

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report Facility-Based Mobile Source Measure for Commercial Airports

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Executive Summary

The 2016 Air Quality Management Plan (AQMP) is the latest regional blue print for achieving the federal and state air quality standards in the South Coast Air Basin (Basin). Based on the 2016 AQMP analysis, significant additional NO_x reductions beyond what will be achieved through existing regulations are needed to achieve the federal 8-hour ozone standards in the Basin – a 45% reduction beyond baseline levels in 2023 and 55% reduction beyond baseline levels in 2031. Controlling mobile source emissions are key to achieving these targets, as mobile sources comprise over 80% of Basin NO_x emissions and are the largest contributor to the region’s ozone problem. The Facility-Based Mobile Source Measures included in the 2016 AQMP are South Coast AQMD’s proposed mobile source measures covering marine ports (MOB-01), railyards (MOB-02), warehouse/distribution centers (MOB-03), commercial airports (MOB-04), and new development and redevelopment projects (EGM-01). These measures are intended to help achieve the emission reductions attributed to CARB's Further Deployment of Cleaner Technology measures by reducing emissions from these facilities through South Coast AQMD’s actions (e.g., indirect source rules or other programs).

The Facility-Based Mobile Source Measure (FBMSM) for Commercial Airports implements the 2016 AQMP Control Measure MOB-04, Emission Reductions at Commercial Airports. This measure applies to Los Angeles International Airport (LAX), John Wayne Orange County Airport (SNA), Hollywood Burbank Airport (BUR), Ontario International Airport (ONT), and Long Beach Airport (LGB). Following the adoption of the 2016 AQMP, staff conducted 17 working groups to address the FBMSM sectors during a year-long public process. Based on the working group discussions, staff recommended that South Coast AQMD pursue a voluntary Memorandum of Understanding (MOU) approach for commercial airports.

On May 4, 2018, the Board considered staff’s recommendations for all FBMSMs and provided specific direction regarding both regulatory and voluntary approaches. For commercial airports, the Board approved staff’s recommendation to pursue a voluntary MOU approach based on the airports’ development of Air Quality Improvement Plans/Measures (AQIP or AQIM) for non-aircraft emissions. Following the Board’s direction, South Coast AQMD established a new Airports MOU working group for the purpose of developing MOUs with individual commercial airports based on their respective AQIPs. All five commercial airports committed to preparing their own AQIPs and developing MOUs with South Coast AQMD.

Since that time, South Coast AQMD staff has conducted four working group meetings. During this process, staff has communicated regularly with airport representatives and their consultants to provide technical support regarding emission calculation methodologies for base and future years’ emissions inventories. In addition, staff has reviewed the airports’ preliminary emission inventory data, draft AQIPs or AQIM emission reduction measures and initiatives, and assisted with the development of draft MOUs.

As part of the MOU process, each airport has developed its own AQIP or AQIM with specific measures and initiatives. The AQIPs (or AQIMs) represent the airports’ comprehensive plans to reduce emissions from non-aircraft mobile sources related to airport operations (e.g., ground

support equipment, shuttle buses, delivery trucks)¹. In general, a measure represents a program in which the airport commits to a well-defined course of action with known emission reductions, while an initiative represents an objective that the airport intends to pursue, but the emission reductions are not readily quantifiable. The AQIPs/AQIMs also include the 2017 baseline emissions as well as emissions forecasts in 2023 and 2031 under business as usual (BAU) and AQIP/AQIM implementation scenarios.

Based on the draft AQIPs/AQIMs developed by the five commercial airports, draft MOUs have been developed for each of the five commercial airports. The MOUs represent voluntary agreements between South Coast AQMD and each commercial airport, with each party having specific responsibilities and commitments. The purpose of the MOU is to quantify the emission reduction benefits associated with the implementation of the airports' AQIP/AQIM strategies that are eligible for SIP credits. Each MOU includes schedules for the eligible SIP creditable AQIP/AQIM measures that specify the metrics, performance targets, timeline for implementation, and the details of the annual reports to be prepared by the airports and submitted to South Coast AQMD.

Under the MOUs, the airports commit to implement the AQIP/AQIM measures eligible for SIP credit and achieve the performance targets in these measures. The airports also commit to provide annual reports to South Coast AQMD, by June 1st of each year beginning in 2021 and through the end of the MOU term in 2031, on the implementation of these measures, including detailed equipment/vehicle data and emissions inventories with supporting methodology and calculations for emission benefits. South Coast AQMD commits to quantify the corresponding SIP emission reductions associated with these AQIP/AQIM measures in the MOUs and to make an enforceable commitment for these reductions to EPA for inclusion into the SIP. Based on the annual reports submitted by the airports, South Coast AQMD will also quantify the actual emission reductions for these measures for the attainment milestone years (2023 and 2031) and prepare and submit the necessary documentation to U.S. EPA for tracking these reductions. South Coast AQMD also commits to ensure that the relevant data including the AQIPs/AQIM, MOUs, annual reports submitted by the airports, and South Coast AQMD's reports to EPA are accessible to the public.

In the event that the actual emission reductions from the implementation of the AQIP/AQIM measures specified in the MOUs are less than the projected emission reduction benefits, South Coast AQMD will be responsible for achieving the reduction shortfall. In such instances, South Coast AQMD also commits to adopt and submit substitute measures to EPA working with the airports and other stakeholders. A public process will be initiated to facilitate the consideration of potential new or enhanced programs, or better efforts to quantify existing programs, to help South Coast AQMD meet any shortfall.

In order for emission reductions from the AQIP/AQIM measures specified in the MOUs to be eligible for SIP credit, these reductions need to meet the EPA's guidelines. These guidelines require that the emission reductions meet EPA's integrity elements (i.e., reductions must be surplus, quantifiable, permanent, and enforceable), federally enforceable backstop commitments, technical support, funding, legal authority, public disclosure, and provisions to assess progress.

¹ Aircraft emissions are not covered in the AQIPs/AQIM/MOUs because of federal jurisdiction over aircraft.

The emission reductions associated with implementation of the AQIP/AQIM measures included in the five MOUs with the commercial airports meet these requirements as described in this staff report.

The FBMSM for Commercial Airports is expected to achieve 0.52 and 0.38 tons per day of NOx emission reductions in 2023 and 2031, respectively, based on the airports implementation of AQIP/AQIM measures in the MOUs. While these emission reductions are modest, there are other AQIP/AQIM measures that airports are implementing that will result in emission reductions that may not be easily quantifiable or SIP creditable.

The draft AQIPs/AQIM/MOUs for all five commercial are attached to the staff report. Each airport has its own public process and approval process for the draft AQIPs/AQIM and MOUs by its respective airport authority. Following South Coast AQMD's public process, the FBMSM for Commercial Airports including the draft MOUs with the commercial airports and the enforceable commitment to backstop any emission reduction shortfall will be considered by the South Coast AQMD Governing Board for approval.

Chapter 1: Background

Introduction

Airports MOU Working Group Activities

Regulatory Background

EPA's Requirements for SIP Emission Reduction Credits

Introduction

The 2016 Air Quality Management Plan (AQMP), adopted by the South Coast Air Quality Management District (South Coast AQMD) Board in March 2017, is the latest regional blueprint for achieving the federal and state air quality standards in the South Coast Air Basin (Basin). Based on the 2016 AQMP analysis, significant additional NO_x reductions beyond existing regulations are needed to achieve the federal 8-hour ozone standards in the Basin (45% in 2023 and 55% in 2031). In addition to California Air Resources Board's (CARB's) State strategy, the 2016 AQMP also included mobile source measures proposed by South Coast AQMD including Facility-Based Mobile Source Measures (FBMSMs). FBMSMs cover facilities including ports (MOB-01), railyards (MOB-02), warehouse/distribution centers (MOB-03), commercial airports (MOB-04), and new development and redevelopment projects (EGM-01). These measures are intended to help achieve some of the emission reductions attributed to CARB's Further Deployment of Cleaner Technology measures by reducing emissions from these facilities through South Coast AQMD's actions (e.g., indirect source regulations, other programs).

MOB-04, Emission Reductions at Commercial Airports, applies to commercial airports located within the Basin. These include Los Angeles International Airport (LAX), John Wayne Orange County Airport (SNA), Hollywood Burbank Airport (BUR), Ontario International Airport (ONT), and Long Beach Airport (LGB). During the 2016 AQMP adoption, the South Coast AQMD Board (Board) approved a motion to amend MOB-04 and directed staff to *“Undertake a stakeholder process and draft for our consideration an indirect source rule for commercial airports within the South Coast Basin by February 1, 2019 to control emissions of NO_x, PM_{2.5}, lead and diesel particulate matter from non-aircraft sources”*. The Board discussion accompanying this amendment provided further direction, including a desire to let the airports prepare their own airport-specific Clean Air Action Plans (AirCAAPs). The Board would then consider this information to determine the level of control in any proposed Indirect Source Rule (ISR).

Following the adoption of the 2016 AQMP, staff initiated several working groups to address the FBMSM sectors including the commercial airports. During the year-long period, South Coast AQMD staff conducted 17 Working Group Meetings covering all five sectors. Some of the key topics discussed during the Working Group meetings included: 1) a framework for developing FBMSMs, 2) potential methods for obtaining SIP credit for voluntary measures, and 3) potential voluntary and regulatory emission reduction strategies for each facility sector. Based on working group discussions, South Coast AQMD Staff recommended that the Governing Board pursue a voluntary MOU approach for commercial airports because of the limited emissions reductions that would be available from the non-aircraft mobile sources operating at the airports, federal preemption of aircraft standards, existing emission reduction programs, and the potential willingness of airports to enter into cooperative agreements were the additional reasons to pursue a voluntary approach.

On May 4, 2018, the Board considered staff's recommendations for all FBMSMs and provided specific directions regarding both regulatory and voluntary approaches.² For commercial airports, the Board approved staff's recommendation to pursue a voluntary Memorandum of Understanding (MOU) approach (instead of an ISR approach) based on the airports willingness to develop airport-specific Air Quality Improvement Plans/Measures (AQIP or AQIM), and the fact that commercial airports contribute only about 8 tons per day of NO_x (absent aircraft emissions). However, in the event that the MOU approach is not successful, staff will report back to the Board and recommend consideration of an airport ISR for the Board's consideration.

A. Airports MOU Working Group Activities

Following the May 2018 Board direction, South Coast AQMD established a new Airports MOU working group for the purpose of developing MOUs with individual commercial airports based on their respective AQIPs/AQIM. The working group consisted of representatives from South Coast AQMD, five commercial airports, commercial airlines, the California Airports Council, CARB, U.S. Environmental Protection Agency (EPA), environmental organizations, freight industries, and other stakeholders. All five commercial airports concurred with the MOU approach and committed to develop individual MOUs with South Coast AQMD based on their respective AQIPs/AQIM. Since the establishment of the working group, South Coast AQMD staff has conducted four working group meetings, which are summarized below. During this process, South Coast AQMD staff communicated regularly with airport representatives and their consultants to provide technical support on emission calculation methodologies for base and future years' emissions inventories, review preliminary emission inventory data, review draft AQIPs/AQIMs and proposed strategies, and develop draft MOUs.

During Airports MOU Working Group meeting #1, held on February 28, 2019, group members discussed the framework and key principles of the MOU, the process of the MOU development, and the specific commitments required by the airports and South Coast AQMD to develop and implement the MOUs. The working group members were advised on the tight timeline for MOU development to accommodate South Coast AQMD's deadline to address Further Deployment of Cleaner Technology measures (Section 182(e)(5) measures) included in the 1997 8-hour ozone attainment strategy, by the end of 2019. Staff clarified that airports would develop their own respective AQIPs/AQIM, which would represent the airports' best efforts to develop programs and strategies for reducing emissions from airport operations based on their existing authority over non-aircraft mobile source emissions. The AQIP/AQIM would then be used as the basis for the MOUs between South Coast AQMD and the airports. All five commercial airports confirmed their commitment to develop their own AQIPs/AQIM and their willingness to enter into MOUs with South Coast AQMD. California Airports Council provided updates on the development of AQIPs/AQIM on behalf of the airports. Staff discussed the U.S. EPA's integrity elements (i.e., emission reductions must be quantifiable, permanent, surplus, and enforceable) and other requirements for emission reductions from AQIP/AQIM measures to be eligible for SIP credits. Staff also offered technical assistance to the airports in their development of emissions inventories and methodologies to estimate emission reduction benefits.

² *Potential Strategies for Facility-Based Mobile Source Measures Adopted in 2016 AQMP*
(<http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2018/2018-may4-032.pdf?sfvrsn=2>)

At the Airports MOU working Group meeting #2, held on May 8, 2019, staff provided an update on the MOU development, reiterating that the AQIPs/AQIM would serve as the basis for the MOUs and that staff would provide technical assistance in the quantification of emissions benefits for the purpose of obtaining SIP credits. Staff requested that airports provide detailed emissions inventories for all non-aircraft mobile source emissions associated with airport operations that are under direct or indirect airport control. These sources include, but are not limited to, ground support equipment (GSE), trucks, off-road equipment/vehicles, and on-road vehicles (e.g., shuttles, buses, passenger vehicles). The truck category includes cargo trucks, delivery, and utility/service trucks. Inclusion of aircraft emissions in the AQIP/AQIM was mentioned as an option that airports could include at their discretion. For all AQIP/AQIM emission sources, the emissions inventories would include the 2017 baseline, as well as 2023 and 2031 future milestone years. For the future years, staff requested that airports provide business as usual (BAU) and AQIP/AQIM emissions forecasts. The latter was meant to reflect emission reductions due to the implementation of the AQIP/AQIM measures. Staff also discussed the responsibilities of the airports and South Coast AQMD under the MOUs. Representatives from each of the commercial airports presented their preliminary AQIP/AQIM measures under development, and their schedule and public process for AQIP/AQIM/MOU adoption by their respective airport authority consistent with South Coast AQMD's schedule for a public hearing in late 2019.

The Airports MOU Working Group meeting #3, held on July 18, 2019, focused primarily on the presentations made by airport representatives regarding more details on the development of their AQIPs/AQIM. The presentations were largely focused on the proposed AQIP/AQIM measures and initiatives including preliminary targets being considered by the airports. Staff provided suggestions and comments on the draft AQIPs/AQIM and encouraged airports to consider stringent performance targets for all non-aircraft sources which were technically feasible and cost-effective through airport programs (e.g., requirements, incentives). The airports re-iterated their commitments to further refine their draft AQIPs/AQIM and also work with South Coast AQMD on developing draft MOUs through both the airport and South Coast AQMD's public processes.

The Airports MOU Working Group meeting #4 will be held on October 15, 2019. South Coast AQMD staff will also conduct a public consultation meeting on October 10, 2019 at the South Coast AQMD headquarters. Responses to the comments received will be incorporated into the staff report. The airport authorities will consider approval of the Draft MOUs with South Coast AQMD in November 2019. The South Coast AQMD Governing Board will consider approval of the FBMSM for Commercial Airports at its December 6, 2019 meeting.

B. Regulatory Background

This section provides a brief summary of the existing and proposed CARB and South Coast AQMD regulations affecting non-aircraft on-road and off-road mobile emission sources related to airport operations. In order for AQIP/AQIM emission reductions to be SIP creditable, these reductions have to be surplus to existing regulations.

South Coast AQMD's Fleet Rules

South Coast AQMD's fleet rules apply to several vehicle categories operating at airports. Rule 1191, Clean On-Road Light- and Medium-Duty Public Fleet Vehicles, applies to all government agencies located in the South Coast AQMD's jurisdiction, including state, regional, county, and city government departments and agencies, and any special districts such as water, air, sanitation, transit, and school districts, with 15 or more non-exempt light-duty vehicles. This regulation requires that these entities acquire low emission gasoline or an alternative fuel vehicles when procuring new vehicles. Rule 1196, Clean On-Road Heavy-Duty Public Fleet Vehicles, is a similar regulation that applies to on-road heavy-duty vehicles with a gross vehicle weight of at least 14,000 pounds. It requires all applicable government agencies and special districts with fleets of 15 or more vehicles (including commercial airports), to acquire a gasoline, dual-fuel or alternative fueled engine or vehicle when purchasing or leasing a new vehicle. Airports and operators must also comply with Rule 1194, Commercial Airport Ground Access, which requires all public and private fleets providing passenger transportation services out of commercial airports to acquire low emission or alternative-fueled vehicles. This rule applies to passenger cars, light-duty trucks, and medium- and heavy-duty transit vehicle fleets of 15 or more vehicles. Passenger shuttle buses and taxi cabs serving airports must comply with this rule as well.

CARB GSE MOU

In 2002, CARB executed an MOU with commercial airlines and cargo operators in the Basin for Ground Support Equipment (GSE). GSE is utilized for various functions at airports such as refueling aircraft, transporting cargo and luggage, and providing maintenance. The main objectives of the MOU were to have airlines meet a 2.65 g/bhp-hr hydrocarbon plus NOx performance target, convert at least 30% of the aggregate GSE fleet to electric, have at least 45% of new GSE purchases be electric, and reduce diesel GSE emissions by installing particle filters. The date to achieve these objectives was December 31, 2010. However, the MOU was terminated in 2006 because CARB's statewide regulations addressed many aspects of the GSE MOU.

CARB In-Use Off-Road Diesel-Fueled Fleets Regulation

CARB requires emission reductions from existing off-road diesel-fueled vehicles through its statewide In-Use Off-Road Diesel-Fueled Fleets Regulation. The regulation applies to all off-road diesel vehicles with engines greater than 25 horsepower including diesel-powered GSE and other diesel off-road equipment and vehicles operated at the airports. The regulation imposes limits on idling, restricts the addition of older vehicles to fleets, and requires fleets to retire, replace or repower older engines to achieve progressively lower average emission rates, or comply with the Best Available Control Technology (BACT) requirements. This rule requires mandatory reporting of applicable equipment to CARB through the Diesel Off-road On-line Reporting System (DOORS).³

CARB On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation

CARB's regulation requires emission controls and replacements for existing diesel trucks and buses through its statewide On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation, commonly referred to as the Truck and Bus Regulation. Heavy-duty vehicles with a gross vehicle weight greater than 14,000 pounds are required to be retrofitted with diesel particulate filters based on truck model years and according to specified schedules. In addition, replacement

³ Available at https://ssl.arb.ca.gov/ssldoors/doors_reporting/doors_login.html

of older heavy-duty vehicles is mandated based on a tiered schedule that began in 2015. By 2023, nearly all trucks and buses will be required to have model year 2010 engines or newer.

CARB Large Spark-Ignition (LSI) Engine Fleet Requirements Regulation

CARB's LSI regulation applies to off-road LSI engine forklifts, sweepers/scrubbers, industrial tow tractors, and airport ground support equipment operated within the State of California. Additionally, it applies only to vehicles with engines of at least 25 horsepower and 1.0 liter displacement that are part of fleets of four vehicles or more. The regulation requires that applicable fleets achieve specific fleet average emission levels (FAELs) for hydrocarbons and NOx. These standards became more stringent over time until reaching the lowest regulated FAEL in 2013. The regulation also mandates reporting of applicable equipment to CARB through DOORS.

CARB Zero-Emission Airport Shuttle Regulation

CARB's Zero-Emission Airport Shuttle Regulation, adopted by the CARB Governing Board in June 2019, promotes the use of zero-emission ground transportation to and from airports in California. The regulation requires that at least 33%, 66%, and 100% of airport shuttle fleets be zero-emission vehicles by December 31, 2027, 2031 and 2035, respectively. It also requires fleet owners to report fleet information annually starting in 2022 and to have zero-emission certificates for 2026 and later model year vehicles.

CARB's Proposed Zero-Emission Airport Ground Support Equipment

CARB is currently in the process of developing a zero-emission measure for GSE at airports in California. The proposed regulation is intended to advance GSE conversion to zero-emission technologies while accelerating the goals and requirements provided in the LSI Engine Fleet Requirements Regulation. A preliminary target of 100% zero-emission GSE by 2032 has been proposed. The proposed regulation is scheduled for Board consideration in late 2020.

C. EPA's Requirements for SIP Credits

In order for emission reductions from the MOUs and AQIPs/AQIMs to be SIP creditable (i.e., reductions counted toward attainment in the attainment demonstration), these reductions need to meet the EPA's guidelines. These guidelines include requirements regarding EPA's integrity elements, federally enforceable backstop commitments, technical support, funding, legal authority, public disclosure, and provisions to assess progress. Chapter 4 provides details on how these requirements are met for the AQIP/AQIM measures specified in the MOUs. The EPA's guidelines are briefly discussed below:

1. U.S. EPA's Integrity Elements – For emission reductions resulting from AQIP measures to meet the Integrity Elements, they must be surplus, permanent, quantifiable, and enforceable. These four elements are briefly explained below.
 - i. Surplus
Emission reductions are surplus if they are not otherwise required by or assumed in a SIP-related program (e.g., an attainment or reasonable further progress plan), any other adopted State, federal or local air quality regulation, a consent decree, or a federal rule designed to reduce emissions of a criteria pollutant or its precursors.

- ii. **Permanent**
Emission reductions are permanent if the reductions occur throughout the term stated in the airports MOU. The MOU terms are based on the 8-hour ozone National Ambient Air Quality Standards attainment dates of 2023 and 2031. Therefore, the emission reductions must continue through 2031.
 - iii. **Quantifiable**
Emission reductions are quantifiable if they can be measured and supported by acceptable operating and technical data provided by the airports. The quantification must use well-established and publicly available calculation methods, including approved emission factors.
 - iv. **Enforceable**
The emission reductions are enforceable if they are independently verifiable, program violations are defined, and if emission-related information is publicly available. The airports will be responsible for having specific procedures and mechanisms to ensure enforcement and implementation of the emission reduction measures identified in the MOU.
2. **Federal Enforceability**
The enforceable commitment must include: (1) a commitment to monitor, assess, and regularly report on emission reductions achieved; and (2) a commitment to adopt and submit substitute measures to the U.S. EPA by specific dates if necessary to remedy any emission reduction shortfalls.
 3. **Technical Support**
To explain how the emission reductions are translated into SIP credits and applied toward the attainment demonstration, documentation and technical analysis must be provided. This documentation should include a description of the assumptions used in estimating and tracking emissions and emissions reductions from affected sources. The level of information in the documentation should be sufficiently detailed so that the public can review and repeat the quantification of the emission benefits.
 4. **Funding**
In the case that an incentive funding program is utilized to achieve emission reductions, adequate funding for the project needs to be available to show that the funds are committed already or are reasonably expected to be available to generate committed reductions.
 5. **Legal Authority to Administer the Program**
In the case of incentive programs, the legal authority to administer these programs needs to be identified by South Coast AQMD.
 6. **Public Disclosure and Tracking Results**

The emission reductions data and other pertinent information related to the MOU measures (i.e., emissions inventory, emission reduction benefits, and implementation of measures) must be fully accessible to the public and U.S. EPA in accordance with the requirements of CAA section 114 and EPA's implementing regulations in 40 CFR 2.301.

Chapter 2 provides a summary of the draft AQIPs/AQIM developed by five commercial airports as part of this MOU process. In Chapter 3, a summary of the MOUs between South Coast AQMD and the five commercial airports is provided including the AQIP/AQIM measures for each airport that are potentially eligible for SIP credits. Chapter 4 presents the proposed SIP creditable emission reductions (quantified by South Coast AQMD staff) associated with the implementation of the AQIP/AQIM measures in the MOUs including South Coast AQMD's enforceable commitments and a demonstration of how the emission reductions from these measures satisfy EPA's requirements. Appendix A includes the draft AQIPs prepared by the five commercial airports. Appendix B includes the draft MOUs between the South Coast AQMD and the five commercial airports. Appendix C includes the draft SIP credit calculation methodology.

Chapter 2: Air Quality Improvement Plans/Measures

Introduction

Los Angeles International Airport (LAX) AQIM

John Wayne Airport (JWA) AQIP

Long Beach Airport (LGB) AQIP

Ontario Airport (ONT) AQIP

Burbank Airport (BUR) AQIP

Introduction

As part of the MOU process, each airport has developed its own Air Quality Improvement Plan (AQIP) or Air Quality Improvement Measures (AQIM). The AQIPs/AQIMs are the airports' comprehensive plans to reduce emissions from non-aircraft mobile sources related to airport operations. Specific measures and initiatives for the applicable sources are identified by each airport and included in the airports' AQIPs/AQIMs. The distinction between measures and initiatives varies among the airports. In general, a measure represents a program in which the airport commits to a well-defined course of action with known emission reductions, while an initiative represents an objective that the airport intends to pursue, but the emission reductions are not readily quantifiable.

The AQIPs/AQIM include the 2017 baseline emissions as well as emissions forecasts in 2023 and 2031 under business as usual (BAU) and AQIP/AQIM implementation scenarios. The emission reduction benefits for the AQIP/AQIM measures presented in this chapter are estimates provided by the airports based on the difference between the BAU and AQIP/AQIM implementation scenarios. Although the airports have provided these estimated benefits, they are only committing to achieve the performance targets associated with these measures. Some of the measures do not have quantified emission reductions because they are either not well defined or they only include general goals or guidelines in lieu of specific performance targets.

The AQIPs/AQIM also include implementation mechanisms for the measures and initiatives which vary depending on the type of measure/initiative. For example, GSE measures establish airport-wide performance targets which would be achieved by GSE operators and tenants. Other measures affect vehicles or equipment which are entirely under the airport's authority. An incentive-based approach is also included in one of the AQIPs/AQIM.

This chapter provides summaries of the individual AQIPs including a brief description of each airport, baseline and BAU emissions inventories and emission benefits, and a brief overview of the AQIP/AQIM measures. The draft AQIPs for the five commercial airports are included in Appendix A of this staff report.

A. Los Angeles International Airport (LAX) AQIM

Background

Los Angeles International Airport (LAX), located at the western edge of the City of Los Angeles, is owned and operated by Los Angeles World Airports, which is a department of the City of Los Angeles. It is surrounded by Westchester, Inglewood, El Segundo, and the Pacific Ocean. LAX is the primary international airport serving the City and County of Los Angeles and surrounding metropolitan areas. LAX covers approximately 3,500 acres of land and has four runways.

LAX is the fourth busiest airport in the world and the second busiest in the United States. LAX served more than 87.5 million passengers in 2018 and currently offers an average of 700 daily nonstop flights to 109 cities in the U.S. and 1,281 weekly nonstop flights to 93 markets in 47 countries on 69 commercial airlines. LAX ranks 10th in the world in terms of air cargo, with

more than 2.4 million tons of air cargo processed in 2018. In 2018, LAX handled over 700,000 total aircraft operations (landing and take-off).

Baseline and BAU Emissions Inventories

The non-aircraft mobile source emissions inventory included in the AQIM is summarized by source category in Table 2.1 and covers GSE, on-road mobile sources, and traffic and parking. The on-road category represents emissions from on-airport traffic from shuttles, buses, and trucks greater than 8,500 Gross Vehicle Weight Rating (GVWR). Traffic and parking represents emissions from the airport-owned fleet.

Table 2.1. Baseline and BAU Non-Aircraft Mobile Source Emissions for LAX by Source Category (NOx, tons per year)

Category	2017	2023	2031
GSE	184.93	150.69	121.31
On-road (> 8,500 GVWR) ¹	50.69	19.56	16.00
Traffic and Parking ²	83.04	25.29	21.11
Total	351.56	195.54	158.42

¹ This inventory is for vehicles subject to the LAX Alternative Fuel Vehicle Requirement Policy

² This inventory is for LAWA-owned fleet vehicles only.

List of AQIM Measures

LAX’s AQIM includes 11 measures affecting various source categories. A summary list of LAX’s AQIM measures is presented in Table 2.2. The measures are grouped into three categories – GSE, on-road mobile, and traffic and parking. The categories are consistent with the ones listed in the emissions inventory.

There are two measures that affect GSE. The first is based on the airport’s GSE Emissions Reduction Policy which establishes airport-wide GSE fleet average emission rates. The other two measures are an incentive fund to accelerate the turnover of the GSE fleet to zero-emission equipment. Five measures target the on-road mobile source category. The first measure is the LAX Alternative Fuel Vehicle Policy which requires that medium and heavy duty vehicles be 13 years old or newer in order to operate at LAX, and requires that vehicles meet LEV III or the optional low-NOx standard. The Alternative Fuel Vehicle Incentive Program creates a \$500,000 fund to incentivize the conversion of 20 heavy-duty trucks to zero or near zero-emission. The Clean Fleet Program for LAWA’s Vehicle Fleet has three programs. For LAWA’s light duty fleet, 25% and 100% of LAWA’s sedan fleet must be electric by 2023 and 2031, respectively. LAWA’s medium and heavy-duty vehicles must meet the LAX Alternative Fuel Vehicle Policy requirements. Additionally, LAWA-owned shuttle buses will be converted to electric by the end of 2030.

Traffic and parking is covered by four measures, which reduce vehicle miles traveled and vehicle idle time. These measures include improvements to public transit with connections to airport

terminals, the installation of smart parking systems, and continuation of the LAX FlyAway and LAWA employee rideshare programs.

The corresponding emission benefits for the AQIM measures with quantifiable emission reductions in 2023 and 2031 are provided in Table 2.2. The measures included in the MOU are also identified in this table.

Table 2.2. Summary of AQIM Measures and Initiatives for LAX

Measure Type ¹	Source Category	Description	2023 AQIM Benefit (NO_x, tpy) ²	2031 AQIM Benefit (NO_x, tpy) ²	SIP creditable (Y/N)
M	GSE	Ground Support Equipment (GSE) Emissions Reduction Policy - Require that the GSE fleet achieve average emission factors for Hydrocarbon and NO _x combined of 1.8 g/hp-hr (2023) and 1.0 g/hp-hr (2031)	56.17	86.16	Y
M	GSE	GSE Incentive Program - \$500,000 fund allocated to incentivize zero-emission GSE by 2023	NQ	NQ	N
M	On-road	LAX Alternative Fuel Vehicle Policy – Third party medium and heavy duty vehicles to utilize clean-fueled low-emission engines			N
M	On-road	LAX Alternative Fuel Vehicle Policy – LAWA-owned medium and heavy duty vehicles to utilize clean-fueled low-emission engines	6.98	9.18	N
I	On-road	Alternative Fuel Vehicle Incentive Program - \$500,000 fund allocated to incentivize the conversion of 20 heavy-duty vehicles to zero or near-zero emission trucks by 2021			Y
I	On-road	LAWA Clean Fleet Program - 20% (2023) and 100% (2031) ZE buses	0.35	1.73	Y
I	On-road	LAWA Clean Fleet Program – 25% (2023) and 100% (2031) EV light-duty sedans.	0.01	0.03	N

Table 2.2. Summary of AQIM Measures and Initiatives for LAX (cont'd)

Measure Type ¹	Source Category	Description	2023 AQIM Benefit (NOx, tpy) ²	2031 AQIM Benefit (NOx, tpy) ²	SIP creditable (Y/N)
I	Traffic and Parking	LAX Employee Rideshare Program - Continue operation of LAWA employee rideshare program	NQ	NQ	N
I	Traffic and Parking	LAX FlyAway Program – Continue operation	NQ	NQ	N
I	Traffic and Parking	LAX Landside Access Modernization Program - Public transit improvements including consolidated car rental, parking lot, and Metro connection	3.99	NQ	N
I	Traffic and Parking	Smart Parking Systems - Improve traffic flow and reduce idling in parking lots	0.24	0.21	N

¹ A measure (M) is an air quality improvement program that has been or will be adopted by LAWA’s Board of Airport Commissioners and typically applies to LAWA tenants or third parties. An initiative (I) is a statement of airport policy and typically applies to LAWA-owned or controlled operations.

² NOx emission reduction benefit as determined by the airport.

NQ = Not Quantifiable

B. John Wayne Airport (JWA) AQIP

Background

John Wayne Airport (JWA), which is owned and operated by the County of Orange, is the only commercial service airport in Orange County, California. It is located approximately 35 miles southeast of Los Angeles, between the cities of Costa Mesa, Irvine, and Newport Beach. The service area includes more than three million people within the 34 cities and unincorporated areas of Orange County.

In 2018, JWA served approximately 10.7 million passengers. A maximum of 85 Class A Average Daily Departures (ADDs) are currently allowed under a 2014 settlement agreement with municipalities and local stakeholders. An additional 2 ADDs are allocated to cargo flights.

Baseline and BAU Emissions Inventories

The non-aircraft mobile source emissions inventory included in the AQIP is summarized by source category in Table 2.3 and covers GSE, fuel trucks, on-road mobile and off-road mobile sources, and passenger traffic. The on-road category incorporates emissions related to airport shuttles, the airport-owned on-road fleet, and delivery trucks. The off-road category incorporates

emissions related to airport-owned off-road fleet and construction equipment. Passenger traffic, which only considers on-airport roadways and parking lots, includes passenger vehicles and taxis.

Table 2.3. Baseline and BAU Non-Aircraft Mobile Source Emissions for John Wayne Airport by Source Category (NOx, tons per year)

Category	2017	2023	2031
GSE	22.28	15.07	9.98
Fuel Trucks	3.69	1.70	1.51
On-road	0.35	0.27	0.24
Off-road	0.13	0.06	0.03
Passenger Traffic	0.64	0.37	0.26
Total	27.09	17.48	12.03

List of AQIP Measures

John Wayne Airport’s AQIP includes 13 measures and initiatives covering various source categories. A summary list of JWA’s AQIP measures and initiatives is presented in Table 2.4. The measures are grouped into five categories – GSE, fuel trucks, on-road mobile, off-road mobile, and passenger traffic. The categories are consistent with the ones listed in the emissions inventory.

The GSE measure is based on the airport’s GSE policy, which establishes airport-wide fleet average emission rates. Another measure calls for the installation of a jet fuel pipeline which will eliminate routine jet fuel truck deliveries. Three other measures affect the on-road mobile source category. These measures involve shifting the time of concession deliveries to the night, phasing out the existing Compressed Natural Gas (CNG) shuttle fleet in favor of electric vehicles, and introducing a greater percentage of low emission or alternative fueled vehicles in the JWA fleet. The Concessions Nighttime Delivery Policy will require, where feasible, that deliveries are performed from 11 pm to 6 am. The JWA Owned Vehicle Clean Fleet Policy will require that vehicles and equipment with greater than 50 HP engines be replaced with zero emission or hybrid vehicles. Finally, the Parking Shuttle Bus Electrification Measure will require that 50% (six) and 80% (ten) of the twelve existing CNG shuttle buses be replaced with electric buses in 2023 and 2031, respectively. JWA may choose to keep two CNG shuttle buses, which would only be used rarely as backup.

The bulk of the measures benefit passenger traffic emissions by reducing vehicle miles traveled and vehicle idling time. These involve smart parking, congestion reduction, re-matching Transportation Network Company (TNC) rides to increase efficiency, and facilitating public transit access. The Smart Parking Features measure requires the installation of smart parking features to facilitate traffic movement and reduce idling. The Congestion and Passenger Vehicle Reduction measure is already implemented and has resulted in congestion reduction with existing holding lots for standby vehicles. The TNC Vehicle Miles Traveled Reduction Policy will designate pickup and drop-off locations and establish a re-matching system. Finally, the Passenger Transportation Mode Shifts measure will assign a liaison to work with the Orange

County Transportation Agency (OCTA) to increase public transit access. In addition, the feasibility of installing EV charging infrastructure for transit vehicles will be explored.

Table 2.4. Summary of AQIP Measures and Initiatives for John Wayne Airport

Measure Type ¹	Source Category	Description	2023 AQIP Benefit (NO_x, tpy) ²	2031 AQIP Benefit (NO_x, tpy) ²	SIP creditable (Y/N)
M	GSE	Ground Support Equipment (GSE) - Require that the GSE fleet achieve average emission factors for NO _x and HC combined of 1.7 (2023) and 0.9 (2031) g/bhp-hr	4.80	3.92	Y
M	Fuel trucks	Jet Fuel Delivery Trucks – Install a jet fuel pipeline by the end of 2019 and eliminate routine jet fuel delivery trucks by 2023	1.70	1.51	Y
M	On-road	Concessions Nighttime Delivery Policy - Require, where feasible, that deliveries are performed from 11 pm to 6 am	0.02	0.02	N
M	On-road	JWA Owned Vehicle Clean Fleet Policy - Replace vehicles with >50 HP engines with zero emission or hybrid vehicles	0.03	0.02	N
M	On-road	Parking Shuttle Bus Electrification - Replace 50% (2023) and 80% (2031) of existing 12 CNG buses with electric buses	0.16	0.35	Y
M	Off-road	Clean Construction Program - Require that heavy-duty diesel-fueled construction equipment meets Tier 4 standards	NQ	NQ	N
I	Passenger traffic	Taxi Clean Fleet Policy - Codify Rule 1194 into taxi operating agreements to encourage adoption of cleaner technologies	NQ	NQ	N
M	Passenger traffic	Smart Parking Features - Install smart parking features to facilitate traffic movement and reduce idling	0.09	0.08	N

Table 2.4. Summary of AQIP Measures and Initiatives for John Wayne Airport (cont'd)

Measure Type ¹	Source Category	Description	2023 AQIP Benefit (NOx, tpy) ²	2031 AQIP Benefit (NOx, tpy) ²	SIP creditable (Y/N)
I	Passenger traffic	Electric Vehicle Charging Infrastructure - Increase the number of EV chargers in passenger and employee parking lots	NQ	NQ	N
I	Passenger traffic	Passenger Transportation Mode Shifts - Assign a liaison to work with OCTA to facilitate public transit access and explore feasibility of installing EV charging infrastructure for transit vehicles	NQ	NQ	N
M	Passenger traffic	TNC Vehicle Miles Traveled Reduction Policy - Designate pickup/drop-off locations and establish a re-matching system	0.06	0.03	N
I	Passenger traffic	Orange County Employee Rideshare Program - Continue implementation of OC Rideshare	NQ	NQ	N
M	Passenger traffic	Congestion and Passenger Vehicle Reduction - Reduce congestion with existing holding lots for standby vehicles (passenger and taxi)	0.03	0.02	N

¹ A measure (M) represents a program, policy, or procedure which is anticipated to result in emission reductions. An initiative (I) represents a program, policy, or procedure with less certain emission reductions.

² This is the NOx emission reduction benefit as determined by the airport.
NQ = Not Quantifiable

C. Long Beach Airport (LGB) AQIP

Background

Long Beach Airport (LGB), which is owned and operated by the City of Long Beach, covers 1,166 acres and has five runways. It is one of the world's busiest airports in terms of general aviation activity. In 2018, LGB served 4 million passengers, with approximately 45 daily commercial departures. LGB operations are governed by a noise reduction ordinance that restricts certain activities such as engine run-ups, missed approaches, and hours of operation. The ordinance also limits the total number of commercial flights per day.

Baseline and BAU Emissions Inventories

Table 2.5 presents the non-aircraft mobile source emissions inventory included in the AQIP by source category including GSE, on-road mobile sources, construction, and traffic and parking. The on-road category incorporates emissions related to the airport-owned fleet. Traffic and parking, which only considers on-airport traffic, includes passenger cars, taxis, limos, shuttles, buses, and cargo trucks.

Table 2.5. Baseline and BAU Non-Aircraft Mobile Source Emissions for Long Beach Airport by Source Category (NOx, tons per year)

Category	2017	2023	2031
GSE	16.78	13.23	10.54
On-road	0.07	0.09	0.13
Construction	2.91	8.59	2.91
Traffic and Parking	2.25	1.04	0.62
Total	22.01	22.95	14.20

List of AQIP Measures

Long Beach Airport’s AQIP includes 7 measures and initiatives covering various source categories. A summary of LGB’s measures is presented in Table 2.6. The measures are grouped into five categories – GSE, on-road mobile sources, construction, traffic and parking, and other. The categories are consistent with the ones listed in the emissions inventory in the previous section, except for measures and initiatives that did not fall into any defined category (e.g. solar panel installation, LEED building certification). These are labeled “other” in the summary table.

The GSE measure is based on the airport’s GSE Emission Reduction Policy, which establishes airport-wide GSE fleet emission rates. One measure impacts the on-road category, which involves a transition of the airport-owned fleet to low emission or alternative fueled vehicles. The target is to achieve 100% light duty compliance by 2023, and 75% and 100% medium to heavy duty compliance by 2023 and 2031, respectively. Construction activities are targeted in a measure that will ensure the use of only the cleanest off-road equipment (e.g., compliance with U.S. EPA Tier 4). Two measures impact passenger traffic and will include a TNC re-match system, with designated pickup and drop-off locations, and the possible expansion of EV charging capabilities. The “other” category measures require a minimum of LEED Silver certification for new buildings and the installation of a solar panel array.

Table 2.6. Summary of AQIP Measures and Initiatives for Long Beach Airport

Measure Type ¹	Source Category	Description	2023 AQIP Benefit (NO _x , tpy) ²	2031 AQIP Benefit (NO _x , tpy) ²	SIP creditable (Y/N)
M	GSE	Ground Support Equipment Emissions Reduction Policy - Require that the GSE fleet achieve average emission factors for HC and NO _x combined of 0.93 (2023) and 0.44 (2031) g/bhp-hr	0.93	4.06	Y
M	Construction	Clean Construction Policy - Tier 4 compliance phase-in with full implementation in 2031	NQ	NQ	N
M	On-road	Airport-Owned Clean Fleet Policy - Transition to SULEV or alternative fuel vehicles. Light duty 100% by 2023; medium and heavy duty 75% by 2023, 100% by 2031	0.03	0.06	N
I	Traffic and Parking	Electric Vehicle Charging Infrastructure Initiative - Assess feasibility of equipping 2% of parking spaces with EVSE	NQ	NQ	N
I	Traffic and Parking	TNC Rematch Initiative - Designate pickup/drop-off locations with re-match system	NQ	NQ	N
M	Other	Sustainable Design Policy - LEED Silver minimum for Terminal Improvements Project	NQ	NQ	N
M	Other	Renewable Energy Policy - Implement solar power system by the end of 2020	NQ	NQ	N

¹ A measure (M) represents a program in which the airport commits to a well-defined course of action. An initiative (I) represents an objective that the airport seeks to achieve but is less well-defined.

² This is the NO_x emission reduction benefit as determined by the airport.

NQ = Not Quantifiable

D. Ontario Airport (ONT) AQIP

Background

Ontario Airport (ONT), which is owned and operated by the Ontario International Airport Authority, is located 35 miles east of Los Angeles in the Inland Empire and covers 1,700 acres. ONT's service area includes a population of six million people in San Bernardino and Riverside

counties, and portions of Orange and Los Angeles counties. In 2018, the airport served approximately 5.1 million passengers with 60 average daily departures. In addition to commercial passenger flights, ONT also serves cargo flights, with approximately 650,000 tons of freight processed annually.

Baseline and BAU Emissions Inventories

Table 2.7 presents the non-aircraft mobile source emissions inventory included in the AQIP by source category including GSE, on-road and off-road sources, and passenger traffic. The on-road category incorporates emissions related to the airport-owned fleet and delivery trucks. The off-road category incorporates emissions related to fire department vehicles and the maintenance contractor fleet. Passenger traffic considers regional travel.

Table 2.7. Baseline and BAU Non-Aircraft Mobile Source Emissions for Ontario Airport by Source Category (NOx, tons per year)

Category	2017	2023	2031
GSE	103.02	91.10	79.84
Fuel Trucks	2.21	1.98	0.60
On-road	0.80	0.36	0.40
Off-road	8.55	8.08	7.82
Passenger Traffic	39.20	20.96	12.74
Total	153.78	122.48	101.40

List of AQIP Measures

Ontario Airport’s AQIP includes 9 measures and initiatives covering various source categories. A summary of the measures is presented in Table 2.8. The measures are grouped into five categories – GSE, fuel trucks, on-road mobile, off-road mobile, passenger traffic, and other. The categories are consistent with the ones listed in the emissions inventory, except for measures and initiatives that did not fall into any defined category (e.g. solar panel installation, LEED building certification). These are labeled “other” in the summary table.

The GSE measure is based on the airport’s GSE Policy, which establishes stringent airport-wide fleet average emission rates. Three measures affect the off-road category, and they involve crash truck replacement, reducing the size of the airport maintenance fleet, and ensuring the use of only the cleanest off-road equipment for construction (e.g., compliance with U.S. EPA Tier 4). The Crash Truck Replacement measure will require the replacement of 7 out of 12 vehicles in the fire department fleet including four crash trucks. The new crash trucks will be Tier 4 compliant. Two measures, the Airport Fleet Policy and the Sally Port, affect the on-road category. These measures involve a transition of the airport-owned fleet to low emission or alternative fueled vehicles and the creation of a centralized delivery location in lieu of terminal loading docks, which is anticipated to reduce vehicle miles travelled. Another measure will reduce passenger traffic emissions by expanding EV charging capability. Finally, the CalGreen and LEED Silver Requirement affects the “other” category and will require new buildings to meet green building standards.

Table 2.8. Summary of AQIP Measures and Initiatives for Ontario Airport

Measure Type ¹	Source Category	Description	2023 AQIP Benefit (NO _x , tpy) ²	2031 AQIP Benefit (NO _x , tpy) ²	SIP creditable (Y/N)
M	GSE	GSE Policy - Require that the GSE fleet achieve average emission factors for NO _x are 2.20 g/hp-hr (2023) and 1.00 g/hp-hr (2031)	22.66	46.03	Y
M	Fuel Trucks	Fuel Truck Operations - Addition of a second jet fuel loading rack to reduce distance travelled	NQ	NQ	N
M	Off-road	Crash Truck Replacement - Replace 7 of 12 vehicles in the fire department fleet, including 4 crash trucks, with Tier 4 compliant engines	3.26	3.26	N
M	On-road	Airport Fleet Policy - Gradually replace vehicles with CNG, hybrid, or electric. This measure is coupled to the following measure	0.05	0.05	N
M	Off-road	Maintenance Truck Reduction - Reduce size of maintenance fleet from 28 to 7 vehicles			N
M	On-road	Sally Port - Centralized delivery location in lieu of terminal loading docks	NQ	NQ	N
M	Off-road	Construction Equipment Policy - Require, where feasible, that contractors use Tier 4 equipment	NQ	NQ	N
I	Other	CalGreen and LEED Silver Requirement - Ensure future buildings meet CALGreen Title 24 regulations	NQ	NQ	N
I	Passenger traffic	EV Infrastructure in Passenger Parking Lots - Expand EV charging availability	NQ	NQ	N

¹ A measure (M) contains concrete goals that result in quantifiable emission reductions. An initiative (I) is a policy that provides infrastructure, incentives, or other tools that promote emission reductions, but do not contain specific requirements.

² This is the NO_x emission reduction benefit as determined by the airport.

NQ = Not Quantifiable

E. Burbank Airport (BUR) AQIP

Background

Burbank Airport (BUR) is owned by the Burbank-Glendale-Pasadena Airport Authority and is operated by TBI Airport Management. It is located approximately 13 miles northwest of Los Angeles and occupies 555 acres with 14 passenger gates. In 2018, BUR served over 5 million passengers, processed 109 million pounds of cargo, and logged over 130,000 total aircraft operations.

Baseline and BAU Emissions Inventories

Table 2.9 presents the non-aircraft mobile source emissions inventory included in the AQIP by source category including GSE, airport fleet, construction, and passenger traffic. The airport fleet category incorporates airport-owned on-road and off-road fleets. Passenger traffic, which only considers on-airport roadways and parking lots, accounts for passenger vehicles, taxis, TNC, and hotel and airport shuttle rides.

Table 2.9. Baseline and BAU Non-Aircraft Mobile Source Emissions for Burbank Airport by Source Category (NOx, tons per year)

Category	2017	2023	2031
GSE	17.85	17.46	16.72
BUR Fleet	1.27	0.78	0.44
Construction	2.37	7.76	2.37
Passenger Traffic	0.54	0.28	0.18
Total	22.03	26.28	19.71

List of measures

Burbank Airport’s AQIP includes 9 measures and initiatives covering various source categories. A summary of the measures is presented in Table 2.10. The measures are grouped into five categories, which include GSE, on-road mobile, off-road mobile, passenger traffic, and other. The categories are consistent with the ones listed in the emissions inventory, except for measures and initiatives that do not fall into any defined category (e.g. solar panel installation, LEED building certification). These are labeled “other” in the summary table.

The GSE measure is based the airport’s GSE Emissions Policy, which establishes airport-wide fleet average emission rates. One measure affects the construction category by ensuring the use of only the cleanest equipment. In addition to compliance with U.S. EPA Tier 4 for off-road sources, this measure requires the use of 2010 or newer model year engines for on-road construction vehicles. One measure, the Airport-Owned Clean Fleet policy, benefits the on-road category and involves a transition of the airport-owned fleet to zero-emission vehicles, with 100% EV light duty and shuttle buses by 2023 and 2031, respectively. Four measures are aimed at passenger traffic: the Regional Intermodal Transportation Center, the Burbank Airport Employee Ride Share Policy, the Burbank-Metrolink Shuttle Connection Program, and the Electrical Charging Infrastructure Initiative. The transportation center currently offers consolidated parking, car rental, and access to public transit. The Burbank-Metrolink Shuttle Connection Program will promote connections to Metrolink trains in an effort to increase ridership. The Electrical Charging Infrastructure Initiative will aim to equip 5% of parking lot

spaces with EV chargers by 2031. Finally, the “other” category is affected by two measures which involve an existing LEED Platinum certified hangar and the installation of a solar panel array.

Table 2.10. Summary of AQIP Measures and Initiatives for Burbank Airport

Measure Type ¹	Source Category	Description	2023 AQIP Benefit (NO _x , tpy) ²	2031 AQIP Benefit (NO _x , tpy) ²	SIP creditable (Y/N)
M	GSE	Ground Support Equipment Emissions Policy - Require that the GSE fleet achieve average emission factors for HC and NO _x combined of 1.92 g/hp-hr (2023) and 0.82 g/hp-hr (2031)	0.70	8.70	Y
M	Construction	Clean Construction Policy - Require EPA 2010 standard for on-road, Tier 4 for off-road. Use grid power where available	1.55	NQ	N
I	BUR Fleet	Airport-Owned Clean Fleet - 100% EV light-duty by 2023; medium and heavy-duty 50% EV by 2031; 50% (2023) and 100% (2031) EV buses	0.04	0.09	Y
I	Passenger traffic	Electrical Charging Infrastructure - 5% of parking spaces equipped by 2031	NQ	NQ	N
I	Passenger traffic	The Regional Intermodal Transportation Center - Consolidated parking, car rental, and access to public transit			N
I	Passenger traffic	Burbank-Metrolink Shuttle Connection Program – Promote Metrolink-Shuttle programs to increase participation	0.33	0.21	N
M	Passenger traffic	Burbank Airport Employee Ride Share Policy – Increase ridership by 3% (2023) and 6% (2031)	0.04	0.05	N
I	Other	Replacement Terminal Project - CalGreen/LEED Silver terminal construction. LEED Platinum hanger	NQ	NQ	N
I	Other	RITC Solar Facility - Install 2.2 MWh solar array	NQ	NQ	N

¹ A measure (M) represents a program in which the airport commits to a well-defined course of action. An initiative (I) represents an objective that the airport seeks to achieve but is less well-defined.

² This is the NO_x emission reduction benefit as determined by the airport.

NQ = Not Quantifiable

Chapter 3: Memorandum of Understandings

Introduction

General MOU Sections Applicable to All Airports

Airport Specific MOU Sections

Introduction

This chapter provides a summary of the main elements contained in the five MOUs between South Coast AQMD and each of the commercial airports. The MOUs represent voluntary agreements between South Coast AQMD and the airports to implement the AQIP measures that are eligible for SIP credit, as identified in Chapter 2. The airports agree to implement the measures and annually report progress to South Coast AQMD. South Coast AQMD then commits to quantify the emission reductions, and prepare and submit the necessary documentation to U.S. EPA for inclusion of the emission reductions into the SIP.

A. General MOU Sections Applicable to All Airports

The MOUs contain sections common to all airports, with the primary difference being the attached schedules, which will be discussed in detail later. This section will summarize the common elements including the purpose, term, and applicability of the MOUs, and airport and South Coast AQMD responsibilities.

MOU Purpose

The central objective of the AQIPs/AQIMs and MOUs is to help achieve the NO_x reductions necessary for attainment of the 1997 and 2008 8-hour ozone standards in 2023 and 2031, respectively. The MOUs describe the process of how South Coast AQMD and the airports intend to quantify the emission reduction benefits associated with the implementation of AQIP/AQIM measures eligible for SIP credit. For each of these measures, the specific implementation, monitoring, and reporting mechanisms are presented in the schedules attached to the MOUs. The schedules provide technical details including metrics and performance targets, the timeline for implementation, and annual reporting by the airport to South Coast AQMD. The emission reductions achieved through the MOUs will be credited into the SIP to the extent that they satisfy U.S. EPA's integrity elements (i.e. quantifiable, surplus, permanent, and enforceable). In the event that the actual achieved reductions fall short of those defined in Chapter 4, South Coast AQMD will be solely responsible for ensuring that the remaining reductions are achieved.

MOU Term

The MOUs will remain in effect from the date of execution through December 31, 2031 unless terminated. South Coast AQMD or the airports may choose to terminate the MOU by providing written notice to the other party at least 90 days in advance of the specified termination date. South Coast AQMD and the airports commit to work together to resolve any issues and negotiate an updated MOU. However, if no agreement is reached, the MOU will terminate on the date specified in the initial notice.

MOU Applicability

The MOUs address only the AQIP/AQIM measures and initiatives that are eligible for SIP credit and do not supersede rules that are established by the U.S. EPA or CARB, or legal obligations that the airports are subject to. Additionally, the MOUs explicitly exclude sources that are not identified as an emission source in the AQIP (e.g. all aircraft parts and

systems). Furthermore, the MOUs do not establish an emissions cap or any other facility-wide limit for any pollutant.

Airport Responsibilities

The airports' implementation of the AQIP/AQIM measures is voluntary, thereby qualifying the airports for incentives through various programs (e.g., FAA Voluntary Aviation Low Emissions Program). Nevertheless, the airports commit to implement the AQIP/AQIM measures eligible for SIP credit and monitor and report on the implementation of these measures. Details regarding the implementation, monitoring, and reporting of these measures are provided in the schedules attached to the MOUs. The schedules provide technical details including metrics and performance targets, the timeline for implementation, and annual reporting requirements. Where feasible, the airports agree to provide monetary or non-monetary incentives for mobile sources included in the AQIP/AQIM. Additionally, the airports agree to support grant funding efforts.

South Coast AQMD Responsibilities

South Coast AQMD's responsibility is to quantify the emission reduction benefits associated with implementation of the AQIP/AQIM measures in the MOUs which are eligible for SIP credit. The quantification of the SIP credits is based on the AQIP/AQIM measures and their supporting calculations provided by the airports as well as the SIP credit calculation methodology developed by South Coast AQMD (Appendix C). South Coast AQMD will provide a SIP update to U.S. EPA for the prospective SIP credits for these measures for the 2023 and 2031 attainment years. South Coast AQMD will also track the implementation of these measures based on the annual reports provided by the airports as specified in the schedules and submit the necessary documentation to U.S. EPA. All emission reduction data and other pertinent information will be made fully accessible to the public.

South Coast AQMD is also responsible for the federally enforceable commitments and any potential emission reduction shortfall associated with implementation of the AQIP/AQIM measures in the MOUs. In the event that the actual reductions from the AQIP/AQIM measures fall short of those defined in Chapter 4, South Coast AQMD will be solely responsible for ensuring that the remaining reductions are achieved by providing substitute measures to EPA. In such events, South Coast AQMD will work together with the airports to consider potential new or enhanced programs, or better efforts to quantify existing programs.

South Coast AQMD may pursue additional funding programs and incentives, at the Governing Board's discretion, in order to accelerate the turnover of equipment to clean technology.

B. Airport Specific MOU Sections

The schedules are documents attached to the MOU that describe the metrics and performance targets of the AQIP/AQIM measures, the timeline for implementation, and the details of the annual reports prepared by the airports. One schedule is attached for each AQIP/AQIM measure

that is eligible for SIP credit. In general, the airports’ commitments include implementing the measure and submitting annual progress reports by June 1, beginning in 2021. In 2023 and 2031, South Coast AQMD will quantify the actual emission reductions and ensure that the relevant data is accessible to the public and submitted to U.S. EPA. The schedules for all airports are summarized below.

Los Angeles International Airport

The MOU schedules for LAX are summarized in Table 3.1.

Table 3.1. MOU Schedules for LAX

Schedule	Title and Program Description
1	Ground Support Equipment Emissions Reduction Policy - Require that all ground support equipment operators at LAX achieve fleet average NOx + Hydrocarbon emission factors of 1.8 and 1.0 grams per brake horsepower-hour in 2023 and 2031, respectively.
2	LAX Alternative Fuel Vehicle Incentive Program - Implement an incentive program that will distribute up to \$500,000 dollars in funding to applicants based on the “incremental cost” differential of the zero or near-zero emission vehicles as compared to conventionally-fueled equivalents with a Gross Vehicle Weight Rating (GVWR) of 14,001 pounds or greater by December 31, 2021.
3	Zero Emission Bus Program – Replace 20% and 100% of LAWA-owned and operated buses with zero-emission buses by 2023 and 2031, respectively.

Under Schedule 1, Los Angeles World Airports (LAWA) commits to implement the AQIM measure by working with airport tenants to achieve the GSE performance targets. LAWA will also submit annual progress reports including detailed equipment and emissions inventories, in addition to data on replaced GSE. The data will include equipment type, fuel type, engine model year, power rating, engine tier level, and activity data (specific activity data to be determined).

Under Schedule 2, LAWA will submit annual progress reports that provide detailed information, accompanied by an emissions inventory, regarding the purchased zero or near-zero emission vehicles as well as the details of the replaced vehicles.

Under Schedule 3, LAWA will submit annual reports that include a list of buses in operation with associated vehicle identification number, model year, power rating, gross vehicle weight rating, fuel type, odometer reading, and annual vehicle miles travelled. Additionally, a detailed emissions inventory and a list of replaced and replacement buses will be provided by LAWA.

John Wayne Airport

The MOU schedules for John Wayne Airport are summarized in Table 3.2.

Table 3.2. MOU Schedules for John Wayne Airport

Schedule	Title and Program Description
1	Ground Support Equipment - Require that all ground support equipment associated with commercial operations achieve a fleet average NOx emission factors of 1.7 and 0.9 g/bhp-hr in 2023 and 2031, respectively.
2	Jet Fuel Delivery Trucks - Install a jet fuel pipeline by the end of 2019 and eliminate routine commercial aviation jet fuel delivery trucks by 2023.
3	Parking Shuttle Bus Electrification – Replace a minimum of 50% and 80% of airport employee and passenger remote parking compressed natural gas (CNG) shuttle buses with battery-electric shuttle buses by 2023 and 2031, respectively. The airport may continue to maintain standby shuttle buses for emergency use.

Under Schedule 1, the airport commits to implement the AQIP measure by working with airport tenants to achieve the performance targets. The airport will also submit annual progress reports including detailed equipment and emissions inventories, in addition to data on replaced GSE. The equipment data will include equipment type, fuel type, engine model year, power rating, engine tier level, and activity data.

Under Schedule 2, the airport will provide annual reports that include the number of fuel delivery truck trips, an estimate of vehicle miles travelled, total amount of jet fuel delivered by fuel trucks and fuel pipeline, and a detailed emissions inventory.

Under Schedule 3, the airport will provide annual reports that include a list of conventionally-fueled shuttle buses in operation with associated vehicle identification number, model year, power rating, gross vehicle weight rating, fuel type, odometer reading, and annual vehicle miles travelled. Additionally, a detailed emissions inventory and a list of replaced and replacement buses will be provided by the airport.

Burbank Airport

The MOU schedules for Burbank Airport are summarized in Table 3.3.

Table 3.3. MOU Schedules for Burbank Airport

Schedule	Title and Program Description
1	Ground Support Equipment - Require that all ground support equipment associated with commercial operations achieve fleet average hydrocarbon plus NOx combined emission factors of 1.92 and 0.82 g/bhp-hr in 2023 and 2031, respectively.
2	Zero-Emission Shuttle Bus Program – Replace 50% and 100% of BUR-owned and operated buses with electric buses by 2023 and 2031, respectively.

Under Schedule 1, the airport commits to implement the AQIP measure by working with airport tenants to achieve the performance targets. The airport will also submit annual progress reports including detailed equipment and emissions inventories, in addition to a list of replaced GSE. The equipment inventories must include equipment type, fuel type, engine model year, power rating, engine tier level, and activity data.

Under Schedule 2, the airport will provide annual reports that include a list of conventionally-fueled shuttle buses in operation with associated vehicle identification number, model year, power rating, gross vehicle weight rating, fuel type, odometer reading, and annual vehicle miles travelled. Additionally, a detailed emissions inventory and a list of replaced and replacement buses will be provided by the airport.

Long Beach Airport

The MOU schedules for Long Beach Airport are summarized in Table 3.4.

Table 3.4. MOU Schedules for Long Beach Airport

Schedule	Title and Program Description
1	Ground Support Equipment - Require that all ground support equipment associated with commercial operations achieve fleet average NOx emission factors of 0.93 and 0.44 g/bhp-hr in 2023 and 2031, respectively.

Under Schedule 1, the airport commits to implement the AQIP measure by working with airport tenants to achieve the performance targets. The airport will also submit annual progress reports including detailed equipment and emissions inventories, in addition to data on replaced GSE. The equipment inventories must include equipment type, fuel type, engine model year, power rating, engine tier level, and activity data.

Ontario Airport

The MOU schedule for Ontario Airport is summarized in Table 3.5.

Table 3.5. MOU Schedule for Ontario Airport

Schedule	Title and Program Description
1	Ground Support Equipment Emissions Reductions Policy - Require that all ground support equipment achieve fleet average NOx emission factors of 2.20 and 1.00 g/bhp-hr in 2023 and 2031, respectively.

Under Schedule 1, the airport commits to implement the AQIP measure by working with airport tenants to achieve the performance targets. The airport will also submit annual progress reports including detailed equipment and emissions inventories, in addition to data on replaced GSE. The equipment data will include equipment type, fuel type, engine model year, power rating, engine tier level, and activity data.

Chapter 4: SIP Creditable Emission Reductions

Introduction

Enforceable Commitment

EPA's Integrity Element Demonstration

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Introduction

In order for the emission reductions associated with implementation of the airports' AQIP/AQIM measures to be SIP creditable, South Coast AQMD is making an enforceable commitment to EPA to achieve these emissions reductions and to make up any potential shortfall. South Coast AQMD is making this commitment based on the airports' commitment to implement the AQIP/AQIM measures specified in their respective MOUs with South Coast AQMD. Although the airports' AQIPs/AQIM include a number of measures and initiatives with potential emission reduction benefits, South Coast AQMD's commitment only covers the reductions from AQIP/AQIM measures that are eligible for SIP credits (i.e., meet EPA's integrity elements requirements). This chapter includes South Coast AQMD's enforceable commitment and provides a demonstration of how the emission reductions from these AQIP/AQIM measures satisfy the EPA's requirements.

A. Enforceable Commitment

South Coast AQMD commits to achieve 0.52 and 0.38 tons per day (tpd) of NO_x reductions in 2023 and 2031, respectively, based on implementation of the airports' AQIP/AQIM measures that are SIP creditable. In the event of any shortfall in the prospective emission reduction benefits in 2023 and 2031, South Coast AQMD commits to adopt and submit substitute measures to EPA to remedy the shortfall. South Coast AQMD will work together with the airports to consider potential new or enhanced programs, or better efforts to quantify existing programs in addressing any shortfalls

Specifically, South Coast AQMD will do the following:

1. Beginning in 2021 and every year thereafter until 2031, monitor the airports' implementation of the AQIP/AQIM measures with SIP creditable emission reductions based on the annual reports submitted by the airports as specified in each MOU with each individual airport;
2. By December 31, 2023, achieve 0.52 tpd of NO_x reductions from the 2023 baseline inventory, as detailed in the 2016 South Coast Air Quality Management Plan;
3. By December 31st of 2023 and 2024, report the following information to EPA:
 - a. Identify the emission reductions achieved in 2022 and 2023;
 - b. Document actions by the airports on implementation of the SIP creditable AQIP/AQIM measures; and
 - c. Determine whether the implementation of SIP creditable AQIP/AQIM measures will achieve the full 0.52 tpd of NO_x reductions in 2023.
4. By December 31, 2031, achieve 0.38 tpd of NO_x reductions from the 2031 baseline inventory, as detailed in the 2016 South Coast Air Quality Management Plan;
5. By December 31st of 2031 and 2032, report the following information to EPA:
 - a. Identify the emission reductions achieved in 2030 and 2031;

- b. Document actions by the airports on implementation of SIP creditable AQIP/AQIM measures; and
 - c. Determine whether the implementation of SIP creditable AQIP/AQIM measures will achieve the full 0.38 tpd of NO_x reductions in 2031.
6. Make each demonstration report publicly available or available by request
 7. By December 31st of 2024 and 2032, adopt and submit substitute measures to EPA in the event of any shortfall in 2023 and 2031 reductions, respectively.

The annual reporting by the airports to South Coast AQMD and the South Coast AQMD's periodic reporting to EPA ensure that the projected emissions reductions will be achieved.

Table 4.1 provides a list of the airports AQIP/AQIM measures eligible for SIP credit and their estimated emission reductions in 2023 and 2031. These prospective SIP creditable emission reductions were estimated by South Coast AQMD staff based on the performance targets and the emission benefits for these measures specified in the AQIPs/AQIM. The methodology to estimate the SIP creditable emission reductions is provided in Appendix C.

Table 4.1 List of SIP Creditable AQIP/AQIM Measures and Estimated Emission Reduction Benefits

Airport	AQIP/AQIM Measure Title and Description	2023 Reductions (NOx, tpy)	2031 Reductions (NOx, tpy)
LAX	Ground Support Equipment Emissions Reduction Policy - Require that all ground support equipment operators at LAX achieve fleet average NOx + Hydrocarbon emission factors of 1.8 and 1.0 grams per brake horsepower-hour in 2023 and 2031, respectively.	146.71	98.94
LAX	LAX Alternative Fuel Vehicle Incentive Program - Implement an incentive program that will distribute up to \$500,000 dollars in funding to applicants based on the “incremental cost” differential of the zero or near-zero emission vehicles as compared to conventionally-fueled equivalents with a Gross Vehicle Weight Rating (GVWR) of 14,001 pounds or greater by December 31, 2021.	0.17	0.21
LAX	LAWA Clean Fleet Program – Replace 20% and 100% of LAWA-owned and operated buses with zero-emission buses by 2023 and 2031, respectively.	6.40	12.50
BUR	Ground Support Equipment - Require that all ground support equipment associated with commercial operations achieve fleet average hydrocarbon plus NOx combined emission factors of 1.92 and 0.82 g/bhp-hr in 2023 and 2031, respectively.	10.19	6.07
BUR	Zero-Emission Shuttle Bus Program – Replace 50% and 100% of BUR-owned and operated buses with electric buses by 2023 and 2031, respectively.	0.11	0.10
ONT	Ground Support Equipment Emissions Reductions Policy - Require that all ground support equipment achieve fleet average NOx emission factors of 2.20 and 1.00 g/bhp-hr in 2023 and 2031, respectively.	7.83	9.93
LGB	Ground Support Equipment - Require that all ground support equipment associated with commercial operations achieve fleet average NOx emission factors of 0.93 and 0.44 g/bhp-hr in 2023 and 2031, respectively.	0.92	0.49

Table 4.1 List of SIP Creditable AQIP/AQIM Measures and Estimated Emission Reduction Benefits (cont'd)

Airport	AQIP/AQIM Measure Title and Description	2023 Reductions (NOx, tpy)	2031 Reductions (NOx, tpy)
JWA	Ground Support Equipment - Require that all ground support equipment associated with commercial operations achieve a fleet average NOx emission factors of 1.7 and 0.9 g/bhp-hr in 2023 and 2031, respectively.	14.53	7.46
JWA	Jet Fuel Delivery Trucks - Install a jet fuel pipeline by the end of 2019 and eliminate routine commercial aviation jet fuel delivery trucks by 2023.	1.52	1.13
JWA	Parking Shuttle Bus Electrification – Replace a minimum of 50% and 80% of airport employee and passenger remote parking compressed natural gas (CNG) shuttle buses with battery-electric shuttle buses by 2023 and 2031, respectively.	1.34	1.06
Total		190	138

B. EPA’s Integrity Element Demonstration

This subsection demonstrates how each AQIP/AQIM measure that is eligible for SIP credit satisfies the EPA’s four integrity element requirements (i.e., surplus, permanent, quantifiable, enforceable).

a. Ground Support Equipment (GSE) AQIP/AQIM measures

All five airports include a GSE measure in their AQIPs/AQIMs. As such, the demonstration provided in this section regarding the compliance with the EPA’s integrity element requirements covers all five airports commitments to implement their respective GSE measure. Table 4.2 presents the GSE performance targets for the five airports as specified in their AQIPs. The performance targets are defined in terms of an airport-wide fleet-average emission factor in g/bhp-hr unit. Some airports use Hydrocarbon (HC) and NOx combined emission factors while others use NOx emission factors. CARB’s In-Use Off-Road Diesel-Fueled Fleets regulation⁴ and Large Spark-Ignition (LSI) Engine Fleet regulation⁵ are also based on fleet average targets. The performance targets reflect the unique mix of GSE fleet at each airport and the estimated emission reductions that can be achieved based on each airport’s best efforts.

⁴ In-Use Off-Road Diesel-Fueled Fleets Regulation; <https://ww2.arb.ca.gov/our-work/programs/use-road-diesel-fueled-fleets-regulation>

⁵ Large Spark-Ignition (LSI) Engine Fleet Requirements Regulation; <https://ww3.arb.ca.gov/msprog/offroad/orspark/orspark.htm>

**Table 4.2 GSE Performance Targets by Airport
(NOx or HC + NOx g/bhp-hr)**

Airport	2023	2031
BUR ¹	1.92	0.82
JWA ²	1.7	0.9
LAX ¹	1.8	1.0
LGB ¹	0.93	0.44
ONT ²	2.2	1.0

¹ The airport uses a HC + NOx combined emission factor

² The airport uses a NOx emission factor

All the five airports' GSE measures meet the required integrity elements as described below.

i. Surplus

Emission reductions are considered surplus when they are not otherwise required by or assumed in the SIP, SIP-related requirements, any other state or local air quality programs, a consent decree, or a federal rule designed to reduce criteria pollutant or precursor emissions. Also, emission reductions are surplus only for the remaining useful life of the vehicle, engine, or equipment being replaced.

For the GSE measures, surplus emission reductions will be achieved through the replacement of existing equipment with cleaner equipment that are above and beyond the requirements in the existing regulations applicable to GSEs. The airports have established more stringent GSE fleet-average performance targets than those required under the current regulations affecting GSE. These regulations are briefly described below:

CARB's In-Use Off-Road Diesel-Fueled Fleets regulation applies to all off-road diesel vehicles with engines rated at 25 horsepower or greater including diesel-powered GSEs and other diesel off-road equipment and vehicles operated at the airports. The regulation requires fleets to retire or retrofit older engines to achieve progressively lower average emission rates of NOx (Table 3 and 4 of CARB's regulation).

CARB's LSI regulation applies to airport ground support equipment and other off-road vehicles powered by spark-ignited engines (e.g., gasoline, LPG) rated at 25 horsepower or more and greater than 1.0 liter displacement. The regulation requires that applicable fleets achieve specific fleet average emission levels (FAELs) for HC and NOx. These FAELs became more stringent over time until reaching the final level in 2013 (Table 2 of CARB's regulation).

Since the proposed GSE fleet average targets in the airports' AQIP/AQIM measures are more stringent than those required under these existing regulations, the emission reductions from these measures are considered surplus. To track and verify the actual emission reductions achieved, the airports will submit annual reports with detailed GSE equipment data and annual emissions inventories.

ii. Permanent

Emission reductions are considered permanent if they are achieved for the entire period that they are credited into the SIP. The emission reductions from the MOU measures are intended to help reach attainment of the 1997 and 2008 8-hour ozone National Ambient Air Quality Standards (NAAQS) in 2023 and 2031, respectively.

The emission reductions from the MOUs' GSE measures will be achieved by the attainment deadlines of 2023 and 2031. The airports have set their GSE fleet average performance targets to become effective by January 1, 2023 and January 1, 2031. Following the MOU adoption by the airport authorities and the South Coast AQMD Governing Board, the airports will begin implementing their GSE measures by working with their tenants to provide sufficient time to achieve the target reductions in 2023 and 2031. The airports have committed to monitor the progress and track the implementation of their respective GSE measure to ensure that the emission reductions are permanent. Beginning 2021, the airports will provide detailed information on GSEs for each preceding year to South Coast AQMD along with emission calculations to track progress toward meeting their performance targets. The airports will also provide data on existing equipment that will be replaced with cleaner equipment.

iii. Quantifiable

Emissions reductions should be calculated by a reliable and replicable methodology and all analyses must be substantiated and documented.

All five airports have developed a 2017 base year GSE emissions inventory based on specific GSE data obtained from their tenants for equipment operated in 2017 at the airports (i.e., equipment type, fuel type, engine size, model year, and operating data). The GSE data at each airport was used in conjunction with established calculation methodology from CARB's OFFROAD model⁶ to estimate emissions. CARB's OFFROAD model provides specific parameters such as GSE emission factors by model year, deterioration factors, load factors, and average activity levels (hours/year/unit). For the 2023 and 2031 emission inventory projections, the age distribution of the GSE equipment was assumed to be the same as the 2017 base year equipment age distribution. Emission reductions expected from the implementation of the GSE measures are provided in the technical appendix of each AQIP/AQIM. While the emissions inventory and emission reduction benefits provided in the AQIPs/AQIM reflect the most updated operational data at each airport, the SIP

⁶ CARB Mobile Source Emission Inventory Off-Road Documentation: <https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-road-documentation-0>

emission reduction credits need to be based on the emissions inventory submitted to EPA as part of the 2016 AQMP. Therefore, the emission reductions provided by the airports were converted to SIP inventory currencies for consistency purposes. The reconciliation of the airports' emissions data with the 2016 AQMP emissions inventory is provided in Appendix C of this report.

As specified in the MOUs, airports have committed to monitor the progress of the implementation of their GSE measures and to submit annual reports to South Coast AQMD. The annual reports will include annual emission inventories including methodology and calculations as well as a detailed list of all GSE operating within their airports for each preceding year (i.e., equipment ID, equipment type, fuel type, engine model year, engine power rating, engine tier and activity data).

iv. Enforceable

Emission reductions are enforceable if they are practically enforceable, independently verifiable, program violations are defined, and if emission-related information is publicly available. A mechanism needs to be established to monitor, assess and report on the implementation of measures and the emission reductions achieved from the measures.

Under the MOUs with South Coast AQMD, the airports have committed to implement their MOU measures including the GSE measure. Each airport will implement its own mechanism to ensure that their GSE performance targets are achieved by working closely with their tenants. For instance, LAWA will receive GSE fleet inventory information from their GSE operators by January 31 of each year. Based on the fleet inventory data, LAWA will calculate the GSE fleet average emission factor. If the average emission factor exceeds the GSE performance targets for LAX, the GSE operator will have to provide LAWA with an action plan within 30 days to comply with the LAX performance targets. In addition, LAWA will require each operator to identify GSEs that are being replaced, the disposal method of retired equipment, and the specifications of the new GSEs to determine compliance with the GSE performance targets. If a GSE fleet does not meet the LAX emissions target, and the failure continues for more than 60 days after the GSE operator receives a notice of failure from LAWA, the GSE operator will be deemed in breach of the measure. In such event, LAWA would take remedial actions against the GSE operator to offset the failure to reduce emissions.

In addition, as part of the GSE schedules in the MOU, beginning in 2021, all the airports have committed to submit annual reports to the South Coast AQMD (by June of each year) for each preceding year including the following specific information, as specified in Attachment A of each MOU:

1. List of ground support equipment operating at the airport with the following information:
 - a. Equipment ID
 - b. Equipment type

- c. Fuel type
 - d. Engine model year
 - e. Power rating (hp or kW)
 - f. Engine tier level (for diesel engines)
 - g. Annual activity data (TBD)
2. A detailed annual emission inventory for all GSE operating at the airport, including methodology and calculations.

The airports' annual reports, the emission reductions achieved every year, and other pertinent information related to the implementation of the MOU measures will be fully accessible to the public and the EPA through a publicly accessible data portal on the internet provided by South Coast AQMD.

b. LAWA's Alternative-Fuel Vehicle Incentive Program

To assist with implementation of its LAX Alternative Fuel Vehicle Requirement Program, LAWA is offering an incentive program to replace conventionally-fueled heavy-duty vehicles with zero or near-zero emission vehicles. Under this program, \$500,000 of incentive funding is allocated to help offset the higher cost of zero and near-zero emission vehicles compared to conventional diesel-fueled vehicles. The funding amount is expected to incentivize the replacement of approximately 20 heavy-duty diesel trucks under this program. This measure is expected to achieve emission reductions by accelerating the natural fleet turnover from conventional diesel trucks to zero or near-zero emission trucks which are certified at 0.02 or lower g/bhp-hr of NOx. Emission reductions associated with the implementation of this measure are eligible for SIP credit as demonstrated below.

i. Surplus

Emission reductions from this measure are surplus because they are above and beyond the requirements under the existing regulations. The funding criteria of zero or near-zero emission vehicles required in this incentive measure is more stringent than the existing regulations for heavy-duty trucks, and therefore, the emission reductions that are expected to be achieved with the incentive funding are considered as surplus.

Currently, on-road heavy duty vehicles are subject to CARB's In-Use On Road Diesel-Fueled Vehicles Regulation⁷, commonly referred to as the Truck and Bus Regulation. The regulation requires that heavy-duty vehicles with a gross vehicle weight rating (GVWR) greater than 14,000 pounds be retrofitted with diesel particulate filters, with implementation schedules based on truck model years. In addition, the older heavy-duty vehicles are required to be replaced according to a tiered schedule that began in 2015. By 2023, nearly all trucks and buses will be required to have model year 2010 engines or newer. The 2010 model year engine standard is 0.2 g/bhp-hr of NOx.

⁷ In-Use On Road Diesel-Fueled Vehicles regulation, commonly referred to as CARB Truck and Bus Regulation: <https://ww2.arb.ca.gov/our-work/programs/truck-and-bus-regulation>

LAWA's Alternative-Fuel Vehicle Incentive program achieves surplus emission reductions above and beyond the existing requirements by funding near-zero or zero-emission trucks which are certified by CARB at 0.02 or lower g/bhp-hr of NOx. LAWA is administering this program through its own application process.⁸

ii. Permanent

LAWA is committed to complete the vehicle replacements through its incentive program before 2023. The emission reductions associated with these vehicle replacements are expected to be permanent as these new trucks continue their operation at LAWA as specified under the MOU. LAWA commits to submit annual reports to South Coast AQMD with specific operational activity data for these funded trucks. LAWA is also responsible for providing documentation on how the retired vehicles are scrapped or relocated outside of California. The annual reports will thus ensure the permanency of the emission reductions.

iii. Quantifiable

Emission reduction benefits from the implementation of this measure were estimated using the vehicle information provided by LAWA. The emission reductions were calculated based on the vehicle model year, CARB's 2023 requirement for trucks meeting the 2010 engine standard, and the emission certification level for near-zero trucks. Each vehicle selected for the funding award is required to submit the following information, as required by LAWA:

- Existing vehicle that is being replaced:
 - Vehicle type
 - Vehicle make
 - Vehicle Gross Vehicle Weight Rating (GVWR)
 - Vehicle Model
 - Vehicle Model Year
 - Engine Model Year
 - Registered Owner
 - Department of Transportation Number (if interstate)
 - California Highway Patrol CA Number (if applicable)
 - Total Annual Miles Traveled: or gallons of fuel used
- Replacement vehicle:
 - ARB Certification Executive Order (EO) Number
 - Propulsion System Engine Make
 - Propulsion System Engine Model Year
 - Propulsion System Engine Model
 - Fuel Type (Fuel Cell, Battery, etc.)

⁸ Zero & Near-Zero Emission Heavy-Duty Vehicle Incentive Program Application: <https://www.lawa.org/-/media/lawa-web/environment/files/zero-and-near-zero-emission-heavy-duty-vehicle-incentive-program-application.ashx?la=en&hash=10DC4556153DEE5AECED40074B39D41AA0066EEE>

- Engine Family

While detailed methodology to estimate emission reductions are provided in LAWA's AQIM, the above data will ensure that the actual emission reductions are quantified correctly under this measure. The SIP creditable emission reduction methodology and calculation is provided in Appendix C of this report.

iv. Enforceable

Under the MOU with South Coast AQMD, LAWA is committed to implement this program through its Alternative Fuel Vehicle Incentive Program described above. LAWA's Board of Airport Commissioners approved the Incentive Program in December 2018. Beginning in 2021, LAWA will also submit annual reports to the South Coast AQMD (by June of each year) for each preceding year including the following specific information for trucks participating in this program:

1. Zero or near-zero Vehicle Identification Number
2. Zero or near-zero vehicle model year
3. Zero or near-zero vehicle GVWR
4. Zero or near-zero vehicle engine model year
5. Zero or near-zero vehicle engine power rating
6. Zero or near-zero vehicle fuel type
7. Executive Order number for the zero or near-zero vehicle engine
8. Zero or near-zero vehicle annual VMT
9. List of, and information on, replaced vehicles (e.g., scrapped)
10. A detailed emission inventory for near-zero or zero-emission trucks, including methodology and calculations.

c. **Bus Electrification measures**

Three (LAX, BUR, and JWA) of the five airports propose to replace existing buses with zero-emission (ZE) electric buses. LAWA will replace its bus fleet (currently 84 buses) that provides transportation for passengers between the aircrafts' gates in the airfield and the airport terminals and for guests traveling between airport parking and passenger terminals (20% in 2023 and 100% in 2031). BUR will replace its buses providing transportation for guests traveling between airport parking and the passenger terminal (50% in 2023 and 100% in 2031). JWA will replace 10 of 12 shuttle buses that operate for passengers and airport employees between off-site parking lots and the airport terminal (6 in 2023 and 4 in 2031). All three measures target either existing diesel-fueled or CNG-fueled buses to be replaced with ZE electric buses. While the target fleets are different among three airports, the measures are similar for the purpose of demonstrating integrity elements as described here.

i. Surplus

Emissions reductions from these measures are surplus because these reductions are above and beyond those required under existing regulations.

There are three existing regulations affecting buses operating at airports. First, CARB's In-Use On Road Diesel-Fueled Vehicles regulation requires the replacement of existing diesel trucks and buses with a GVWR greater than 14,000 pounds to be equivalent to the 2010 or newer engine model year exhaust emissions standards by 2023. Because the airports plan to replace their existing buses with electric zero-emission buses, the emissions reductions above the 2010 engine standard of 0.2 g/bhp-hr NOx would be considered surplus in 2023 and 2031.

Second, South Coast AQMD Rule 1194 requires airports and operators of both public and private fleets providing passenger transportation services out of commercial airports to acquire low emission or alternative-fueled vehicles. This rule applies to passenger cars, light-duty trucks, and medium- and heavy-duty transit vehicle fleets of 15 or more vehicles operated by the airport authority or any other public or private fleet operators that transport passengers from commercial airports. Passenger shuttle buses and taxi cabs serving airports must comply with this rule as well. The rule requires fleets to use alternative fuel vehicles when serving in and out of the airports. Because the airports plan to replace its existing CNG shuttle buses with electric ZE buses, the resulting emission reductions would be surplus to the requirements of Rule 1194.

Third, CARB's Zero-Emission Shuttle Bus regulation⁹, adopted by the CARB Governing Board in June 2019, requires that at least 33%, 66%, and 100% of airport shuttle fleets be zero-emission vehicles by December 31, 2027, 2031 and 2035, respectively. It also requires fleet owners to report fleet information annually starting in 2022 and to have zero-emission certificates for 2026 and later model year vehicles. LAWA plans to replace 20% of LAWA-owned buses with ZE buses at LAX by 2023. BUR plans to replace 50% of its contracted buses with ZE buses by 2023. JWA plans to replace 40% of its contracted CNG buses with JWA-owned ZE buses by 2023. Because the replacement requirement under CARB's regulation does not start until 2027, all replaced buses by the airports by 2023 will be surplus to the regulation. By 2031, only 34% of the buses that LAX and BUR plan to replace will be surplus based on the 66% zero-emission bus replacement requirement in 2031 under CARB's regulation. JWA plans to replace 80% of buses with ZE buses by 2031. Thus, 16% of the replacement ZE buses will still be surplus to the regulation in 2031.

ii. Permanent

All three airports have phase-in schedules for the deployment of ZE buses by January 1, 2023 and January 1, 2031 under their respective measures. Following the MOU adoption by the airport authorities and the South Coast AQMD Governing Board, the airports will begin implementing their respective bus electrification measure.

⁹ CARB Zero-Emission Airport Shuttle regulation; <https://ww2.arb.ca.gov/our-work/programs/zero-emission-airport-shuttle>

Beginning 2021, the airports will submit annual reports to South Coast AQMD that include detailed information on shuttle buses replaced for each preceding year along with emission calculations to track progress toward meeting the performance targets. In the annual reports, LAWA, BUR and JWA will also provide documentation regarding the existing buses to ensure that the emission reductions are permanent.

iii. Quantifiable

Emission reduction benefits are estimated using vehicle specific information for ZE shuttle buses (i.e., vehicle miles traveled per year) along with applicable emission factors from CARB's EMFAC model.¹⁰

Under the MOUs, both airports have committed to monitor the progress of the implementation of their respective zero-emission bus replacements and to submit annual reports to South Coast AQMD including a detailed annual emission inventory for each preceding year. The report will also include information on the calculations and methodology to further substantiate the emission reductions from the measure.

Further details for calculating the emission reductions are included in the technical support document portion of each airport's AQIP/AQIM. The SIP credit calculation methodology for these measures will be based on the VMTs for these ZE buses and the corresponding EMFAC emission factors as described in Appendix C of this staff report.

iv. Enforceable

Under the MOUs with South Coast AQMD, LAWA, BUR, and JWA have committed to implement these measures. Beginning in 2021, LAWA, BUR and JWA are also committed to submit annual reports to the South Coast AQMD (by June of each year) for each preceding year including the following specific information for buses covered under these measures:

1. List of buses operating at the airport with the following information:
 - a. Vehicle Identification Number
 - b. Vehicle model year
 - c. GVWR
 - d. Engine model year
 - e. Engine power rating
 - f. Vehicle fuel type
 - g. Odometer reading
 - h. Annual vehicle miles travelled
2. A detailed emission inventory for buses, including methodology and calculations.

¹⁰ <https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-modeling-tools>

3. List of buses replaced during the reported year and above listed information on both replaced and replacement buses including documentation for proof of scrappage or equipment or moved out of state.

d. JWA Jet Fuel Pipeline Installation measure

JWA will install a new pipeline to transport jet fuel to a new storage tank at the airport facility by the end of 2019. This project eliminates routine commercial aviation jet fuel delivery trucks before 2023.

i. Surplus

Fuel delivery trucks are covered under CARB's In-Use On Road Diesel-Fueled Vehicles regulation (described in previous sections), which requires that all existing trucks meet the 2010 model year engine standard by 2023. Therefore, since this measure eliminates emissions from jet fuel delivery trucks to the airport, the reductions above and beyond the existing regulation are considered surplus.

ii. Permanent

JWA plans to complete the pipeline project by the end of 2019 and once constructed, the pipeline will replace the delivery of jet fuel by trucks permanently.

Beginning 2021, JWA will submit annual reports to South Coast AQMD, for each preceding year, to document the implementation of this measure and the permanency of the emission reductions. The annual report will provide data on the existing routine and non-routine commercial aviation jet fuel delivery trucks (number of trucks trips, truck model year, and vehicle miles traveled), volume of fuel delivered by trucks, and an emissions inventory for trucks including methodology and calculations.

iii. Quantifiable

The new jet fuel pipeline will eliminate the emissions associated with the existing routine commercial jet fuel delivery trucks. Emission reduction benefits resulting from the measure are estimated by using information provided by JWA on fuel delivery trucks and applying emission factors from CARB's EMFAC model. The annual reports provided by JWA will ensure that the emission reductions estimated from the eliminated truck delivery trips are real and quantifiable in subsequent years.

Further details for calculating the emission reductions are included in the technical support document portion of JWA's AQIP. The SIP credit calculation methodology for these measures will be based on the VMTs for these trucks and the corresponding EMFAC emission factors as described in Appendix C of this staff report.

iv. Enforceable

Under the MOU with South Coast AQMD, JWA is committed to implement the measure. Beginning in 2021, JWA is also committed to submit an annual report to

the South Coast AQMD (by June of each year) for each preceding year including the following specific information for this measure:

1. Total number of routine and non-routine truck trips delivering jet fuel for commercial aviation, and truck model years, if available.
2. Total amount of jet fuel delivered.
3. An estimate of total vehicle miles travelled.
4. A detailed emission inventory for fuel delivery trucks, including methodology and calculations.

The annual reports provided by JWA will include specific information that will enable and verify emission reduction benefits. The information will also become part of the record keeping and will be maintained for public access throughout the MOU period.

C. Technical Analyses

The airports have provided emissions inventories for base year (2017) and two future milestone years (2023 and 2031) under the business-as-usual scenario and the MOU implementation scenarios. These inventories are included in the airports' AQIPs. The South Coast AQMD has also provided the necessary documentation and technical analysis for estimating SIP related emission reduction benefits in Appendix C of this staff report.

D. Funding

LAWA's Alternative-Fuel Vehicle Incentive Program is the only AQIP measure that is based on incentive funding to implement the program. LAWA has allocated a total of \$500,000 for this incentive program which has already been approved by the airport's authority. LAWA will be responsible for administering its own program.

E. Legal Authority

Pursuant to Section 40702 of the California Health and Safety Code, South Coast AQMD "shall adopt rules and regulations and do such acts as may be necessary or proper to execute the powers and duties granted to, and imposed upon" South Coast AQMD. Moreover, Section 40701(f) of the California Health and Safety Code provides that a district shall have power to "cooperate and contract with any federal, state, or local governmental agencies, private industries, or civic groups necessary or proper to the accomplishment of the purposes of this division." Such acts that are necessary to attain the federal ozone NAAQS in 2023 and 2031 include entering into MOUs with the airport authorities to achieve emission reductions from non-aircraft related mobile sources at the airports.

F. Tracking actual emission reductions from MOU measures

Beginning in 2021, the airports have committed to submit annual reports to South Coast AQMD on their eligible SIP creditable AQIP/AQIM measures in the MOUs. The annual reports will contain detailed information on the implementation of these measures including equipment and

vehicle data (e.g., engine size, model year, operating data, etc.), annual emissions inventories along with methodologies and calculations, and information on replaced equipment and vehicles including, where applicable, documentation regarding proof of scrappage or equipment being moved out of state. The annual reports will be made available to the public by South Coast AQMD so any progress on emission reduction benefits toward the final goal can be calculated and validated by the public.

G. Public disclosure

The South Coast AQMD will provide public access to all information related to the emission reductions associated with implementation of the AQIP's eligible SIP creditable measures in the MOUs. Also, the public will have access to the annual reports submitted by the airports to the South Coast AQMD as described in the previous sections. The South Coast AQMD plans to post the annual reports within 30 days of the receipt for access by the public.

In order to ensure easy accessibility to the information, the South Coast AQMD will post the documents on the South Coast AQMD website. A new Airports MOU topic page will be created once the MOUs have been adopted by the airport authorities and the South Coast AQMD Governing Board and subsequently submitted to CARB for submittal to EPA. Also, there will be contact information to address any further inquiries from the public regarding the posted information.

H. Reporting to EPA

By June 1st of each year beginning in 2021 and through the MOU term ending in 2031, the airports will provide annual reports to South Coast AQMD on implementation of the eligible SIP creditable AQIP measures identified in the MOUs. The annual reports will include detailed equipment/vehicle data and emission calculations to demonstrate progress toward meeting the performance targets in these measures. Based on information in the annual reports provided by the airports, South Coast AQMD will quantify the corresponding SIP creditable actual emission benefits achieved from implementation of the MOU measures and provide reports to EPA to document these reductions.

For the 2023 emission reduction commitment (0.52 tpd), South Coast AQMD will report to EPA by December 31st of 2023 and 2024. For the 2031 emission reduction commitment (0.38), South Coast AQMD will report to EPA by December 31st of 2031 and 2032. The reports to EPA will identify the emission reductions achieved each year, document actions by the airports on implementation of the eligible SIP creditable AQIP/AQIM measures, and determine whether the implementation of the MOU measures will achieve the full NO_x reductions in 2023 and 2031. Each demonstration report will be publicly available or available by request.

In the event of any potential shortfalls of emission reduction benefits, a process will be triggered to remediate the shortfall with the airports as described above. By December 31st of 2024 and 2032, South Coast AQMD will adopt and submit substitute measures to EPA in the event of any shortfall in 2023 and 2031 reductions, respectively.