ALLIANCE FOR AUTOMOTIVE INNOVATION

July 17, 2026

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Auto Innovators' comments on Drive Forward Light-duty Vehicle Program Second Public Workshop

The Alliance for Automotive Innovation (Auto Innovators) represents the full auto industry value chain, including the manufacturers producing most vehicles sold in the U.S., equipment suppliers, battery producers, semiconductor makers, technology companies, and autonomous vehicle developers. Our mission is to work with policymakers to realize a cleaner, safer, and smarter transportation future and to ensure a healthy and competitive auto industry that supports U.S. economic and national security. Representing over 5 percent of the country's GDP, responsible for supporting nearly 11 million jobs, and driving $1.5 trillion in annual economic activity, the automotive industry is the nation's largest manufacturing sector.

Given the breadth and complexity of the concepts presented at the June 22 workshop, and the abbreviated time allowed for review and comment, Auto Innovators' comments do not address every aspect of the proposals, nor do we fully detail our inputs and assumptions used to outline our initial responses to CARB's proposals. We would instead appreciate working with staff as we develop recommendations and complete our assessment of the proposals' feasibility, cost-effectiveness, and benefits. We look forward to discussing with CARB its inputs, assumptions, and analyses used to determine the standards and requirements proposed at the workshop.

I. Criteria Emissions Standards

a. Tailpipe Particulate Matter Standards

We encourage CARB to retain the low-emission vehicle (LEV) IV particulate matter (PM) standards, adopted less than four years ago, for light- and medium-duty vehicles while expanding the existing in-use PM relief to all model years included in Drive Forward. The difference in total PM emissions load and subsequent impacts on ambient air quality associated with a 0.5 mg/mile light- and medium-duty vehicle tailpipe standard are negligible and not cost-effective.

Additionally, it is difficult to accurately capture results for such low PM emissions. The current equipment and technology used to assess PM experience variability at such low emission values. Emissions results are often higher due to these measurement inaccuracies, making the certification process difficult.

For the Standardized Regulatory Impact Assessment (SRIA), we recommend CARB use the LEV IV standards, comparing the emission and air quality benefits of the LEV III PM and workshopped 0.5 mg/mile PM standards against the LEV IV baseline. We further recommend the SRIA provide an analysis of total anthropogenic and non-anthropogenic PM sources.

We look forward to discussing PM emission standards with CARB, including data on PM emissions and air quality benefits of various regulatory scenarios and the costs of gasoline particulate filters (GPFs) and associated hardware and software.

b. Tailpipe NMOG + NOx Standards

i. Fleet Average NMOG + NOx Standards

The fleet average non-methane organic gases + oxides of nitrogen (NMOG+NOx) standards are challenging unless there is a rapid and sustained increase in California's zero-emission vehicle (ZEV) market and especially in states that may adopt Drive Forward standards under Clean Air Act section 177. If internal combustion engine (ICE) vehicles were to achieve SULEV20 emissions on average - as discussed at the workshop - the ZEV market for ICE manufacturers would need to grow from today's 11%[1] to 40% by 2038 in California and in all other states which adopt California's regulation. If ICE vehicles only achieved SULEV30 on average – the assumption CARB made just four years ago during the Advanced Clean Cars II (ACC II) rulemaking – the ZEV market would need to reach 60%.

However, ZEV sales remain significantly lower than the levels implicitly required in the NMOG+NOx fleet average. Figure 1 below provides historical California annual ZEV sales both for the total market and just the legacy manufacturers[2].

Figure 1[3]

Year	Total ZEV Market Share	Total Legacy OEM ZEV Market Share
2016	3.6%	2.7%
2017	4.8%	3.9%
2018	8%	4.4%
2019	7.9%	3.9%
2020	7.9%	3.1%
2021	13%	5.7%
2022	20.1%	7.6%
2023	25.7%	11.3%
2024	26.2%	13.1%
2025	23.9%	12.9%

Comparing total ZEV market share with legacy OEM ZEV market share also reveals a meaningful gap across section 177 states, as shown for a few of the section 177 in Figure 2. These differences suggest that aggregate state ZEV penetration can mask the lower EV adoption levels among legacy automakers.

[1] Compiled by Auto Innovators from data provided by S&P Global Mobility. Reflects calendar year 2025 excluding Tesla, Rivian, and other EV-only automakers.

[2] A legacy OEM is a full line OEM with both ZEVs and ICE vehicles.

[3] Compiled by Alliance for Automotive Innovation with data provided by S&P Global Mobility, new vehicle registrations between January 1, 2016 - December 31, 2025

Figure 2[4] 2025 Section 177 ZEV Sales

State	Total ZEV Sales	Total Legacy OEM ZEV Sales
New York	9.1%	6.3%
New Jersey	12.2%	7.1%
Colorado	19.9%	15.5%
Washington	19%	10.9%
Massachusetts	10.6%	6.9%

Therefore, we encourage CARB to set standards that are reasonably achieve for legacy automakers.

We also recommend that CARB to maintain a ZEV credit trading mechanism for the proposed minimum. Trading has historically been a fundamental element of California's clean vehicle programs and has played an important role in reducing compliance costs while achieving the same overall environmental objectives. Eliminating or constraining this flexibility could also reduce the ability of manufacturers to manage short-term market disruptions.

At the workshop, CARB said it expects ICE vehicles to achieve a 20 mg/mile bin average in the timeframe of the standards. There are many challenges to achieving a 20 mg/mile ICE fleet average and examples of vehicles with tested emissions lower than 20 mg/mile NMOG+NOx are insufficient as a feasibility demonstration. Our concerns include:

- Vehicle test results are not the sole determinant of which bin is chosen for certification. Vehicle models are certified to higher bin levels than test results.
- Manufacturers plan significant headroom between test results and bin certification to reduce risks associated with build, test, and in-use operation and maintenance variability across their useful lives of 15 years / 150,000 miles. This headroom, and the ability to collect reliable development and certification data at the associated extremely low levels, must be included in CARB's feasibility and cost-effectiveness assessments.
- A 20 mg/mile ICE fleet average will likely require significant production of ICE vehicles certified to bins lower than SULEV20 to offset higher emitting vehicles (e.g., outgoing legacy vehicles, high-performance vehicles, and diesel-fueled vehicles). Each step in lower ICE emissions increases the difficulty and costs, but the leverage of a SULEV15 vehicle (if possible) or even a SULEV5 or SULEV10 vehicle (if included and possible) against a 20 mg/mile standard is small. Any vehicle certified above SULEV30 would require multiple ICE vehicles below SULEV20 to offset it.
- Additional challenges exist with measuring emissions at the extremely low levels necessary for ICE certification to bins lower than SULEV20.
- We are not aware of any ICE vehicle certifications below SULEV20. Headroom and test variability alone may limit certifications to SULEV15 even if lower bins are available. CARB has also previously expressed concern for on-board diagnostic (OBD) feasibility for certifications below SULEV15. We echo those concerns and note that OBD requirements may need to be adjusted to enable lower bin certifications.
- The equivalent high-altitude Federal Test Procedure (FTP) proposed requirement will likely require FTP headroom beyond that already observed, further increasing the challenges of certifying vehicles at the emissions levels needed to meet a 20 mg/mile ICE fleet average.

[4] *Id.*

ii. High altitude NMOG + NOx bin standards should be higher than sea level standards.

Using the same standard for both low- and high-altitude settings will increase the cost and complexity of meeting the NMOG+NOx standards, which as discussed are already challenging on their own. Setting the high-altitude NMOG+NOx standards at the same level as low-altitude standards will also likely drive vehicle development activities into expensive and limited capacity high-altitude facilities and test chambers.

iii. Quick Driveaway and Partial Cool-Down Standards

If adopted, we support retaining the LEV IV approach to these conditions.

iv. Plug-In Hybrid Electric Vehicle (PHEV) High-Power Cold Start

If adopted, we support retaining the LEV IV approach. We encourage CARB to reconsider the Step 2 PHEV high-power cold start requirements.

c. Evaporative Emissions

We are concerned that the proposed Non-Integrated Refueling Canister Only System (NIRCOS) in-use leak standard of 0.001-inch does not account for the measurement uncertainties inherent in testing complete, in-service vehicles as opposed to the controlled laboratory conditions (inert gas, stable temperature, high pressure, small isolated volumes) under which leak-detection equipment is typically utilized at the component/subsystem level. Full-vehicle evaporative systems present additional variables, including residual fuel vapor generation/condensation, pressure-sensitive components not designed for high-pressure testing, and long thermal stabilization times, all of which can significantly affect measurement repeatability and reproducibility (R&R). A gauge R&R study is critical to validate that any proposed vehicle test method and threshold can be reliably and consistently applied to in-service customer vehicles.

d. E15 Emissions Certification

We are concerned with requirements for an attestation of emissions compliance on E15 fuel. It is difficult to assess the merits of this proposal without more specific details. We look forward to CARB sharing a detailed fuel specification as well as an inventory of exactly which emissions tests are under consideration.

While EPA has allowed E15 fuel in vehicles manufactured after 2001, many automakers have only recently completed internal validations. On many occasions, that validation has not included E15 emissions testing. Therefore, an attestation on E15 to all emissions cycles could be challenging. Automakers likely will not have longitudinal data on E15 for vehicles at full useful life on E15. We recommend that such attestations be made to one bin level higher than the original certification bin until automakers and CARB collect more data.

e. Brake Particulate Matter Standards

Research funded by CARB indicates that the highest brake PM emissions are associated with low-metallic brake pad materials; much lower emissions are associated with original equipment (OE) and aftermarket

non-asbestos organic (NAO) brake pad materials.[5] To our understanding, many new vehicles sold in the U.S. are already equipped with NAO material brake pads. Therefore, regulation on new U.S. market vehicles may have minimal air quality benefits. We recommend that CARB provide a cost-benefit analysis as the European Commission did for EURO7, especially because these markets are different.

Brake systems are safety-critical systems. Future brake PM requirements should preserve braking performance, durability, robustness and vehicle safety. Environmental requirements should not unintentionally limit necessary safety-related brake system design choices without clear environmental benefits. Prior to adopting standards, we encourage CARB to consider a monitoring only requirement and then later decide whether standards are necessary.

If CARB were to adopt brake PM standards, we encourage consideration of the following:

- Performance-based standards, allowing manufacturers to pick the best technologies to meet safety, emissions, and other performance requirements for each brake system.
- Standards that can generally be met through brake pad and/or rotor material and coating technologies across the entire range of U.S. market vehicles.
- Lead-time to build brake dynamometer capacity (approximately two to three years after the regulations are adopted and enforceable), and to characterize U.S. market vehicles and apply modified brake system designs, if necessary (an additional three years for brake system development).
- Component bench test procedures, assuming testing is required.
- Certification procedures that would allow grouping vehicles and/or systems to reduce test burdens.

Finally, the standards shared at the workshop appear to be the UNECE standards, converted from a basis of kilometers to miles, in combination with a different test cycle and applied to different vehicle powertrain types in some cases. We offer the following questions and comments about the standards and test procedures.

i. Applying UNECE In Combination with the California Brake Dynamometer Cycle

The California Brake Dynamometer Cycle (CBDC) can generate higher PM emissions in component testing.[6] UNECE standards designed for application in combination with the Worldwide Harmonized Light-Duty Vehicles Test Procedures (WLTP) brake cycle would not be appropriate with the CBDC.

Furthermore, UN GTR No. 24, WLTP Brake and UN-R 179 are the international baseline. The European Union has already adopted this framework, and China is currently moving in this direction. A separate CBDC would undermine this harmonized approach and could create additional testing effort, development work, and different technical solutions for the same environmental objective. We recommend harmonizing completely with UNECE test procedures and test cycles.

[5] Stanard et al. 2026. Eastern Research Group. Brake and Tire Wear Emissions. Prepared for California Air Resources Board. Xii. Figure ES-1.

[6] Martikainen S, Wassermann S, Huber MP, Zimmermann T, Bacher H, Mayrhofer H, Weidinger C. A Comparative Statistical Analysis of Two Brake Emission Test Cycles. Atmosphere. 2026; 17(5):528. https://doi.org/10.3390/atmos17050528

However, if the CBDC is adopted for California brake PM certification, we encourage CARB to consider adjusting the standards and test cycle and evaluate the feasibility and cost-effectiveness of these standards across many U.S. market vehicles.

ii. Potential application of more stringent standards to conventional and plug-in hybrids.

The standards shared at the workshop grouped conventional and plug-in hybrids with battery electric vehicles under a more stringent standard on the basis of "strong" regenerative braking capacity. Automakers would appreciate more information on how CARB will distinguish between "weak" and "strong" regenerative braking capacity, and whether the distinguishing feature between the standards applied is the powertrain type (as in the UNECE standards) or the regenerative braking capacity.[7] This will help automakers evaluate this proposal.

We also need more information on how CARB will simulate the regenerative capacity or category on a brake dynamometer. For example, whether a different factor for regenerative capacity would be applied to different types of powertrains and what those factors would be.

iii. Alternative Methods for Brake-Wear PM Emissions Testing

Only component bench testing is effective for certification testing because it provides better comparability and lower variability. Whole vehicle testing is not sufficiently developed for certification purposes. Furthermore, while vehicle and on-road measurements may provide valuable research data, it remains unclear whether they would deliver a measurable environmental benefit compared to the established GTR24 laboratory approach.

iv. An Optional Certification Pathway to Potentially Reduce Test Burden

To reduce test and certification burdens, we encourage CARB to consider an optional design-based certification pathway in combination with the preferred approach of performance-based standards. For example, accepting designs that have been shown by research to have generally lower PM emissions as in compliance with the standards without formal testing or attestations. We do not recommend a standalone design-based standard; a performance-based standard should always be an option.

II. Greenhouse Gas (GHG) Standards

a. General Input on the Standards Under Consideration

While we are still evaluating the proposed GHG standards, we are concerned that California's EV market (and subsequent Section 177 states' EV markets) will not meet the level of electrification necessary in the time proposed to achieve these requirements. To better assess the proposal, we need more information on the interrelated vehicle classification rules; averaging, banking, and trading mechanisms (including pooling); air conditioning and/or off-cycle credits; and other compliance mechanisms.

[7] For example, depending on how "weak" vs. "strong" regenerative braking capacity is defined, a hybrid may fall into the "weak" category, but the powertrain might fall into a more stringent standard category as shown at the workshop.

The targets under consideration appear quite challenging. Comparing GHG emissions of current vehicles (MYs 2026 and 2027)[8] to the proposed targets for MYs 2031 and 2038 (Figures 4 and 5 for passenger cars and light trucks, respectively), suggests a large and rapid growth in EVs will be necessary.

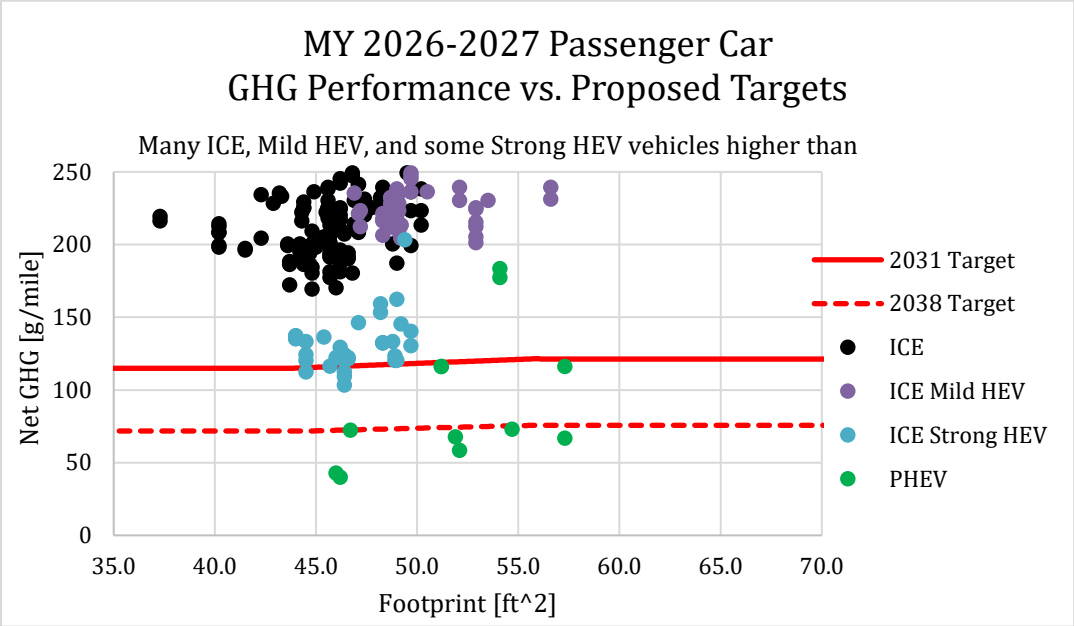
Non-hybridized ICE vehicle emissions are far above the proposed MY 2031-2038 targets. Even at historical rates of improvement (approximately 1-2% per year), ICE vehicles would likely remain well above target, requiring equivalent off-setting vehicles well below the target. Mild hybrid ICE vehicles fare no better than non-hybridized ICE vehicles, with emissions likely to remain far above CARB's proposed targets.

Some strong hybrid EVs can meet the proposed 2031 target but most do not. Given that there is limited additional ICE powertrain technology to apply beyond the strong hybrid level, the emissions from many strong hybrids will likely remain higher than the proposed targets, requiring offsetting vehicles with emissions lower than the proposed targets to meet fleet average requirements. By 2038, no strong hybrid is likely to meet the proposed target; all will likely require off-setting vehicles with emissions significantly better than the target.

The emissions from current plug-in hybrids, assuming no upstream emissions and the current utility factors, have mixed emissions relative to the proposed targets with some higher than even the 2031 target but many near the 2038 target. However, CARB is also considering lowering utility factors, which would increase the imputed emissions of plug-in hybrids. Furthermore, vehicles near their target have little or no weight to off-set vehicles higher than their target.

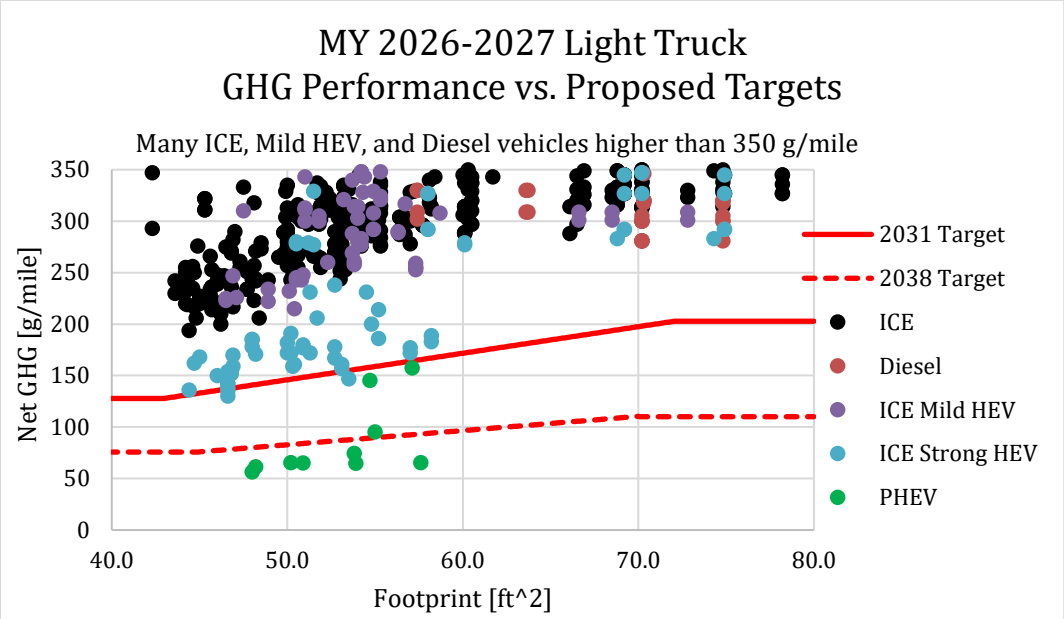
BEVs and other ZEVs become the only compliance option to offset strong hybrid emissions and any remaining ICE vehicles.

Figure 4



[8] S&P Global Mobility. Vehicle Technical Intelligence Platform (VTIP). Accessed July 9, 2026. Reflects vehicle tailpipe CO2 emissions adjusted by the air conditioning credits allowed under U.S. EPA's Multi-Pollutant Rule for MY 2032. Vehicle classifications assume no changes from ARB's current approach.

Figure 5



b. Do not propose a shorter phase-in for GHG fleet average standards.

Manufacturers are uncertain whether California's and section 177 states' EV market will support the standards in the timeframe discussed. Accelerating the phase-in schedule for the GHG standards would be infeasible without significant disruptions to vehicle markets.

c. Continue discussion on PHEV utility factors with automakers to determine one fleet utility factor curve / function.

Automakers are best equipped to provide data on modern PHEVs. We intend to discuss the available data further with CARB to establish an appropriate utility factor. We also prefer a single utility factor for all manufacturers without manufacturer-specific allowances. This would provide a clear value for planning purposes and avoid lengthy negotiations between automakers and CARB.

d. Eliminate upstream emission factors for ZEVs and PHEVs.

The proposed GHG targets are already challenging even if upstream emissions are eliminated. Including upstream emissions would further reduce their feasibility.

e. GHG Credit Banking and Trading

i. Credit banking and trading should continue to be available tools.

Credit banking and trading provides critical flexibility to reduce costs by allowing manufacturers to better align technology applications with vehicle program timing and to address particularly challenging emissions rules or unforeseen problems. Credit banking and trading should therefore be preserved.

ii. Credit banking and trading should not be considered when evaluating the feasibility of the GHG standards.

If CARB were to explicitly consider credit banking and trading in assessing the feasibility and costs of standards, resulting regulations could effectively require dependence on them. For example, if credit trading is included in such considerations, compliance with the standards could depend on purchasing credits from manufacturers that build only ZEVs, yet that earn credits against such standards.

f. Air Conditioning Leakage, Air Conditioning Efficiency, and Off-Cycle Credits

i. Continue air conditioning leakage credits for both ICE and ZEVs.

Low global warming potential refrigerants and air conditioning system leakage reduction are important to limit GHG emissions.

ii. Expand air conditioning efficiency credits to cover alternative heating, ventilation, air conditioning and battery conditioning technologies in ZEVs and PHEVs.

Customer comfort and battery thermal regulation are important sources of electrical energy use in ZEVs and PHEVs. Retaining existing credits and creating new technology credits could encourage continued innovation and the application of the most efficient systems available.

iii. Retain menu-based off-cycle technology credits for ICE vehicles.

The current menu-based off-cycle technology credit system has led to broad application of efficiency technologies that might not have entered the market otherwise. The menu-based approach should continue as a simple means to encourage technologies with real-world benefits that are not captured in laboratory test cycles. We are open to discussing updated menu values to reflect modern vehicles.

III. Alternative Pathways to Support Compliance with Criteria Emissions, GHG Emissions, and ZEV Floor Standards

a. Include pooling of California and Section 177 state targets and performance in fleet averages.

An optional pooling provision would help automakers address market differences between states. However, pooling should not be viewed as enabling compliance with standards that are not feasible across California and the section 177 states.

b. Include credits based on the MY 2025 standard.

We encourage CARB to allow manufacturers to bank early credits against Drive Forward requirements based on the prior ACC I criteria emission, GHG emission, and ZEV standards, which encourages manufacturers to exceed those requirements prior to the start of Drive Forward.

IV. Small Volume Manufacturer Provisions

Small Volume Manufacturers (SVMs) produce a limited number of sports cars for the U.S. These vehicles see limited use, approximately 2,543 miles per year on average, resulting in a negligible environmental impact.[9]

SVMs face additional challenges in meeting emissions regulations because they do not benefit from the same economies of scale as larger manufacturers. For instance, they cannot leverage shared automotive platforms across multiple brands to reduce production and development costs, nor can they benefit from mass production technologies, instead relying on unique technological solutions typically associated with longer development and procurement timelines.

We appreciate CARB's longstanding recognition of the unique challenges faced by SVMs to comply with newly adopted emissions standards, as demonstrated by the dedicated provisions included in ACC II , including:

- Full exemption from annual ZEV requirements through MY 2035.
- Alternative fleet-average NMOG+NOx standards (50 mg/mi rather than 30 mg/mi), with full inclusion of ZEVs in fleet-average calculations.
- Allowing Bin 125 for NMOG+NOx certification
- Optional alternative fleet-average greenhouse gas emissions targets, subject to approval.
- SVM-specific phase-ins for compliance with several emission standards.

The above flexibilities allow SVMs to achieve compliance with the stringent emissions-related requirements in a technologically and economically feasible manner while continuing to invest in innovative technologies for new vehicle models.

We recommend maintaining the longstanding approach to providing SVM-specific provisions in future California emissions regulations, including any new requirements such as brake PM emissions. We also recommend expanding NMOG+NOx bin availability for SVMs to Bin 160 given CARB's proposal to require the same NMOG+NOx levels at both sea-level and high altitude.

V. Consider vehicles and fuels systematically.

Improved fuels can enable lower emissions not only on new vehicles, but more importantly also on the large fleet of legacy vehicles. We recently shared the following recommendations on gasoline with U.S. EPA.

- Reduce refinery gate and downstream sulfur caps to 10ppm.
- Lower the summer vapor pressure cap.[10]
- Eliminate sub-87 AKI market fuels.
- Add particulate matter index (PMI) or yield sooting index (YSI) controls on market fuels.
- Adopt a water limit of 0.2% by volume.
- Increase detergency minimums.

[9] 89 Fed. Reg. 12754 (Feb. 20, 2024). Note 38.

[10] California reformulated gasoline already has a lower summer vapor pressure cap than that required by EPA.

Drop-in low carbon fuels can lower GHG emissions from both legacy and new vehicles without the time required to fully turn over the fleet. Higher octane fuels can enable more efficient engine designs for new vehicles. We look forward to discussing with CARB our data on improved fuel quality.

VI. ZEV0 Bin Certification

a. Battery Durability and Warranty: account for 'virtual miles' accumulated via V2X use.

Please see our joint letter with Vehicle-Grid Integration Council, California Electric Transportation Coalition, and Plug In America, which explains this recommendation in detail. We would welcome the opportunity to discuss this issue further given its impact on the development of the bidirectional vehicle market.

b. Convenience Cord: allow manufacturers to give consumers a voucher to redeem a convenience cord at no cost.

We support CARB's objective of ensuring convenient access to charging for all EV drivers. However, a universal requirement to bundle a convenience cord with every EV beginning in MY 2031 does not account for drivers who already have adequate charging solutions or prefer alternative equipment. In these cases, consumers would be required to pay an added cost—potentially $200–$500—for a product they may never use, with this cost embedded in the vehicle price for all buyers, including cost-sensitive and low-income households.

Common scenarios where a bundled convenience cord may be unnecessary include:

- Drivers who already own a home Level 2 charger or multiple cords.
- Drivers who prefer to purchase a different cord with specific features (such as smart charging or enhanced durability).
- Fleet operators who design customized depot-based charging solutions do not rely on individual vehicle cords.

To maintain universal access while avoiding unnecessary costs and waste, we propose allowing manufacturers to alternatively provide a redeemable convenience cord voucher with each EV. Allowing manufacturers the option to use a voucher system as an alternative to bundling a convenience cord with every EV would reduce embedded vehicle costs and optimize production and logistics. Manufacturers could align cord production and distribution with actual redemption rates, lowering materials, labor, inventory, and transportation costs. These efficiencies can help keep EV prices lower for all consumers, while still guaranteeing that any driver who needs a convenience cord can obtain one at no cost. We also believe manufacturers should be allowed to offer an "opt out" provision to consumers as an alternative to both a voucher system and a bundling requirement. Providing manufacturers with an array of options offers critical flexibility while still ensuring consumers have free and convenient access to charging cords.

In contrast, a mandatory bundling requirement would build the cost of a convenience cord into the price of every EV, regardless of whether the buyer needs or uses it, and could lead to unnecessary waste[11]. A voucher system offers a practical compromise: it preserves CARB's goal of universal access to charging solutions, while providing flexibility to manufacturers and avoiding unnecessary costs for consumers. We

will follow up with CARB staff to discuss our proposal in more detail to ensure it is a consumer-friendly experience.

c. Battery Labeling

Please see our joint letter with The Rechargeable Battery Association Cirba Solutions, and Redwood Materials, which provides two recommendations related to battery labeling. These recommendations will increase safety, minimize unnecessary costs, and align CARB's requirements with other battery labeling laws outside the state.

In addition to the joint letter, we encourage CARB to continue allowing automakers to specify battery "Rate Capacity (Ah)" as an alternative to "Energy Capacity (kWh)" similar to ACC II.

d. High-level Communication Standard

i. Require SAE J2953/3 Appendix G for conformance testing for both IS0 15118-2 and DIN 70121

Since 2024, the SAE Hybrid Communication and Interoperability Task Force has been developing J2953/3 to create better-defined EV interoperability to increase successful charging sessions. SAE published the first version in 2025 and are updating it (expected to be published by the end of the year) to include CharIn's EV Priority 1 test plan, which has 78 test cases covering DIN 70121 and ISO 15118-2 communications. This plan prioritizes the test cases that use messages paramount to enable a successful charging session –and therefore are more likely to support charging interoperability. These test cases deliver interoperability and safety outcomes CARB is seeking without requiring automakers to implement the full DIN and ISO test set, many of which targets edge case fault conditions rarely encountered outside the lab. Furthermore, J2953/3 Appendix G also includes ISO 15118-5 tests, which confirm ISO 15118-3 implementation. Requiring J2953/3 Appendix G streamlines the resources, time, and effort necessary to implement these communication protocols without undermining CARB's goal to facilitate vehicle interoperability.

Finally, we support the long-term vision offered by ISO 15118-20 (-20), especially because it supports bidirectional charging and Plug & Charge. However, -20 is not ready for widespread adoption because conformance testing is still in development. Therefore, -20 should not be mandated.

ii. Do not exclude earlier versions of Plug & Charge from being used.

Before ISO 15118-2 became broadly established across the charging ecosystem, companies developed their own infrastructure to support Plug & Charge capabilities and give consumers early access to a more seamless charging experience. If CARB adopts additional ISO 15118-2 requirements, we encourage CARB not to preclude these earlier Plug & Charge implementations from also being used. While ISO 15118-2 is now in the market, implementation and interoperability across the ecosystem continue to evolve, so this legacy infrastructure can still play a valuable role in providing customers with a consumer-friendly charging experience.

e. Require SAE J3400 inlet adapters to be available for purchase.

CARB proposes that beginning in MY 2031, all PHEVs that are DC fast charge capable must meet inlet requirements for SAE J3400, with an adapter included if an alternative inlet is used. We encourage CARB to revise this requirement so that an adapter must be available for purchase rather than be required to be included with every vehicle. We prefer not to require the supply of a part unless it is needed by the customer. Requiring availability for purchase preserves customer access while reducing unnecessary cost and complexity related to materials, shipping, and logistics.

VII. BEV Window Sticker

a. Allow manufacturers to decide whether to use a QR code, the static sticker label, or both, to provide information about vehicle range, charging speeds, and battery warranty information.

Requiring both forms of information disclosure risks prioritizing duplication over effectiveness. It is not clear that a dual-disclosure requirement would improve consumer comprehension, comparison shopping, or purchasing outcomes. Therefore, manufacturers should have flexibility to provide the required information through either a physical label or a QR-code-based disclosure. Providing manufacturers with this flexibility would not diminish consumer access to information. Rather, it would allow manufacturers to meet CARB's consumer protection objectives using the disclosure format best suited to their products and customers. This approach also avoids unnecessary costs from maintaining duplicative disclosure systems.

b. Allow manufacturers to specify "results may vary" for listed driving ranges.

The calculated driving ranges are standardized estimates derived from test procedures. They are not guarantees of how far every consumer will be able to drive every time they use the vehicle. Actual range can vary significantly based on factors such as driving speed, acceleration, temperature, terrain, traffic conditions, use of climate controls, vehicle load, and battery condition. Including a "results may vary" statement provides important context that helps consumers understand the distinction between a test result and the range they may experience in everyday driving.

This disclosure promotes transparency and helps set realistic consumer expectations by recognizing that range is inherently affected by conditions that differ from one driver and trip to another. Without such context, consumers may incorrectly assume that the labeled range is an assured outcome and therefore have a perceived EV ownership experience. Stating "results may vary" does not diminish the utility of the range ratings and it gives consumers a more accurate understanding of these estimates.

VIII. Data Standardization

Although some manufacturers met the ZEV data standardization requirements prescribed in ACC II (13 CCR 1962.5), these capabilities are still in their infancy, and the field is rapidly developing. Through automakers' experiences implementing ACC II's requirements, the industry has identified areas for improvement and streamlining that will ultimately lower the barriers for consumers' access to their own vehicle's data. We look forward to working with CARB to iterate on data standardization to ensure it enhances the consumer EV ownership experience.

a. The propulsion-related parts definition is broad and complex.

Interpreting ACC II's "propulsion-related parts" definition for the purposes of warranty coverage and diagnostics has been challenging. First, the breadth of the components listed in the definition have become overly complex, risking inconsistent interpretation across manufacturers. This potential scenario could undermine consumers' EV ownership experience. While CARB has provided a stand-alone flowchart as a "propulsion-related part determination guidance", the flowchart is not currently included in the regulation to improve regulatory interpretation.

Second, the propulsion-related parts definition includes numerous components within warranty coverage that are not directly related to vehicle propulsion. We look forward to working with CARB to develop a straightforward definition that precisely targets the relevant vehicle components.

b. Maintain the existing structure for propulsion-related fault codes.

We support ACC II's propulsion-related fault codes framework – manufacturers can determine the diagnostics they need for vehicle serviceability and will report those through SAE standardized parameters and fault codes specified in the regulations. Standardized fault codes enable independent technicians to access and interpret diagnostics that are critical to servicing and repairing vehicles.

c. Update references

CARB previously proposed to update 13 CCR 1962.5 to reference the latest versions of SAE J1979-3, SAE J1979-DA, and SAE J2012-DA. We support also including these updates into Drive Forward to prevent manufacturers from undertaking unnecessary software rework.

d. Phase-in Schedule

We recommend CARB delay requiring manufacturers to meet data standardization regulations until at least MY 2031 or when the Drive Forward standards begin, whichever is later. We also recommend that CARB retain the alternative phase-in plan described in 13 CCR 1962.5(a)(4).

e. Flexibility for Deficiencies

Manufacturers who implemented CCR 13 1962.5 appreciated CARB's allowance for deficiencies if a manufacturer could not fulfill all requirements in a model year. Given the nascency of ZEV data standardization, we encourage CARB to maintain this flexibility.

We further encourage CARB to allow deficiencies for data stream parameters, fault codes, vehicle identification information, and vehicle operation tracking requirements. CARB and automakers know that these tracking requirements are complex: a vehicle must report dozens of fault codes and other parameters to meet data standardization requirements. The only remedy in ACC II for missing, incomplete, or incorrectly reported outputs was to recall the vehicle or remove them from the data standardization phase-in. Allowing deficiencies for data stream parameters, fault codes, vehicle identification information, and vehicle operation tracking requirements would provide manufacturers the necessary flexibility to make good faith progress towards data standardization requirements without the threat of recalls.

Finally, we encourage CARB to allow concerns for minor non-compliance, such as a mismatch between an actual fault and the DTC reported to the scan tool. Concerns would be listed in the cover letter for tracking purposes but would not impose a mandatory timeframe for remedy.

IX. Medium-duty Vehicles

a. NMOG+NOx for MDVs

ZEV adoption for medium-duty vehicles (MDVs) is slower than anticipated, especially in the heavier Class 3 segment. Given slower ZEV adoption, we are concerned that CARB's proposed NMOG+NOx standards for MDVs are infeasible, particularly over CARB's proposed phase-in timeframe. CARB proposes to combine Class 2b and Class 3 segments into a single fleet average standard. CARB would require this combined fleet to meet a fleet average standard of 170 mg/mi in MY 2031, phasing down to a 100 mg/mi standard in MY 2033.

This standard is challenging for any MDV, and particularly so for the combined MDV fleet that CARB proposes. Class 3 vehicles are heavier and produce more emissions than Class 2b vehicles. The standard as proposed would require infeasible changes to a manufacturer's medium-duty fleet. Auto Innovators looks forward to discussing the MDV fleet average with CARB further.

CARB's proposal to phase in the MDV fleet average from MY 2031 to MY 2033 does not provide adequate lead time for manufacturers due to the small number of medium-duty products each manufacturer makes. A manufacturer's medium-duty product line refreshes at a slower rate than their light-duty line due to the limited number of medium-duty products.

Additionally, the changes to MDV NMOG+NOx fleet averages risks increasing costs, given the smaller market size and limited vehicle lines. Manufacturers have less flexibility to distribute costs across the fleet compared to light-duty vehicles.

The population of the entire U.S. Class 2b-3 fleet of work trucks, work vans, and cutaway chassis-cab vehicles is small; the entire segment consists of fewer than one million vehicles sold per year, compared to the light-duty fleet that consists of over 14 million vehicle sales.

b. MDV Certification Bin Levels

We recommend that CARB provide additional, higher bin levels for the combined MDV fleet. CARB's proposed bin standards only go up to ULEV 170, yet CARB's proposed fleet average standard for MY 2031 is 170 mg/mi. Manufacturers anticipate a need for bins at higher levels than ULEV 170 as fleets begin to transition to lower standards.

We are also concerned that CARB intends to extend the additional ZEV0 bin requirements to MDVs. MDVS are used for different purposes than LDVs, so the same ZEV) bin requirements – such as a 200-mile minimum range requirement – would not be appropriate. Particularly for last-mile delivery, this long range is not needed. CARB risks increasing the cost of these vehicles by imposing range requirements that do not reflect use cases for MDVs.

b. Portable Emissions Measurement System (PEMS) Testing for MDVs

i. PEMS testing has unique challenges

CARB's proposed gross combined weight rating (GCWR) threshold for PEMS testing is misaligned with EPA's Tier 4 thresholds, which could lead to unnecessary duplicative testing because of the agencies' divergent requirements.

Vehicle testing is an essential but costly part of the production process. Aligned requirements across systems reduce manufacturers' testing burdens. On-road PEMS testing particularly involves substantial testing burden. Manufacturers must ship equipment and transport hazardous calibration gases across state lines, and the logistical challenges posed by PEMS testing create significant cost. Auto Innovators would like to discuss with CARB the role of PEMS testing and potential alternatives to PEMS testing that would achieve the same objective.

CARB's priority in this proposal is high towing capacity pickup trucks, yet the proposed 14,000 lbs. GCWR threshold would include vehicle configurations beyond CARB's stated target, such as commercial vans, cutaways, and low towing capacity vehicles. As proposed, the 14,000 lbs. GCWR threshold would create arbitrary distinctions among pickup configurations that cross the threshold solely through option content. Many of these applications are characterized by urban and regional delivery, passenger transportation, and vocational service routes rather than sustained trailer towing.

We encourage CARB to align the applicability thresholds with its stated intent to capture high-capacity towing vehicle applications while avoiding unintended impacts on vehicle segments that were not identified as the focus of this requirement. CARB could consider a 22,000 lbs. GCWR threshold to better target vehicles typically operated in high-load towing conditions.

PEMS testing is a finite and costly resource for both manufacturers and CARB. Extending applicability to lower-GCWR configurations increases compliance burden and consumes limited testing capacity.

Thank you for considering,

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