

April 10, 2025

Mr. Shawn Wang
Program Supervisor
Planning, Rule Development & Implementation
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178

CITY OF LONG BEACH SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT MEMORANDUM OF UNDERSTANDING – UPDATED ANNUAL PROGRESS REPORT FOR CALENDAR YEAR 2023

Dear Mr. Wang,

Long Beach Airport (“LGB” or “the Airport”) is pleased to submit the Airport’s updated 2023 annual progress report. On December 6, 2019, a Memorandum of Understanding (MOU) was entered into by the South Coast Air Quality Management District (South Coast AQMD) and the Airport for the voluntary reduction of emissions from commercial non-aircraft airport mobile sources. This report details the progress achieved in Calendar Year (CY) 2023 and is intended to provide an overview of the Airport’s efforts to implement the MOU measure and quantify actual emission reductions. There is one measure in the LGB MOU related to non-aircraft commercial passenger airport mobile sources – the Ground Support Equipment (GSE) measure. Reportable information identified in the MOU for this measure and emissions estimates are provided in the following sections. This report does not apply to any source in operation at the Airport that is not specifically identified in the MOU measure.

PROGRESS ON MOU MEASURES

MOU SCHEDULE NO. 1 – GROUND SUPPORT EQUIPMENT

Schedule No. 1 of the MOU requires the Airport to reduce nitrogen oxides (NOx) emissions from GSE to achieve a fleet average composite factor (performance level) which is less than or equal to 0.93 grams of NOx per brake horsepower-hour (g/hp-hr NOx) by January 1, 2023 and is less than or equal to 0.44 g/hp-hr NOx by January 1, 2031. To achieve these targets, the Airport has been working with airlines and third-party GSE operators to accelerate the turnover of existing equipment to newer, lower-emission equipment.

A list of GSE subject to this measure with the required information specified in MOU Schedule No. 1 Section III.B.1., *List of Ground Support Equipment*, is provided in **Exhibit A, Table 1**. Information on the sale or retirement of non-zero emission GSE subject to this measure including information from the California Air Resources Board DOORS web portal and relocation details (as applicable) as required by MOU Schedule No. 1, Section III.B.2, *List of Sold, Retired, or Relocated Equipment*, is presented in **Exhibit A, Table 2**. As required by MOU Schedule No. 1, Section III.B.3, *Emission Inventory*, an inventory of emissions from GSE activity at the Airport has been developed. Information pertaining to the development of the GSE emissions inventory, including in-depth discussion of the performance factor

and emission inventory calculation methodologies, can be found in **Exhibit A** with additional supporting documentation provided in **Exhibit B**.

DISAGGREGATION OF COMMERCIAL AND NONCOMMERCIAL OPERATIONS

During the 2023 survey year data collection process, it was identified that GSE related to non-commercial operations (i.e., general aviation [GA] operations), including as flight schools, firefighting and law enforcement, and other non-commercial entities, had reported equipment for the 2023 survey and each other prior survey year except for the 2017 MOU baseline. For the purposes of the MOU, commercial operations constitute all GSE operators which support cargo, airline, or charter aircraft operations.

Upon discussion with South Coast AQMD, it was determined that the MOU, both in its emission and performance level reporting requirements, is specific in its applicability to commercial GSE only, therefore moving forward only commercial GSE will be included in the annual MOU reporting metrics. For this 2023 annual report, noncommercial GSE metrics have also been included for transparency and disclosure purposes. Additionally, updated GSE reporting metrics for prior reporting periods excluding noncommercial equipment have been included in **Exhibit B** to clearly illustrate like-to-like year-over-year airport progress.

RESULTS OF THE 2023 GSE SURVEY

In CY 2023, there were 173 units of commercial in-use GSE with power ratings greater than 25 horsepower (i.e., reportable GSE) in operation at the Airport – a net increase of 9 units relative to the count of reportable GSE in CY 2022. The airport composite commercial fleet saw a net reduction of 12 units of pre-Tier 4 final diesel and pre-model year 2010 non-diesel (i.e., legacy) reportable GSE. The airport composite fleet also witnessed an increase in reportable GSE of model year 2010 or newer non-diesel, Tier 4 final diesel, and electric GSE to the measure of four (4), three (3), and 13 units respectively. Additionally, two (2) units which had been reported in prior survey years were determined via dialogue with the equipment operators to be duplicate or unreportable non-GSE equipment and were removed from the inventory in this CY 2023 report.

In CY 2023, the Airport achieved a performance level of 0.55 g/hp-hr NO_x, demonstrating continued achievement of the MOU's January 1, 2023 target. This factor represents a steady decrease relative to the CY 2022 commercial performance level of 0.68 g/hp-hr NO_x. This continued decrease is attributable to the removal and relegation to low- or emergency-use of legacy GSE. LGB expects the performance factor to continue its downward trend in future reporting years as the Airport continues to coordinate with airport partners to replace or relocate older conventionally fueled equipment.

2023 Long Beach Airport MOU Commercial GSE Summary

Fleet Mix ¹					Fleet Emissions (tons per year; metric tons for CO ₂ e) ²						
Total	Electric	Diesel	Gas	Other	CO	ROG	NOx	PM ₁₀	PM _{2.5}	SOx	CO ₂ e
173	96	40	32	5	11.3	0.8	3.1	0.10	0.08	<0.01	891

Notes:

1. Fleet counts include ≥25 horsepower in-use equipment used in the calculation of the NOx performance factor.
2. Fleet emissions include the operation of all reported equipment, including <25 horsepower and low-use (<200 hours per year) or emergency-use equipment.

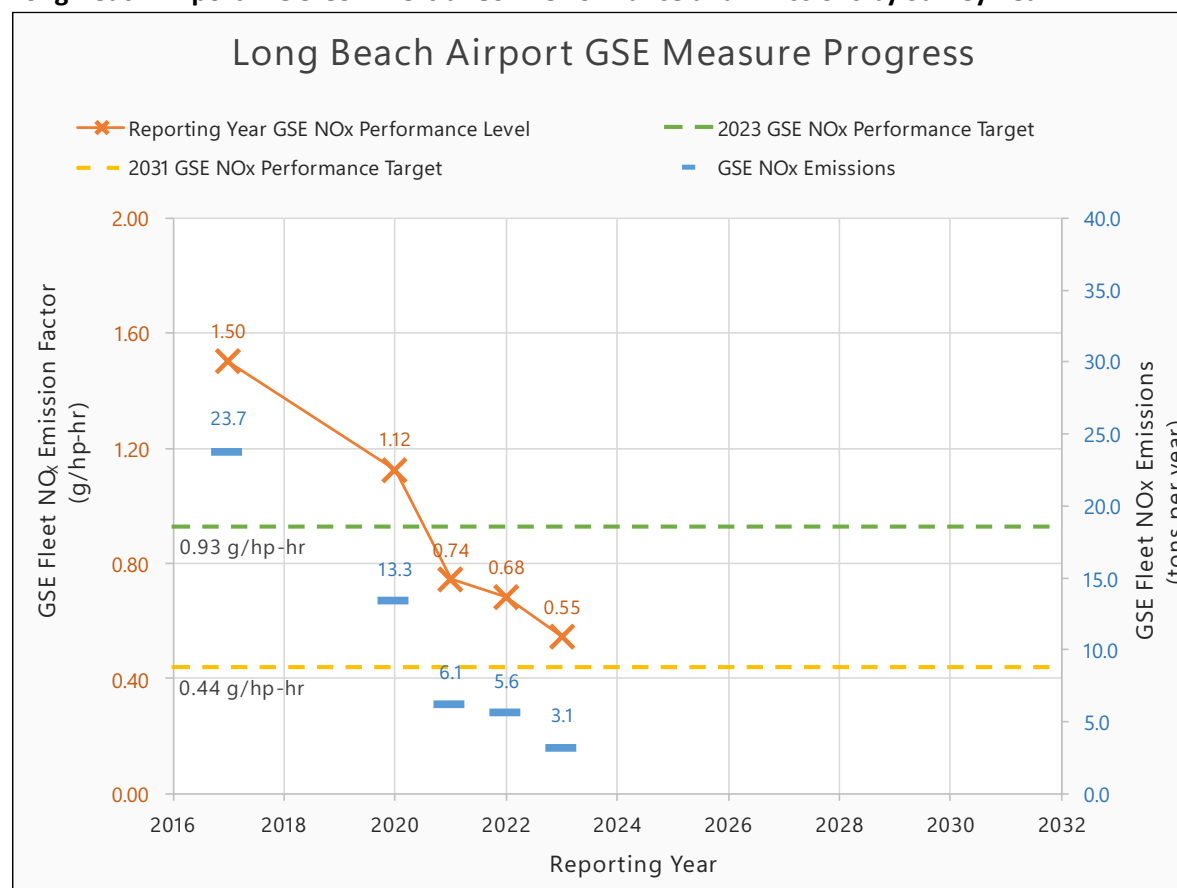
2023 Long Beach Airport Noncommercial GSE Summary

Fleet Mix ¹					Fleet Emissions (tons per year; metric tons for CO ₂ e) ^{2,3}						
Total	Electric	Diesel	Gas	Other	CO	ROG	NOx	PM ₁₀	PM _{2.5}	SOx	CO ₂ e
18	10	2	1	5	3.2	0.3	1.2	0.02	0.02	<0.01	117

Notes:

1. Fleet counts include >25 horsepower in-use equipment used in the calculation of the NOx performance factor.
2. Fleet emissions include the operation of all reported equipment, including <25 horsepower and low-use (<200 hours per year) or emergency-use equipment.
3. Emissions are estimated using commercial GSE activity levels available through CARB's OFFROAD model. These activities may overestimate actual emissions for non-commercial operations.

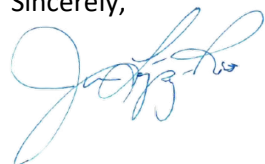
Long Beach Airport MOU Commercial GSE Performance and Emissions by Survey Year



The total annual NOx emissions associated with commercial GSE operations at LGB were 3.1 tons in CY 2023, a significant decrease relative to the commercial CY 2022 total of 5.6 tons. Like the Airport's performance factor, the emissions decrease is attributable to the accelerated changeout of older, conventionally fueled GSE. Overall, in CY 2023 the commercial GSE fleet at LGB achieved an annual reduction of 20.6 tons of NOx (88 percent) relative to the NOx emissions from GSE at the Airport in the MOU's baseline (2017).

Long Beach Airport appreciates the ongoing partnership and collaboration with South Coast AQMD in the implementation of this MOU. If there are any questions, please contact either myself at juan.lopez-rios@longbeach.gov (562) 570-2608 or Jeremy Gilbride at gilbridej@cdmsmith.com (949) 930-9809 at your convenience.

Sincerely,



Juan López-Rios
Deputy Director, Long Beach Airport

Enclosed are the following documents.

Exhibit A: MOU Schedule No. 1 – Ground Support Equipment MOU Report

Exhibit B: MOU Schedule No. 1 – Ground Support Equipment Survey, Emissions Inventory Report, March 2025