

State of California
AIR RESOURCES BOARD

**PUBLIC HEARING TO CONSIDER THE PROPOSED AMENDMENTS TO THE
LARGE SPARK-IGNITION ENGINE FLEET REQUIREMENTS REGULATION**

STAFF REPORT: INITIAL STATEMENT OF REASONS

**DATE OF RELEASE: May 31, 2016
SCHEDULED FOR CONSIDERATION: July 21, 2016**

Location:

**California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814**

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

This Page Intentionally Left Blank

EXECUTIVE SUMMARY

Air quality in California has improved dramatically over the past 30 years, due in large part to the continued progress in controlling pollution from mobile sources. Despite the achievements to date, the vast majority of Californians live in areas of the state that still do not meet state or federal health-based ambient air quality standards for ozone. In addition, climate change continues to pose a serious threat to the economic well-being, public health, natural resources, and environment of California. The California Air Resources Board (ARB or Board) pursues emission reductions from all feasible sources in order to continue our progress toward clean air and to meet and sustain our air quality and climate goals.

Large spark-ignition (LSI) engines, which are defined as spark-ignition (i.e., Otto-cycle) engines greater than 25 horsepower, are used in a variety of equipment, including, but not limited to, forklifts, airport ground support equipment (GSE), sweeper/scrubbers, industrial tow tractors, generator sets, and small irrigation pumps. LSI equipment is found in approximately 2,000 fleets throughout the state operating at warehouses and distribution centers, seaports, airports, rail yards, manufacturing plants, and many other commercial and industrial facilities.

ARB first adopted emission standards for new off-road LSI engines in 1998. Then, in June 2006, the Board adopted, and later amended in 2010, the Large Spark-Ignition Engine Fleet Requirements Regulation (LSI Fleet Regulation), an integral component of the 2003 State Implementation Plan for Ozone (2003 SIP). The regulation was developed to significantly reduce emissions of oxides of nitrogen (NO_x) and hydrocarbons (HC) from over an estimated 90,000 pieces of in-use LSI equipment in California by accelerating the introduction of cleaner equipment and retrofits and the retirement of uncontrolled in-use equipment. The final regulatory performance milestone was reached in 2013, and June 2016, will mark the sunset of the recordkeeping requirement for most fleets.

In April 2015, the Board affirmed its vision of a zero and near-zero emission freight system through Resolution 15-22, which directed staff to pursue development of the potential immediate and near-term actions described in the *Sustainable Freight: Pathways to Zero and Near-Zero Emissions, Discussion Document* (Pathways Document) (ARB, 2015) as quickly as possible to meet public health and climate change needs. The Pathways Document describes a number of potential actions intended to facilitate the transition to a zero emission transportation system and supports the on-going effort to develop California's Sustainable Freight Action Plan. This proposal would support two near-term actions identified in the Pathways Document:

- Collection of data from freight facilities to support future actions to reduce emissions and health risk and to improve efficiency (Data Collection); and

- Development of proposed requirements to support broad scale deployment of zero emissions equipment in LSI applications (Zero Emission Off-Road Measure).¹

These actions are also described in the *California Sustainable Freight Action Plan, Draft Discussion Document* (ARB, 2016b)(Draft Freight Plan), which was developed pursuant to Executive Order B-32-15 and builds upon the technical and stakeholder work that informed the development of the Pathways Document.

Proposed Requirements

This report presents staff's proposal to amend the LSI Fleet Regulation set forth under Title 13, California Code of Regulations (CCR), Sections 2775, 2775.1, and 2775.2 to establish new reporting and labeling requirements and extend existing recordkeeping requirements. The proposed regulatory amendments are expected to improve the reliability of the emission reductions projected for the existing LSI Fleet Regulation by increasing enforcement effectiveness and compliance rates. In addition, this proposal is one of several ARB data collection efforts that supports the near-term Data Collection action described in the Pathways Document. The compliance data gathered as a result of the proposed amendments would be used to inform the development of future measures that accelerate the deployment of zero emission technology in LSI and other off-road equipment, such as the Zero Emission Off-Road Measure described in the Pathways Document, to be proposed for future Board consideration. Staff believes that this potential future measure will be a key enabling step in transitioning zero emission technology into heavier, higher-power-demand applications, such as those that currently utilize diesel powertrains.

Specifically, these proposed amendments would require fleets to:

- Submit an initial report by June 30, 2017, and then annually thereafter;
- Label all affected equipment with an ARB-issued equipment identification number (EIN); and
- Continue recordkeeping as they have been required to do pursuant to the existing regulation.

The proposed recordkeeping, reporting, and labeling requirements would sunset after June 30, 2023, for most fleets. Fleet operators taking advantage of exemptions that currently require documentation in order to qualify would be required to maintain records, report, and label affected equipment beyond June 30, 2023.

¹ Measure is also a component of ARB's 2016 Mobile Source Strategy.

Although reporting and labeling requirements were not included in previous LSI rulemakings, equivalent requirements set forth in the In-Use Off-Road Diesel-Fueled Fleets Regulation² (ARB, 2010a) have proved to be an effective mechanism for increasing compliance rates and gathering valuable population and emissions information about the off-road sector. As such, staff seeks to incorporate similar requirements into the LSI Fleet Regulation with this proposal.

This proposal would not modify existing performance requirements, including fleet average provisions.

Staff Recommendation

ARB staff recommends that the Board adopt the proposed LSI regulatory amendments as set forth in the proposed Regulation Order in Appendix A and as described in this Initial Statement of Reasons.

Staff conducted two sets of three public workshops statewide to solicit feedback from stakeholders during the development of the proposed amendments. Additionally, staff considered alternatives to the current proposal, including no action, and rejected those alternatives.

² Fleet regulation to reduce particulate matter and NOx emissions from in-use off-road heavy-duty diesel vehicles in California.

Table of Contents

I. INTRODUCTION AND BACKGROUND	1
A. SPECIFIC PURPOSE OF AMENDMENTS	1
B. LEGAL AUTHORITY	2
C. HISTORY AND PREVIOUS AMENDMENTS	2
D. EXISTING REGULATION	4
II. STATEMENT OF REASONS	5
A. DESCRIPTION OF PROBLEM PROPOSAL IS INTENDED TO ADDRESS	5
B. PROPOSED SOLUTION TO THE PROBLEM	5
III. SUMMARY OF THE PROPOSED ACTION	6
A. APPLICABILITY	6
B. EXISTING PERFORMANCE REQUIREMENTS	6
C. PROPOSED REPORTING REQUIREMENTS	6
D. PROPOSED LABELING REQUIREMENTS	7
E. PROPOSED EXTENSION OF RECORDKEEPING REQUIREMENTS	8
F. SUNSET OF PROPOSED AMENDMENTS	8
G. KEY EXEMPTIONS TO PROPOSED AMENDMENTS	9
1. Small Fleets	9
2. Agriculture	9
H. SUMMARY AND RATIONALE FOR EACH REGULATORY PROVISION	10
IV. AIR QUALITY	10
V. ENVIRONMENTAL ANALYSIS	10
VI. ENVIRONMENTAL JUSTICE	11
VII. ECONOMIC IMPACTS	11
A. SUMMARY OF ECONOMIC IMPACTS	11
B. LEGAL REQUIREMENTS	12
C. LSI FLEET BREAKDOWN	12
D. ECONOMIC IMPACT ANALYSIS	13
1. Economic Impacts Assessment	14
2. Impact on Jobs	15
3. Impact on California Businesses	15
4. Impact on Small Business	16
5. Impacts to Health and Welfare of California Residents	16
6. Impact on Public Agencies	16

VIII. EVALUATION OF REGULATORY ALTERNATIVES	17
A. NO ACTION.....	17
B. REQUIRE SMALL FLEETS TO REPORT AND LABEL.....	18
C. ONE TIME REPORTING ONLY.....	18
IX. JUSTIFICATION FOR ADOPTION OF REGULATIONS DIFFERENT FROM FEDERAL REGULATIONS CONTAINED IN THE CODE OF FEDERAL REGULATIONS	18
X. PUBLIC PROCESS FOR DEVELOPMENT OF PROPOSED ACTION (PRE-REGULATORY INFORMATION)	18
XI. REFERENCES.....	20
XII. APPENDICES.....	21

This Page Intentionally Left Blank

I. INTRODUCTION AND BACKGROUND

A. SPECIFIC PURPOSE OF AMENDMENTS

Large spark-ignition (LSI) engines, which are defined as spark-ignition (i.e., Otto-cycle) engines greater than 25 horsepower, are used in a variety of equipment, including, but not limited to, forklifts, airport ground support equipment (GSE), sweeper/scrubbers, industrial tow tractors, generator sets, and small irrigation pumps. LSI equipment is found in approximately 2,000 fleets throughout the state operating at warehouses and distribution centers, seaports, airports, rail yards, manufacturing plants, and many other commercial and industrial facilities.

This proposal, which seeks to amend the Large Spark-Ignition Engine Fleet Requirements Regulation (LSI Fleet Regulation), would apply specifically to operators of forklifts, sweeper/scrubbers, industrial tow tractors, and airport GSE that use an LSI engine.³ The proposed amendments would help ensure the emission reductions projected for the current LSI Fleet Regulation are being achieved by increasing enforcement effectiveness and compliance rates. In addition, the information collected to comply with the proposed amendments would be used to inform future efforts to accelerate deployment of zero emission technology in off-road equipment, which is in alignment with the near-term actions described in the *Sustainable Freight: Pathways to Zero and Near-Zero Emissions, Discussion Document* (Pathways Document)⁴ (ARB, 2015) and the *California Sustainable Freight Action Plan, Draft Discussion Document* (Draft Freight Plan)⁵ (ARB, 2016b), as well as the actions set forth in the 2016 Mobile Source Strategy (ARB, 2016a).

To achieve its healthy air quality, climate, and sustainability goals, California must take effective, well-coordinated actions to transition to a zero emission transportation system, for both passengers and freight. The Pathways Document sets out ARB's vision of a clean freight system and the immediate and near-term steps that ARB can take to support steady and continual progress in moving both domestic and international cargo in California more efficiently, with zero emission technology everywhere feasible, and near-zero emission technology with renewable fuels everywhere else. Success will depend on gains made in significantly increasing the capacity and durability of batteries and fuel cells in harsh environments, driving down costs of advanced technologies, and the development and expansion of energy and alternative fuel infrastructure.

³ The proposed amendments would apply only to equipment with LSI engines greater than 1.0 liter in displacement, which is consistent with the applicability of the existing LSI Fleet Regulation.

⁴ On April 23, 2015, ARB directed staff to pursue development of potential near-term actions described in the Pathways Document through Resolution 15-22.

⁵ Developed as directed by Executive Order B-32-15 prioritizing California's transition to a more efficient and less polluting freight transport system.

This proposal is one of several ARB efforts to provide the data necessary to fully evaluate: (1) the feasibility of increasing deployment of zero emission technology in LSI and other off-road equipment categories; (2) the cost and economics of widespread deployment of those technologies and the associated fueling infrastructure; and (3) the potential impacts on businesses and the environment.

B. LEGAL AUTHORITY

In 1988, the California legislature enacted the California Clean Air Act (CCAA), which declared that attainment of state ambient air quality standards is necessary to promote and protect public health, particularly the health of children, the elderly, and those with respiratory diseases. The legislature also directed that these standards be attained by the earliest practicable date.

The CCAA, as codified in California Health and Safety Code sections 39001, 39002, 39003, 39500, 39600, 39601, 39602.5, 39607, 39658, 43000, 43011, 43013, 43018, 43101, 43102, 43104, 43150, 43151, and 43600, grants ARB authority to regulate on-road and off-road sources of emissions. Off-road emissions sources include LSI equipment such as forklifts, airport GSE, sweeper/scrubbers, generator sets, small irrigation pumps, and other similar types of equipment. ARB is therefore authorized to regulate LSI equipment as a separate mobile source category and as an emission source.

C. HISTORY AND PREVIOUS AMENDMENTS

ARB first adopted emission standards for new off-road LSI engines in 1998. Specifically, the rulemaking required engine manufacturers to certify new LSI engines to a 3.0 gram per brake horsepower-hour (g/bhp-hr) combined hydrocarbons (HC) and oxides of nitrogen (NO_x), or HC+NO_x, standard. The emission control requirements were phased-in, in increments of 25 percent of engine sales per year, beginning with the 2001 model year. By the 2004 model year, 100 percent of the new engines were required to be emission-controlled. To achieve this standard, manufacturers relied upon the same emission control technologies used in automotive engines for more than 20 years—three way catalytic converters, electronic fuel/air controllers, and oxygen sensors. The 3.0 g/bhp-hr standard represented a 75 percent reduction in emissions versus LSI engines with no emission controls.

Building on this success, in 2002, the United States Environmental Protection Agency (U.S. EPA) harmonized the federal standard with California's 3.0 g/bhp-hr HC+NO_x standard starting with the 2004 model year and adopted a more stringent 2.0 g/bhp-hr standard for new 2007 and subsequent model year engines. The federal program demonstrated that additional reductions from new engines were technically feasible and cost-effective.

In the 2003 State Implementation Plan for Ozone (2003 SIP), California committed to achieve NO_x and HC reductions of between 6.1 and 13.0 tons per day by 2010 through

two additional LSI measures—the development of more stringent new engine standards and the development of in-use fleet requirements. ARB adopted these two LSI measures in a 2006 rulemaking, which harmonized California’s standard with U.S. EPA’s 2.0 g/bhp-hr HC+NOx standard starting with the 2007 model year, set forth a more stringent 0.6 g/bhp-hr California standard beginning with the 2010 model year, and established in-use LSI fleet requirements. The 0.6 g/bhp-hr standard represents a 95 percent emission reduction versus uncontrolled LSI engines and is still in effect today.

The in-use element of the 2006 rulemaking—the LSI Fleet Regulation, requires in-use fleet operators of LSI equipment to meet specific HC+NOx Fleet Average Emission Level (FAEL) standards. LSI equipment subject to the LSI Fleet Regulation is found in approximately 2,000 LSI fleets in many diverse California industries, such as manufacturing, wholesale, transportation and utilities, retail, services, construction, and public agencies (ARB, 2010b). The regulation of in-use LSI equipment provided an enormous opportunity because each uncontrolled forklift has the same emissions per day as over 700 clean passenger cars. At that time, there were over 30,000 uncontrolled forklifts in California.

The LSI Fleet Regulation was later amended in 2010 primarily to provide additional compliance flexibility.

In April 2015, the Board directed staff⁶ to pursue development of the potential near-term actions described in the Pathways Document as quickly as possible to meet public health and climate change needs. The Pathways Document describes a number of potential immediate and near-term actions intended to facilitate the transition to a zero emission transportation system and supports the on-going effort to develop California’s Sustainable Freight Strategy. This proposal would support two of the near-term actions identified in the Pathways Document:

- Collection of data from freight facilities to support future actions to reduce emissions and health risk and to improve efficiency (Data Collection); and
- Development of proposed requirements to support broad scale deployment of zero emissions equipment in LSI applications (Zero Emission Off-Road Measure).

These actions are also described in the Draft Freight Plan, which was developed pursuant to Executive Order B-32-15 and builds upon the technical and stakeholder work that informed the development of the Pathways document.

⁶ Through Board Resolution 15-22.

D. EXISTING REGULATION

The LSI Fleet Regulation applies specifically to operators of four or more forklifts, sweeper/scrubbers, industrial tow tractors or airport GSE that use an LSI engine and requires such operators to meet specific HC+NO_x FAEL standards. The FAEL standards vary based upon equipment type and fleet size. For example, FAEL standards for forklift fleets (see Table ES-1) are more stringent because there are more retrofit devices available for forklifts than for other types of LSI equipment. In addition, FAEL standards are more stringent for large fleets (greater than 25 pieces of LSI equipment) because of their greater ability to incorporate zero and near-zero emission equipment into their operations. The FAEL standards have become more stringent over time, and the final FAEL standards, which still apply today, became effective on January 1, 2013. In addition, since 2007, fleet operators have been required to maintain updated fleet records at their facilities and make them available to ARB staff upon request. Except for operators taking advantage of exemptions that currently require documentation in order to qualify, the recordkeeping requirements are scheduled to sunset on June 30, 2016.

**Table ES-1:
Fleet Average Emission Level Standards in grams per kilowatt-hour
(grams per brake horsepower-hour) of Hydrocarbons plus Oxides of Nitrogen**

Fleet Type	Fleet Size	Initial Compliance Dates and HC+NO _x Fleet Average Emission Level Standards		
		1/1/2009	1/1/2011	1/1/2013
Large Forklift	26+	3.2 (2.4)	2.3 (1.7)	1.5 (1.1)
Medium Forklift	4 - 25	3.5 (2.6)	2.7 (2.0)	1.9 (1.4)
Non-Forklift Fleet	4+	4.0 (3.0)	3.6 (2.7)	3.4 (2.5)
Small Forklift Fleet	1-3	Exempt from Fleet Requirements		
Small Non-Forklift Fleet	1-3			

II. STATEMENT OF REASONS

A. DESCRIPTION OF PROBLEM PROPOSAL IS INTENDED TO ADDRESS

While the statewide emission reductions projected for the LSI Fleet Regulation were committed to in the 2003 SIP, ensuring these reductions are actually being achieved has been challenging. LSI equipment is found in many diverse industries and at many locations throughout the state, and there currently is not an effective mechanism in place for determining compliance and compliance rates. As a result, there is very limited data available on the sector, which has hindered staff's ability to accurately assess the progress that has been made towards achieving the regulation's ultimate air quality goals. More importantly, fleets that may be violating the requirements of the regulation are able to continue operating undetected, which increases public exposure to air pollutants, results in inequity among regulated fleets, encourages other fleets not to comply, and undermines the original intent of the LSI Fleet Regulation. Of the limited number of fleets staff has been in contact with, approximately 11 percent were determined to be in violation.

Furthermore, the Board directed staff per Resolution 15-22 to quickly pursue development of potential near-term actions identified in the Pathways Document. One such potential action, which is also identified in the *2016 Mobile Source Strategy*, is the development of the Zero Emission Off-Road Measure. While staff continues to evaluate and implement other methods for gathering the data necessary, the lack of LSI data currently available has hindered the development and proposal of this future measure. Because supporting data is essential for the development of regulatory measures, the Pathways Document also identifies Data Collection as a potential near-term action. This proposal is one of several ARB data collection efforts that supports the objectives of the Data Collection element.

The LSI sector is expected to serve as the launching point for many transformative technologies that could one day penetrate the off-road diesel sector as well. Staff believes increasing the deployment of zero emission technology in the LSI sector first would: (1) facilitate the necessary technology innovation and maturation that needs to occur in order to transfer such technologies into larger, higher-power-demand applications; (2) drive down technology costs; (3) increase market acceptance of zero emission technology; and (4) help identify opportunities to optimize infrastructure in order to support both on- and off-road vehicles and equipment.

B. PROPOSED SOLUTION TO THE PROBLEM

Staff is proposing these regulatory amendments to improve enforcement effectiveness and compliance rates, and to provide staff with the necessary data to inform a measure for accelerating deployment of zero emission technology in the LSI sector.

This proposal consists of the following major elements:

- The addition of reporting requirements, beginning June 30, 2017;
- The addition of equipment labeling requirements, beginning June 30, 2017; and
- The continuation of existing recordkeeping requirements.

The proposed reporting and labeling requirements are consistent with the current reporting and labeling requirements of the In-Use Off-Road Diesel-Fueled Fleets Regulation⁷ (Off-Road Regulation) (ARB, 2010a). Such requirements in the Off-Road Regulation have proved to be an effective mechanism for increasing compliance rates and gathering valuable population and emissions information about the off-road sector. For consistency and to make the implementation of these proposed requirements as seamless as possible, ARB staff is enhancing its existing reporting system used for the Off-Road Regulation, the Diesel Off-road On-line Reporting System (DOORS), to accommodate LSI equipment reporting.

Furthermore, the proposed action is consistent with the actions described in the Pathways Document and Draft Freight Plan and therefore, would further the goals of Resolution 15-22 and Executive Order B-32-15. It would also help fulfill the objectives set forth in ARB's 2016 Mobile Source Strategy.

III. SUMMARY OF THE PROPOSED ACTION

A. APPLICABILITY

The applicability of the proposed requirements would be consistent with the applicability of the current LSI Fleet Regulation set forth under the California Code of Regulations, title 13, sections 2775, 2775.1, and 2775.2. Fleets with four or more forklifts, sweeper/scrubbers, industrial tow tractors, or airport GSE that use an LSI engine would be subject to the proposed amendments. Examples of airport GSE include forklifts, tugs, belt loaders, bobtails, cargo loaders, lifts, air conditioners, service trucks, de-icers, fuel delivery trucks, and ground power units.

B. EXISTING PERFORMANCE REQUIREMENTS

Existing performance requirements, including FAEL standards, would not be modified by the proposed amendments. They would continue to remain in effect irrespective of the adoption of these proposed amendments.

C. PROPOSED REPORTING REQUIREMENTS

Staff is proposing to require all fleets subject to the current requirements of the LSI Fleet Regulation to report their LSI equipment to ARB, beginning June 30, 2017, and annually

⁷ Fleet regulation to reduce particulate matter and NOx emissions from in-use off-road heavy-duty diesel vehicles in California.

thereafter. In addition to the business and contact information of the fleet, the operator would also be required to provide information about each piece of LSI equipment, including:

- Equipment Type, Make, Model, Model Year, Serial Number and Lift Capacity;
- Engine Manufacturer, Model Year, Displacement, U.S. EPA Family Name, Emission Certification Standard, and Horsepower (or Operating Voltage, if applicable);
- If retrofit is installed, Retrofit Verification Level, Manufacturer, Serial Number; and
- Annual Hour Meter Readings (if necessary to qualify for an exemption).

When equipment is purchased or brought into California, the owner would have 30 days from the date of purchase or entry into the state to inform ARB of the purchase through reporting and receive an Equipment Identification Number (EIN), which is described in the following section.

Reporting could be completed by submitting paper forms or through the use of the Diesel Off-road Online Reporting System (DOORS), which would be modified to accept LSI fleet information. As it does for the Off-Road Regulation, DOORS would automatically notify operators of their fleet's compliance status with the applicable FAEL standard.

The proposed requirements would require, and provide a mechanism for, fleets to report applicable compliance information to ARB. As previously mentioned, the collected information would enhance enforcement efforts and increase compliance rates as well as inform future efforts to accelerate deployment of zero emission equipment in LSI applications.

D. PROPOSED LABELING REQUIREMENTS

Beginning June 30, 2017, medium and large fleets would also be required to label all affected equipment with a unique EIN. Similar to a license plate number for an on-road vehicle, the EIN would be unique and would stay with the equipment even when sold to a new owner. Once a piece of equipment is reported, ARB staff or DOORS would assign its EIN. The fleet owner would be responsible for affixing the EIN to the reported piece of equipment.

The fleet owner would be allowed to choose the best method for affixing the EIN, but it would need to be kept legible for the life of the equipment. Some owners could choose to attach an EIN decal or plate, and others could choose to paint the EIN on the equipment. The affixed EIN would need to be in white letters and numbers on a red background. It would be required to be placed in clear view on the outside of the equipment approximately 5 feet above the ground, or if the equipment is not at least 5 feet tall, as high above the ground as it could be placed on the equipment in a location where it would remain legible. Each character would need to be at least 3 inches in height and 1.5 inches in width. Figure II-1 shows an LSI forklift with an affixed EIN.

**Figure II-1:
Example of an Equipment Identification Number Installed
on LSI Equipment**



This affixed EIN would allow enforcement staff to quickly identify equipment during inspections and reconcile information about such equipment with reported data.

E. PROPOSED EXTENSION OF RECORDKEEPING REQUIREMENTS

Staff is proposing to extend the recordkeeping requirements of the existing LSI Fleet Regulation. Except for fleet operators taking advantage of an exemption that currently requires documentation in order to qualify, the existing recordkeeping requirements are scheduled to sunset on June 30, 2016. Staff is proposing to extend these existing recordkeeping requirements until June 30, 2023, to facilitate the proposed reporting requirements and ARB's enforcement activities. The proposed extension would also be consistent with the sunset of the proposed reporting and labeling requirements.

F. SUNSET OF PROPOSED AMENDMENTS

Establishing a sunset date for recordkeeping and reporting requirements is consistent with other fleet regulations ARB has adopted. Here, the proposed reporting, labeling, and extended recordkeeping requirements would sunset on June 30, 2023.

The data collected as a result of the proposed amendments would inform the development of a future proposal to accelerate the deployment of zero emission equipment in LSI sectors. Such a measure is tentatively scheduled for Board consideration in the 2019/2020 timeframe. Should such a regulation be adopted, it would likely include recordkeeping, reporting, and labeling elements that would be a continuation of the requirements being proposed here.

That said, even if the development of the zero emission LSI proposal is not completed in the anticipated timeframe, staff believes the proposed reporting window would

provide sufficient data to substantially bolster the LSI enforcement program. In addition, the data that would be collected would continue to be available to enforcement staff for inspections even after the sunset date has passed.

Fleet operators taking advantage of exemptions that currently require documentation in order to qualify would be required to continue maintaining records, reporting, and labeling affected equipment beyond June 30, 2023.

G. KEY EXEMPTIONS TO PROPOSED AMENDMENTS

1. Small Fleets

As with the current LSI Fleet Regulation, small fleets (fleets with one to three pieces of equipment) would be exempt from the proposed reporting and labeling requirements. However, small fleets would be allowed to report and label on a voluntary basis. ARB could use such reported information for the development of incentive or assistance programs that benefit small businesses.

2. Agriculture

In-field equipment⁸ is currently exempt from the LSI Fleet Regulation. Similarly, fleets with such equipment would also be exempt from the proposed reporting and labeling requirements. In addition, although operators of Agricultural Crop Preparation Service⁹ equipment would continue to be subject to the emission requirements in the LSI Fleet Regulation, such equipment would be exempt from the proposed reporting and labeling requirements.

Staff is already working with the agriculture industry on a comprehensive survey that would provide data beyond what would be required by the proposed amendments. Because of this, staff has agreed to exempt agricultural fleets from the proposed reporting and labeling requirements as to not disrupt the current process.

⁸ Agricultural operations or forest operations equipment that is used no more than half of its annual operating hours in agricultural crop preparation services.

⁹ Packinghouses, cotton gins, nut hullers and processors, dehydrators, feed and grain mills, and other related activities that fall within the United States Census Bureau NAICS (North American Industry Classification System) definition for Industry 115114 – “Postharvest Crop Activities,” as published in the North American Industry Classification System – United States, 2002. For forest operations, “Agricultural Crop Preparation Services” means milling, peeling, producing particleboard and medium density fiberboard, and producing woody landscape materials and other related activities that fall within the United States Census Bureau NAICS definition for Industries 321113 (Sawmills) and 321219 (Reconstituted Wood Product Manufacturing,” as published in the North American Industry Classification System – United States, 2007.

H. SUMMARY AND RATIONALE FOR EACH REGULATORY PROVISION

Pursuant to Government Code sections 11346.2(b)(1) and 11349.1, and California Code of Regulations, title 1, section 10, staff provides a summary in Appendix C that identifies the section in the regulation where each amendment is proposed and describes the rationale for each proposed amendment.

The anticipated benefits from the regulatory action include ARB's ability to monitor for compliance with the regulation; improved enforcement effectiveness; and meaningful data collection that will help inform potential measures described in the Pathways Document, ensuring reliability of the emission reductions projected for the existing LSI Fleet Regulation and ultimately helping California reach its long term air quality and climate goals.

Staff is also proposing a number of non-substantive amendments solely for consistency purposes. Proposed modifications to the regulations that merely correct errors in the text or are editorial in nature are not summarized in Appendix C.

IV. AIR QUALITY

The regulation, as amended by the proposed amendments, would not result in any direct improvement or decline in air quality. However, staff expects the proposed amendments would help improve the reliability of the emission reductions projected for the existing LSI Fleet Regulation.

V. ENVIRONMENTAL ANALYSIS

This chapter provides the basis for ARB's determination that the proposed amendments are exempt from the requirements of the California Environmental Quality Act (CEQA). A brief explanation of this determination is provided herein. ARB's regulatory program, which involves the adoption, approval, amendment, or repeal of standards, rules, regulations, or plans for the protection and enhancement of the State's ambient air quality, has been certified by the California Secretary for Natural Resources under Public Resources Code section 21080.5 of CEQA (14 CCR § 15251(d)). Public agencies with certified regulatory programs are exempt from certain CEQA requirements, including but not limited to, preparing environmental impact reports, negative declarations, and initial studies. ARB, as a lead agency, prepares a substitute environmental document (referred to as an "Environmental Analysis" or "EA") as part of the Staff Report prepared for a proposed action to comply with CEQA (17 CCR § 60000-60008). If the proposed amendments are finalized, a Notice of Exemption will be filed with the Office of the Secretary for the Natural Resources Agency and the State Clearinghouse for public inspection.

ARB has determined that the proposed amendments are exempt from CEQA under the “general rule” or “common sense” exemption (14 CCR § 15061(b)(3)). The common sense exemption states a project is exempt from CEQA if “the activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.”

The proposed amendments would require LSI fleets to report owner, equipment, and engine information to ARB. In addition, the proposed amendments would establish equipment labeling requirements similar to current requirements for California off-road diesel vehicles. Establishing reporting and labeling requirements for California LSI equipment would have no potential to adversely affect air quality or any other environmental resource area. Based on ARB’s review, it can be seen with certainty that there is no possibility that the proposed amendments would result in a significant adverse impact on the environment; therefore, this activity is exempt from CEQA.

VI. ENVIRONMENTAL JUSTICE

State law defines environmental justice as “the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.” (Gov. Code § 65040.12(c).) ARB is committed to making environmental justice an integral part of its activities. The Board approved its Environmental Justice Policies and Actions on December 13, 2001, to establish a framework for incorporating environmental justice into ARB’s programs consistent with the directives of State law (ARB, 2001). These policies apply to all communities in California, but recognize that environmental justice issues have been raised more in the context of low-income and minority communities.

The proposed amendments to the regulation are consistent with the goals of the current LSI Fleet Regulation to reduce emissions of air pollutants and the associated health risks over time statewide. This is consistent with the Board’s environmental justice policy in that the proposed amendments would improve the reliability of the regulation’s projected emission reductions in all communities throughout the state, including low-income and minority communities.

VII. ECONOMIC IMPACTS

A. SUMMARY OF ECONOMIC IMPACTS

The economic impacts assessment described in this Initial Statement of Reasons (ISOR) was conducted to meet current legal requirements under the Administrative Procedure Act. In this chapter, staff provides the estimated costs to businesses and public agencies to comply with the proposed amendments to the regulation. The

amendments are expected to affect approximately 2,000 fleets. The total cost impact to all affected entities, including private businesses and local and state government entities is projected to be approximately \$10.7 over a six-year period.

The cost estimates are based on approximations of the amount of time and materials required to comply with each of the amended provisions for each fleet size based on similar reporting and labeling requirements for the Off-Road Regulation and industry rates. The approximations of costs provide a general estimate of the economic impacts that typical fleets might encounter. Individual companies may experience different impacts than those projected here, depending on various factors.

Staff has determined that the additional costs of the proposed amendments would not adversely affect businesses. As a result, staff does not expect a noticeable change in employment, business creation, expansion, or elimination, or business competitiveness in California.

B. LEGAL REQUIREMENTS

Section 11346.2 of the Government Code requires an economic impact assessment for non-major regulations or a standard regulatory impact analysis (SRIA) for major regulations to be included in the ISOR when proposing to adopt, amend, or repeal a regulation. A major regulation is defined by section 11342.548 of the Government Code as a regulation that will have a potential economic impact to California business enterprises and individuals in an amount exceeding \$50 million in any 12-month period. Staff has determined that the proposed regulatory amendments do not meet the major regulation threshold because the economic impact is below \$50 million.

For non-major regulations, sections 11346.2 and 11346.3 of the Government Code require state agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall include a consideration of the impact of the proposed regulation or amendments on California jobs; business expansion, elimination, or creation; the ability of California businesses to compete; and benefits of the regulation to the health and welfare of California residents, worker safety, and the state's environment.

C. LSI FLEET BREAKDOWN

The 2010 LSI ISOR estimated that there are 2,000 fleets of LSI equipment subject to the current LSI Fleet Regulation (ARB, 2010b). Staff used off-road diesel fleet data¹⁰ to estimate the economic impact of the proposed amendments on private, federal, state, and local government fleets, individually. Specifically, staff assumed that the distribution of the aforementioned fleet types among off-road diesel fleets is the same

¹⁰ Data reported to ARB by fleet operators pursuant to the requirements of the Off-Road Regulation, as of September 3, 2015.

for LSI fleets. For example, because local government fleets represent approximately 6.5 percent of total diesel fleets reported to ARB, staff assumed that local government fleets also represent 6.5 percent of the total LSI fleets that would be subject to the proposed amendments.¹¹

Staff assumed no growth or decline in the number of public or private companies. It is likely, any new businesses in California (formed after September 3, 2015) would have less than four forklifts or other regulated LSI equipment, and therefore be exempt from the LSI Fleet Regulation and these amendments.

The ISOR for the original LSI Fleet Regulation rulemaking, dated March 3, 2006, estimated that there were 92,104 affected pieces of LSI equipment in 2010, and that there would be an estimated 96,964 pieces of LSI equipment by 2020 (ARB, 2006). Assuming that the number of pieces increases by the same amount each year, staff estimates that there will be 95,506 pieces of equipment when these amendments would become effective in 2017. The analysis of the LSI fleet breakdown is shown below in the Table VII-1:

**Table VII-1:
Estimated LSI Fleet Composition in 2017¹**

Fleet Type	% of Diesel Fleets	Estimated LSI Fleets²	% of Diesel Vehicles	Estimated Equipment in LSI Fleets³
Federal	0.45	9	1.10	1,050
State	0.69	14	1.15	1,100
Local Gov.	6.46	129	6.94	6,630
Private	92.4	1,848	90.81	86,730

¹ Values do not include small fleets (fewer than 4 pieces of equipment) and exempt agricultural fleets.

² Assumes 2,000 total affected LSI fleets.

³ Assumes 95,506 total pieces of affected LSI equipment.

D. ECONOMIC IMPACT ANALYSIS

The following is a description of the methodology used to estimate costs, as well as staff’s analysis of the economic impact on jobs, California businesses, state and local agencies, and impacts on the health and welfare of California residents.

¹¹ No other applicable data were available to validate these assumptions. The proposed amendments are intended to fill this data gap, so that broad assumptions, such as these, would not have to be made when developing future advance technology measures, such as the Zero Emission Off-Road Measure.

1. Economic Impacts Assessment

As shown below in Table VII-2, the total cost for reporting and labeling required by the proposed amendments would be approximately \$10.7 million for all fleets, public and private, of which approximately \$9.7 million would be for private fleets only. To estimate the cost, staff assumed the labor cost for reporting and labeling would be the same as the labor cost staff assumed for the Off-Road Regulation, adjusted for inflation. Based on industry rates, staff assumed a cost of \$50/hour for either employee time or a hired consultant when the Off-Road Regulation was originally adopted in 2007 (ARB, 2007). According to the Bureau of Labor Statistics inflation calculator, \$50 in 2007 dollars is estimated at \$57 in 2016 dollars, adjusted for inflation. The cost for the label itself is estimated to be \$10 per piece of equipment, based on a survey of label vendors. It is expected that it would take a maximum of one hour to report and label each piece of equipment. Thus, the total cost for reporting and labeling for each piece of equipment would be \$67 (\$57 plus \$10). The smallest fleet that would require reporting and labeling would consist of four pieces of equipment. Staff assumed that the average size of a private fleet that would be subject to the proposed amendments is 47 pieces of equipment (86,730 pieces / 1,848 fleets) and that the largest fleets operate 100 pieces of equipment. This results in a range of costs from approximately \$270 (for fleets with 4 pieces of equipment) to \$6,700 (for fleets with 100 pieces of equipment).

To estimate the total cost of the proposal, staff assumed a 0.5 percent annual growth rate and a 10.6 percent annual turnover rate. As an example, staff determined a growth cost of approximately \$176,500 and a turnover cost of approximately \$3.7 million for private fleets over the life of the proposed requirements based on these growth and turnover assumptions.¹² The total estimated cost for each fleet type is also shown in the Table VII-2 below.

¹² Assumed annual growth rate derived from LSI equipment inventory population projections. Assumed annual turnover rate based on industry estimates of equipment lifespan and staff estimates on the current penetration of battery-electric equipment. See *Appendix B: Methodology for Determining Cost of Growth and Natural Turnover* for additional details.

**Table VII-2:
Estimated Initial LSI Fleet Reporting and Labeling Costs¹**

	Number of Equipment in LSI Fleets	Initial Reporting and Labeling Costs	Reporting and Labeling Costs due to Growth	Reporting and Labeling Cost due to Turnover	Total Reporting and Labeling Cost
Federal	1,050	\$70,400	\$2,140	44,700	\$117,200
State	1,100	\$73,700	\$2,240	46,900	\$122,800
Local Gov.	6,630	\$444,000	\$13,500	\$283,000	\$741,000
Private	86,730	\$5,811,000	\$176,500	\$3,700,000	\$9,690,000
Total					\$10,670,000

¹ Values do not include small fleets (fewer than 4 pieces of equipment) and exempt agricultural fleets. In addition, cost values may not add up to total due to rounding.

2. Impact on Jobs

The proposed regulatory amendments are not expected to create or eliminate jobs for California businesses.

3. Impact on California Businesses

The proposed amendments would only impact medium fleets (4 to 25 pieces of equipment) and large fleets (26 or greater pieces of equipment). For this analysis, staff assumed that the largest fleets operate 100 pieces of equipment. As shown in Table VII-3 below, the initial cost of reporting and labeling to a medium fleet would range from approximately \$270 to \$1,675, and be approximately \$970 for an average medium fleet. The cost to a large fleet would range from approximately \$1,740 to \$6,700, and be approximately \$4,220 for an average large fleet. Assuming a 0.5 percent annual growth rate and a 10.6 percent annual turnover rate, a medium fleet is expected to incur an annual cost of approximately \$30 to \$190 over the six-year life of the regulation while the annual cost for growth and turnover would range from approximately \$190 to \$745 for a large fleet.

**Table VII-3
Estimated Costs of Proposed Amendments Per Fleet**

Fleets	Fleet Size		Initial Cost Range		Annual Growth and Turnover Costs*	
					Growth	Turnover
Medium	4	25	\$270	\$1,675	\$30	\$190
Large	26	100	\$1,740	\$6,700	\$190	\$745

*Annual cost estimates are based on a 0.5 percent annual growth rate and 10.6 percent annual turnover rate.

The proposed amendments are not expected to have a substantive impact on California businesses. In addition, this regulation is not expected to create new businesses, or expand or eliminate existing businesses, within the State.

4. Impact on Small Business

Small businesses would be exempt from the proposed amendments because they are small fleets (less than four pieces of equipment), which are already exempt from the current LSI Fleet Regulation. While small businesses would not be required to report, some may voluntarily comply with the proposed LSI Fleet Regulation reporting and labeling requirements. A small fleet would assume a cost of \$67 for either 1 hour of employee time or a hired consultant to complete the equipment reporting and labeling. The cost to a small fleet, therefore, would range from \$67 to \$201 if they choose to comply.

5. Impacts to Health and Welfare of California Residents

The proposed regulatory amendments would not directly reduce criteria or greenhouse gas emissions, as they only require reporting and labeling and do not affect the current emission standards. As such, there would be no direct impacts, either negative or positive, on health, or welfare to California residents, worker safety, and California’s environment associated with the proposed regulatory amendments. However, the proposed amendments are expected to help ensure compliance with the LSI Fleet Regulation, improving the reliability of the emission reductions projected for the existing rule.

6. Impact on Public Agencies

As shown in the analysis above, the estimated total cost of the amendments for all public agencies is approximately \$981,000 over the life of the proposed amendments. Federal fleets would have a cost of \$117,200 and state fleets would have cost of \$122,800. Local government fleets, such as those owned by cities and counties, would have a cost of \$741,000. In addition, local and state agencies are expected to incur \$57,500 in annual costs for growth and turnover of their equipment over the life of the amendments.

Of this amount, the share of the local agencies would be \$49,300 and the share of State agencies would be \$8,200.

Administrative costs of the proposed amendments are expected to be minimal for affected local and state agencies, except that ARB would need to add four additional staff for implementation and enforcement of the proposed amendments. The cost of each staff is estimated at \$145,000 per year. The total cost of additional staff would be \$1.16 million for fiscal years 2017/2018 and 2018/2019.

VIII. EVALUATION OF REGULATORY ALTERNATIVES

California Government Code section 11346.2 requires ARB to consider and evaluate reasonable alternatives to the proposed amendments to the LSI Fleet Regulation and provide the reasons for rejecting those alternatives. This section discusses alternatives evaluated and provides reasons why these alternatives were not included in the proposal. Staff has not identified any alternatives that would lessen any adverse impact on small businesses. The proposed regulation does not meet the major regulation threshold as specified in section 57005 of the Health and Safety Code, and therefore, staff did not include any major regulation alternatives in the analysis.

Staff evaluated three alternative strategies to the current proposed amendments. Based on the analysis, staff concluded that the proposed amendments provide the most effective and least burdensome approach to impacted fleets. Staff did not find any of the alternatives considered to be more effective in carrying out the purpose for which the proposed regulatory action is proposed or to be as effective as or less burdensome to affected businesses than the proposal. The alternatives considered and staff's rationale for finding them unsuitable is discussed below.

A. NO ACTION

The first alternative considered was to take no action. Staff rejected this alternative for the following reasons:

- Enforcement staff would continue facing challenges detecting non-compliance among the regulated community, which would increase the public's exposure to air pollutants, result in inequity among regulated fleets, encourage other fleets not to comply, and undermine the original intent of the LSI Fleet Regulation;
- Enforcement inspections would continue to require significant staff time to reconcile observed equipment and recordkeeping;
- Staff would still be unable to accurately account for the progress that has been made towards the ultimate goals of the LSI Fleet Regulation; and
- Efforts to accelerate deployment of zero emission technology in LSI applications, and eventually in other off-road applications would be hindered.

B. REQUIRE SMALL FLEETS TO REPORT AND LABEL

The second alternative considered was to include small fleets in the applicability of the proposed reporting and labeling requirements. Small Fleets account for nearly 60 percent of total LSI fleets in California, but only about 20 percent of total LSI equipment (ARB, 2006). ARB staff estimates that the reporting and labeling costs for small fleets over the life of the proposed amendments would total approximately \$2.7 million, which would likely impose a significant cost burden on such fleets because they are typically small businesses. Because of this and because small fleets account for such a small portion of total LSI emissions in California, staff rejected this alternative.

C. ONE-TIME REPORTING ONLY

An alternative considered was to require fleets currently subject to the LSI Fleet Regulation to submit a one-time fleet inventory report to ARB, with no labeling requirement. This alternative would eliminate the on-going time and resources to maintain up-to-date records and report such data to ARB on an annual basis, as well as the time and resources necessary to obtain EINs and affix decals to LSI equipment.

Staff estimates it would take, on average, one business day to complete reporting, and up to ten days for the largest fleets. The estimated cost for one fleet inventory report would be between \$228 and \$5,700 per fleet. The total statewide cost for this alternative is estimated to be around \$5.4 million over its life.

This alternative was rejected because it would prevent staff from identifying trends in reported data (e.g., population growth, turnover, etc.) that could be used to inform future policy and planning decisions. In addition, by not requiring labeling, enforcement inspections would continue to be inefficient and require significant staff time to reconcile observed equipment and records. Furthermore, the cost difference between a one-time report and on-going reporting and labeling would be minimal.

IX. JUSTIFICATION FOR ADOPTION OF REGULATIONS DIFFERENT FROM FEDERAL REGULATIONS CONTAINED IN THE CODE OF FEDERAL REGULATIONS

The proposed regulation would only apply in California and would not affect nor conflict with federal regulations.

X. PUBLIC PROCESS FOR DEVELOPMENT OF PROPOSED ACTION (PRE-REGULATORY INFORMATION)

Staff has offered the California public several opportunities to learn about and comment on the proposed LSI regulatory amendments. ARB has staffed a LSI toll-free hotline and maintained a webpage since 2005 providing LSI owners immediate regulation assistance.

During the development process, staff proactively searched for opportunities to present information about the proposed regulation at places and times convenient to stakeholders. For example, meetings were held in northern, central valley, and southern California to encourage public participation, and provided on-line viewing and real-time on-line question-and-answer sessions.

Since starting the proposed amendment process, ARB has held two sets of three workshops while developing this regulatory amendment, as shown in Table X-1. Notices and meeting details were posted to ARB's LSI webpage and e-mailed to subscribers of the LSI listserv. In addition, staff broadcasted the workshop notice for the initial series workshops to a wide audience, which included not only the LSI Fleet listserv, but several associated list serves, including the mobile source program, sustainable freight, agriculture, in-use agriculture, climate change agriculture, workshops, low carbon fuel standard, cargo handling equipment, off-road diesel, goods movement bond, transport refrigeration unit, on-road diesel, and ombudsman listservs. Attendees included representatives from environmental organizations, LSI equipment dealers, rental yards, private businesses, and other parties. Individuals were encouraged to provide data, review draft regulations, and participate in open forum workshops where staff directly addressed their concerns. For the second series of workshops, staff notified stakeholders that were signed up for the mobile source program and LSI listservs only. At that time, stakeholders were requested to sign up for the LSI listserv if they wanted to be notified of upcoming LSI program events. Table X-1 provides information regarding meetings that were held to apprise the public about the development of the proposed amendments to the regulation.

**Table X-1:
Summary of Outreach Efforts for the Proposed Regulation**

Date	Meeting	Type	CA Location
June 8, 2015	Public Workshop	Meeting/Webcast	Cal/EPA, Sacramento
June 10, 2015	Public Workshop	Meeting/Webcast	SJVAPCD, Fresno
June 12, 2015	Public Workshop	Meeting/Webcast	SCAQMD, Diamond Bar
September 29, 2015	Public Workshop	Meeting/Webcast	Cal/EPA, Sacramento
September 30, 2015	Public Workshop	Meeting/Webcast	SCAQMD, Diamond Bar
October 8, 2015	Public Workshop	Meeting/Webcast	SJVAPCD, Fresno
October 14, 2015	One Stop Truck Event	Public Meeting	Del Mar
October 20, 2015	One Stop Truck Event	Public Meeting	Anderson
October 29, 2015	505 Training Class	Public Meeting	Santa Rosa
November 18, 2015	One Stop Truck Event	Public Meeting	Fresno/Bakersfield
November 19, 2015	One Stop Truck Event	Public Meeting	Los Angeles
December 2, 2015	505 Training	Public Meeting	Selma
December 11, 2015	One Stop Truck Event	Public Meeting	Alameda
December 16, 2015	One Stop Truck Event	Public Meeting	Rocklin

ARB continues to offer free 505 training classes; these classes train LSI owners on the ARB regulation and compliance with the regulation. In addition, staff provided a brief update on the proposed regulatory amendments during several of the One Stop Truck Events held throughout California.

XI. REFERENCES

ARB, 2001. California Air Resources Board, Policies and Actions for Environmental Justice. December 13, 2001. <http://www.arb.ca.gov/ch/programs/ej/eipolicies.pdf>

ARB, 2006. California Air Resources Board, Initial Statement of Reasons: New Emission Standards, Fleet Requirements, and Test Procedures for Forklifts and Other Industrial Equipment. March 3, 2006. <http://www.arb.ca.gov/regact/lore2006/isor.pdf>

ARB, 2007. California Air Resources Board, Technical Support Document: Proposed Regulation for In-Use Off-Road Diesel Vehicles, Appendix J: Costs and Economic Analysis Methodology. <http://www.arb.ca.gov/regact/2007/ordiesel07/tsdappj.pdf>

ARB, 2010a. California Air Resources Board, Regulation for In-Use Off-Road Diesel-Fueled Fleets. December 2011. <http://www.arb.ca.gov/msprog/ordiesel/documents/finalregorder-dec2011.pdf>

ARB, 2010b. California Air Resources Board, Initial Statement of Reasons: Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the

Off-Road Large Spark-Ignition Fleet Requirements. October 2010. <http://www.arb.ca.gov/regact/2010/offroadlsi10/offroadisor.pdf>

ARB, 2015. California Air Resources Board, Sustainable Freight: Pathways to Zero and Near Zero Emissions, Discussion Document. April 2015. <http://www.arb.ca.gov/gmp/sfti/sustainable-freight-pathways-to-zero-and-near-zero-emissions-discussion-document.pdf>

ARB, 2016a. California Air Resources Board, 2016 Mobile Source Strategy. May 2016. <http://www.arb.ca.gov/planning/sip/2016sip/2016mobsrsrc.pdf>

ARB, 2016b. California Department of Transportation et al., California Sustainable Freight Action Plan, Draft Discussion Document. July 2016. http://www.casustainablefreight.org/app_pages/view/154

California Code of Regulations, Title 13, Sections 2775, 2775.1, 2775.2.

XII. APPENDICES

Appendix A: Proposed Regulation Order

Appendix B: Methodology for Determining Cost of Growth and Turnover

Appendix C: Summary and Rationale for Each Regulatory Provision