State of California
CALIFORNIA AIR RESOURCES BOARD

ZERO-EMISSION AIRPORT SHUTTLE REGULATION

FINAL STATEMENT OF REASONS

December 2019

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State of California
AIR RESOURCES BOARD

**Final Statement of Reasons for Rulemaking,
Including Summary of Comments and Agency Response**

PUBLIC HEARING TO CONSIDER THE Zero-Emission Airport Shuttle Regulation

Public Hearing Dates: February 21, 2019, and June 27, 2019
Agenda Item Numbers: 19-2-6 and 19-6-2

I. GENERAL

The staff report: Initial Statement of Reasons for Rulemaking (staff report), entitled "The Proposed Zero-Emission Airport Shuttle Regulation" released December 31, 2018, is incorporated by reference herein. The staff report contained a description of the rationale for the proposed amendments. On December 31, 2018, all references relied upon and identified in the staff report were made available to the public.

As explained in the staff report, the Zero-Emission Airport Shuttle Regulation is designed to assist in attaining air quality standards, reducing health risks to individuals living in California, and meeting climate change goals by requiring California's airport shuttle fleets to transition to zero-emission shuttles.

On February 21, 2018, following a 45-day comment period, the California Air Resources Board (CARB or Board) held a public hearing to consider the proposed Zero-Emission Airport Shuttle Regulation, as described in the staff report and associated Notice of Public Hearing (45-Day Notice). The regulation requirements are included in title 17, division 3, sections 95690.1, 95690.2, 95690.3, 95690.4, 95690.5, 95690.6, and 95690.7 of the California Code of Regulations. CARB approved the proposed regulation and instructed staff to continue to work with stakeholders and address the concerns of emergency situations. The board also instructed staff to add a public process for use in requests for extensions, when applicable.

Written comments were received from a total of 19 comment letters from individuals or organizations during the 45-day comment period and one comment letter was received outside of the 45-day comment period. Oral comments were given by 20 individuals during the September public hearing. Four written comments were received at the hearing. After the February 21, 2019 public hearing, staff proposed modifications to the originally proposed regulation, in order to address comments received during the 45-day public comment period, as well as comments during the board hearing.

The text of the proposed modifications to the originally proposed regulation and supporting documents were made available for a supplemental 15-day comment period through a "Notice of Public Availability of Modified Text and Availability of Additional Documents" (15-Day Notice). The 15-Day Notice, modified regulatory

language, and additional supporting documents were posted on May 9, 2019, on CARB's website (https://ww2.arb.ca.gov/rulemaking/2019/asb19), accessible to stakeholders and interested parties. The comment period commenced on May 9, 2019 and ended on May 24, 2019. All modifications to the regulatory language are clearly indicated in the Notice of Public Availability of Modified Text (https://ww2.arb.ca.gov/rulemaking/2019/asb19). There were 28 comment letters received during this period.

The written responses to the Draft Environmental Analysis (EA) was posted on December 31, 2018 for public review. The Final EA was subsequently published on June 24, 2019 for public review.

On June 27, 2018, the Final Environmental Analysis, Response to Comments, Final Regulation Order, and Proposed Resolution 19-16 were presented at the second board hearing. Oral comments were given by 14 individuals during the June public hearing. The Board adopted Resolution 19-16 which approves written responses to the Draft EA, certified the Final EA, and approved the findings and statement of overriding considerations and adoption of the Zero-Emission Airport Shuttle regulation. The Final Statement of Reasons (FSOR) updates the staff report by identifying and providing the rationale for the modifications made to the originally proposed regulatory text, including changes directed by the Board at the February 2019 hearing and text circulated for public comment during the 15-day comment period. The FSOR also contains a summary of the comments received during the formal rulemaking process by CARB on the proposed Zero-Emission Airport Shuttle regulation or the process by which they were adopted, and CARB's responses to those comments.

A. MANDATES AND FISCAL IMPACTS TO LOCAL GOVERNMENTS AND SCHOOL DISTRICTS

The Board has determined that this regulatory action will result in a mandate to local agencies but not local school districts. However, the Board finds that that these costs are not reimbursable pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code. The costs on airport operators are not reimbursable by the State because airport shuttle services are voluntary. The government jurisdictions that operate airports in general, and transit services in particular, are not obligated to provide these facilities or services. (See Arcadia Unified School Dist. v. State Dept. of Ed. (1992) 2 Cal.4th 251, 264 [school districts not obligated to provide transit services].) Costs of optional services are not mandated and are not subject to reimbursement.

In chapter VIII of the ISOR, staff acknowledges a higher upfront capital cost for zero-emission shuttles but also shows that annual operating costs are lower, resulting in a total cost of ownership that is comparable to or lower than conventional shuttles. The cost analysis shows the annual costs of the regulation reflect higher initial costs for zero-emission shuttle and associated infrastructure without grant funding or financing. Staff's proposal provides sufficient time and opportunities for airport shuttle operators to access incentive funding to deploy zero-emission technologies which can dramatically decrease the upfront cost of the shuttles.

The State is committed to using incentives to help with the transition to zero-emission technologies. Substantial funding is currently available in multiple programs and can reduce or eliminate upfront incremental costs of zero-emission shuttles and corresponding infrastructure. Funding cannot be guaranteed to be available indefinitely and may not be necessary in later years as the incremental costs decline.

B. CONSIDERATION OF ALTERNATIVES

For the reasons set forth in the staff report, in staff's comments and responses at the hearing, and in this FSOR, the Board determined that no alternative considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed, or would be as effective and less burdensome to affected private persons, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law than the action taken by the Board.

1. Small Business Alternative

This alternative is a less ambitious version of the proposed regulation that would require, in 2035, a 75 percent (zero-emission vehicle) ZEV in-use fleet composition requirement as opposed to the regulation's 100 percent in-use fleet percentage requirement. Such an alternative would achieve some reduction of criteria air pollutants and greenhouse gases (GHG), and move the heavy-duty ZEV market directionally towards expanded commercial usage, at a lower overall capital cost than the proposed regulation, to impacted fleets.

This Small Business Alternative does not meet California's SIP strategy goals of maximum nitrous oxides (NOx), particulate matter (PM), toxic air contaminant (TAC), and GHG emission reductions, nor does it fully meet California's SIP strategy goals of increasing the first wave of ZEV deployment or spurring economic growth, fuel diversity, and energy independence. Furthermore, this alternative potentially prolongs fleets maintenance of dual vehicle and fueling infrastructure (pre- and post- regulation), which could be an economic burden. This alternative would regulate a smaller population of vehicles resulting in less impact to the environment from factories that manufacture vehicles and related fueling infrastructure support products. This alternative would also have lower impacts related to refueling, infrastructure construction, and electric power grid upgrades.

This Small Business Alternative would result in lower overall demand for vehicle manufacturing and would therefore have a lower environmental impact as related to manufacturing. Decreased environmental impacts are related to less infrastructure installations needed due to the smaller scope. This results in short-term construction-related impacts to biological resources, geology and soil, cultural resources impacts, and hydrology and water quality, associated with installation of electric vehicle charging/refueling infrastructure. Furthermore, this Small Business Alternative is a less impactful contribution toward a more robust ZEV market, due to the reduced number of shuttles, which is a secondary goal of this Regulatory Proposal. Accordingly,

alternatives that do not achieve the mandate of air emission reductions are inconsistent with CARB's legislative direction. The primary goals of the proposed regulation would not be achieved using this alternative.

2. No Phase-in of the 100% Requirement

Under this alternative, fleets would not have to follow a specific phase-in schedule, but would still meet a 100% ZEV composition requirement in the compliance year, 2035. Therefore, any zero-emission airport shuttle purchases made by regulated fleets in the years leading up to the compliance year would be entirely voluntary. This would significantly extend the regulation's voluntary early action period for all fleets to apply for incentive grant funding. Retaining the final end-point and mandatory reporting would ensure that emission reductions would be achieved by replacing internal combustion vehicles with ZEVs.

This alternative would not, in early years, provide a signal to the market that technology should be adopted and increases the risk of noncompliance in the first regulatory compliance year, 2035, should fleets procrastinate on purchasing technology to meet the fleet composition requirement. In addition, the rate of voluntary adoption of technology has potential for being very low and therefore, in this scenario, there is very high risk for minimal to no early deployment and an increased risk of incurred penalties for companies that fail to meet the requirement by the compliance date.

The combination of these two outcomes would significantly hinder the ability to appropriately plan infrastructure and could magnify the impact to the environment by needing all construction-related activities to happen in a few years instead of being spread out over two decades, which include air emissions resulting from construction activities. Delay in technology adoption would also result in the rush of zero-emission airport shuttle production orders which would force manufacturers to scale-up manufacturing facilities in a short period of time. This would add potential adverse environmental impacts associated with manufacturing due to inefficiencies in the comparatively rapid scaling of manufacturing systems (a few years rather than over a decade) and subsequent increases in resource consumption such as energy, fuel, etc. Such a surge in production would transfer pressure up the supply chain due to increased demand for raw materials and parts, such as increased mining activities for the precious/exotic metals needed for batteries.

Procrastination would also result in short-term or reactive planning by electric utilities and/or merchant hydrogen suppliers in meeting transportation energy demand that results in more infrastructure upgrade activities. This is in contrast to the proposed regulation's long compliance schedule, which includes incremental milestones that encourage systematic infrastructure improvements to meet stepwise energy demand, improving overall system efficiency.

This alternative would result in lower overall air pollutant emission reductions due to a predicted shorter period in which zero-emission technologies will be in-use. While airport shuttle fleets could decide to transition to ZEVs before the regulatory requirement, regardless of CARB's action on the proposed regulation, it would not be due to CARB's regulatory authority.

This alternative would provide minimal early commercial development impact due to a reduced number of shuttles, which is contrary to the secondary goal of the proposed regulation, a contribution toward a more robust heavy-duty ZEV market. Accordingly, alternatives that do not achieve the mandate of air emission reductions are inconsistent with CARB's legislative direction. While airport shuttle fleets could decide to take early action on the purchase of ZEVs and installation of energy infrastructure, since it will not be mandated under CARB's action on the proposed regulation, there is no guarantee that this will occur and there is significant risk that compliance procrastination will undermine the intent of the regulation.

3. Ultra-low NOx Engine Emission Rate Averaging Alternative

This alternative introduces an ultra-low NOx vehicle option as an interim compliance alternative instead of a 100 percent ZEV requirement. Ultra-low NOx is defined as an internal combustion engine that complies with the existing optional 0.02 g/bhp-hr NOx emission certification standard. Under this alternative, fleets would have the option to purchase shuttles powered by an internal combustion engine that complies with the ultra-low NOx emission standard. These vehicles would also be required to operate on renewably derived fuel. In 2027, the fleet would need to comply with an emission rate that averages 33% zero tailpipe emissions into their total fleet ramping up in 2031 to 66% of fleet zero-tailpipe emissions and then in 2035 to 100% of fleet zero tailpipe emissions.

This alternative does not meet the requirements of California's SIP strategy, which calls for both the elimination of tailpipe criteria pollutant emissions within the nonattainment areas and a shift of the vehicle population towards zero-emission technologies. Although a renewable fuel component would reduce lifecycle GHG emissions, the criteria emission reduction will not occur within the areas these shuttles are operated. Furthermore, the intent of the regulation is the requirement of zero-emission technologies in a fleet that is especially suited for those technologies, as they exist contemporarily. The scope of the proposed regulation has been limited to impact fleets that have specific operating characteristics that are compatible with zero-emission technologies. The introduction of an internal combustion option during the fleet transformation period would undermine the heavy-duty ZEV commercialization component of the regulation.

Accordingly, alternatives that do not achieve the mandate of air emission reductions are inconsistent with CARB's legislative direction. While privately-owned airport shuttle fleets could decide to buy zero-emission airport shuttles, it is likely that fleets will gravitate to the option closest to business-as-usual, i.e., the ultra-low NOx combustion pathway, given the option. Fleets that choose the ultra-low NOx option will have difficulty complying with the zero-emission airport shuttles mandate in later years, as early action incentive funding will no-longer be available, increasing risk of noncompliance. The primary goals of the proposed regulation would not be achieved using this alternative.

4. Performance Standards in Place of Prescriptive Standards

Government Code section 11346.2(b)(4)(A) (Government Code, 2015) requires that when CARB proposes a regulation that would mandate the use of specific technologies or equipment, or prescribe specific actions or procedures, it must consider performance standards as an alternative. The proposed regulation, requiring zero-emission airport shuttles be purchased when shuttles are otherwise being purchased, is a performance standard, as it does not prescribe which technology must be deployed or explicitly require the purchase of any specific shuttle or by a specific date.

This proposed standard would allow regulated entities the flexibility to decide whether battery electric or fuel cell zero emissions technology would best fit their application. The proposed regulation requirements for ZEV technology can be met through application of existing technology that is available and in use today. The proposed regulation does not prescribe a single set of technologies, but instead allows any zero-emission technologies to be used, such as battery-electric or fuel-cell vehicles. At the June 27, 2019 public hearing the Board approved a zero emission powertrain certification process that will help drive technology innovation and refinement, empower fleet decision-making by increasing consumer confidence in the technology, and provide data to inform future measures that accelerate the overall transition to zero-emission technologies.

II. MODIFICATIONS MADE TO THE ORIGINAL PROPOSAL

A. MODIFICATIONS APPROVED AT THE BOARD HEARING AND PROVIDED FOR IN THE 15-DAY COMMENT PERIOD

Subsequent to the February 21, 2019 Board hearing, modifications to the original proposal were made at the Board's direction and to address comments reviewed during the 45-day public comment period. CARB staff released a Notice of Public Availability of Modified Text and Availability of Additional Documents and Information (15-Day Notice) on May 9, 2019, which notified the public of additional documents added into the regulatory record and presented additional modifications to the regulatory text.

The following is a summary of the changes that were made to the initial proposal and were made available for a 15-day comment period. Staff's proposed modifications to previously proposed adoptions of new sections 95690.1, 95690.2, 95690.3, 95690.4, 95690.5, 95690.6, and 95690.7, Title 17 of the California Code of Regulations are summarized below

1. Modification to Section 95690.2. Definitions.

    a. In section 95690.2(a), staff proposes to add definitions for "Emergency," "State of Emergency," and "State of War Emergency" and clarify language which defines "Fixed Destination Route." These additions clarify which conditions would be included in subsection 95690.6(c) Emergency Exemption as well as ease interpretation of which types of airport shuttle operations are included in section 95690.3(a).

2. Modification to Section 95690.3. Applicability.

    a. In section 95690.3(a)(3), staff clarified the language that the fixed destination route is to be 30 miles or less but not specifically "from a regulated airport." The clarification eases interpretation of the geographic applicability of the proposed regulation.

3. Modification to Section 95690.5. Airport Shuttle Fleet Requirements.

    a. In section 95690.5(a)(1)(A), staff added language to clarify when fleets with 1 or 2 vehicles will be required to transition to zero emission vehicles. This provides more clarity to small fleet owners concerning the compliance schedule.

    b. In section 95690.5(d), staff revised the language to clarify that exempt airport shuttles would be allowed to operate on or after January 1, 2036.

    c. In section 95690.5(e)(2), staff added language allowing regulated airports the option to verify compliance using CARB's TRUCRS website. This revision adds flexibility to the compliance verification process for airports.

4. Modification to Section 95690.6. Exemptions and Extensions.

    a. In section 95690.6, staff modified the language in order to bifurcate section 95690.6 Exemptions and Extensions into section 95690.6 Exemptions and section 95690.7 Extensions. The proposed Extensions section will encompass the infrastructure facility extension, the compliance extension, and include a public process for submitting and approving applications for extensions.

    b. In section 95690.6(a)(3), staff revised the language to clarify that the reporting requirement for reserve airport shuttles will start on January 1, 2026 and that mileage readings must be taken on December 31st.

    c. In section 95690.6(c), staff added language to exempt vehicle operation during emergency situations and require fleet owners to provide information specified in subsection 95690.7(a). This was added in response to comments from stakeholders over concern for their ability to respond to an emergency situation while maintaining compliance with the regulation.

    d. In renumbered sections 95690.7(a) and 95690.7(b), staff removed the language detailing what information must be submitted to the Executive Officer, as the necessary documentation is specified by the criteria set forth in section 95690.7(c).

    e. In renumbered section 95690.7(c)(1), staff added new language describing the information that the fleet owner must provide to the

Executive Officer. This consists of information that is required in section 95690.5(a) Reporting Requirements for Airport Shuttle Fleets, the projected start and end dates of the exemption, supporting documentation that demonstrates the need for the requested exemption, and a mitigation plan that would detail efforts made by the fleet owner to reduce or eliminate the future need for the exemption.

f. In renumbered section 95690.7(c)(2), staff is added a 30-Day public comment period to the extension application process. After fleet owners submit their application, CARB will make the application materials available to the public for comment for a total of 30 days. This addition facilitates a transparent evaluation process.

g. In renumbered section 95690.7(c)(3), staff revised the language to clarify the final actions that the Executive Officer will take in the exemption application process and that the decision will be made available to the public within 15 days of the close of the public comment period.

B. UPDATE TO THE ECONOMIC IMPACT ASSESSMENT IN THE INTIAL STATEMENT OF RESONS

Staff received a comment that the economic impact assessment did not include state and local taxes for electricity prices. Staff conducted a more thorough analysis that used a weighted average for electricity prices in California and included state and local taxes. The results confirmed the initial approach for electricity costs as provided in the staff report and no changes were made to the assumed electricity prices. These modifications are detailed in the 15-day Notice.

C. NON-SUBSTANTIAL MODIFICATIONS

Subsequent to the 15-day public comment period mentioned above, staff identified the following additional non-substantive changes to the regulation:

Section 95690.4(f), *Request for Extension*: Staff has decided not to proceed with this provision.

Section 95690.5(a)(1): Deleted an extra “the” in the first sentence of the subsection

Section 95690.7(c)(1)(B): Corrected the spelling of the word “extension”.

Section 95690.7(c)(3): Added “modify” to the first sentence to make it consistent with subsequent language.

The non-substantial modifications, described above, clarify and do not materially alter the requirements, rights, responsibilities, conditions, or prescriptions contained in the amendments as adopted by CARB and approved by OAL.

III. SUMMARY OF COMMENTS AND AGENCY RESPONSE

Written comments were received during the 45-day comment period in response to the **February 21, 2019** public hearing notice, and written and oral comments were presented at the Board Hearing. Listed below are the organizations and individuals that provided comments during the 45-day comment period:

Comment Code	Comment Period Received
OP	Comments received during the 45-day comment period of the original proposal, December 31, 2018 – February 13, 2019
B	Comments received in written materials during the board hearing, February 21, 2019
T	Comments received as testimony at the board hearing, February 21, 2019
E	Comments received outside of the comment period
F	Comments received during the 15-day comment period of the modified proposal, May 9, 2019 – May 24, 2019

Table A. Written comments received at the Board Hearing – February 21, 2019

Comment Code	Submitter	Affiliation	Date Received
B-01	Cory Shumaker	California Hydrogen Business Council	February 22, 2019
B-02	Don Gilbert	San Francisco International Airport	February 22, 2019
B-03	Lisa McGhee	San Diego Airport Parking Company	February 22, 2019
B-04	Michael Neuenburg	Sacramento Metropolitan AQMD	February 22, 2019

Table B. Comments submitted during the 45-day comment period

Comment Code	Submitter	Affiliation	Date Received
OP-01	Laura Dill	Individual	January 04, 2019
OP-02	William Mayben	Individual	January 05, 2019
OP-03	Jerry Roane	TriTrack Motors	January 07, 2019
OP-04	William Mayben	Individual	January 07, 2019
OP-05	Kevin Meikle	Fresno Yosemite Int'l Airport (FAT)	February 06, 2019
OP-06	Heidi Sickler	Silicon Valley Leadership Group	February 14, 2019

OP-07	Ryan Kenny	Clean Energy	February 15, 2019
OP-08	Ray Pingle	Sierra Club California	February 15, 2019
OP-09	Thomas Becker	Individual	February 15, 2019
OP-10	Thomas Becker	Individual	February 17, 2019
OP-11	Kent Leacock	Proterra	February 19, 2019
OP-12	Sarah Johnson	California Airports Council (CEC)	February 19, 2019
OP-13	Vincent Wiraatmadja	BYD	February 19, 2019
OP-14	Laura Renger	Southern California Edison	February 19, 2019
OP-15	Hannah Goldsmith	CalETC	February 19, 2019
OP-16	Jimmy O'DEA	Union of Concerned Scientists	February 19, 2019
OP-17	William Barrett	American Lung Association in California	February 19, 2019
OP-18	Urvi Nagrani	Motiv Power Systems	February 20, 2019
OP-19	Nina Kapoor	Coalition for Renewable Natural Gas	February 20, 2019

Table C. Oral comments given at the Board Hearing – February 21, 2019

Comment Code	Submitter	Affiliation	Date Received
T-01	Alan Abbs	Bay Area Air Quality Management District	February 21, 2019
T-02	Michael Neuenburg	Sacramento Metropolitan AQMD	February 21, 2019
T-03	Zorik Pirveysian	South Coast AQMD	February 21, 2019
T-04	Cory Shumaker	California Hydrogen Business Council	February 21, 2019
T-05	Hannah Goldsmith	CalETC	February 21, 2019
T-06	Erin Rodriguez	Union of Concerned Scientists	February 21, 2019
T-07	William Barrett	American Lung Association	February 21, 2019
T-08	Don Gilbert	San Francisco International Airport	February 21, 2019
T-09	Sarah Johnson	California Airports Council	February 21, 2019
T-10	Tamara Mccrossen-Orr	Los Angeles World Airport (LAWA)	February 21, 2019
T-11	Susan Fizzell	Port of Oakland	February 21, 2019
T-12	Richard C. Harris	San Diego International Airport	February 21, 2019
T-13	Jim Lites	California Airports Council	February 21, 2019
T-14	Urvi Nagrani	Motiv Power Systems	February 21, 2019
T-15	Ryan Kenny	Clean Energy	February 21, 2019
T-16	Charles Watson	Proterra	February 21, 2019
T-17	Sam Jammal	BYD	February 21, 2019
T-18	Bill Magavern	Coalition for Clean Air	February 21, 2019

T-19	Lisa McGhee	San Diego Airport Parking Company (SDAP)	February 21, 2019
T-20	Ray Pingle	Sierra Club	February 21, 2019

Table D. Comments received outside of the 45-Day comment period

Comment Code	Submitter	Affiliation	Date Received
E-01	Anthony Durpree	Park and Fly	February 25, 2019

Table E. Comments received during the 15-day comment period

Comment Code	Submitter	Affiliation	Date Received
F-01	David Bezanson, PHD	Individual	May 5, 2019
F-02	Lisa Mcghee	SDAP	May 10, 2019
F-03	Hannah Goldsmith	CalETC	May 24, 2019
F-04	Jim Lites	California Airports Council	May 24, 2019
F-05	Lisa Mcghee	SDAP	May 24, 2019

Table F. Written comments received at the Board Hearing – June 27, 2019

Comment Code	Submitter	Affiliation	Date Received
SB-01	Lisa Mcghee	SDAP	June 26, 2019
SB-03	Vincent Wiraatmadja	BYD	June 26, 2019

Table G. Written comments received at the Board Hearing – June 27, 2019

Comment Code	Submitter	Affiliation	Date Received
ST-01	Claire Garcia	The Lion Electric Co.	June 26, 2019
ST-02	Jimmy O'Dea	Union of Concerned Scientists	June 26, 2019
ST-03	Paige Samblanet	Earth Justice	June 26, 2019
ST-04	Will Barrett	American Lung Association	June 26, 2019
ST-05	Jim Lites	California Airports Council	June 26, 2019
ST-06	Kent Leacock	Proterra	June 26, 2019
ST-07	Heidi Sickler	Silicon Valley Leadership Group	June 26, 2019
ST-08	Lisa Mcghee	SDAP	June 26, 2019
ST-09	Vincent Wiraatmadja	BYD	June 26, 2019
ST-10	Rocky Rushing	Coalition for Clean Air	June 26, 2019
ST-11	Mei Mei Collins	California Public Interest Research Group	June 26, 2019
ST-12	Ryan Kenny	Clean Energy	June 26, 2019
ST-13	Katherine Garcia	Sierra Club of California	June 26, 2019
ST-14	Hannah Goldsmith	CalETC	June 26, 2019

The comments below are organized by topic. Commenters wishing to find a response to their comment may look it up by number.

A. COMMENTS IN SUPPORT:

The following commenters along with over 100 medical professionals are fully committed to and supportive of the objectives and goals of the forthcoming Zero-Emission Airport Shuttle Regulation to reduce toxic emissions and climate changing greenhouse gases. These commenters state that the regulation is a well-rounded, effective, and needed solution to curbing fuel emissions, and will help improve California's economy. The supportive comments encourage CARB to continue strong action in accelerating zero-emission deployment and offer their support in helping to facilitate ZE technologies across all transportation sectors.

B-04, OP-01, OP-02, OP-06, OP-08, OP-11, OP-13, OP-14, OP-15, OP-16, OP-17, OP-18, T-01, T-02, T-03, T-05, T-06, T-07, T-08, T-10, T-11, T-14, T-16, T-17, T-18, T-20, F-01, F-03, ST-01, ST-02, ST-03, ST-04, ST-05, ST-06, ST-07, ST-09, ST-10, ST-11, ST-13, ST-14, SB-03

Agency Response: Thank you for your support. The Zero-Emission Airport Shuttle regulation will create environmental benefits due to the emissions reductions achieved by broadly implementing zero-emission technologies as a necessary component to effectively address these multiple and complicated air quality and climate protection issues all at once. Staff understands that airports will continue to play an important role in helping California meet air quality standards and emissions reduction goals by deploying the cleanest technologies.

B. COMMENTS OUTSIDE OF THE REGULATORY SCOPE

Comment: This comment supports the regulation and states that bringing down Bay Area fuel emissions and cleaning up air is important. [OP-01]

Comment: This comment states that CARB should regulate all airport vehicles including aircraft. [OP-03]

Comment: This comment questions if California's ZE plan is not workable. The comment states that only 1% of vehicles in California are electric. [OP-09; OP-10]

Comment: This comment states that the regulation should include a policy toward Advanced and direct current fast charging minimum power level development and include higher incentives to support the newest standards. [B-03; T-19]

Comment: This comment states that CARB should develop a consistent policy that is reliable and ensures fleets that adopt ZE technology, that

there is a benefit and it can be scalable. Fleet customers need a rate choice. [B-03; T-19]

Comment: This comment also asks about working with manufacturers to produce chassis specifically for electrical models, as this would help reduce cost.
[E-01]

Agency Response: The above comments are beyond the scope of this rulemaking.

C. COMMENTS ON THE ZERO-EMISSION POWERTRAIN CERTIFICATION REGULATION (ZEPCert)-OUTSIDE OF REGULATORY SCOPE

Comment: This comment states that there should be bids for ZE shuttles since bids are not open enough to allow all suppliers to participate. [OP-03]

Comment: This comment states that voluntary sign up for certification is not a good idea because it will allow room for manufacturers to skirt issues and release inferior products. This comment asks for assurance in purchasing high quality products. [E-01]

Comment: This comment states that the 50,000 mile warranty is not large enough to maintain safety. The comment also states that setting a higher warranty could assist with reduced emissions and provide better longevity and durability. [B-03; T-19]

Comment: This comment supports the regulation, and urges CARB to work with vehicle manufacturers to ensure a certification standard that does not add unnecessary regulation or financial burden that will impede ZEV adoption. [T-06]

Comment: This comment states that all vehicles should be certified in their final stage. Final stage manufacturers should be responsible for recalls and corrections. [B-03; T-19]

Comment: This comment states that CARB should create mandatory reparability provisions and incentive programs for zero-emission technology. [B-03; T-19]

Agency Response: The above comments are regarding the regulatory aspects of the ZEPCert Regulation and thus are beyond the scope of this rulemaking.

D. EXEMPTIONS

Comment: This comment states that in the event of a transportation service disruption or irregular condition like a natural disaster, the airport would have to rely on the reserve fleet. This comment asks for an exemption in such a situation and that CARB should raise the reserve fleet mileage to 5,000 miles in order to keep the fleet in proper condition. This comment also asks that CARB not count temporary vehicles that are necessary for sudden traffic surges, if such vehicles are contracted or leased during occurrences that are short but have high demand in operations. [B-02; T-08; T-09; OP-12; T-12, T-13]]

Comment: This comment asks CARB to consider adding exemptions in the proposal for emergency situations and states that flexibility is needed in these cases. [T-10]

Comment: This comment states that having an emergency exemption is acceptable but a temporary event should not have an exemption and that the 3,000 mile threshold is generous and that they would actually prefer the threshold to be 1,000 miles. [T-18; OP-16]

Comment: This comment states that with the reserve fleet mileage still set at 3,000 miles, it will be harder for large airports to stay under that limit due to fleet readiness testing. This comment also says that if they cut back on testing, the reliability of reserve buses will diminish and impede ability to respond to emergencies [F-04].

Agency Response: Based on stakeholder comments, CARB staff modified section 95690.6(c) of the Proposed Regulation Order to exempt shuttle operation in emergency situations. This revision appears in the 15-day regulatory language. This exemption would provide flexibility during unforeseen and temporary circumstances. CARB staff believes the current exemptions in the proposed regulation address many of the concerns listed in the comments. Section 95690.6(a) of the Proposed Regulation Order allows shuttle operators to maintain a reserve fleet that is exempt from the regulatory compliance schedule and can operate up 3,000 miles per year.

E. INCENTIVES

Comment: This comment states that the regulation overstates available incentive funding. [T-11]

Comment: This comment states concern about being able to continue to compete for FAA funding. [T-12, ST-05]

Comment: This comment states that most of the costs of transitioning to ZE technology can be covered by incentives and programs under SB 350. [T-20]

Comment: This comment states that due to the FAA funding program being voluntary, airports cannot show they are exceeding the requirements at a certain point, so there is concern about eligibility for further grants. [T-13]

Comment: This comment states there is continued concern about accessing FAA funds as the turnover dates get closer. [F-04]

Comment: This comment states that once the regulation is in place, grant funding will no longer be accessible since the FAA program is voluntary only. The comment asks CARB to consider a voluntary MOU pathway. [OP-23]

Comment: This comment states that because small and private fleets are an important proportion for transportation services, expanding funding to invest in them is important. [T-19]

Comment: This comment supports the regulation and asks CARB to ensure there is reliable funding for the program to ensure adoption. [OP-13; T-03; T-17]

Comment: This comment supports the regulation and states that there is more than adequate funds available to assist the transition to ZEVs. [T-20]

Comment: This comment offers support for the regulation and states that CARB should continue to provide strong market signals and incentives to accelerate ZE deployment. [OP-06]

Comment: This comment asks about funding that is available for fleets that have already converted to clean energy. [E-01]

Comment: This comment states that access and funding of incentive programs through the transition is important and that programs like Heavy Duty Vehicle Incentive Program (HVIP) and Low-Carbon Fuel Standards (LCFS) credits are important resources to help offset the costs. [OP-18]

Comment: This comment states that funding incentive programs like HVIP are essential for transitioning to ZE vehicles. [OP-11]

Agency Response: No changes have been made to the proposal as a result of these comments. CARB staff developed the proposed regulation so that airport shuttle operators would remain

eligible for incentive programs for several years. The compliance schedule would allow fleets that achieve ZEV milestones early to have continued funding opportunity throughout most of the transition period. CARB staff, in consultation with Federal Aviation Administration (FAA) staff, developed the Purchase Replacement Requirements in Section 95690.5(b) of the Proposed Regulation Order. This provision was added to maintain eligibility for CARB and FAA incentive funding opportunities. Currently available incentive programs are detailed in the Executive Summary of the Initial Statement of Reasons (ISOR).

Funding for incentive programs such as HVIP is allocated annually through the budget process and specifics are determined through a public process as part of an annual funding plan. Insuring this funding is available is beyond the scope of this rulemaking.

F. ADMINISTRATION

Comment: This comment states that the regulation puts an unreasonable administrative burden on airport staff and forces them to have to enforce the new rule. This comment asks for an online database. [T-11]

Comment: This comment states that airports do not want to have to collect and store compliance certificates for off-airport providers. This comment suggests implementing a format through the TRUCRS database. [OP-12; T-09]

Agency Response: Based on stakeholder comments, CARB staff modified section 95690.5(e)(2) of the Proposed Regulation Order to give regulated airports the option of verifying compliance online using CARB's TRUCRS website. This revision appears in the 15-day regulatory language.

G. TIMELINE

Comment: This comment states that the timeframe is too aggressive to be feasible. Companies expressed doubt that they can acquire enough electric vehicle charging and supply at their airports, and they also have spatial concerns. [O-07; T-15, ST-12]

Comment: This comment states they support the rule and that the timeline is cautious and airports should be able to meet it. [T-18]

Comment: This comment supports the proposed regulation and states that the board should tighten the deadline because all the equipment to accomplish these goals are at hand. [OP-02]

Agency Response: No changes have been made to the proposal as a result of these comments. CARB staff developed the regulatory timeline in conjunction with airports, businesses, owners, and environmental stakeholders. Staff looked at real-world examples of airport shuttle projects, including infrastructure installations, to estimate the time needed for fleet owners to adopt zero-emission shuttles. Given the transformational nature of the transition, adequate time is needed for initial planning, construction, and delivery. The first compliance deadline is December 31, 2027 and provides adequate time for fleets to initiate this transition. The Proposed Regulation Order also includes flexibilities, like the reserve fleet exemption and infrastructure Facility Extension, to ensure continuity of service throughout the transition.

H. REGULATED AIRPORTS

Comment: This comment states that small airports should not be included in the regulation since CARB surveys showed that small hub airports do not own or contract shuttle buses. [T-09; OP-12; OP-05]

Agency Response: No changes have been made to the proposal as a result of this comment. Staff agrees that small hub airports do not currently own or operate shuttles. Therefore, they will not be affected by the fleet requirements of the proposed regulation unless they choose to deploy their own shuttle fleets in the future. However, businesses that provide shuttle service to small hub airports would be subject to the proposed regulation. With three of the four small hub airports being in or near disadvantaged communities, CARB staff believes it is appropriate to maintain the inclusion of small airports so these communities are not excluded from the benefits of the reduction of emissions and the transition to zero-emission technology.

I. RELIABILITY OF TECHNOLOGY

Comment: This comment states that the regulation should not apply to shuttles that are conducting long-distance operations and expresses

concern that, under the regulation, shuttle operators have to invest in vehicles not available through trusted dealers or that do not yet exist on market. This comment asks that CARB ensure the products are reliable or manufacturer guaranteed. [OP-12]

Comment: This comment states that reliability is important, and the regulation mandates purchasing electric vehicles that are unproven and not yet widely available. The comment states that CARB should not be pushing unproven technology. [T-11]

Comment: This comment states concern that there has not yet been demonstration of how short-range vehicles that average over 100 miles a day can confidently stay in service without a three-phase power and 480 volts. [T-19]

Comment: This comment states concern about battery health and life when they are being continuously recharged. [E-01]

Agency Response: No changes have been made to the proposal as a result of these comments. The Technical Feasibility chapter of the ISOR details the current state of zero-emission technologies in the airport shuttle sector. The chapter covers the number of zero-emission airport shuttles currently in operation as well as the available types of shuttles. The chapter also describes why airport shuttle duty cycles are suitable zero-emission technology; the duty cycles involve low speeds, stop-and-to operation, and short, fixed routes that present opportunities for overnight and midday charging.

The proposed regulation applies to shuttles with fixed destination routes of less than 30 miles, which allows for opportunities for overnight charging as well as intermittent charging throughout the day. In addition, staff is proposing a phase-in schedule that would allow for continued technology advancement, reliability and shuttle availability before zero-emission shuttles are required.

Comment: This comment supports the regulation but wants the board to unlink the regulation from the Powertrain Certification. This is because they believe the certification regulation will increase costs, reduce product options coming to market, slow technology transfer, and refocus engineering efforts from customer requested features to features that are compliance-driven and aren't market needs. [OP-18; T-14]

Comment: This comment states that they support the regulation; however, their support is contingent on changing the linked Powertrain

Certification regulation. These concerns are in a letter submitted to the ZEPCert regulation. [OP-15; T-05]

Agency Response: No changes have been made to the proposal as a result of these comments. The proposed regulation requires compliance with the ZEPCert regulation in order to ensure that zero-emission heavy-duty vehicles are reliable in their intended applications. By requiring ZEPCert compliance, this measure will achieve the goal of helping drive technology innovation and refinement, empowering fleet decision-making by increasing consumer confidence in the technology, and providing data to inform future measures that accelerate the overall transition to the zero-emission technologies California needs to meet its long-term air quality and climate goals.

Comment: This comment states that the regulation is overly optimistic and underestimates costs to public health, societal, and economic costs due to not supporting and including technologies that are currently ready, such as Compressed Natural Gas (CNG), in the regulation. This comment states that short-term strategies that are already available should be an option. [OP-07, ST-12]

Comment: This comment asks CARB to consider the bias and preference for one ZE technology over another since bias can skew towards a non-optimal choice and may not be sustainable. This comment suggests a funding parity policy to allow fleet operators to choose based on their business. [B-01; T-04]

Comment: This comment states that CARB displays prejudice against internal combustion engines and promotes battery-powered vehicles to the detriment of other propulsion systems. [OP-09]

Comment: This comment asks that CARB set flexible performance-based standards to promote the best mix of technology at the lowest cost rather than mandating a technology. [OP-19]

Agency Response: No changes have been made to the proposal as a result of these comments. The proposed regulation is part of a suite of measures put forth by CARB in order to achieve NOx and GHG reductions mandated by the 2016 SIP. The strategy includes the deployment of zero-emission technologies in the sectors where those technologies are feasible. Zero-emission technologies are necessary to meet California's long term air quality and climate change goals. Other CARB measures, such as the Innovative

Clean Transit Regulation, require the cleanest internal combustion technologies (low NOx CNG) and CARB continues to promote incentive funding for businesses that adopt those technologies. Cost and savings estimates were done based on battery-electric technology because that is the most common technology currently being utilized. However, the proposed regulation does not require or give preferential treatment to a specific type of zero-emission technology. For example, fuel-cell technology is another type of zero-emission technology which would be a compliance option for the proposed regulation.

J. APPLICABILITY

Comment: This comment states that all airport shuttle operators create emissions, and therefore all airport commercial operators should be subject to regulation. [B-03; T-19]

Comment: This comment states that the rule should apply to all ground transportation operations at California airports. The commenter has provided vehicle inventory data from three major airports to show that the Zero-Emission Airport Shuttle regulation only affects a small percentage of all airport ground transportation vehicles. [SB-01, ST-08]

Agency Response: The strategy of the 2016 SIP emphasizes the deployment of zero-emission technologies in the heavy-duty sectors where those technologies are feasible. The Technical Feasibility chapter of the ISOR details why the vehicle types and operational characteristics included in the proposed regulation are appropriate applications for currently available zero-emission technologies.

Comment: This comments asks if plug-in hybrid electric vehicles (PHEVs) will be included in the definition of ZEV shuttle. [F-02]

Agency Response: PHEVs are not included in the definition of ZEV shuttle. The Zero-Emission Airport Shuttle regulation regulatory language defines a ZEV shuttle as a battery-electric or fuel cell shuttle. PHEVs are hybrid vehicles which means they use an internal combustion engine along with a battery electric propulsion system. No changes have been made to the proposal as a result of these comments.

Comment: This comments asks if a ZEV that currently operating will be required by the Zero-Emission Airport Shuttle regulation to meet ZEPCert requirements in the future. [F-02]

Agency Response: Shuttles with model year 2025 and earlier will not be required by the Zero-Emission Airport Shuttle regulation to meet the ZEPCert requirements.

Comment: This comments asks which types of shuttles are required to meet ZEPCert requirements by the Zero-Emission Airport Shuttle regulation [F-02].

Agency Response: The Zero-Emission Airport Shuttle Regulation requires Class 4,5,6,7 and 8 shuttles with model year(s) 2026 and later to meet ZEPCert requirements.

Comment: This comments asks if Class 2b and Class 3 shuttles are required to meet the compliance schedule for the Zero-Emission Airport Shuttle Regulation. [F-02].

Comment: This comment states that Class 2b and 3 vehicles should be included in the measure because they represent a significant portion of airport ground transportation activities. [F-02]

Agency Response: The Zero-Emission Airport Shuttle Regulation requires shuttles which are Class 2b and higher to meet the fleet ZEV requirements of 33% by December 31, 2027, 66% by December 31, 2031, and 100% December 21, 2035.

Comment: This comment states that the majority of SAN Airport shuttle operations are Class 2b and 3 vehicles This comment states the measure should require ZEPCert certification for Class 2b and 3 shuttles or these classes will not be a reliable, safe products and that without ZEPCert requirements, Class 2b and 3 operators will be forced to take undue risk. [F-05, ST-08].

Agency Response: No changes have been made to the proposal as a result of this comment. The proposed ZEPCert regulation does not offer a certification option for complete Class 2b and Class 3 ZEVs. Complete medium-duty battery-electric and fuel-cell vehicles have an existing certification process required by CARB's Zero-Emission Vehicle Standards for 2018 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles. This regulation includes requirements, such as a range test. Staff believes that these requirements provide support for owners or Class 2b and Class 3 vehicles.

K. COSTS

Comment: This comment states that staff cost analysis is incorrect and needs modification to fix EV rates and include out-the-door prices including local taxes and fees. [B-03; T-19,]

Agency Response: Initially, staff had used a conservative statewide estimate of $0.17 per kilowatt-hour (kWh) for the electricity rate. In response to this stakeholder comment, CARB staff conducted a more thorough analysis of electricity prices that uses a statewide weighted average kWh price and includes local taxes. Using the CARB Battery Electric Truck and Bus Charging Cost Calculator, staff determined kWh prices for public and private shuttle fleets, grouped each result according to utility provider, and calculated the average kWh price. The average rates for each utility provider were weighted according to how many shuttles are served relative to the total population. Combining the weighted kWh prices produced a weighted kWh price of $0.15 per kWh. Staff then included an additional 12% tax to the weighted average price, as recommended by the commenter. This addition yielded $0.17 per kWh, confirming the initial approach for electricity costs as provided in the staff report.

Comment: This comment asks to see the worksheet and use cases that staff used to determine the kWh price of $.17/kWh [F-05]

Agency Response: No changes have been made to the proposal as a result of this comment. As part of the electricity cost analysis described in the response above, staff created a worksheet which contains the assumptions that were entered into the CARB Battery Electric Truck and Bus Charging Calculator (e.g. fleet sizes at each airport, charging rate, and charging strategy) as well as the resulting kWh price produced by the calculator. The worksheet also shows how those results were combined into a weighted average kWh price that was used in our analysis. Calculator inputs were gathered from survey and research data contained in the Cost Calculation and Survey Results Spreadsheet which is available in the Background Materials link on the Zero-Emission Airport Shuttle webpage. In addition to compiling this worksheet as a reference as part of a 15-day change, staff directly provided the commenter with the requested worksheet.

Comment: This comment states that ARB's electricity cost analysis is missing small operators' tariffs (rate schedules), small business commercial rates, and electricity loads due to other business activities. The commenter has provided documentation showing that its kWh rate

in the San Diego Gas and Electric AP TOU rate schedule averages 27 cents per kWh rather than the $.17 per kWh estimated by staff. [F-05, ST-01, ST-08].

Agency Response: No changes have been made to the proposal as a result of this comment. Using CARB's Battery Electric Truck and Bus Calculator, staff's analysis assumed commercial rate schedules that allowed a maximum electricity demand which was at least 100 kilowatts (kW) higher than what is needed for managed depot vehicle charging. This allows for ample electricity use for other business activates without exceeding the maximum demand for the customer's rate schedule.

Staff modeled the electricity rates in part based on the most common shuttle types and average annual miles driven by those shuttles at each airport. At any one business the shuttle type and duty cycle may vary from what staff used in the calculations. This causes the electricity price at a particular business, or with a particular utility company, to differ from the statewide average calculated by CARB staff. Staff believes its statewide average to be a good representation of kWh prices.

Comment: The comment states that staff's analysis does not take into account future changes in electricity prices. The commenter provides yearly pricing information for three utility companies. Two of which have electricity prices that have decreased (adjusted for inflation) since 2005 and one that has increased. [SB-01]

Agency Response: No changes have been made to the proposal as a result of this comment. Staff used CARB's Battery Electric Truck and Bus Calculator to estimate a statewide average electricity price. The calculator uses recent utility rate data from all major utility companies in California. This data was then adjusted for inflation and is presented in constant 2016 dollars for years 2020 through 2040. Other than adjusting for inflation, staff did not project potential additional increases or decreases in future electricity costs. Due to uncertainty in the future electricity prices and comments indicating both increases and decreases in recent prices, staff believes the constant statewide average electricity price projection is a valid estimate of future costs for zero-emission airport shuttle bus operators.

Comment: This comment states that the projected costs associated with class 4 vehicles and infrastructure are highly understated. [E-01]

Agency Response: No changes have been made to the proposal as a result of this comment. In the staff report for the Zero-Emission Airport Shuttle regulation, it acknowledges the higher upfront cost for technology transition. The fleet requirements, which are phased in starting in 2027, provide adequate time for shuttle operators to financially prepare for shuttle and infrastructure purchases. The cost estimates detailed in the Economic Impact Assessment for Class 4 cutaway vehicles are based on data obtained from CARB's Heavy Duty Vehicle Replacement Program staff and communication with vehicle manufacturers. CARB staff recognizes that estimates cannot fully account for the prices quoted to private businesses.

Comment: This comment states that airports are concerned that the cost of the regulation's measures could outweigh the benefits of having the regulation. [OP-12; T-09; T-13, ST-12]

Comment: This comment states the substantial burden of expense will be incurred by fleet owners, as an electric airport shuttle bus is almost double the cost of a low NOx shuttle bus and this is in addition to high costs of infrastructure, regular maintenance, electricity and staff training. [OP-07; OP-12; T-09; T-15]

Comment: This comment states that there are issues with staff cost predictions: it understates infrastructure costs, and does not account for maintenance and fuel costs. [OP-12; T-09; T-11; T-13, ST-12]

Comment: This comment states that their company offers leasing programs that can help catalyze adoption rates. [OP-13; T-17]

Comment: This comment states that this company has approved commercial EV rates that will help make electricity fueling more affordable. This comment states that SCE also has a charging infrastructure program that can help cut costs for transitioning to electric fleets. [OP-14]

Comment: This comment states that CARB's regulation analysis does not account for forecast of growth, investment impacts, time for technology transfer, or other application emissions that would be less likely to happen if powertrain costs rise instead of declining. [OP-18]

Agency Response: No changes have been made to the proposal as a result of these comments. Staff understands there is an associated higher upfront incremental capital cost for purchasing zero-emission shuttles and associated infrastructure but also recognizes there are operational savings that offset these costs over the life of a shuttle. Charger and charger installation costs vary by technology provider and location. CARB staff gathered data from zero-emission electrical charging infrastructure installations at airports and private businesses to estimate costs in the Economic Impacts Assessment. Incentive programs are also available to airport shuttle operators that help reduce the capital cost of electrical charging equipment and infrastructure.

The Economic Impacts Assessment also estimated savings due to the elimination of fuel purchases and the differential maintenance costs between zero-emission shuttles and their internal combustion counterparts. CARB staff estimates that the savings experienced by zero-emission shuttles, including the monetization of LCFS credits will outweigh the costs of the Zero-Emission Airport Shuttle regulation and result in a statewide cost savings of over $30 million during the period of 2020 through 2040.

Comment: This comment is concerned about credits generated for the LCFS program. This comment points out that smaller fleets will have a harder time generating enough credits to monetize because brokers are only listed in large volumes of credit and that fleets that do not own their own infrastructure will not be able to generate credits [B-03; T-19, F-05]

Comment: This comment states that fleets that do not own their own charging infrastructure will not be able to generate credits. California Public Utility Commission pilot programs and the Volkswagen Mitigation trust incentive program involve charging infrastructure that is not owned by the fleets. Because the fleets using these incentive programs will not own their infrastructure, CARB should model their cost analysis without the use of LCFS credits. [F-05, SB-01]

Agency Response: No changes have been made to the proposal as a result of this comment. The LCFS regulation has provisions that address small fleets and fleets that do not own their own infrastructure. For non-residential EV charging, the owner of the Fueling Supply Equipment (FSE) is the default credit generator. The LCFS regulation allows the default credit generator to designate a third-party on its behalf to be the reporting and credit generating entity in the program. This flexibility allows

smaller entities to work with third parties to designate their reporting and administrative efforts and aggregate credits to make a sizeable offering in the credit market. If the fleet operator is not the FSE owner, they could contract with the FSE owner to become the designated credit generator or share the LCFS credit value resulting from charging their fleet vehicles. Additionally, in this potential scenario the fleet owner would be saving money by not building its own infrastructure.

Staff's cost analysis assumed the use of LCFS credits but did not assume the use of any other incentive funds. Fleet owners should be aware of the stipulations involved with any federal, state, or local incentive funds so they can decide which program or combination of programs are in their best economic interest.

Comment: This comment asks staff to perform an alternatives analysis before adoption to include off-ramps should specific benchmarks not be met. This comment says that the Board should at a minimum provide authority to scale back the regulation if staff's projections on cost, operational reliability, and technology readiness fall short. This comment also states that natural gas engines emitted lower NOx emissions than its EPA certification standard. This comment wants staff to consider low NOx shuttle buses and off-ramps. [O-07; T-15]

Agency Response: No changes have been made to the proposal as a result of this comment. Government Code section 11346.2, subdivision (b)(4) requires CARB to consider and evaluate reasonable alternatives to the proposed regulatory action and provide reasons for rejecting those alternatives. CARB staff performed analyses of alternatives and discussed them in detail, as well as reasons why they were not adopted, in Chapter IX of the ISOR and Chapter I: Section B of this FSOR.

Developing specific benchmarks and off-ramps is counter to the goal of providing certainty to the market, and in general should not be required on a widespread basis. The airport shuttle regulation as structured better protects environmental benefits without giving a blanket deferral when a specific issue does not apply to the majority of the state. It will ensure the zero-emission shuttle deployment meets the project objectives identified in the Environmental Analysis including reducing criteria pollutant emissions and GHGs to the maximum extent possible to meet federal and State standards; incentivizing and spurring ZEV technology to help meet the State Implementation Plan and protecting and preserving the public health via reducing harmful air pollution. Overall this approach has carefully crafted fact-

dependent exemptions provides a more flexible solution for airport shuttle operators.

In addition, as part of the implementation of the Innovative Clean Transit regulation, the staff will be annually reviewing the same sorts of issues with regards to zero-emission shuttle bus technology. That review will ensure that the board is kept apprised of any broader issues that arise with regards to performance, reliability of zero-emission buses, associated infrastructure necessary to operate and maintain zero-emission buses, creation of jobs and training programs for employment in manufacturing, maintaining, and operating zero-emission bus technologies, the deployment status of zero-emission buses and related technologies, and the availability and barriers to deployment of zero-emission buses in the various categories. If issues are identified that have an impact on the airport shuttle segment, the Executive Officer and Board would have the ability to revisit the shuttle regulation if statewide issues make it necessary.

Comment: This comment asks staff to show that the current price of a ZEV shuttle is less than in 2015. [F-02]

Agency Response: No changes have been made to the proposal as a result of this comment. The cost analysis reflects declining battery costs (per kilowatt hour) each year. Staff understands that batteries represent one of the most significant costs for battery electric and fuel cell buses. Staff relied on a cost analysis prepared by the Innovative Clean Transit regulation team, Appendix E "Battery Cost for Heavy-Duty Electric Vehicles" as part of the ISOR released on August 7, 2018, and Appendix F-2 "Bus Price Projections" to better understand heavy duty vehicle and battery costs and their price projections. Those studies show that there is a clear expected downward trend in battery prices for ZEV heavy duty vehicle applications that will continue in the foreseeable future due to effects on production volume as well as introducing new technologies into the market. The studies also demonstrate that the median of the expected battery price reduction is consistent with bus price projections from Proterra and the battery cost reduction estimate from BYD. Lower battery costs per kWh are expected to result in significantly lower battery electric and fuel cell shuttle prices, longer range (for the same battery pack volume), or both depending on market factors.

The cost projection for shuttles in the staff report are presented in 2016 dollars to show the effects of shuttle prices independent of inflation. While battery prices, and therefore ZEV shuttle prices, are projected to drop, it is the incremental cost of ZEVs compared to internal combustion shuttles which is most crucial to our analysis. Additional mandatory safety equipment, such as cameras and sensors, may increase future shuttle prices but will affect internal combustion and ZEV shuttles equally so the incremental cost of ZEV shuttles should not be affected.

L. INVENTORY

Comment: This comment asks how many currently operating and on-order ZEV shuttles were included in the Staff Report, how we confirmed that the ZEV shuttles had been ordered, and what makes and models have been ordered. [F-02]

Agency Response: The Staff Report cites 110 ZEV shuttles currently operating or ordered in California. Of these, 39 ZEV shuttles had been confirmed at the time of the survey and were not part of the economic analysis which began in the year 2020. Staff obtained data regarding vehicle orders from shuttle manufacturers, press releases, as well as grant data from incentive programs administered by CARB, the Federal Aviation Administration and the federal Environmental Protection Agency. The zero-emission vehicles that have been ordered include Class 3, Class 4, and Class 8 shuttles. Manufacturers included Lightning Systems, Phoenix Motorcars, Proterra, and BYD.

M. EMISSIONS ANALYSIS

Comment: This comment asks what volume of renewable diesel or biodiesel fuel was used to determine the greenhouse gas (GHG) / carbon intensity (CI) analysis for diesel shuttles. [F-02]

Agency Response: Staff's emissions analysis combined all types of diesel fuel for the GHG emissions analysis. The upstream, or well-to-tank, analysis uses an average CI that accounts for a statewide average fuel mixture of diesel, renewable diesel, and bio-diesel. For tailpipe, or tank-to-wheel emissions, biodiesel is considered to be similar to conventional diesel. No changes have been made to the proposal as a result of this comment.

Comment: This comment asks if CNG fuel was 100% eliminated in the analysis of GHG / CI for the CNG shuttles. [F-02]

Agency Response: Staff's emissions analysis completely eliminates CNG beginning in 2035 when airport shuttles are required to be 100% zero-emission. No changes have been made to the proposal as a result of this comment.

N. COMMENTS ADDRESSED IN THE ENVIRONMENTAL RESPONSE

Comment: This comment asks if the process to produce and charge ZE vehicles produces more air pollutants than what is being reduced. [E-01]

Comment: This comment discusses regulating commercial and freight aircraft and the air pollution effects from these aircraft. [OP-04]

Comment: This comment states that CEQA requires the State to respond truthfully and answer relevant questions. [OP-09]

Comment: This comment asks about the number of people killed by fires started by faulty transmission equipment and inquires about how much power is transmitted across forested areas. [OP-09]

Comment: This comment asks whether class 4 or class 5 shuttle buses are capable of running on butanol and if renewable butanol exists. This comment also asks if increasing the number of plug-in battery powered vehicles in California will increase the load on long distance electrical power transmission lines. [OP-09]

Comment: This comment asks about bird kills by various power generation technologies. [OP-10]

Comment: This comment asks questions relating to increased electric generation and the transmission necessitated by the proposed regulation. The comment also seems concerned that the proposed regulation would increase electrical demand and result in more power generation and transmission. [OP-09; OP-10]

Comment: This comment expresses concern about the consequences of demand for renewable natural gas as a result of this regulation. [OP-19]

Agency Response: These comments are addressed in the "Environmental Response to Comments" document. See Response to Comments on Draft Environmental Analysis Prepared for the Zero-Emission Airport Shuttle Regulation and Zero-Emission Powertrain Certification Regulation [https://ww3.arb.ca.gov/regact/2019/zepcert/responsetocomments.pdf?_ga=2.26969721.550906774.1562180039-

976973454.1470331978] presented and approved by the Board at the June 27, 2019 hearing.

IV. PEER REVIEW

Health and Safety Code Section 57004 sets forth requirements for peer review of identified portions of rulemakings proposed by entities within the California Environmental Protection Agency, including CARB. Specifically, the scientific basis or scientific portion of a proposed rule may be subject to this peer review process. Here, CARB determined that the rulemaking did not contain a scientific basis or scientific portion subject to peer review, and thus no peer review as set forth in section 57004 needed to be performed.

The regulation requires airport shuttle operators to purchase zero-emission shuttles and report usage. Requirements to purchase zero-emission shuttles, calculate and report miles traveled, track the number of shuttles in fleets, and other requirements of the Zero-Emission Airport Shuttle regulation do not establish "a regulatory level, standard, or other requirement for the protection of public health or the environment," such as an ambient air quality standard or toxic exposure level. As such, it does not have a "scientific basis" or "scientific portions" that form the foundations of a regulatory standard or level.

The scientific studies and assessments used to analyze the potential environmental impacts of these regulations, such as the findings that diesel particulate is a toxic air contaminant and that greenhouse gases contribute to climate change were developed previously and subject to public review.