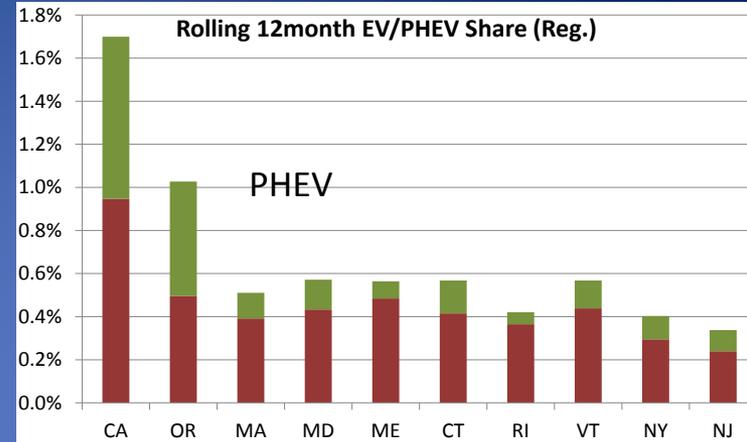
1. e-VMT will reduce the volume of vehicles and thereby eliminate the scale and volume goals of the ZEV Regulation.

## Response

- The ZEV Regulation already allows for varied compliance scenarios with widely divergent scale and volume variations.
- e-VMT-favorable policies can increase the volumes of PHEVs, which can reduce costs for all components: on-board chargers, motors, batteries (all common components to BEVs).

# Northeast Concerns

- Widely divergent sales rates between CA and Northeast ZEV States
- In MY12 - 17, this variation in sales rates is inconsequential to BEV OEMs' credit balances, however it is causing significant credit imbalances to PHEV and EREV OEMs.
- OEMs support ZEV Action Plan...



Vehicle (eVMT)	CA	NY	NJ	MA	MD	CT	etc.	Ttl
Volt (9,000)	2.39	0	0	0	0	0	0	2.39
Leaf (9,000)	3	1.95	1.5	.99	.75	.30	.24	9.0

# Previous Board Comments on e-VMT

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- **Board Resolution 12-11:**

*“BE IT FURTHER RESOLVED that the Board directs the Executive Officer to return to the Board with in-use data for range extended battery electric vehicles and plug-in hybrid electric vehicles, and, if warranted, propose appropriate modifications to treatment and credits for these vehicle types in 2016”*

ARB has contracted with UC Davis for household eVMT research, which will be delivered in 2015 and provide analysis for 100 households. The OEM e-VMT data set is orders of magnitude larger and should be more convincing

We believe the intention of this was to direct staff to provide information “no later than” 2016. We are encouraging staff to make this evaluation in 2014/15 and not wait for the 2016 review.

# Why is an e-VMT Option Urgent?

- Credit Imbalances between California and the Northeast.
- OEM Resource Allocation
  - Line-up Planning for larger volumes in 2018
  - Cost savings for OEMs.
- While maintaining ZEV program goals/benefits:
  - Better align ZEV Credits with Environmental Goals
  - Increase the market potential of ZEV technologies

# Summary

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- ARB's current ZEV credit structure undervalues the social benefit of PHEVs and EREVs compared to BEVs.
  - This Impacts credits on a per-car basis
  - This affects Northeast vs California credit balances
- Adopting e-VMT will support greater sales of PEVs because more consumers can utilize the full-functional flexibility of PHEVs & EREVs.
- While uncertainties will always exist, providing this e-VMT flexibility to OEMs is consistent with ARB's commitment to maintaining the ZEV Regulation, while making small flexible adjustments.

# Next Steps

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- We plan to discuss this proposal with other OEMs and interested parties over the next few months
- We are working with INL to make the results of this data public, as quickly as possible
- We would like to work with ARB staff and section 177 states in order to make a proposal in time for the October Hearing
  - July 14<sup>th</sup> – August 22<sup>nd</sup> time to develop the concept
  - INL Data Available August 1<sup>st</sup>
  - August 22<sup>nd</sup> Route internally at ARB
  - September 8<sup>th</sup> 45 Day Notice
  - October 23<sup>rd</sup> Hearing