



TOYOTA MOTOR NORTH AMERICA, INC.

Sustainability and Regulatory Affairs
1630 W. 186th Street, Gardena, CA 90248

October 14, 2022

Chair Liane M. Randolph and Members of the Board
California Air Resources Board
1001 I Street
Sacramento, CA, 95812

RE: Comments Related to Proposed Advanced Clean Fleets Regulation

Dear Chair Randolph and Members of the Board,

Toyota Motor North America (Toyota) appreciates the opportunity to comment on California Air Resources Board's (CARB) Advanced Clean Fleets (ACF) regulation and supporting rulemaking documents including the Initial Statement of Reasons (ISOR), published on August 30, 2022. Toyota believes the ACF regulation will support California's goals of reducing GHG and NOx emissions and the State's transition toward an electrified economy.

Our attached comments focus on ACF's High Priority Fleet requirements and include several proposals regarding implementation of the regulation and suggested clarifying revisions to the regulatory language.

Toyota is in a unique position to comment for the following reasons:

- Toyota was an active participant in CARB's Zero and Near Zero Freight Facility (ZANZEFF) program and can provide insight regarding Zero Emission (ZE) truck operations.
- Toyota will be one of the first OEMs to certify fuel cell technology to be applicable for Class 8 truck applications.
- Unlike many OEMs, Toyota operates its own logistics fleet in California transporting parts and vehicles to and from ports, railyards, warehouses, and dealers, and thus both the High Priority Fleet requirements and Drayage truck requirements impact Toyota operations.

Toyota is a Major Heavy-Duty Fleet Operator in California

As the highest-selling OEM in California, Toyota has significant logistics operations that extend from San Diego to Northern California and are serviced through Toyota's own

logistics fleet as well as contracted third-party fleets. On an annual basis, over 630,000 new Toyota and Lexus vehicles pass through California ports and railyards before they reach their final destinations, each of which are managed by Toyota's logistics operations.

In addition, Toyota has 174 Toyota and Lexus dealers throughout California selling 300,000 vehicles annually. To support these vast logistic needs within the state:

- Class 8 trucks (both Toyota and third party-operated) are used daily to deliver vehicles, parts, and raw materials from various seaports, railyards, and warehouses.
- On average, Toyota and its logistic partners drive 120,000 miles/day in Class 8 trucks to support California operations.

As part of our long-term environmental goals, Toyota hopes to replace those diesel truck miles with zero emission miles utilizing fuel cell (FC) electric trucks.

Impact of ACF on Toyota's Operations

Under CARB's ACF regulation, Toyota is subject to both the High Priority Fleet requirements and Drayage truck requirements. Toyota meets the criteria described in the High Priority Fleet regulation because Toyota "owns, operates, or directs 50 or more vehicles" and has "\$50 million or more in total gross annual revenue." Toyota also meets the criteria for Drayage truck requirements given that some of our trucks visit seaports to deliver vehicle accessories.

Toyota believes the ACF regulation will have an enormous impact on both the environment and the economy. There will be environmental benefit with ZE trucks on the road, but also operational trade-offs. As an example, Toyota and its logistic partners, operate auto carriers to deliver vehicles to dealerships. The current diesel-powered auto carriers can carry - on average - eight vehicles per truck. The transition to ZE auto carriers would decrease the load allowance to six vehicles due to physical limitations (e.g., no vehicle placement over truck cab and/or weight restrictions). Toyota estimates that for every diesel auto carrier replaced, 1.2 ZE (Battery or FC) auto carriers is needed. In other words, Toyota would need to make approximately 20% more truck trips to carry the same number of vehicles. With the sale of 300,000 Toyota vehicles/year in California, the seemingly small difference in vehicles per truckload can amount to significant costs and disruptions to our business operations. It would also increase the number of heavy-duty trucks on California roadways by 20% and contribute to additional traffic congestion.

Summary

Toyota requests CARB take a "balanced" approach that drives emissions improvements, while doing so as economically as possible. Toyota agrees with the State that technology will ultimately drive the transition to carbon neutrality. However, this transition requires careful consideration around the time needed to develop new infrastructure, implement new driver/workforce training, and adjust business models.

Toyota would like to thank you again for the opportunity to comment on the ACF rule and for considering the attached proposals to enhance the regulation. We welcome further dialogue and discussion with staff. For further questions, please contact Glenn Choe, Principal Engineer, at glenn.choe@toyota.com or 502-542-9078.

Sincerely

A handwritten signature in black ink, appearing to read "Tom Stricker". The signature is fluid and cursive, with the first name "Tom" and last name "Stricker" clearly distinguishable.

Tom Stricker
Group Vice President
Sustainability and Regulatory Affairs
Toyota Motor North America

Attachment

Toyota Detailed Comments on ACF Regulatory Proposal

Overall Comments on the Proposal

Market Assessment (Biennial/Triennial Review)

Toyota recommends CARB consider conducting a market assessment every two to three years. CARB's Innovative Transit Rule and At-Berth Regulation offered "check-in" opportunities for CARB to assess the market readiness of those regulations. Moreover, for the Advanced Clean Cars (ACC) II regulation, the CARB Board directed CARB to monitor ZEV market conditions and routinely report such monitoring to the CARB Board. Toyota believes similar measures are needed for the ACF regulation. To effectively inform the review, market assessments should measure:

- Infrastructure development/cost (EV and H2)
- Purchase price of zero emission (ZE) trucks
- Total cost of ownership metrics
- Impact to business operations (changes required to support ZE truck adoption)

During the Advanced Clean Trucks rulemaking, CARB required Large Entity Reporting to scope out the size of fleets in California. Similar survey/information could be voluntarily requested to facilitate the market reviews. In addition, CARB should collaborate with entities like the California Chamber of Commerce to develop market assessment and to provide information sharing opportunities.

Toyota believes a market assessment is critical to the effective operation of the ACF rule because of the early stage of the Heavy-Duty ZE technology and the relative uncertainty of the associated costs. For example, the cost information and assumptions described by CARB as the "Total Cost of Ownership" (Appendix G of the ISOR) is incomplete. Toyota's experience with FC Class 8 tractors at the California ports has given us unique insight into the costs of this technology. We have concerns that some of the near term (2025) fuel cell costs for Class 8 Day Cab trucks (Appendix G of the ISOR, p. G-58, Table 29) were underestimated. Table 29 provides the following:

Table 29: 2025 Day Cab Tractor Cost Breakdown

Cost Component	Diesel	Natural Gas	Battery-Electric	Fuel Cell Electric
Total Miles	599,280	599,280	599,280	599,280
Operating Years	12	12	12	12
Energy Storage	-	-	450 kWh	10 kWh/40 kg H2
Vehicle Power	-	-	350 kW	350 kW/175 kWFC
Vehicle Price	\$143,862	\$195,607	\$201,999	\$212,353
Taxes	\$28,772	\$39,121	\$40,400	\$42,471
Financing Costs	\$31,571	\$42,927	\$44,329	\$46,602
Total Vehicle Cost	\$204,205	\$277,655	\$286,727	\$301,425
Fuel Economy	6.7 mpg	6.5 mpg	0.54 mi./kWh	10.9 mi./kg
Unit Fuel Cost	\$4.06/gal	\$1.98/gal	\$0.21/kWh	\$5.48/kg
Fuel Cost	\$361,069	\$181,399	\$234,326	\$300,201
DEF Consumption	\$4,975	\$0	\$0	\$0
LCFS Revenue	\$0	\$0	-\$248,902	-\$84,907
Total Fuel Cost	\$366,045	\$181,399	-\$14,576	\$215,293
Maintenance Cost	\$118,898	\$118,898	\$89,174	\$89,174
Midlife Costs	\$0	\$0	\$40,545	\$29,750
Registration Fee	\$35,732	\$37,733	\$16,860	\$17,261
Depreciation	-\$43,159	-\$58,682	-\$60,600	-\$63,706
Residual Value	-\$33,363	-\$45,363	-\$46,845	-\$49,246
Insurance Costs	\$10,078	\$13,702	\$14,150	\$14,876
Total Other Costs	\$88,186	\$66,289	\$53,285	\$38,108
EVSE Cost	\$0	\$0	\$84,954	\$0
Infrastructure Upgrade Cost	\$0	\$45,309	\$99,679	\$0
Total Infrastructure Cost	\$0	\$45,309	\$184,633	\$0
TOTAL	\$658,436	\$570,651	\$510,068	\$554,827
Payback Period vs Diesel (yr)	-	-	8.1	12.1

Toyota believes the values for vehicle purchase price, fuel cost, fuel efficiency, and other metrics need to be further reviewed and supplemented with more market-based data. For example, Table 29 does not adequately reflect the capital cost necessary to acquire fuel cell trucks, data which was available from CARB's ZANZEFF demonstration project and the CARB/CEC Drayage truck pilot project.

Credit Mechanism for High Priority Fleets

For High Priority Fleets, CARB offers a milestone option for compliance. The milestone option is based upon the percentage of the fleet that is ZE trucks.

Toyota suggests that the milestone option be based upon credits earned by each milestone. If the milestone were based upon credits, and fleets could bank the credits, there would be incentive to over comply at each milestone. As shown under the ACC regulations, a crediting mechanism offers greater regulatory flexibility and incentivizes early adopters.

In the early years of ACF regulation, fleets will need regulatory flexibility given the many unknowns like infrastructure needs, higher cost of ZE trucks, and capability/range of ZE trucks. Toyota believes utilizing credits can lead to regulatory incentive mechanisms that incentivizes fleets to over comply while also providing the necessary flexibilities. And CARB has demonstrated, with other programs utilizing credit mechanisms, that it has the

experience/resources in place capable of implementing such a mechanism. Thus, implementation of a credit mechanism for ACF should not be an overly burdensome task.

“Early Adopter” Credit for Longer Range Trucks

Operationally, California is a large state with many line-haul routes between Northern California and Southern California. Range will play a significant role as fleets attempt to assimilate routes driven by diesel to ZE. Diesel trucks can travel, on average, 600 miles with a single fill up; currently, the projected highest range of a ZE truck is 275 miles on a single charge.

Toyota believes range should be a consideration for credit for ZE trucks because the ZE technology is novel and requires further development. Early iterations of the ACCs regulation included a crediting structure based upon range to encourage longer range ZE technology development for light duty vehicles and to address range anxiety. Other CARB programs, such as the Innovative Clean Transit rule offered early adopter bonus credits as well.

In the near-term, ZE trucks with longer range means increased costs for fleets. With eligibility for CARB’s Hybrid and Zero Emission Vehicle Incentive Program phasing out (due to ACF compliance obligations), CARB should instead offer fleets a regulatory incentive to purchase longer range ZE trucks.

Toyota recommends including an allowance of “early adopter” bonus credits for fleet acquisitions of longer-range trucks. Early adopter bonus credits should be tiered based upon range. For example, Toyota suggests the following credit for fleet purchasers:

- For trucks with a range of greater than 300 miles: 1 bonus credit.
- For trucks with a range of greater than 500 miles: 2 bonus credits.
- Credits should sunset by 2030 or based upon market assessment study.

Comments on the Proposed Draft Regulation Language

Section 2015.2 High Priority and Federal Fleets Milestone Option Exemptions and Extensions

The regulation offers infrastructure construction delay extensions of one year. There are many uncertainties given supply chain issues, parts availability, and lack of technical expertise in developing or installing 1MW chargers or 1 ton/day H2 fueling stations. Given Toyota’s experience with light duty hydrogen infrastructure development, Toyota recommends CARB provide a two-year extension for construction delays. Such an extension should be made available until 2030 or based upon market assessment findings.

Section 2015 High Priority and Federal Fleets Definitions

The movement of goods throughout California and the U.S. can involve complex logistical relationships with varying levels of control. CARB acknowledges the complexity of these

relationships, and the varying business models utilized for logistics, by differentiating between entities that merely hire fleet services and those that own or control fleets. With varying compliance obligations depending on an entity's status under the rule (e.g., hiring entity vs. controlling party vs. fleet owner), the regulatory language establishing an entity's status must be clear. While it may not be possible to clearly delineate every logistical relationship, clarifying language could be added to the regulation to create more certainty for regulated parties.

For example, the term/phrase "direct" and "direct the operation" (and its derivatives) is used in several contexts in the regulation including as it relates to hiring entities and common ownership and control. Hiring entities are entities that "hire and operate or hire and direct the operation" of a fleet. The term/phrase also appears in the definition of "controlling party" and "common ownership or control." While the "common ownership or control" definition attempts to clarify its reach by providing specific examples of control, Toyota recommends additional clarity. Toyota recommends including a definition of "direct" or "direct the operation" to mean "to manage or control the selection of a particular vehicle and a particular driver as to the details of who, when, where, and how work is to be performed for a particular load. The mere request for cargo pickup, the setting of the origination/destination of that cargo, and timing surrounding pick-up/delivery is not considered "directing" or "directing the operation" of the vehicle."

In addition, Toyota recommends striking the following language in proposed Section 2015(a)(3): "The requirements of section 2015(g) apply to any motor carrier, broker, governmental agency, person, or entity that hires ~~and operates or hires and directs the operation of~~ vehicles in fleets subject to title 13, California Code of Regulations (CCR) sections 2013 through 2013.4, or vehicles in fleets subject to this regulation per the scope and applicability of section 2015(a)(1-2)." Section 2015(g) requires subject entities to verify compliance of the fleets it hires. It does not require the hiring entity to take action with respect to a fleet's emissions. This makes sense because hiring entities have little, if any, control over the fleet and are not in the position to alter a particular fleet's configuration. Such an obligation (turnover of ICE, procurement of ZE trucks) should be left to those entities that own the fleet or those with a controlling relationship that involves "directing the operation" of a fleet on a day-to-day basis.