



Waymo LLC
1600 Amphitheatre Pkwy
Mountain View, CA

July 26, 2024

Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Advanced Clean Cars II Amendments — Request for Comment

Dear Chair Randolph:

Waymo submits the following comments in response to the July 26, 2024, workshop soliciting input on amendments to the Advanced Clean Cars II regulation. Waymo supports the California Air Resources Board's (CARB) goals to reduce vehicle emissions through the Advanced Clean Cars program, recognizing the positive impact on health, climate, and community in transitioning to Zero-Emissions Vehicles.

Waymo's mission is to be the world's most trusted driver, making it safer, more accessible, and more sustainable to get around. Waymo operates a shared, electric, and autonomous mobility service — Waymo One — which consists entirely of electric vehicles (EV), and is already delivering well over 50,000 zero-emission trips each week across three major urban areas.¹ Waymo's EV chargers are supplied with 100% renewable energy and achieve a carbon intensity of 0 grams of CO₂ per kWh, as determined under California's Low Carbon Fuel Standard.² In addition to the direct emissions benefits, the data collected to date indicate the Waymo Driver is already reducing traffic injuries and fatalities in the places where we currently operate.³ As we scale our EV fleet safely and responsibly, we have the potential to accelerate the transition to ZEVs, while supporting safer walkable, bikeable, and transit-oriented neighborhoods, and ultimately help the state in reaching its climate and clean mobility goals.

We are writing to suggest that CARB expand ACC II amendments to update electric vehicle charging requirements to better reflect the growing needs of shared, autonomous, electric mobility, specifically Section 1962.3 subdivision (c)(1) of Title 13 of the California Code of Regulation (“§ 1962.3(c)(1)”). Under this section, CARB requires that all electric vehicles be equipped with an

¹ <https://waymo.com/blog/2024/06/waymo-one-is-now-open-to-everyone-in-san-francisco/>

² California Air Resources Board. “Low Carbon Fuel Standard (LCFS) Guidance 19-01 Book-and-Claim Accounting for Low-CI Electricity.” April 2019.
https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/guidance/lcfsguidance_19-01.pdf.

³ <https://waymo.com/safety/>

alternating current (AC) charger inlet or approved adapters to enable AC charging. We understand the intent of this requirement is to serve as both a consumer protection measure, and to broadly build confidence in EV charging options. We agree that reliable, convenient, and affordable charging options are critical to accelerate consumer adoption of EVs.

However, § 1962.3(c)(1) as currently written requires AC charging technology that is unnecessary and irrelevant to shared,⁴ autonomous, electric fleets. The purpose-built EVs that comprise autonomous rideshare fleets are solely reliant on DC fast charging; imposing an AC charger requirement as currently written, would add needless cost, weight, and waste to a more efficient shared fleet model. Faster and more efficient DC-based systems are now — and will continue to be — the sole charging technology for shared autonomous, EV fleets. The capital, maintenance costs, risks, and diverted design attention associated with including AC chargers present a material cost and barrier to the continued scaling of an EV-oriented commercial AV sector. We respectfully request the addition of language that would allow manufacturers to focus solely on DC charging solutions when designing and producing EVs for primary use in commercial fleets of shared, electric, and autonomous vehicles.

I. A DC-only charging pathway reduces barriers to EV adoption by commercial autonomous vehicle (AV) fleets.

Shared AV fleets operate in a fundamentally different manner than personally owned vehicles. Personal vehicles are parked 95% of the time,⁵ whereas shared AV fleets are continuously in use, shared by our riders, and operationally require fast charging. Personal vehicles that spend so much of their lives parked are amenable to slower AC-based charging, but the high vehicle up-time of shared AV EVs requires fast-charging that can only be obtained through centralized DC infrastructure. Requiring AC charging hardware in shared AV fleets would add unnecessary cost and complexity without providing meaningful benefit to the fleet operator or the public, posing a barrier to AV-specific EV growth and adoption.

II. EVs produced for shared AV fleets are highly unlikely to enter the consumer market.

Autonomous electric vehicles produced solely for shared AV purposes are unlikely to enter the consumer market even after they are retired from commercial use. These vehicles are specifically designed for driverless operation supported by complex backend systems inaccessible to everyday drivers and do not include the features or functionality that consumers expect in a personal vehicle. The ACC II is right to safeguard the consumer-friendliness of future personal EVs, but there is no reasonable expectation of commercial shared AVs entering the consumer market.

⁴ A “shared” vehicle is utilized by multiple users, either simultaneously or consecutively. Shared vehicles are part of the larger framework of Shared Mobility, which includes carsharing, ridesharing, ride hailing, carpooling, vanpooling, bikesharing, and scooter sharing. Source: Harvard Kennedy School. “Research guides: Transportation Policy: Shared Mobility & Urban Freight.” Accessed Jul 25, 2024. Last updated May 4, 2024. <https://guides.library.harvard.edu/hks/transportation-policy/shared-mobility>.

⁵ Shoup, Donald. “The High Cost of Free Parking.” *Journal of Planning Education and Research* 17, no. 1 (September 1, 1997): 3–20. <https://doi.org/10.1177/0739456x9701700102>.

III. Allowing AV manufacturers to focus on DC-only charging systems facilitates specialization and innovation.

We believe that an exception to the AC charging requirement for shared AV fleets would be in the best interest of both the industry and the state of California. DC charging is the most effective and efficient way to charge an EV. DC systems are required by large shared AV fleets to maximize vehicle up-time, user access, and ultimately the displacement of non-ZEV miles traveled. By allowing manufacturers to focus on developing and deploying the most advanced DC charging technologies for shared AV fleets, California can facilitate cleaner air while maintaining its position as a leader in clean transportation innovation.

IV. Proposed Amendment to § 1962.3(c)(1).

To facilitate growth in the implementation of EV-based AVs and the benefits to health and climate it would facilitate, we propose the following amendment to § 1962.3(c)(1):

(1) Alternating Current (AC) Charger Inlet. Beginning with the 2006 model year, all vehicles identified in subsection (a) must be equipped with a conductive charger inlet and charging system which meets all the specifications applicable to AC Level 1 and Level 2 charging contained in SAE Surface Vehicle Recommended Practice SAE J1772 REV OCT 2017, SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charger Coupler, which is incorporated herein by reference. All such vehicles, manufactured through 2025 model year, must also be equipped with an on-board charger with a minimum output of 3.3 kilowatts or capable of providing sufficient power to enable a complete charge in less than 4 hours. All such vehicles manufactured for 2026 and subsequent model years must also be equipped with an on-board charger with a minimum output of 5.76 kilowatts (calculated as 24 amps at 240 volts AC) or capable of providing sufficient power to enable charging from a state of discharge to a full charge in less than 4 hours.

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(6) Exemption for Commercial Operators of Fully Electric Autonomous Vehicles.

The requirements of section 1962.3(c)(1), which prescribes that all vehicles described in subsection (a), must be equipped with AC charging equipment shall not apply to **vehicles designed and manufactured exclusively for operation as part of a commercial autonomous vehicle fleet licensed or permitted by the appropriate state agencies of competent authority.**

We respectfully request that CARB consider granting an exception to the AC charging requirement for commercial AV fleets as part of the amendments to ACC II. We believe that this common-sense approach would benefit all stakeholders, ultimately strengthening the ACC II program.

Thank you for your time and consideration. We look forward to continuing to work with CARB to advance the deployment of clean transportation solutions in California.

Respectfully submitted,

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