

MOU SCHEDULE NO. 1 – GROUND SUPPORT EQUIPMENT

This MOU Schedule No. 1 is based on the City's AQIP measure for ground support equipment¹.

- I. PROGRAM DESCRIPTION – Require that all ground support equipment associated with commercial operations achieve a fleet average NOx emission factors of 0.93 and 0.44 g/bhp-hr by January 1, 2023 and January 1, 2031, respectively.
- II. PROGRAM TIMEFRAME – Upon execution through 2032.
- III. AIRPORT OBLIGATIONS – The City agrees to:
 - A. Implement the measure by working with airport tenants to achieve the above performance targets by specified dates through accelerated turnover to cleaner equipment. Airport shall have complete discretion as to mechanisms used to implement this measure. Such mechanisms may include leases, licenses, operational requirements, or other agreements.
 - B. Beginning in 2021, and every year thereafter through 2032, provide the following information to South Coast AQMD on an annual basis by June 1 for each preceding calendar year:
 1. List of ground support equipment subject to this GSE measure 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 for non-zero emission equipment that is sufficient to determine emission reductions at a reasonable level of accuracy (i.e., actual operating hours from hour meter readings/maintenance records, average operating hours representative of equipment type and airport, or average operating hours by equipment/fuel type from CARB's OFFROAD model, if applicable)

¹ Ground Support Equipment or "GSE" is any vehicle or equipment used to support aircraft operations that is subject to, or included in compliance plans to meet, the requirements of the California Air Resources Board (CARB) In-Use Off-Road Diesel (ORD) Vehicle Regulation Program, CARB Off-Road Large Spark-Ignition (LSI) Engine Fleet Requirements Regulation Program, or CARB Portable Equipment Registration Program and associated Portable Diesel Engine Airbourne Toxic Control Measure. Furthermore, GSE as defined here only includes equipment that is not subject to compliance with SCAQMD Rule XX - RECLAIM, or included in a mobile source emission reduction credit program under SCAQMD Rule XVI.

2. For non-zero emission ground support equipment subject to this GSE measure, information regarding the sale or retirement of equipment available through CARB's DOORS system and, for pre-Tier 4 diesel, pre-2010 gasoline, or pre-2010 LPG ground support equipment relocated from LGB to another airport within the South Coast Air Basin, identify: a) the airport to which equipment is relocated, b) date of relocation, and c) estimated projected usage hours.
3. An annual emission inventory for all ground support equipment associated with commercial operations at LGB, including methodology and calculations.

III SOUTH COAST AQMD OBLIGATIONS – South Coast AQMD agrees to:

- A. Verify emission reductions from the implementation of this AQIP measure in order to determine actual emission reductions.
- B. Ensure that any emission reduction data related to this AQIP measure and other pertinent information and accessible to the public and the USEPA.

MOU SCHEDULE NO. 1 – III.B.1. List of Ground Support Equipment

List of ground support equipment subject to this GSE measure 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 based on average operating hours from CARB's OFFROAD model

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP01-001	TOWBARL ESS TOW TRACTOR	A/C Tug Narrow Body		Electric			--	385	AP8600	Lektro, Inc.	No	No
LGB-OP01-002	TOWBARL ESS TOW TRACTOR	A/C Tug Narrow Body		Electric			--	385	AP8600	Lektro, Inc.	No	No
LGB-OP01-003	TOWBARL ESS TOW TRACTOR	A/C Tug Narrow Body		Electric			--	385	AP8360	Lektro, Inc.	No	No
LGB-OP02-001	FUEL TRUCK	Fuel Truck		Diesel	2006	200	--	200		FORD	Yes	Yes
LGB-OP02-002	FUEL TRUCK	Fuel Truck		Gasoline	1992	180	--	200		FORD	Yes	Yes
LGB-OP02-003	FUEL TRUCK	Fuel Truck		Diesel	1991	180	--	200		FORD	Yes	Yes
LGB-OP02-004	FUEL TRUCK	Fuel Truck		Gasoline	1992	130	--	200		CHEVY	Yes	Yes
LGB-OP02-005	FUEL TRUCK	Fuel Truck		Diesel	2001	250	--	200		INTERNATION AL	Yes	Yes
LGB-OP02-006	FUEL TRUCK	Fuel Truck		Diesel	2001	250	--	200		INTERNATION AL	Yes	Yes

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP02-007	FUEL TRUCK	Fuel Truck		Diesel	2005	130	--	200		INTERNATION AL	Yes	Yes
LGB-OP02-008	FUEL TRUCK	Fuel Truck		Diesel	2009	150	--	200		INTERNATION AL	Yes	Yes
LGB-OP02-009	FUEL TRUCK	Fuel Truck		Diesel	2006	130	--	200		INTERNATION AL	Yes	Yes
LGB-OP02-010	MAINTENANCE TRUCK	Maint. Truck		Gasoline	1992	130	--	200		CHEVY	Yes	Yes
LGB-OP03-001	FORK LIFT	Forklift		LPG/Propane	1993	93	--	591		Toyota	No	No
LGB-OP03-002	FORK LIFT	Forklift		LPG/Propane	1996	94	--	591		Toyota	No	No
LGB-OP04-001	Golf Truck	Cart		Electric	2005		--	152			No	No
LGB-OP05-001	Tug	A/C Tug Narrow Body		Electric	2016		--	385	Towbot Model 432-618-7223		No	No
LGB-OP05-002	Tug	A/C Tug Narrow Body		Electric	2019		--	385	Mototok Model M 528		No	No
LGB-OP05-003	GPU	Ground Power Unit		Electric	2018		--	798	Foxcart GSE Model FDC-420M		No	No
LGB-OP06-001	REFUELER	Fuel Truck		Diesel	1990	285	≤ Tier 1	83		Oshkosh	No	No
LGB-OP06-002	REFUELER	Fuel Truck		Diesel	1990	285	≤ Tier 1	83		Oshkosh	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP06-003	REFUELER	Fuel Truck		Diesel	2007	250	Tier 3	83		GMC	No	No
LGB-OP06-004	REFUELER	Fuel Truck		Gasoline	1991	217	--	83		Ford	No	No
LGB-OP06-005	GOLF CART	Cart		Electric	1998	6	--	152		Taylor Dunn	No	No
LGB-OP06-006	GOLF CART	Cart		Gasoline	2005	22	--	152		Kawasaki	No	No
LGB-OP06-007	GOLF CART	Cart		Gasoline	2000	22	--	152		Kawasaki	No	No
LGB-OP06-008	FORK LIFT	Forklift		Electric	2010	80	--	591		Clark	No	No
LGB-OP06-009	FORK LIFT	Forklift		Electric	2009	51	--	591		Toyota	No	No
LGB-OP06-010	FORK LIFT	Forklift		Diesel	2006	154	Tier 2	591		Caterpillar	No	No
LGB-OP06-011	SUPERTUG	A/C Tug Narrow Body		Gasoline	1998	95	--	385		Taylor Dunn	No	No
LGB-OP06-012	SUPERTUG	A/C Tug Narrow Body		Gasoline	1998	95	--	385		Taylor Dunn	No	No
LGB-OP06-013	SUPERTUG	A/C Tug Narrow Body		Diesel	1994	105	≤ Tier 1	385		Harlan	No	No
LGB-OP06-014	GENERATOR	Generator		Diesel	2002	75	Tier 1	913		DavCo	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP06-015	GENERATOR	Generator		Diesel	1981	335	≤ Tier 1	913		Onon	No	No
LGB-OP07-001	FUEL TRUCK	Fuel Truck		Diesel	2002	216	Tier 1	200	Jet Fuel Truck - 10,000 gallon	Dart	Yes	No
LGB-OP07-002	FUEL TRUCK	Fuel Truck		Diesel	1981	275	≤ Tier 1	200	Jet Fuel Truck - 10,000 gallon	Dart	Yes	No
LGB-OP07-003	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Diesel	1998	215	≤ Tier 1	200	Large Tug	Stewart & Stevenson	Yes	No
LGB-OP07-004	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Diesel	2011	53	Tier 4i	385	Large Toyota Tug	Toyota Industrial Equipment	No	No
LGB-OP07-005	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Diesel	1990	90	≤ Tier 1	385	Small Toyota Tug	Toyota Industrial Equipment	No	No
LGB-OP07-006	LIFT	Lift		Electric			--	391	Scissor Lift	Upright	No	No
LGB-OP07-007	FORK LIFT	Forklift		Electric	2012	53	--	591	Toyota Forklift	Toyota	No	No
LGB-OP07-008	GOLF CART	Cart		Electric	2002	3	--	152	People Mover	Club Cart	No	No
LGB-OP07-009	TOWBARLESS TOW TRACTOR	A/C Tug Narrow Body		Electric	2006	33	--	385	Stand up Lektro	Lektro	No	No
LGB-OP07-010	TOWBARLESS TOW TRACTOR	A/C Tug Narrow Body		Electric	2012	45	--	385	Sit Down Lektro	Lektro	No	No

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LGB-OP07-011	SCRUBBER/SWEEPER	Sweeper		Electric		3	--	339	Scrubber	Factory Cat Clark	No	No
LGB-OP07-012	SWEEPER	Sweeper		Gasoline	1998	32	--	339	Sweeper	American Lincoln	No	No
LGB-OP07-013	SCRUBBER/SWEEPER	Sweeper		Electric			--	339	Sweeper/Scrubber	Factory Cat	No	No
LGB-OP07-014	ELECTRIC CART	Cart		Electric	2004	4	--	152	Electric Flat Bed	Club Car	No	No
LGB-OP07-015	ELECTRIC CART	Cart		Electric			--	152	Golf Cart	Club Cart	No	No
LGB-OP07-016	LAVATORY CART	Lav Cart		Electric			--	150	Lav Cart	Aero Specialties	No	No
LGB-OP07-017	POTABLE WATER CART	Cart		Electric			--	152	Water Cart	Aero Specialties	No	No
LGB-OP07-018	FUEL TRUCK	Fuel Truck		Diesel	2020	200	Tier 4	83	Jet Fuel Truck - 3,000 gallons		No	No
LGB-OP07-019	FUEL TRUCK	Fuel Truck		Diesel	2011	220	Tier 4i	83	Jet Fuel Truck - 7,000 gallons		No	No
LGB-OP07-020	FUEL TRUCK	Fuel Truck		Diesel	2011	220	Tier 4i	83	Jet Fuel Truck - 7,000 gallons		No	No

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LGB-OP07-021	FUEL TRUCK	Fuel Truck		Diesel	2011	390	Tier 4i	83	AvGas fuel Truck - 1,200 gallons		No	No
LGB-OP07-022	FUEL TRUCK	Fuel Truck		Diesel	2011	390	Tier 4i	83	AvGas fuel Truck - 1,200 gallons		No	No
LGB-OP07-023	FLUID CART	Cart		Electric			--	152	Diesel Cart - 300 gallons		No	No
LGB-OP07-024	Ground Power Unit	Ground Power Unit		Diesel	2017	155	Tier 4	798	185,317	Cummins GPU	No	No
LGB-OP07-025	Ground Power Unit	Ground Power Unit		Diesel	2018	74	Tier 4	798	185,842	JetGo GPU	No	No
LGB-OP08-001	REFUELER	Fuel Truck		Diesel	2000	174	≤ Tier 1	83	REFUELER	EAM	No	No
LGB-OP08-002	TUG	A/C Tug Narrow Body		Diesel	2011	84	Tier 3	385	TUG	Eagle	No	No
LGB-OP08-003	TUG	A/C Tug Narrow Body		Diesel	2014	49	Tier 4	385	TUG	Tug	No	No
LGB-OP08-004	REFUELER	Fuel Truck		Diesel	2017	250	Tier 4	83	REFUELER	EAM	No	No
LGB-OP08-005	REFUELER	Fuel Truck		Diesel	2017	250	Tier 4	83	REFUELER	EAM	No	No
LGB-OP08-006	REFUELER	Ground Power Unit		Gasoline	1995	300	--	798	REFUELER	GM	No	No

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LGB-OP08-007	TUG	A/C Tug Narrow Body		Electric	2005		--	385	TUG	Lektro, Inc.	No	No
LGB-OP08-008	TUG	A/C Tug Narrow Body		Electric	1999		--	385	TUG	Lektro, Inc.	No	No
LGB-OP08-009	SERVICE TRUCK	Service Truck		Gasoline	2011	195	--	883	SERVICE TRUCK	Chevrolet	No	Yes
LGB-OP08-010	SERVICE TRUCK	Service Truck		Gasoline	2000	119	--	883	SERVICE TRUCK	Ford	No	Yes
LGB-OP08-011	REFUELER	Fuel Truck		Diesel	2018	200	--	83	REFUELER	INTERNATIONAL	No	Yes
LGB-OP08-012	REFUELER	Fuel Truck		Diesel	2008	285	--	83	REFUELER	FREIGHTLINE R	No	Yes
LGB-OP08-013	REFUELER	Fuel Truck		Diesel	2019	260	--	83	REFUELER	INTERNATIONAL	No	Yes
LGB-OP08-014	REFUELER	Fuel Truck		Diesel	2001	290	--	200	REFUELER	ISUZU	Yes	Yes
LGB-OP08-015	Ground Power Unit	Ground Power Unit		Diesel	2013	130	Tier 4i	798		7,156,610	No	No
LGB-OP08-016	Ground Power Unit	Ground Power Unit		Diesel	2010	130	Tier 3	798		154,909	No	No
LGB-OP08-017	Ground Power Unit	Ground Power Unit		Diesel	2004	107	Tier 2	798		158,921	No	No
LGB-OP09-001	Electric Cart	Cart		Electric			--	152	Golf Cart		No	No

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LGB-OP10-001	Fuel Truck	Fuel Truck		Gasoline	1991	300	--	200	GMC		Yes	Yes
LGB-OP10-002	Gold Cart	Cart		Electric			--	152	Yamaha		No	No
LGB-OP11-001	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		LPG/Propane	1999	230	--	385		EAGLE	No	No
LGB-OP11-002	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Electric	2014		--	385		JETPORTER	No	No
LGB-OP11-003	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Electric	1999		--	385		LEKTRO	No	No
LGB-OP11-004	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Electric	1995		--	385		LEKTRO	No	No
LGB-OP11-005	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Electric	2004		--	385		LEKTRO	No	No
LGB-OP11-006	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Diesel	2011	110	Tier 3	385		WOLLARD	No	No
LGB-OP11-007	FUEL TRUCK	Fuel Truck		Gasoline	1976	147	--	200		GMC	Yes	No
LGB-OP11-008	FORK LIFT	Forklift		LPG/Propane	1999	46	--	591		CLARK	No	No
LGB-OP11-009	FORK LIFT	Forklift		LPG/Propane	1999	74	--	591		YALE	No	No
LGB-OP11-010	FORK LIFT	Forklift		LPG/Propane	2001	93	--	591		CLARK	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP11-011	FORK LIFT	Forklift		LPG/Propane	2005	103	--	591		YALE	No	No
LGB-OP11-012	FORK LIFT	Forklift		LPG/Propane	2008	98	--	591		HYSTER	No	No
LGB-OP11-013	FORK LIFT	Forklift		LPG/Propane	2017	62	--	591		HYSTER	No	No
LGB-OP11-014	FORK LIFT	Forklift		LPG/Propane	2008	86	--	591		YALE	No	No
LGB-OP11-015	Ground Power Unit	Ground Power Unit		Diesel	2011	155	Tier 3	798		168,966	No	No
LGB-OP11-016	Ground Power Unit	Ground Power Unit		Diesel	2011	155	Tier 3	798		168,967	No	No
LGB-OP11-017	Ground Power Unit	Ground Power Unit		Diesel	2019	155	Tier 4	798		188,514	No	No
LGB-OP12-001	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Gasoline	1982		--	385		HARLAN	No	Yes
LGB-OP12-002	FORK LIFT	Forklift		LPG/Propane	1998		--	591	GC30K	CAT	No	No
LGB-OP13-001	Bag Tug	Baggage Tug		Electric	2001	40	--	846		Tug	No	No
LGB-OP13-002	Bag Tug	Baggage Tug		Electric	2001	40	--	846		Tug	No	No
LGB-OP13-003	Bag Tug	Baggage Tug		Electric	2002	40	--	846		Tug	No	No

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LGB-OP13-004	Bag Tug	Baggage Tug		Electric	2002	40	--	846		Tug	No	No
LGB-OP13-005	Bag Tug	Baggage Tug		Electric	2002	40	--	846		Tug	No	No
LGB-OP13-006	Bag Tug	Baggage Tug		Electric	2005	40	--	846		Tug	No	No
LGB-OP13-007	Bag Tug	Baggage Tug		Gasoline	2016	40	--	846		Tug	No	No
LGB-OP13-008	Belt Loader	Belt Loader		Electric	2013	60	--	706		Tug	No	No
LGB-OP13-009	Belt Loader	Belt Loader		Electric	2013	60	--	706		Tug	No	No
LGB-OP13-010	Belt Loader	Belt Loader		Electric	2017	60	--	706		Tug	No	No
LGB-OP13-011	Belt Loader	Belt Loader		Electric	2017	60	--	706		Tug	No	No
LGB-OP13-012	Belt Loader	Belt Loader		Electric	2018	60	--	706		Tug	No	No
LGB-OP13-013	Belt Loader	Belt Loader		Electric	2018	60	--	706		Tug	No	No
LGB-OP13-014	Belt Loader	Belt Loader		Electric	2019	60	--	706		Tug	No	No
LGB-OP13-015	Belt Loader	Belt Loader		Electric	2019	60	--	706		Tug	No	No

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LGB-OP13-016	FORK LIFT	Forklift		LPG/Propane	2007	52	--	591		Toyota	No	No
LGB-OP13-017	Lav Truck	Lav Truck		Gasoline	2018	297	--	1,158		Phoenix Metals	No	Yes
LGB-OP13-018	Passenger Stairs	Passenger Stand		Gasoline	2018	49	--	137		Phoenix Metals	No	No
LGB-OP13-019	Passenger Stairs	Passenger Stand		Gasoline	2018	49	--	137		Wollard	No	No
LGB-OP13-020	AIR CONDITIONING	Air Conditioner		Electric	2001	131	--	391		TLD	No	No
LGB-OP13-021	Provision truck	Catering Truck		Gasoline	2019	200	--	928		Mallaghan	No	Yes
LGB-OP13-022	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Diesel	2011	110	Tier 3	385		Stewart Stevenson	No	No
LGB-OP13-023	AIRCRAFT TOW TRACTOR	A/C Tug Narrow Body		Diesel	2016	74	Tier 4	385		JBT	No	No
LGB-OP13-024	Air Start	Air Start Unit		Diesel	2018	333	Tier 4	200		182,491	Yes	No
LGB-OP13-025	Ground Power Unit	Ground Power Unit		Electric	2021	155	--	798			No	No
LGB-OP13-026	Ground Power Unit	Ground Power Unit		Electric	2021	155	--	798			No	No
LGB-OP13-027	Ground Power Unit	Ground Power Unit		Electric	2016	155	--	798			No	No

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LGB-OP13-028	Ground Power Unit	Ground Power Unit		Electric	2018	155	--	798			No	No
LGB-OP14-001	CART	Cart		Gasoline			--	152	Golf Cart Truck	Suzuki	No	No
LGB-OP14-002	FORK LIFT	Forklift		LPG/Propane			--	591	Fork Lift	Nissan	No	No
LGB-OP14-003	FORK LIFT	Forklift		LPG/Propane			--	591	Fork Lift	Caterpillar	No	No
LGB-OP14-004	GOLF CART	Cart		Electric			--	152	Golf Cart	E-Z-Go	No	No
LGB-OP15-001	FUEL TRUCK	Fuel Truck		Diesel	2016	450	--	83	TRACTOR	PETERBILT	No	Yes
LGB-OP15-002	FUEL TRUCK	Fuel Truck		Diesel	2013	450	--	83	TRACTOR	PETERBILT	No	Yes
LGB-OP15-003	FUEL TRUCK	Fuel Truck		Diesel	2016	450	--	83	TRACTOR	PETERBILT	No	Yes
LGB-OP15-004	FUEL TRUCK	Fuel Truck		Diesel	2016	450	--	83	TRACTOR	PETERBILT	No	Yes
LGB-OP15-005	FUEL TRUCK	Fuel Truck		Diesel	2017	450	--	83	TRACTOR	PETERBILT	No	Yes
LGB-OP15-006	FUEL TRUCK	Fuel Truck		Diesel	2018	450	--	83	TRACTOR	PETERBILT	No	Yes
LGB-OP15-007	FUEL TRUCK	Fuel Truck		Diesel	2021	450	--	83	TRACTOR	VOLVO	No	Yes

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LGB-OP15-008	FUEL TRUCK	Fuel Truck		Diesel	2020	450	--	83	TRACTOR	VOLVO	No	Yes
LGB-OP15-009	FUEL TRUCK	Fuel Truck		Diesel	2021	450	--	83	TRACTOR	VOLVO	No	Yes
LGB-OP16-001	FORK LIFT	Forklift		Diesel	2015	155	Tier 4	591	AFL05	Hyster	No	No
LGB-OP16-002	CONTAINER LOADER	Cargo Loader		Diesel	1998	152	≤ Tier 1	556	AL18D	Lantis	No	No
LGB-OP16-003	CONTAINER LOADER	Cargo Loader		Diesel	2000	152	≤ Tier 1	556	AL22D	Lantis	No	No
LGB-OP16-004	LIGHT TOWER	Other GSE		Diesel	2017		Tier 4	412	APLD	GENERAC	No	No
LGB-OP16-005	LIGHT TOWER	Other GSE		Diesel	2017		Tier 4	412	APLD	GENERAC	No	No
LGB-OP16-006	LIGHT TOWER	Other GSE		Diesel	2018		Tier 4	412	APLD	GENERAC	No	No
LGB-OP16-007	LIGHT TOWER	Other GSE		Diesel	2018		Tier 4	412	APLD	GENERAC	No	No
LGB-OP16-008	PUSHBACK TRACTOR	A/C Tug Narrow Body		Diesel	1998	210	≤ Tier 1	385	ATA27	STEWART-STEVENSON	No	No
LGB-OP16-009	BELT LOADER	Belt Loader		Electric	2000		--	706	ACME	TUG	No	No
LGB-OP16-010	BELT LOADER	Belt Loader		Electric	1999		--	706	ACME	TUG	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP16-011	BELT LOADER	Belt Loader		Electric	2000		--	706	ACME	TUG	No	No
LGB-OP16-012	CARGO TRACTOR	Cargo Tractor		Electric	1999		--	1,114	ATGOE	TUG	No	No
LGB-OP16-013	CARGO TRACTOR	Cargo Tractor		Electric	1999		--	1,114	ATGOE	TUG	No	No
LGB-OP16-014	CARGO TRACTOR	Cargo Tractor		Electric	1999		--	1,114	ATGOE	TUG	No	No
LGB-OP16-015	CARGO TRACTOR	Cargo Tractor		Electric	2000		--	1,114	ATGOE	TUG	No	No
LGB-OP16-016	CARGO TRACTOR	Cargo Tractor		Electric	2000		--	1,114	ATGOE	TUG	No	No
LGB-OP16-017	CARGO TRACTOR	Cargo Tractor		Electric	2000		--	1,114	ATGOE	TUG	No	No
LGB-OP16-018	CARGO TRACTOR	Cargo Tractor		Electric	2000		--	1,114	ATGOE	TUG	No	No
LGB-OP16-019	CARGO LOADER	Cargo Loader		Gasoline	2015		--	556	AL220	TLD	No	No
LGB-OP16-020	RAMP PICKUP TRUCK	Service Truck		Gasoline	2017		--	883	APK22	FORD	No	Yes
LGB-OP16-021	Ground Power Unit	Ground Power Unit		Diesel	2007	155	Tier 3	798	PERP-ATCM	148,832	No	No
LGB-OP16-022	Ground Power Unit	Ground Power Unit		Diesel	2010	155	Tier 3	798	PERP-ATCM	157,623	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP16-023	Air Start	Air Start Unit		Diesel	2019	400	Tier 4	79	PERP-ATCM	190,624	No	No
LGB-OP17-001	A/C Cart	Air Conditioner		Diesel	2006	72	Tier 2	293	TLD	ACE-302-H-CUP	No	No
LGB-OP17-002	A/C Cart	Air Conditioner		Electric	2011	72	--	293	TLD	ACE-H-302-EMP	No	No
LGB-OP17-003	A/C Cart	Air Conditioner		Electric	2011	72	--	293	TLD	ACE-H-302-EMP	No	No
LGB-OP17-004	A/C Cart	Air Conditioner		Electric	2011	72	--	293	TLD	ACE-H-302-EMP	No	No
LGB-OP17-005	A/C Cart	Air Conditioner		Electric	2011	72	--	293	TLD	ACE-H-302-EMP	No	No
LGB-OP17-006	A/C Cart	Air Conditioner		Electric	2011	72	--	293	TLD	ACE-H-302-EMP	No	No
LGB-OP17-007	Air Start Cart	Air Start Unit		Diesel	2016		Tier 4	59	TLD	ASU-600-180-CUP	No	No
LGB-OP17-008	Baggage Tug	Baggage Tug		Electric	2003	40	--	635	Stewart & Stevenson / Tug	MX4-45	No	No
LGB-OP17-009	Baggage Tug	Baggage Tug		Electric	2003	40	--	635	Stewart & Stevenson / Tug	MX4-45	No	No
LGB-OP17-010	Baggage Tug	Baggage Tug		Electric	2003	40	--	635	Stewart & Stevenson / Tug	MX4-45	No	No
LGB-OP17-011	Baggage Tug	Baggage Tug		Electric	2003	40	--	635	Stewart & Stevenson / Tug	MX4-45	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP17-012	Baggage Tug	Baggage Tug		Electric	2017	40	--	635	TUG Technologies	MX4-45	No	No
LGB-OP17-013	Baggage Tug	Baggage Tug		Electric	2003	40	--	635	Stewart & Stevenson / Tug	MX4-45	No	No
LGB-OP17-014	Baggage Tug	Baggage Tug		Electric	2003	40	--	635	Stewart & Stevenson / Tug	MX4-45	No	No
LGB-OP17-015	Baggage Tug	Baggage Tug		Electric	2003	40	--	635	Stewart & Stevenson / Tug	MX4-45	No	No
LGB-OP17-016	Baggage Tug	Baggage Tug		Gasoline	2001		--	635	Stewart & Stevenson / Tug	M1A-40	No	No
LGB-OP17-017	Baggage Tug	Baggage Tug		Gasoline	2001		--	635	Stewart & Stevenson / Tug	M1A-40	No	No
LGB-OP17-018	Baggage Tug	Baggage Tug		Gasoline	2002	150	--	635	Tiger	TIG-30	No	No
LGB-OP17-019	Baggage Tug	Baggage Tug		Gasoline	2002	150	--	635	Tiger	TIG-30	No	No
LGB-OP17-020	Baggage Tug	Baggage Tug		Gasoline	2002	150	--	635	Tiger	TIG-30	No	No
LGB-OP17-021	Baggage Tug	Baggage Tug		Gasoline	2002	150	--	635	Tiger	TIG-30	No	No
LGB-OP17-022	Belt Loader	Belt Loader		Diesel	2001	53	Tier 1	530	Stewart & Stevenson / Tug	660 14 1	No	No
LGB-OP17-023	Belt Loader	Belt Loader		Gasoline	2003		--	530	Tiger	BL2000	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP17-024	Belt Loader	Belt Loader		Gasoline	2003		--	530	Tiger	BL2000	No	No
LGB-OP17-025	Belt Loader	Belt Loader		Electric	2000		--	530	Stewart & Stevenson / Tug	660 E	No	No
LGB-OP17-026	Belt Loader	Belt Loader		Electric	2000		--	530	Stewart & Stevenson / Tug	660 E	No	No
LGB-OP17-027	Belt Loader	Belt Loader		Electric	2000		--	530	Stewart & Stevenson / Tug	660 E	No	No
LGB-OP17-028	Belt Loader	Belt Loader		Electric	2000		--	530	Stewart & Stevenson / Tug	660 E	No	No
LGB-OP17-029	Belt Loader	Belt Loader		Diesel	2001	53	Tier 1	530	Stewart & Stevenson / Tug	660 14 1	No	No
LGB-OP17-030	Belt Loader	Belt Loader		Electric	2001		--	530	Stewart & Stevenson / Tug	660 E	No	No
LGB-OP17-031	Belt Loader	Belt Loader		Electric	2001		--	530	Stewart & Stevenson / Tug	660 E	No	No
LGB-OP17-032	Belt Loader	Belt Loader		Diesel	2001		Tier 1	530	Stewart & Stevenson / Tug	660 14 1	No	No
LGB-OP17-033	Belt Loader	Belt Loader		Diesel	2001		Tier 1	530	Stewart & Stevenson / Tug	660 14 1	No	No
LGB-OP17-034	Belt Loader	Belt Loader		Electric	2017		--	530	TUG Technologies	660E-AC	No	No
LGB-OP17-035	Belt Loader	Belt Loader		Electric	2017		--	530	TUG Technologies	660E-AC	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP17-036	Belt Loader	Belt Loader		Electric	2017		--	530	TUG Technologies	660E-AC	No	No
LGB-OP17-037	Belt Loader	Belt Loader		Electric	2017		--	530	TUG Technologies	660E-AC	No	No
LGB-OP17-038	Belt Loader	Belt Loader		Electric	2017		--	530	TUG Technologies	660E-AC	No	No
LGB-OP17-039	Electric GPU	Ground Power Unit		Electric	2001		--	599	Hobart	900SX200	No	No
LGB-OP17-040	Electric GPU	Ground Power Unit		Electric	2001		--	599	Hobart	900SX200	No	No
LGB-OP17-041	Electric GPU	Ground Power Unit		Electric	2001		--	599	Hobart	900SX200	No	No
LGB-OP17-042	Electric GPU	Ground Power Unit		Electric	2001		--	599	Hobart	900SX200	No	No
LGB-OP17-043	Electric GPU	Ground Power Unit		Electric	2018		--	599	ITW GSE CE 2400	3GWF-200/260N	No	No
LGB-OP17-044	Electric GPU	Ground Power Unit		Electric	2018		--	599	ITW GSE CE 2400	3GWF-200/260N	No	No
LGB-OP17-045	Electric GPU	Ground Power Unit		Electric	2018		--	599	ITW GSE CE 2400	3GWF-200/260N	No	No
LGB-OP17-046	Electric Tug	A/C Tug Narrow Body		Electric	2003		--	289	Stewart & Stevenson / Tug	MX4-45	No	No
LGB-OP17-047	Forklift	Forklift		Electric	2001		--	443	Toyota	7FBH15	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP17-048	Forklift	Forklift		Electric	2001		--	443	Toyota	5FBE20	No	No
LGB-OP17-049	Forklift	Forklift		Diesel	2006		Tier 2	443	TCM	FD100-9	No	No
LGB-OP17-050	Golf Cart	Cart		Gasoline	2003		--	114	EZ-GO	Workhorse ST-480	No	No
LGB-OP17-051	Golf Cart	Cart		Gasoline	2003		--	114	EZ-GO	Workhorse ST-480	No	No
LGB-OP17-052	Golf Cart	Cart		Gasoline	2006		--	114	EZ-GO	Workhorse ST-480	No	No
LGB-OP17-053	Golf Cart	Cart		Electric	2012		--	114	Club Car	JL Carryall 252	No	No
LGB-OP17-054	Golf Cart	Cart		Electric	2012		--	114	Club Car	JL Carryall 252	No	No
LGB-OP17-055	GPU	Ground Power Unit		Diesel	2004	93	Tier 2	599	Stewart & Stevenson / Davco	GPU 400/100 TIER II	No	No
LGB-OP17-056	Lavatory Cart	Lav Cart		Gasoline	2005		--	113	Phoenix Metal Products	LC250/150	No	No
LGB-OP17-057	Lavatory Truck	Lav Truck		Gasoline	2016	300	--	869	Phoenix Metal Products / Isuzu	TL600 / NPR	No	No
LGB-OP17-058	Lift Truck	Lift		Diesel	2015		Tier 4	293	NMC Wollard	TML-704	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP17-059	Pickup	Service Truck		Gasoline	2017		--	662	Ford	F150	No	Yes
LGB-OP17-060	Push Back Lektro	A/C Tug Narrow Body		Electric	2016	58	--	289	Lektro	AP8950SDB	No	No
LGB-OP17-061	Push Back Lektro	A/C Tug Narrow Body		Electric	2016	58	--	289	Lektro	AP8950SDB	No	No
LGB-OP17-062	Push Back Tug	A/C Tug Narrow Body		Diesel	2006		Tier 2	289	TUG Technologies	GT35A	No	No
LGB-OP17-063	Push Back Tug	A/C Tug Narrow Body		Diesel	2001	74	Tier 1	289	Stewart & Stevenson / Tug	GT35A	No	No
LGB-OP17-064	Push Back Tug	A/C Tug Narrow Body		Diesel	2001	74	Tier 1	289	Stewart & Stevenson / Tug	GT35A	No	No
LGB-OP17-065	Push Back Tug	A/C Tug Narrow Body		Diesel	2002		Tier 1	289	Stewart & Stevenson / Tug	GT35A	No	No
LGB-OP17-066	Snorkle	Lift		Diesel	2002		Tier 1	293	Upright	SB-60 D	No	No
LGB-OP17-067	Stair Truck	Passenger Stand		Diesel	2002	53	Tier 1	103	NMC Wollard	CMPS170 (TLPH310E)	No	No
LGB-OP17-068	Stair Truck	Passenger Stand		Diesel	2002		Tier 1	103	NMC Wollard	CMPS170 (TLPH310E)	No	No
LGB-OP17-069	Stair Truck	Passenger Stand		Diesel	2005	53	Tier 2	103	NMC Wollard	CMPS170 (TLPH310E)	No	No
LGB-OP17-070	Stair Truck	Passenger Stand		Diesel	2003	53	Tier 1	103	NMC Wollard	CMPS170 (TLPH310E)	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP17-071	Van	Service Truck		Gasoline	2018		--	662	Ford	Transit Connect	No	Yes
LGB-OP17-072	Water Cart	Water Truck		Gasoline	2005		--	233	Phoenix Metal Products	WC400	No	No
LGB-OP17-073	Water Truck	Water Truck		Gasoline	2017		--	233	Phoenix Metal Products / Isuzu	Isuzu NPR	No	No
LGB-OP17-074	GOLF CART	Cart		Electric	2002		--	114	GO-7936	JN6-229711	No	No
LGB-OP17-075	GOLF CART	Cart		Diesel	2012		Tier 4	114	GO-7947	QE1204-257755	No	No
LGB-OP17-076	LIGHT CART	Cart		Diesel	2002		Tier 1	114	LC-01	MLT4060	No	No
LGB-OP17-077	LIGHT CART	Cart		Diesel	2002		Tier 1	114	LC-04	MLT4060	No	No
LGB-OP17-078	PICK UP	Service Truck		Gasoline	2008		--	662	IPD-7843	F-150	No	Yes
LGB-OP17-079	MAIL TRUCK	Other GSE		Gasoline	2006		--	309	MT-7216	NPR16 ? Box Truck	No	Yes
LGB-OP17-080	WHEEL CHAIR LIFT	Passenger Stand		Electric	2002		--	103	CL-0015	WO-23-154	No	No
LGB-OP17-081	WHEEL CHAIR LIFT	Passenger Stand		Electric	2002		--	103	CL-0025	WO-23-154	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP17-082	GPU	Ground Power Unit		Diesel	2005		Tier 2	599		GPU-4090-E-CUP	No	No
LGB-OP18-001	BAG TUG	Baggage Tug		Gasoline	2019		--	846		A&V	No	No
LGB-OP18-002	BAG TUG	Baggage Tug		Gasoline	2019		--	846		A&V	No	No
LGB-OP18-003	BAG TUG	Baggage Tug		Gasoline	2019		--	846		A&v	No	No
LGB-OP18-004	BAG TUG	Baggage Tug		Gasoline	2019		--	846		A&V	No	No
LGB-OP18-005	AIR START	Air Start Unit		Diesel	2014		Tier 4i	79		Tug	No	No
LGB-OP18-006	BELT LOADER	Belt Loader		Gasoline	2019		--	706		Tug	No	No
LGB-OP18-007	BELT LOADER	Belt Loader		Gasoline	2019		--	706		Tug	No	No
LGB-OP18-008	GROUND POWER	Ground Power Unit		Diesel	2007	230	Tier 3	798			No	No
LGB-OP18-009	PUSHBAC K TRACTOR	A/C Tug Narrow Body		Diesel	2019		Tier 4	385		tug	No	No
LGB-OP18-010	PUSHBAC K TRACTOR	A/C Tug Narrow Body		Diesel	2020		Tier 4	385		Eagle	No	No
LGB-OP19-001	Belt Loader	Belt Loader		Gasoline	1972	120	--	200	Cochran-Western	701	Yes	Yes

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP19-002	Belt Loader	Belt Loader		Gasoline	1980	120	--	200	Cochran-Western	702	Yes	Yes
LGB-OP19-003	Belt Loader	Belt Loader		Gasoline	2015	140	--	200	TUG Inc	777	Yes	Yes
LGB-OP19-004	Stair Truck	Passenger Stand		Gasoline	2001	140	--	200	Wollard	810	Yes	Yes
LGB-OP19-005	Stair Truck	Passenger Stand		Gasoline	2008	140	--	200	Wollard	811	Yes	Yes
LGB-OP19-006	Stair Truck	Passenger Stand		Gasoline	2010	140	--	200	Stinar	812	Yes	Yes
LGB-OP19-007	Tug	A/C Tug Narrow Body		Gasoline	1998	140	--	200	Jet Line	935	Yes	Yes
LGB-OP19-008	Motor Stairs	Passenger Stand		Gasoline	1972	16	--	200	Skyramp	897	Yes	No
LGB-OP20-001	AIR CONDITIONING	Air Conditioner		Diesel	2016	82	Tier 4	200	Air Conditioning Cart	TUG	Yes	No
LGB-OP20-002	BAG TUG	Baggage Tug		Gasoline	2016	76	--	846	Bag Tug	TUG	No	No
LGB-OP20-003	BAG TUG	Baggage Tug		Gasoline	2016	76	--	846	Bag Tug	TUG	No	No
LGB-OP20-004	BELT LOADER	Belt Loader		Gasoline	2016	76	--	706	Belt Loader	TUG	No	No
LGB-OP20-005	BELT LOADER	Belt Loader		Gasoline	2018	76	--	706	Belt Loader	TUG	No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP20-006	BELT LOADER	Belt Loader		Gasoline	2018	76	--	706	Belt Loader	TUG	No	No
LGB-OP20-007	GPU	Ground Power Unit		Diesel	2018	94	Tier 4	798	GPU	TLD	No	No
LGB-OP20-008	PUSHBAC K	A/C Tug Narrow Body		Diesel	2016	94	Tier 4	385	PushBack	TLD	No	No
LGB-OP20-009	Ground Power Unit	Ground Power Unit		Diesel	2014	86	Tier 4i	798	PERP-ATCM	168,615	No	No
LGB-OP20-010	Aircraft Tractor	A/C Tug Narrow Body		Diesel	2014	86	Tier 4i	96	Aircraft Tractor	TLD	No	No
LGB-OP21-001	Pushback Tractor	A/C Tug Narrow Body		Gasoline			--	385			No	No
LGB-OP21-002	Pushback Tractor	A/C Tug Narrow Body		Gasoline			--	385			No	No
LGB-OP21-003	Baggage Tug	Baggage Tug		Electric			--	846			No	No
LGB-OP21-004	Baggage Tug	Baggage Tug		Electric			--	846			No	No
LGB-OP21-005	Baggage Tug	Baggage Tug		Electric			--	846			No	No
LGB-OP21-006	Baggage Tug	Baggage Tug		Electric			--	846			No	No
LGB-OP21-007	Baggage Tug	Baggage Tug		Gasoline			--	846			No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP21-008	Belt Loader	Belt Loader		Electric			--	706			No	No
LGB-OP21-009	Belt Loader	Belt Loader		Electric			--	706			No	No
LGB-OP21-010	Belt Loader	Belt Loader		Electric			--	706			No	No
LGB-OP21-011	Belt Loader	Belt Loader		Electric			--	706			No	No
LGB-OP21-012	Ground Power Unit	Ground Power Unit		Gasoline			--	798			No	No
LGB-OP21-013	Ground Power Unit	Ground Power Unit		Gasoline			--	798			No	No
LGB-OP21-014	Air Start	Air Start Unit		Gasoline			--	79			No	No
LGB-OP22-001	Belt Loader	Belt Loader		Gasoline	1980		--	177			No	No
LGB-OP22-002	Belt Loader	Belt Loader		Gasoline	1980		--	177			No	No
LGB-OP22-003	Ground Power Unit	Ground Power Unit		Diesel	1999	165	≤ Tier 1	200			No	No
LGB-OP22-004	Air Start	Air Start Unit		Diesel	2007	630	Tier 3	20			No	No
LGB-OP22-005	Aircraft Tractor	A/C Tug Narrow Body		Diesel	2008	200	Tier 3	96			No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP22-006	Cargo Tractor	Cargo Tractor		Gasoline	2008	75	--	279			No	No
LGB-OP22-007	Cargo Tractor	Cargo Tractor		Gasoline	2008	75	--	279			No	No
LGB-OP22-008	Cargo Tractor	Cargo Tractor		Gasoline	2008	75	--	279			No	No
LGB-OP22-009	Cargo Tractor	Cargo Tractor		Gasoline	2008	75	--	279			No	No
LGB-OP22-010	Cargo Tractor	Cargo Tractor		Gasoline	2008	75	--	279			No	No
LGB-OP22-011	Fork Lift	Forklift		LPG/Propane	2009	59	--	148			No	No
LGB-OP22-012	Cargo Loader	Cargo Tractor		Diesel	2009	160	Tier 3	279			No	No
LGB-OP22-013	Cargo Loader	Cargo Tractor		Diesel	2010	110	Tier 3	279			No	No
LGB-OP22-014	Cargo Loader	Cargo Tractor		Diesel	2011	160	Tier 3	279			No	No
LGB-OP22-015	Ground Power Unit	Ground Power Unit		Diesel	2011	155	Tier 3	200			No	No
LGB-OP22-016	Cargo Tractor	Cargo Tractor		Diesel	2012	65	Tier 4i	279			No	No
LGB-OP22-017	Cargo Loader	Cargo Loader		Diesel	2017	74	Tier 4	139			No	No

Airport GSE ID	Reported Type	Emissions Designation	Activity Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
LGB-OP22-018	Cargo Tractor	Cargo Tractor		Gasoline	2018	86	--	279			No	No
LGB-OP22-019	Cargo Tractor	Cargo Tractor		Gasoline	2018	86	--	279			No	No

Notes: Reported Type, Fuel Type, Engine Model Year, Power Rating, Vehicle Description, Vehicle Manufacture, Low Use Designation, and On-Road Equivalent Engine data are provided directly by airport GSE operators. A unit's Emissions Designation is the representative emissions unit from the EMFAC2017 or OFFROAD2017 models from which a unit's emission rates are derived. A unit's Activity Designation is the representative activity unit from the OFFROAD2017 model from which a unit's activity is derived. A unit's Airport GSE ID is a unique ID assigned by the airport for tracking and identification of the unit in subsequent years.

MOU SCHEDULE NO. 1 – III.B.2. List of Sold, Retired, or Relocated Equipment

For non-zero emission ground support equipment subject to this GSE measure, information regarding the sale or retirement of equipment available through CARB's DOORS system and, for pre-Tier 4 diesel, pre-2010 gasoline, or pre-2010 LPG ground support equipment relocated from LGB to another airport within the South Coast Air Basin, identify: a) the airport to which equipment is relocated, b) date of relocation, and c) estimated projected usage hours.

On January 15, 2020, Southwest Airlines sold a single Stewart Stevenson GT1628 diesel aircraft tug (EIN SW6P98). The vehicle was sold to a Canadian GSE Operator and is no longer in operation in the South Coast Air Basin (SCAB).

On April 10, 2020, FedEx suspended operations at Long Beach Airport. FedEx did not respond to inquiries for GSE operated at Long Beach prior to this suspension of operations. Additionally, during the 2017 MOU process, GSE belonging to FedEx was aggregated by Airlines 4 America (A4A) in their provided data set and was not explicitly identifiable. With the data available, it is not possible to determine the equipment operated by FedEx at Long Beach Airport from January to April 2020, nor determine if the equipment was scrapped, retired, or moved to another local airport upon FedEx's departure.

In June 2020, Ross Aviation sold a diesel fuel truck to a company based out of Texas which is no longer in operation in the SCAB. In mid-2020, Ross aviation scrapped a Hobart AC 90 GPU. In November 2020, Ross aviation transferred a Hobart Jet Ex GPU from BUR to Scottsdale (SDL) airport.

In August 2020, Signature Flight Support transferred a 174HP engine year 2000 diesel refueled truck from LGB to Van Nuys (VNY) airport. In September, an LSI tow and it is unclear whether the unit will remain in use in the SCAB.

On October 7, 2020, JetBlue Airways ceased operations at Long Beach Airport. The following equipment, owned and operated by JetBlue Airways, also ceased operation at the airport at that time. The annual activities for these units, presented in the *MOU Schedule No. 1 – III.B.1. List of Ground Support Equipment* table, and in the table below, are prorated to account for this mid-year departure. It is assumed that the outgoing equipment was transferred to another airport within the SCAB although JetBlue has not yet confirmed this.

No other equipment was identified as having been retired, scrapped, or sold in the reporting year.

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designated Low Use	On-Road Equivalent Engine	Vehicle Location
LGB-OP17-001	A/C Cart	TLD	ACE-302-H-CUP	Diesel	2006	72	No	No	mothballed at lgb
LGB-OP17-002	A/C Cart	TLD	ACE-H-302-EMP	Electric	2011	72	No	No	mothballed at lgb
LGB-OP17-003	A/C Cart	TLD	ACE-H-302-EMP	Electric	2011	72	No	No	mothballed at lgb
LGB-OP17-004	A/C Cart	TLD	ACE-H-302-EMP	Electric	2011	72	No	No	mothballed at lgb
LGB-OP17-005	A/C Cart	TLD	ACE-H-302-EMP	Electric	2011	72	No	No	mothballed at lgb
LGB-OP17-006	A/C Cart	TLD	ACE-H-302-EMP	Electric	2011	72	No	No	mothballed at lgb
LGB-OP17-007	Air Start Cart	TLD	ASU-600-180-CUP	Diesel	2016		No	No	transferred to lax (10/2020)
LGB-OP17-008	Baggage Tug	Stewart & Stevenson / Tug	MX4-45	Electric	2003	40	No	No	transferred to lax (10/2020)
LGB-OP17-009	Baggage Tug	Stewart & Stevenson / Tug	MX4-45	Electric	2003	40	No	No	mothballed at lgb
LGB-OP17-010	Baggage Tug	Stewart & Stevenson / Tug	MX4-45	Electric	2003	40	No	No	transferred to lax (10/2020)
LGB-OP17-011	Baggage Tug	Stewart & Stevenson / Tug	MX4-45	Electric	2003	40	No	No	transferred to lax (10/2020)

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designated Low Use	On-Road Equivalent Engine	Vehicle Location
LGB-OP17-012	Baggage Tug	TUG Technologies	MX4-45	Electric	2017	40	No	No	transferred to lax (10/2020)
LGB-OP17-013	Baggage Tug	Stewart & Stevenson / Tug	MX4-45	Electric	2003	40	No	No	transferred to lax (10/2020)
LGB-OP17-014	Baggage Tug	Stewart & Stevenson / Tug	MX4-45	Electric	2003	40	No	No	transferred to lax (10/2020)
LGB-OP17-015	Baggage Tug	Stewart & Stevenson / Tug	MX4-45	Electric	2003	40	No	No	mothballed at lgb
LGB-OP17-016	Baggage Tug	Stewart & Stevenson / Tug	M1A-40	Gasoline	2001		No	No	mothballed at lgb
LGB-OP17-017	Baggage Tug	Stewart & Stevenson / Tug	M1A-40	Gasoline	2001		No	No	mothballed at lgb
LGB-OP17-018	Baggage Tug	Tiger	TIG-30	Gasoline	2002	150	No	No	transferred to lax (10/2020)
LGB-OP17-019	Baggage Tug	Tiger	TIG-30	Gasoline	2002	150	No	No	transferred to lax (10/2020)
LGB-OP17-020	Baggage Tug	Tiger	TIG-30	Gasoline	2002	150	No	No	transferred to lax (10/2020)
LGB-OP17-021	Baggage Tug	Tiger	TIG-30	Gasoline	2002	150	No	No	transferred to lax (10/2020)
LGB-OP17-022	Belt Loader	Stewart & Stevenson / Tug	660 14 1	Diesel	2001	53	No	No	transferred to lax (10/2020)
LGB-OP17-023	Belt Loader	Tiger	BL2000	Gasoline	2003		No	No	mothballed at lgb

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designated Low Use	On-Road Equivalent Engine	Vehicle Location
LGB-OP17-024	Belt Loader	Tiger	BL2000	Gasoline	2003		No	No	mothballed at lgb
LGB-OP17-025	Belt Loader	Stewart & Stevenson / Tug	660 E	Electric	2000		No	No	mothballed at lgb
LGB-OP17-026	Belt Loader	Stewart & Stevenson / Tug	660 E	Electric	2000		No	No	mothballed at lgb
LGB-OP17-027	Belt Loader	Stewart & Stevenson / Tug	660 E	Electric	2000		No	No	mothballed at lgb
LGB-OP17-028	Belt Loader	Stewart & Stevenson / Tug	660 E	Electric	2000		No	No	mothballed at lgb
LGB-OP17-029	Belt Loader	Stewart & Stevenson / Tug	660 14 1	Diesel	2001	53	No	No	mothballed at lgb
LGB-OP17-030	Belt Loader	Stewart & Stevenson / Tug	660 E	Electric	2001		No	No	mothballed at lgb
LGB-OP17-031	Belt Loader	Stewart & Stevenson / Tug	660 E	Electric	2001		No	No	mothballed at lgb
LGB-OP17-032	Belt Loader	Stewart & Stevenson / Tug	660 14 1	Diesel	2001		No	No	transferred out of basin (10/2020)
LGB-OP17-033	Belt Loader	Stewart & Stevenson / Tug	660 14 1	Diesel	2001		No	No	transferred out of basin (10/2020)
LGB-OP17-034	Belt Loader	TUG Technologies	660E-AC	Electric	2017		No	No	transferred to lax (10/2020)
LGB-OP17-035	Belt Loader	TUG Technologies	660E-AC	Electric	2017		No	No	transferred to lax (10/2020)

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designated Low Use	On-Road Equivalent Engine	Vehicle Location
LGB-OP17-036	Belt Loader	TUG Technologies	660E-AC	Electric	2017		No	No	mothballed at lgb
LGB-OP17-037	Belt Loader	TUG Technologies	660E-AC	Electric	2017		No	No	transferred to lax (10/2020)
LGB-OP17-038	Belt Loader	TUG Technologies	660E-AC	Electric	2017		No	No	transferred to lax (10/2020)
LGB-OP17-039	Electric GPU	Hobart	900SX200	Electric	2001		No	No	mothballed at lgb
LGB-OP17-040	Electric GPU	Hobart	900SX200	Electric	2001		No	No	mothballed at lgb
LGB-OP17-041	Electric GPU	Hobart	900SX200	Electric	2001		No	No	mothballed at lgb
LGB-OP17-042	Electric GPU	Hobart	900SX200	Electric	2001		No	No	mothballed at lgb
LGB-OP17-043	Electric GPU	ITW GSE CE 2400	3GWF-200/260N	Electric	2018		No	No	mothballed at lgb
LGB-OP17-044	Electric GPU	ITW GSE CE 2400	3GWF-200/260N	Electric	2018		No	No	mothballed at lgb
LGB-OP17-045	Electric GPU	ITW GSE CE 2400	3GWF-200/260N	Electric	2018		No	No	mothballed at lgb
LGB-OP17-046	Electric Tug	Stewart & Stevenson / Tug	MX4-45	Electric	2003		No	No	mothballed at lgb
LGB-OP17-047	Forklift	Toyota	7FBH15	Electric	2001		No	No	transferred to lax (10/2020)

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designated Low Use	On-Road Equivalent Engine	Vehicle Location
LGB-OP17-048	Forklift	Toyota	5FBE20	Electric	2001		No	No	transferred to lax (10/2020)
LGB-OP17-049	Forklift	TCM	FD100-9	Diesel	2006		No	No	transferred to lax (10/2020)
LGB-OP17-050	Golf Cart	EZ-GO	Workhorse ST-480	Gasoline	2003		No	No	mothballed at lgb
LGB-OP17-051	Golf Cart	EZ-GO	Workhorse ST-480	Gasoline	2003		No	No	mothballed at lgb
LGB-OP17-052	Golf Cart	EZ-GO	Workhorse ST-480	Gasoline	2006		No	No	mothballed at lgb
LGB-OP17-053	Golf Cart	Club Car	JL Carryall 252	Electric	2012		No	No	mothballed at lgb
LGB-OP17-054	Golf Cart	Club Car	JL Carryall 252	Electric	2012		No	No	mothballed at lgb
LGB-OP17-055	GPU	Stewart & Stevenson / Davco	GPU 400/100 TIER II	Diesel	2004	93	No	No	transferred to lax (10/2020)
LGB-OP17-056	Lavatory Cart	Phoenix Metal Products	LC250/150	Gasoline	2005		No	No	mothballed at lgb
LGB-OP17-057	Lavatory Truck	Phoenix Metal Products / Isuzu	TL600 / NPR	Gasoline	2016	300	No	No	transferred to lax (10/2020)
LGB-OP17-058	Lift Truck	NMC Wollard	TML-704	Diesel	2015		No	No	transferred to lax (10/2020)

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designated Low Use	On-Road Equivalent Engine	Vehicle Location
LGB-OP17-059	Pickup	Ford	F150	Gasoline	2017		No	Yes	transferred to lax (10/2020)
LGB-OP17-060	Push Back Lektro	Lektro	AP8950SDB	Electric	2016	58	No	No	transferred to lax (10/2020)
LGB-OP17-061	Push Back Lektro	Lektro	AP8950SDB	Electric	2016	58	No	No	transferred to lax (10/2020)
LGB-OP17-062	Push Back Tug	TUG Technologies	GT35A	Diesel	2006		No	No	mothballed at lgb
LGB-OP17-063	Push Back Tug	Stewart & Stevenson / Tug	GT35A	Diesel	2001	74	No	No	mothballed at lgb
LGB-OP17-064	Push Back Tug	Stewart & Stevenson / Tug	GT35A	Diesel	2001	74	No	No	transferred to lax (10/2020)
LGB-OP17-065	Push Back Tug	Stewart & Stevenson / Tug	GT35A	Diesel	2002		No	No	mothballed at lgb
LGB-OP17-066	Snorkle	Upright	SB-60 D	Diesel	2002		No	No	transferred to lax (10/2020)
LGB-OP17-067	Stair Truck	NMC Wollard	CMPS170 (TLPH310E)	Diesel	2002	53	No	No	mothballed at lgb
LGB-OP17-068	Stair Truck	NMC Wollard	CMPS170 (TLPH310E)	Diesel	2002		No	No	mothballed at lgb
LGB-OP17-069	Stair Truck	NMC Wollard	CMPS170 (TLPH310E)	Diesel	2005	53	No	No	mothballed at lgb
LGB-OP17-070	Stair Truck	NMC Wollard	CMPS170 (TLPH310E)	Diesel	2003	53	No	No	transferred to lax (10/2020)

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designated Low Use	On-Road Equivalent Engine	Vehicle Location
LGB-OP17-071	Van	Ford	Transit Connect	Gasoline	2018		No	Yes	transferred to lax (10/2020)
LGB-OP17-072	Water Cart	Phoenix Metal Products	WC400	Gasoline	2005		No	No	mothballed at lgb
LGB-OP17-073	Water Truck	Phoenix Metal Products / Isuzu	Isuzu NPR	Gasoline	2017		No	No	transferred to lax (10/2020)
LGB-OP17-074	GOLF CART	GO-7936	JN6-229711	Electric	2002		No	No	mothballed at lgb
LGB-OP17-075	GOLF CART	GO-7947	QE1204-257755	Diesel	2012		No	No	mothballed at lgb
LGB-OP17-076	LIGHT CART	LC-01	MLT4060	Diesel	2002		No	No	mothballed at lgb
LGB-OP17-077	LIGHT CART	LC-04	MLT4060	Diesel	2002		No	No	mothballed at lgb
LGB-OP17-078	PICK UP	IPD-7843	F-150	Gasoline	2008		No	Yes	mothballed at lgb
LGB-OP17-079	MAIL TRUCK	MT-7216	NPR16 ? Box Truck	Gasoline	2006		No	Yes	mothballed at lgb
LGB-OP17-080	WHEEL CHAIR LIFT	CL-0015	WO-23-154	Electric	2002		No	No	mothballed at lgb
LGB-OP17-081	WHEEL CHAIR LIFT	CL-0025	WO-23-154	Electric	2002		No	No	mothballed at lgb

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designated Low Use	On-Road Equivalent Engine	Vehicle Location
LGB-OP17-082	GPU		GPU-4090-E-CUP	Diesel	2005		No	No	transferred to lax (10/2020)
LGB-OP22-001	Belt Loader			Gasoline	1,980		No	No	retired 8/12/2020
LGB-OP22-002	Belt Loader			Gasoline	1,980		No	No	retired 8/12/2020
LGB-OP22-003	Ground Power Unit			Diesel	1,999	165	No	No	transferred out of basin (04/2020)
LGB-OP22-004	Air Start			Diesel	2,007	630	No	No	transferred to ont (04/2020)
LGB-OP22-005	Aircraft Tractor			Diesel	2,008	200	No	No	transferred to ont (04/2020)
LGB-OP22-006	Cargo Tractor			Gasoline	2,008	75	No	No	transferred to lax (04/2020)
LGB-OP22-007	Cargo Tractor			Gasoline	2,008	75	No	No	transferred to ont (04/2020)
LGB-OP22-008	Cargo Tractor			Gasoline	2,008	75	No	No	transferred to ont (04/2020)
LGB-OP22-009	Cargo Tractor			Gasoline	2,008	75	No	No	transferred to ont (04/2020)
LGB-OP22-010	Cargo Tractor			Gasoline	2,008	75	No	No	transferred to ont (04/2020)
LGB-OP22-011	Fork Lift			LPG/ Propane	2,009	59	No	No	transferred out of basin (04/2020)

Airport GSE ID	Reported Type	Vehicle Description	Vehicle Manufacture	Fuel Type	Engine Model Year	Power Rating	Designa ted Low Use	On-Road Equivalent Engine	Vehicle Location
LGB- OP22- 012	Cargo Loader			Diesel	2,009	160	No	No	transferred out of basin (04/2020)
LGB- OP22- 013	Cargo Loader			Diesel	2,010	110	No	No	transferred to ont (04/2020)
LGB- OP22- 014	Cargo Loader			Diesel	2,011	160	No	No	transferred to lax (04/2020)
LGB- OP22- 015	Ground Power Unit			Diesel	2,011	155	No	No	transferred out of basin (04/2020)

MOU SCHEDULE NO. 1 – III.B.3. Emission Inventory

An annual emission inventory for all ground support equipment associated with commercial operations at LGB, including methodology and calculations.

Fleet Mix					Emissions (tons per year; metric tons for CO ₂ e)							
Total	Electric	Diesel	Gas	Other	CO	ROG	NO _x	PM ₁₀	PM _{2.5}	SO _x	CO ₂ e	
305	109	105	76	15	43.4	3.2	16.2	0.46	0.40	0.01	2,551	

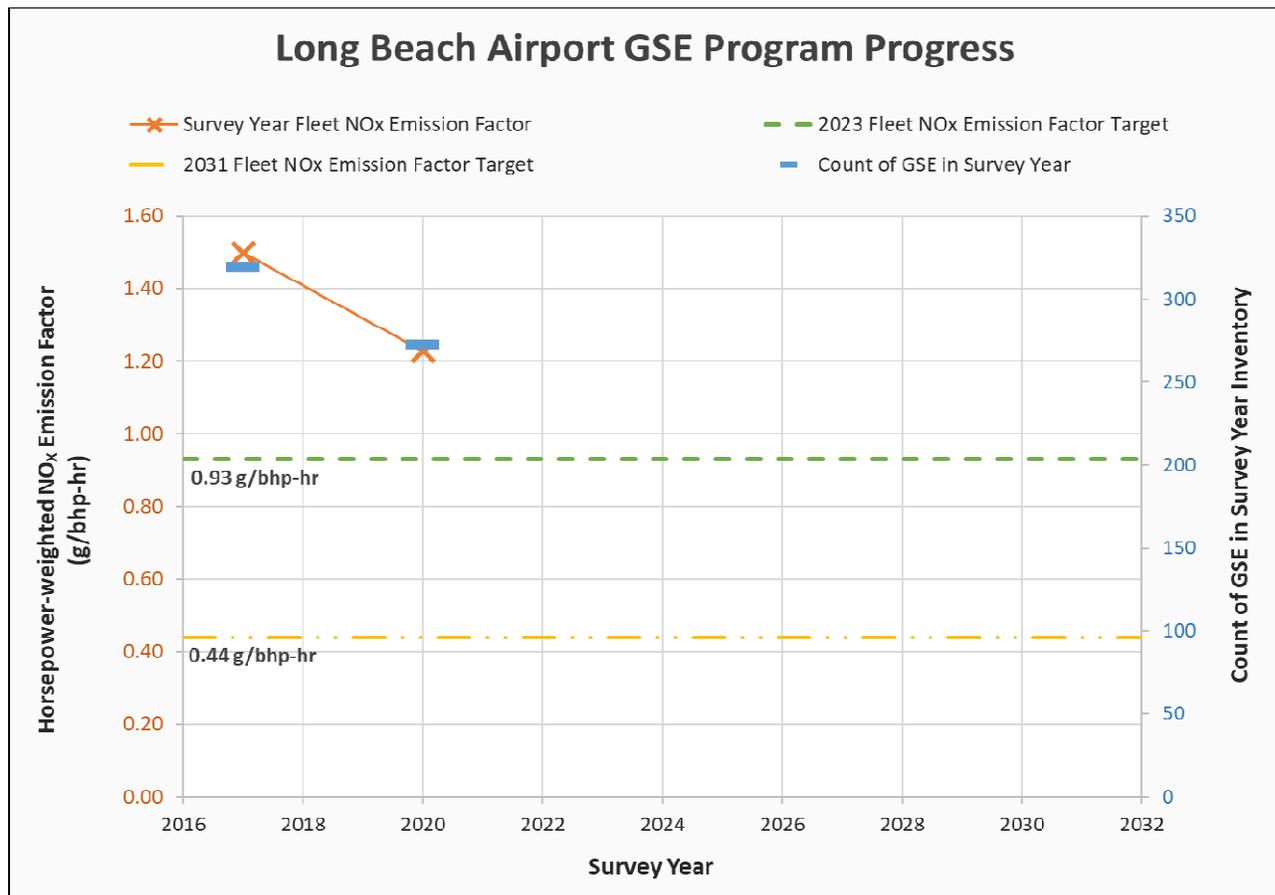
Notes: Emissions and equipment counts include equipment operated at Long Beach Airport for at least part of 2020.

Fleet average NO_x emission factor:

1.23 grams per brake horsepower-hour

Notes: Equipment used to determine fleet average NO_x emission factor does not include Low-use or combustion engines less than 25 horsepower:

Total = 273, Electric = 109, Diesel = 90, Gasoline = 59, Other = 15



Methodology - Collection of Data

In March 2021, reporting forms were distributed to all known GSE operators at the airport. Operators were given a deadline of March 22, 2021 to submit completed reporting forms, which detail model year, horsepower, GSE type, fuel type, and other identifying characteristics of equipment operating at the airport. High levels of turnover associated with COVID-19 have hindered data acquisition, however at the time of writing of this report, only a single operator's report was still outstanding. The equipment reported by that operator for the 2018 survey were used as surrogates in the 2020 GSE inventory.

Each unit of reported GSE was reviewed for accuracy and GSE program applicability based on previous data and professional judgement. Non-electric GSE with power ratings less than or equal to 25 horsepower are exempt from the California Air Resource Board (CARB) in-use off-road diesel-fueled (ORD) fleets, and large spark-ignition (LSI) fleets regulations, upon which the MOU's GSE agreement is based, and were removed from the inventory. Low-use ground support equipment (defined as operating fewer than 200 hours per year), were retained in the inventory for the purposes of determining fleet-total emissions but were not included in the calculation of the fleet-wide grams of NO_x per brake horsepower-hour performance factor. Quality review was performed for each reported unit and adjustments were made to irregular data. Such adjustments include but are not limited to corrections to on-road/off-road vehicle designations, and the use of surrogate horsepower and model year data based on fleet-aggregated values for units where such data was not reported or otherwise attainable from a previous inventory.

Methodology - Emission Calculations

The fleet performance factor was estimated using California regulatory standard emissions models, OFFROAD2017 and EMFAC2017, developed by CARB. For each unit of GSE, a representative equipment type was identified from either the OFFROAD2017 model (for off-road engine units) or EMFAC2017 model (for on-road engine units) based on Table 2-3 in the Hollywood Burbank AQIP Technical Support Document. Emission factors from the emissions models were queried for the Los Angeles (South Coast) region for calendar year 2020, assuming all adopted rules for exhaust controls. All fuel types, model years, and horsepower bins (OFFROAD2017 only) were selected, and an aggregated speed was assumed (EMFAC2017 only). Emission factors were assigned to each reported unit of GSE based on the GSE category, model year, horsepower, and fuel type of the equipment. For units which were reported without complete horsepower or model year data, the average horsepower or model year for similar equipment in-use at the airport were used.

Emission factors were obtained in units of grams per brake horsepower-hour from OFFROAD2017, and in units of grams per mile from EMFAC2017. For equipment paired to the EMFAC2017 model, an average on-airport speed of 15 miles per hour was multiplied against the model's emission factor and the resulting factor was divided by a reported equipment's respective horsepower to convert to the appropriate grams per brake horsepower-hour unit. The resultant factors, with units of grams per brake horsepower-hour, were weighted by reported equipment horsepower and averaged to determine the NO_x fleet performance factor.

On July 12 2021, it was determined that the publicly available version of CARB's OFFROAD2017 model did not incorporate the engine-standard requirements associated with CARB's 2006 LSI rulemaking and subsequent 2010 amendments. These standards required new LSI equipment certified for sale in the state of California to meet stringent emission standards for NOx and hydrocarbons which far exceeded previous requirements. As a result, LSI engine emissions calculated using the OFFROAD2017 factors resulted in vastly overpredicted emissions, especially for newer equipment.

SCAQMD was informed of this discrepancy and discussed the issue with CARB on July 14, 2021. Updated emission factors were developed by CARB based on actual historical engine certifications in the state of California since the 2006 rulemaking came into effect. These updated factors were provided initially on July 16, 2021 and were updated on July 23, 2021 with final load factors and deterioration caps provided on August 13, 2021. These finalized LSI factors were used with CARB's ORDAS factors for diesel (which also incorporated the most recent engine standard requirements) were used to develop the emissions inventory.

Although the emission factors were updated, the fundamental calculation methodology was not changed from the methodology used in the 2017 AQIP and MOU. Equipment categories were paired to each reported unit and emission factors were looked up based on the model year, fuel type, horsepower, and equipment category of a given unit. In the calendar year 2017 MOU calculations, base emission factors were back calculated from the OFFROAD2017 model's tons per year per equipment population outputs. The CARB-provided updated base factors were calculated using zero-hour emissions, emission deterioration rates, fuel correction factors, and load factors. Activity factors were derived from the OFFROAD2017 default activity levels for diesel GSE pairings, except where gasoline & natural gas pairings provided a more specific factor (i.e. for air start GSE units, the activity for gasoline & natural gas "air start units" was used in lieu of the diesel "other GSE" activity). For low-use equipment, the activity level was assumed to be 200 hours per year regardless of the equipment type. Per unit emissions were calculated using the following formula and summed across all equipment listed at the airport to determine the fleet-total emissions:

$$\text{Emissions (grams per year)} = \text{Activity (hours per year)} \times \text{Power Rating (horsepower)} \times \text{Load Factor (dimensionless)} \times \{ \text{Zero-hour Emission Factor (grams per brake horsepower-hour)} + [\text{Deterioration Rate (grams per brake horsepower-hour per hour)} \times \text{Equipment Lifetime Cumulative Operational Hours (hours)}] \} \times \text{Fuel Correction Factor (dimensionless)}$$