Carnegie Mellon University

Consumer adoption and valuation of EVs

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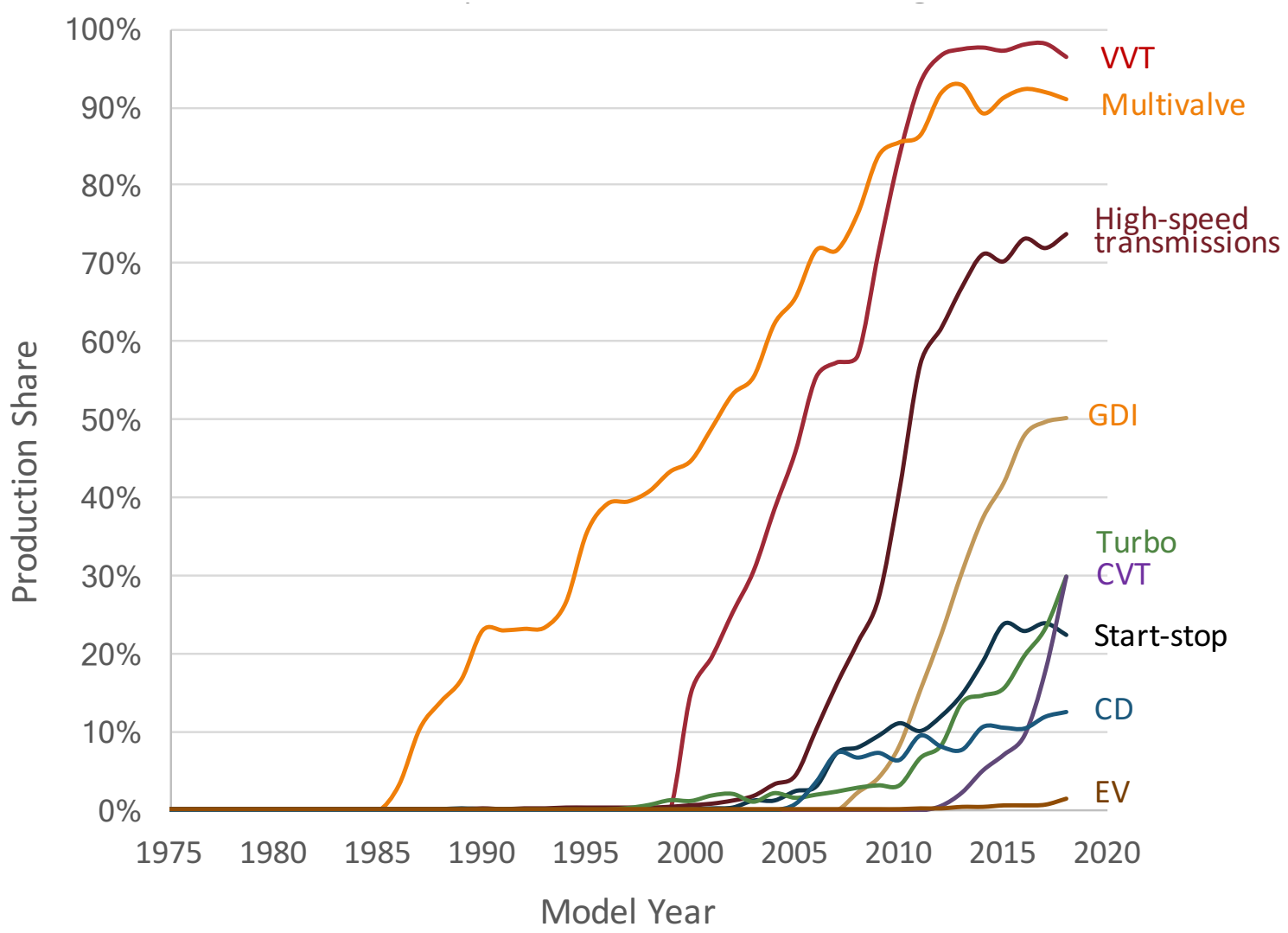
Consumer adoption of zero-emission vehicles is the greatest opportunity and uncertainty for light-duty vehicle energy efficiency in 2025-2035

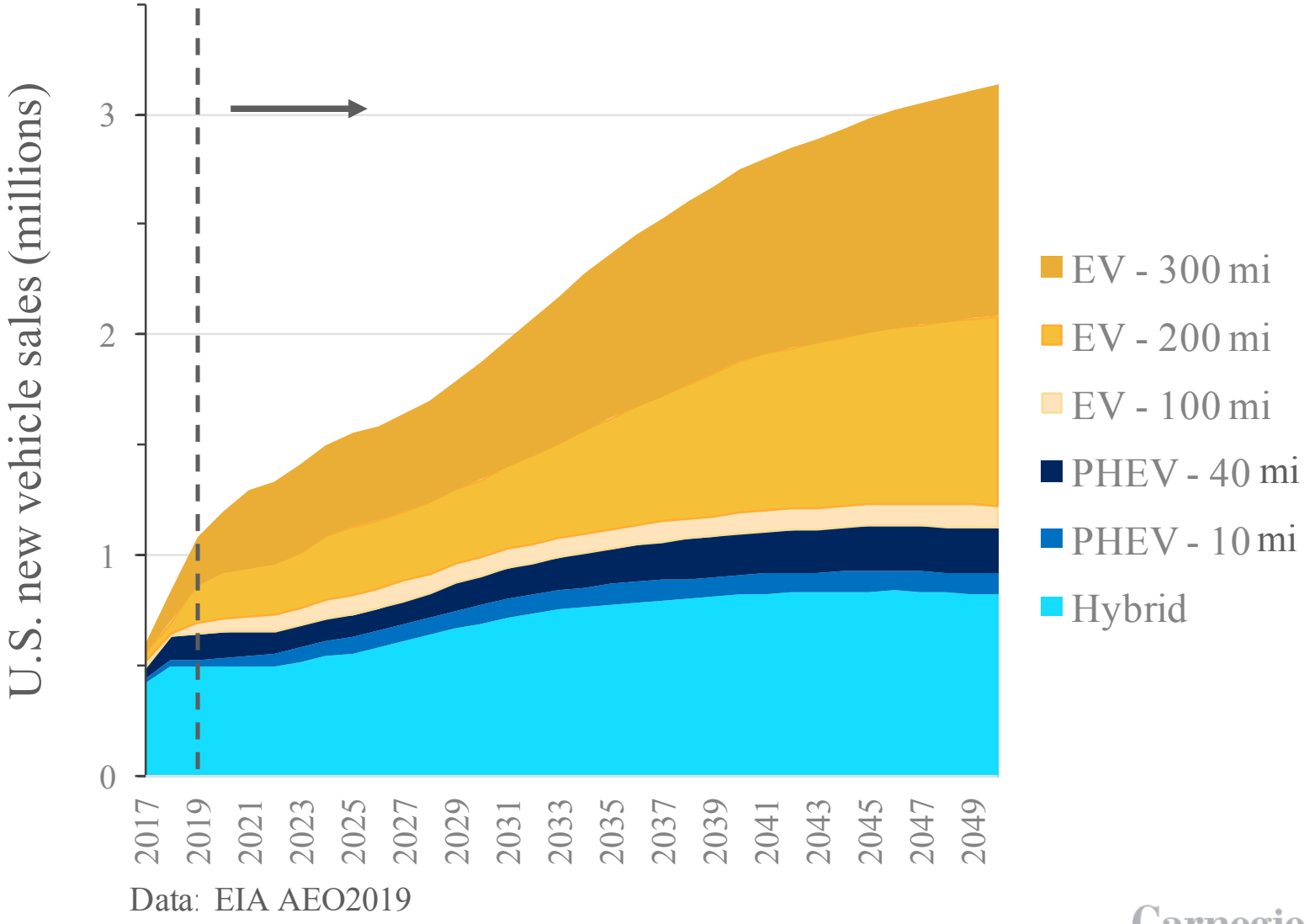
(NASEM. 2021. *Assessment of Technologies for Increasing Fuel Efficiency of Light Duty Vehicles 2025-2035.*)

Historical adoption of powertrain technologies



Data: EPA

Electrified vehicle sales projected to increase



Data: EIA AEO2019

Barriers to consumer adoption of EVs include limited range, risk aversion, and unfamiliarity with the new technology.

Improved performance, in particular increasing range, will help to overcome these barriers.

(NASEM. 2021. *Assessment of Technologies for Increasing Fuel Efficiency of Light Duty Vehicles 2025-2035.*)

Survey of U.S. new vehicle purchasers

Authors: Connor Forsythe, Kenneth Gillingham, Jeremy J. Michalek, Kate S. Whitefoot

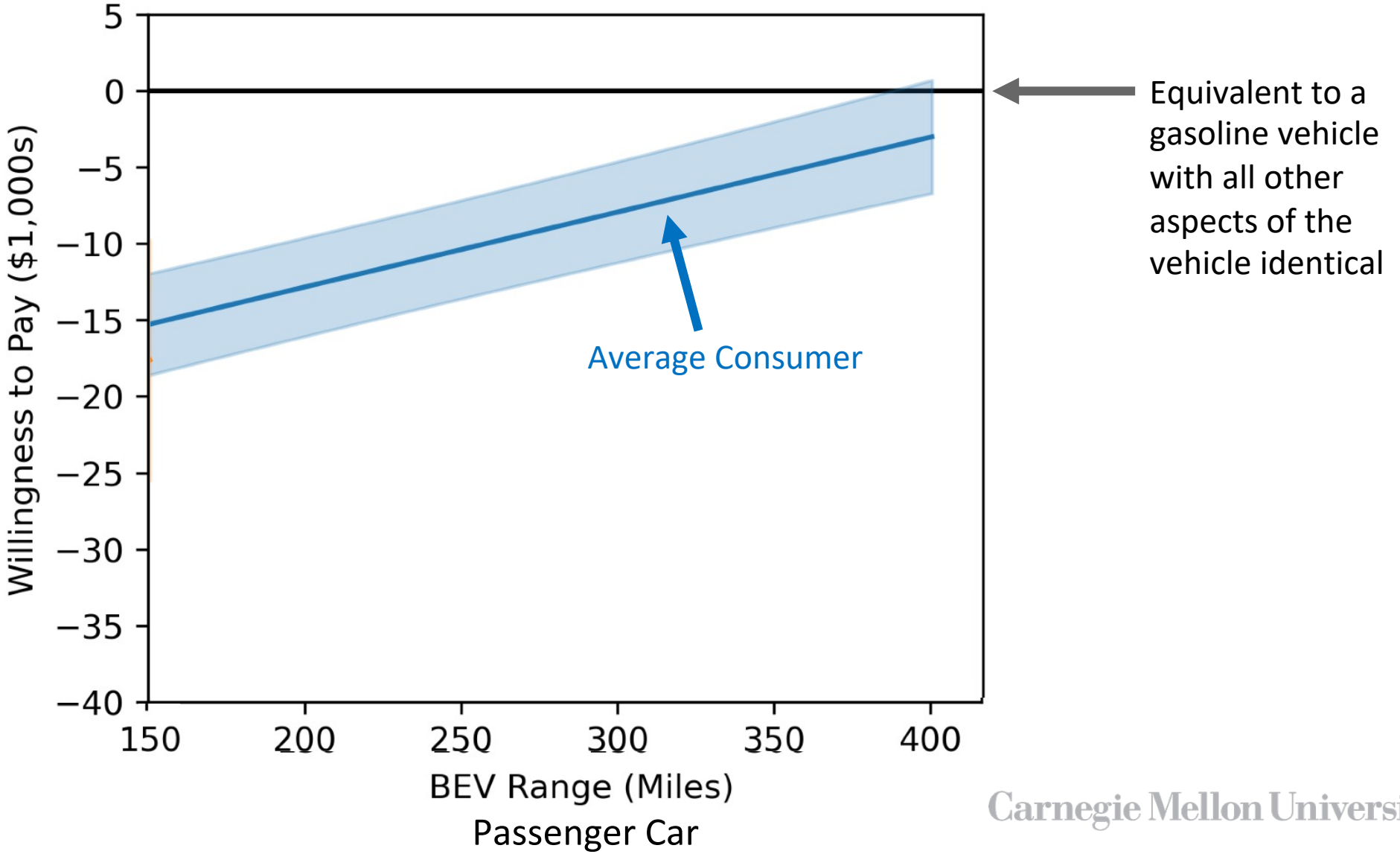
- Conducted a survey experiment examining how mainstream consumers consider EVs
- Weighted sample is representative of the U.S. new vehicle consumer population
- Mimic comparison of vehicle options online when purchasing a vehicle

Suppose these 3 vehicles below were the only vehicles available for purchase, which would you choose?

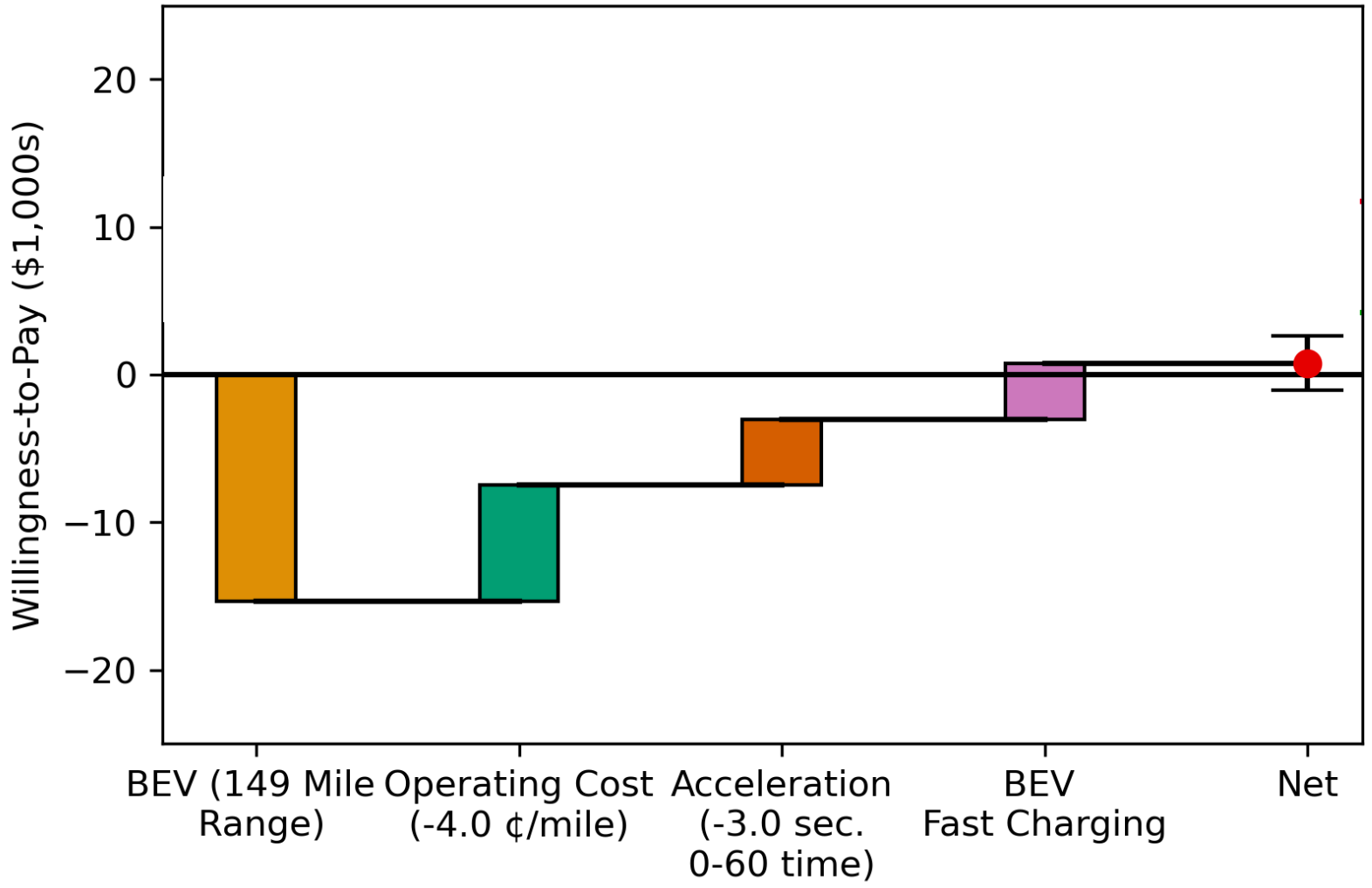
Each option will look like this:

Attribute*	Option 1	Option 2	Option 3
Vehicle Type	Electric 300 mile range on full charge	Electric 400 mile range on full charge	Plug-In Hybrid & 300 mile range on 1 tank (first 40 miles electric)
Purchase Price	$36,000	$17,000	$56,000
Fast Charging Capability	Available	Not Available	--
Operating Cost (Equivalent Gas Fuel Efficiency)	9 cents per mile (29 MPG equivalent)	12 cents per mile (22 MPG equivalent)	9 cents per mile (29 MPG equivalent)

High range BEVs approach equivalency with gas vehicles



Nissan Leaf (BEV) valued equivalently to Nissan Versa (gas)



“Vehicle efficiency standards for 2035 should be set at a level consistent with market dominance of ZEVs”

(NASEM. 2021. *Assessment of Technologies for Increasing Fuel Efficiency of Light Duty Vehicles 2025-2035.*)

Account for ZEVs in setting efficiency & emission standards

- Historically, federal agencies have not not considered ZEVs when setting fuel efficiency and GHG standards
- As ZEVs become a larger part of the market, EPA “can and must” consider ZEVs in setting emission standards (NASEM, 2021)
- The Department of Transportation should consider ZEVs in setting fuel efficiency standards so the two regulations are coordinated and do not diverge (NASEM, 2021)

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