

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

DRAFT AIRCRAFT EMISSIONS INVENTORY FOR SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

AUGUST 2016



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

**TECHNICAL ASSISTANCE RELATED TO EMISSION INVENTORIES,
GOODS MOVEMENT AND OFF-ROAD SOURCES
UPDATED AIRCRAFT EMISSIONS INVENTORY
CONTRACT NUMBERS 12381/12382
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1. Introduction

As part of the development of the 2016 Air Quality Management Plan (AQMP), the aircraft emissions inventory for the South Coast Air Quality Management District (SCAQMD) was evaluated and updated under this inventory study. Specifically, an updated aircraft emissions inventory was developed for the 2012 base year and 2040 forecast year based on the latest available activity data and calculation methodologies. For some airports which had available data for interim years between 2012 and 2040, emissions were also developed for these interim years.

The summaries of emissions are presented in a number of tables in Section 2 of this report in different formats. Section 3 describes the overall inventory methodology utilized in this study and presents the list of airports in the SCAQMD, the aircraft activity data for these airports, and the emissions calculation methods used for different types of aircraft. Sections 4 and 5 present the emissions inventories for the 2012 base year and 2040 forecast year, respectively, for each airport by major aircraft type (i.e., air carrier, air taxi, general aviation, and military) and major aircraft engine type (i.e., jet, piston, mixed). Section 6 lists the references used in this inventory study.

Supporting tables are also provided in the appendices. Appendix A presents the EPA's latest average emission factors in terms of tons of emissions per landing and take-off cycle (LTO) for major aircraft types (i.e., commercial air carrier, air taxi-jet, air taxi-piston, general aviation-jet, general aviation-piston, and military). Appendix B presents the FAA's GA/Air Taxi survey results showing the average percentages of jet and piston type engines for general aviation and air taxi aircraft. Appendix C includes the specific number of aircraft operations with aircraft and engine combination data for the six commercial airports at SCAQMD. The commercial airports include LAX, Ontario International, Bob Hope, John Wayne, Long Beach, and Palm Springs Airports.

2. Summary of Results

Tables 2.1 and 2.2 present the total 2012 and 2040 aircraft emissions by major aircraft/engine types for all airports operating in the SCAQMD, respectively. Tables 2.3 and 2.4 present the total 2012 and 2040 aircraft emissions for each airport. Tables 2.5 and 2.6 provide a breakdown of aircraft and on-board auxiliary power units (APUs) emissions for commercial airports. Finally, 2012 and 2040 CO₂ emissions for commercial airports (based on EDMS runs) are presented in Tables 2.7 and 2.8, respectively.

**Table 2.1. 2012 Aircraft Emissions by Major Aircraft/Engine Type
(tons per year)**

Aircraft Type	Engine Type	TOG	VOC	THC	CO	NO _x	SO _x	PM10	PM2.5
AC	Jet	629.47	626.17	544.40	4,157.38	4,475.22	448.91	80.24	80.23
AT	Jet	78.36	77.69	68.00	457.71	129.92	25.15	10.94	10.81
AT	Piston	0.30	0.26	0.24	43.92	0.25	0.02	0.94	0.65
GA	Jet	357.10	351.71	312.15	3,662.92	207.69	43.00	45.19	44.41
GA	Piston	56.85	50.10	51.61	4,000.23	21.64	3.33	78.85	54.38
Mil	Mixed	125.70	125.02	108.72	374.44	265.31	24.88	38.25	37.96
Total		1,247.79	1,230.96	1,085.12	12,696.61	5,100.04	545.29	254.41	228.44

AC=Air Carrier, AT= Air Taxi, GA=General Aviation, Mil= Military

**Table 2.2. 2040 Aircraft Emissions by Major Aircraft/Engine Type
(tons per year)**

Aircraft Type	Engine Type	TOG	VOC	THC	CO	NO _x	SO _x	PM10	PM2.5
AC	Jet	1,153.19	1,147.17	997.36	9,984.68	7,515.92	895.36	142.87	142.87
AT	Jet	64.93	64.53	56.13	253.50	44.17	9.41	10.03	9.84
AT	Piston	0.52	0.47	0.43	77.44	0.43	0.04	1.66	1.15
GA	Jet	391.20	386.29	340.83	3,534.17	210.87	44.73	50.48	49.57
GA	Piston	60.41	53.24	54.84	4,250.83	23.00	3.54	83.79	57.79
Mil	Mixed	152.14	151.34	131.59	489.82	315.10	31.79	61.74	61.43
Total		1,822.40	1,803.04	1,581.18	18,590.44	8,109.50	984.87	350.57	322.64

AC=Air Carrier; AT= Air Taxi; GA=General Aviation, Mil= Military

Table 2.3. 2012 Aircraft Emissions by Airport (tons per Year)

Facility Name	TOG	VOC	THC	CO	NOx	SOx	PM10	PM2.5
Agua Dulce Airpark	0.058	0.055	0.051	2.035	0.025	0.005	0.043	0.033
Banning Municipal Airport	0.371	0.353	0.327	12.999	0.161	0.033	0.272	0.210
Bermuda Dunes	3.061	2.961	2.666	71.180	1.854	0.366	2.155	1.807
Big Bear City	7.722	7.580	6.712	92.138	12.147	1.254	2.354	1.961
Bob Hope Airport	34.078	33.635	29.543	351.206	165.198	17.885	9.320	8.263
Brackett Field	8.357	7.990	7.334	255.739	5.463	0.859	5.459	4.250
Cable	7.442	7.071	6.547	260.622	3.229	0.656	5.458	4.217
Catalina	1.775	1.711	1.549	44.759	1.155	0.205	1.197	0.981
Chino	15.680	14.998	13.758	474.963	10.398	1.621	10.164	7.920
Chiriaco Summit	0.484	0.460	0.426	16.962	0.210	0.043	0.355	0.274
Compton/Woodley	5.328	5.062	4.687	186.584	2.312	0.469	3.907	3.019
Corona Municipal Airport	4.036	3.835	3.551	141.352	1.751	0.356	2.960	2.287
Desert Air Sky Ranch	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Desert Center	0.012	0.012	0.011	0.424	0.005	0.001	0.009	0.007
El Monte	7.315	6.975	6.424	237.705	3.946	0.704	5.103	3.973
Ernst Field	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Flabob	3.229	3.068	2.841	113.081	1.401	0.284	2.368	1.830
French Valley	7.926	7.531	6.972	277.572	3.439	0.698	5.813	4.491
Fullerton Municipal Airport	4.761	4.526	4.187	164.737	2.134	0.426	3.471	2.686
Hemet-Ryan	6.091	5.786	5.357	213.283	2.643	0.536	4.466	3.451
Jack Northrop Field/Hawthorne Muni	7.238	6.942	6.343	206.661	5.121	0.783	4.592	3.614
Jacqueline Cochran Regional Airport	8.895	8.577	7.782	219.492	8.294	1.078	4.864	3.840
John Wayne Airport	92.696	90.134	82.446	1,535.279	347.974	39.366	10.307	10.303
Lake Riverside Estates	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Long Beach Airport	30.959	29.984	27.035	690.386	112.712	11.320	16.229	13.164
Los Alamitos Army Air Base	33.811	33.612	29.250	96.655	68.296	6.476	4.630	4.445
Los Angeles International Airport	589.473	586.135	510.071	3,908.046	3,633.987	376.663	67.266	67.266
March Air Force Base	34.542	34.326	29.882	106.615	70.333	6.680	4.881	4.657
Ontario International Airport	51.922	51.536	45.006	287.834	348.907	32.064	6.333	6.333
Palm Springs International Airport	14.876	14.699	12.897	143.734	59.563	7.279	3.911	3.515
Perris Valley	2.357	2.245	2.071	78.068	1.242	0.222	1.645	1.275
Pines Airpark	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quail Lake Sky Park	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Redlands Municipal Airport	3.552	3.375	3.125	124.390	1.541	0.313	2.605	2.013
Rialto- Miro Municipal Air Field	2.422	2.301	2.130	84.811	1.051	0.213	1.776	1.372
Riverside Municipal	6.276	5.984	5.513	204.068	3.462	0.603	4.328	3.359
San Bernardino International Airport	3.098	2.991	2.707	73.157	3.443	0.427	1.663	1.324
San Clemente Island Naval Air Station	24.159	24.027	20.890	143.724	52.687	5.124	26.152	26.152
Santa Monica Municipal Airport	9.559	9.150	8.375	286.533	5.201	0.982	6.762	5.389
Skylark Field	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Van Nuys	191.185	189.167	166.479	984.421	138.877	26.623	8.389	8.389
Whiteman	6.092	5.802	5.354	202.629	3.171	0.571	4.269	3.307
Zamperini Field	16.947	16.363	14.821	402.769	16.702	2.108	8.934	7.063
All Airports Combined	1,247.79	1,230.96	1,085.12	12,696.61	5,100.04	545.29	254.41	228.44

Table 2.4. 2040 Aircraft Emissions by Airport (tons per year)

Facility Name	TOG	VOC	THC	CO	NOx	SOx	PM10	PM2.5
Agua Dulce Airpark	0.060	0.057	0.053	2.027	0.026	0.005	0.043	0.033
Banning Municipal Airport	0.383	0.365	0.337	12.943	0.167	0.034	0.272	0.212
Bermuda Dunes	1.302	1.261	1.133	29.564	0.817	0.157	0.901	0.757
Big Bear City	7.795	7.656	6.774	91.797	12.184	1.263	2.354	1.970
Bob Hope Airport	38.700	38.173	33.546	472.789	220.579	25.038	11.951	10.617
Brackett Field	9.290	8.860	8.159	305.417	4.482	0.860	6.467	5.045
Cable	7.684	7.319	6.752	259.500	3.349	0.685	5.458	4.248
Catalina	1.798	1.735	1.569	45.003	1.163	0.207	1.197	0.983
Chino	22.636	21.842	19.796	555.706	20.570	2.715	12.236	9.698
Chiriaco Summit	0.500	0.476	0.439	16.889	0.218	0.045	0.355	0.276
Compton/Woodley	5.501	5.240	4.834	185.781	2.397	0.490	3.907	3.041
Corona Municipal Airport	4.168	3.970	3.662	140.743	1.816	0.371	2.960	2.304
Desert Air Sky Ranch	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Desert Center	0.013	0.012	0.011	0.422	0.005	0.001	0.009	0.007
El Monte	9.833	9.382	8.634	320.686	4.849	0.920	6.817	5.324
Ernst Field	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Flabob	0.875	0.834	0.769	29.556	0.381	0.078	0.622	0.484
French Valley	8.184	7.795	7.191	276.378	3.566	0.729	5.813	4.524
Fullerton Municipal Airport	6.128	5.837	5.384	206.822	2.672	0.547	4.352	3.388
Hemet-Ryan	6.288	5.990	5.525	212.365	2.740	0.560	4.466	3.476
Jack Northrop Field/Hawthorne Muni	13.260	12.809	11.575	318.635	10.731	1.607	7.963	6.476
Jacqueline Cochran Regional Airport	9.088	8.776	7.946	218.671	8.389	1.101	4.864	3.865
John Wayne Airport	95.883	94.000	84.433	1,220.511	518.754	54.215	11.961	11.954
Lake Riverside Estates	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Long Beach Airport	42.761	41.573	37.284	877.675	151.133	16.084	19.790	16.137
Los Alamitos Army Air Base	33.826	33.628	29.262	96.611	68.303	6.477	4.630	4.446
Los Angeles International Airport	888.968	884.332	768.848	7,589.727	5,101.402	629.564	100.158	100.158
March Air Force Base	34.565	34.350	29.902	106.507	70.344	6.683	4.881	4.660
Ontario International Airport	265.731	264.188	229.997	1,996.651	1,478.914	173.677	28.939	28.939
Palm Springs International Airport	24.785	24.549	21.465	225.218	143.074	16.762	5.534	5.105
Perris Valley	2.429	2.319	2.132	77.733	1.278	0.231	1.645	1.284
Pines Airpark	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quail Lake Sky Park	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Redlands Municipal Airport	3.668	3.493	3.222	123.854	1.598	0.327	2.605	2.027
Rialto- Miro Municipal Air Field	2.501	2.382	2.197	84.446	1.090	0.223	1.776	1.382
Riverside Municipal	11.870	11.390	10.397	339.471	7.788	1.254	7.555	5.978
San Bernardino International Airport	3.160	3.055	2.760	72.928	3.473	0.435	1.663	1.332
San Clemente Island Naval Air Station	43.460	43.224	37.580	265.870	102.030	11.440	49.090	49.090
Santa Monica Municipal Airport	9.452	9.094	8.260	254.942	5.864	1.042	6.334	5.131
Skylark Field	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Van Nuys	186.732	184.780	162.579	970.356	141.956	27.131	8.490	8.490
Whiteman	6.630	6.315	5.825	223.808	2.893	0.591	4.707	3.664
Zamperini Field	12.494	11.981	10.951	362.442	8.503	1.317	7.805	6.130
All Airports	1,822.40	1,803.04	1,581.18	18,590.44	8,109.50	984.87	350.57	322.64

**Table 2.5. 2012 Aircraft and APU Emissions for Commercial Airports
(tons per year)**

Airport	Type	TOG	VOC	THC	CO	NOx	SOx	PM10	PM2.5
Bob Hope	Aircraft	33.41	32.97	28.96	342.68	156.97	16.64	8.20	7.14
	APU	0.67	0.67	0.58	8.52	8.23	1.25	1.12	1.12
	Total	34.08	33.64	29.54	351.21	165.20	17.88	9.32	8.26
John Wayne	Aircraft	91.68	89.13	81.57	1,521.32	330.86	37.02	8.40	8.39
	APU	1.01	1.01	0.87	13.95	17.12	2.35	1.91	1.91
	Total	92.70	90.13	82.45	1,535.28	347.97	39.37	10.31	10.30
Long Beach	Aircraft	30.63	29.66	26.75	685.85	106.38	10.59	15.62	12.55
	APU	0.33	0.32	0.28	4.54	6.33	0.73	0.61	0.61
	Total	30.96	29.98	27.03	690.39	112.71	11.32	16.23	13.16
Los Angeles International	Aircraft	579.03	575.75	501.05	3,786.05	3,509.33	359.74	49.95	49.95
	APU	10.44	10.38	9.03	122.00	124.66	16.93	17.32	17.32
	Total	589.47	586.13	510.07	3,908.05	3,633.99	376.66	67.27	67.27
Ontario International	Aircraft	50.85	50.47	44.08	274.31	336.95	30.35	4.65	4.65
	APU	1.07	1.07	0.93	13.53	11.95	1.71	1.68	1.68
	Total	51.92	51.54	45.01	287.83	348.91	32.06	6.33	6.33
Palm Springs International	Aircraft	14.57	14.39	12.63	139.59	57.49	6.90	3.49	3.10
	APU	0.31	0.31	0.27	4.15	2.08	0.38	0.42	0.42
	Total	14.88	14.70	12.90	143.73	59.56	7.28	3.91	3.51
Total	Aircraft	800.18	792.37	695.04	6,749.80	4,497.97	461.24	90.32	85.79
	APU	13.83	13.75	11.95	166.68	170.37	23.33	23.05	23.05
	Total	814.00	806.12	707.00	6,916.48	4,668.34	484.58	113.37	108.84

**Table 2.6. 2040 Aircraft and APU Emissions for Commercial Airports
(tons per year)**

Airport	Type	TOG	VOC	THC	CO	NOx	SOx	PM10	PM2.5
Bob Hope	Aircraft	38.07	37.55	33.00	465.74	210.38	23.56	10.76	9.43
	APU	0.63	0.62	0.54	7.04	10.20	1.48	1.19	1.19
	Total	38.70	38.17	33.55	472.79	220.58	25.04	11.95	10.62
John Wayne	Aircraft	94.42	92.54	83.17	1,200.28	497.57	51.24	9.39	9.38
	APU	1.46	1.46	1.26	20.23	21.19	2.97	2.57	2.57
	Total	95.88	94.00	84.43	1,220.51	518.75	54.22	11.96	11.95
Long Beach	Aircraft	42.56	41.37	37.11	875.36	143.68	15.27	19.24	15.59
	APU	0.20	0.20	0.17	2.32	7.46	0.82	0.55	0.55
	Total	42.76	41.57	37.28	877.68	151.13	16.08	19.79	16.14
Los Angeles International	Aircraft	877.51	872.93	758.93	7,412.73	4,921.05	605.80	79.49	79.49
	APU	11.46	11.40	9.91	176.99	180.35	23.76	20.66	20.66
	Total	888.97	884.33	768.85	7,589.73	5,101.40	629.56	100.16	100.16
Ontario International	Aircraft	260.98	259.46	225.89	1,939.15	1,426.20	166.16	21.52	21.52
	APU	4.75	4.73	4.11	57.50	52.71	7.52	7.42	7.42
	Total	265.73	264.19	230.00	1,996.65	1,478.91	173.68	28.94	28.94
Palm Springs International	Aircraft	24.53	24.30	21.25	222.33	137.96	16.08	5.01	4.58
	APU	0.25	0.25	0.22	2.89	5.11	0.69	0.52	0.52
	Total	24.78	24.55	21.46	225.22	143.07	16.76	5.53	5.10
Total	Aircraft	1,338.07	1,328.16	1,159.35	12,115.59	7,336.85	878.10	145.42	140.00
	APU	18.76	18.66	16.22	266.98	277.01	37.24	32.91	32.91
	Total	1,356.83	1,346.81	1,175.57	12,382.57	7,613.86	915.34	178.33	172.91

**Table 2.7. 2012 CO2 Emissions for Commercial Airports
(tons per year)**

FAA ID	Facility Name	CO2 Emissions (Short Tons)
BUR	Bob Hope Airport	37,559
SNA	John Wayne Airport	89,761
LGB	Long Beach-Daugherty Field	20,441
LAX	Los Angeles International Airport	919,742
ONT	Ontario International Airport	78,327
PSP	Palm Springs International	14,212
	Total	1,160,041

**Table 2.8. 2040 CO2 Emissions for Commercial Airports
(tons per year)**

FAA ID	Facility Name	CO2 Emissions (Short Tons)
BUR	Bob Hope Airport	53,185
SNA	John Wayne Airport	123,954
LGB	Long Beach-Daugherty Field	29,702
LAX	Los Angeles International Airport	1,537,365
ONT	Ontario International Airport	424,110
PSP	Palm Springs International	35,779
	Total	2,204,095

3. Emissions Inventory Methodology

The overall methodology in estimating aircraft emissions, described in more details in this section, involved: 1) identification of airports operating in the SCAQMD region, 2) collection of aircraft activity data from airports, FAA's databases, and SCAG and 3) application of FAA's Emissions and Dispersion Modeling System (EDMS) model for airports with detailed aircraft activity data for commercial air carrier operations or the use of EPA's average emission factors for airports with total aircraft operations data (by major aircraft type) and other aircraft operations with no details on aircraft or engine types.

3.1. List of Airports

In order to identify the active airports operating in the SCAQMD, the list of airports used in the previous inventory study (August 2012) was used as a starting point. This list was compared and verified with FAA's database of airports in the region and also verified with SCAG staff. Table 3.1 includes the list of 43 airports included in this inventory study.

Table 3.1 – Airports in the South Coast Air Quality Management District

FAA ID	Facility Name	County	Owner	Longitude	Latitude
L70	Agua Dulce Airpark	Los Angeles	PR/PU	-118.315	34.503
BNG	Banning Municipal Airport	Riverside	PU	-116.851	33.923
UDD	Bermuda Dunes	Riverside	PR/PU	-116.275	33.748
L35	Big Bear City	San Bernardino	PU	-116.854	34.264
BUR	Bob Hope Airport	Los Angeles	PU	-118.359	34.201
POC	Brackett Field	Los Angeles	PU	-117.782	34.092
CCB	Cable	San Bernardino	PR	-117.688	34.112
AVX	Catalina	Los Angeles	PR/PU	-118.416	33.405
CNO	Chino	San Bernardino	PU	-117.637	33.975
L77	Chiriaco Summit	Riverside	PU	-115.711	33.665
CPM	Compton/Woodley	Los Angeles	PU	-118.244	33.89
AJO	Corona Municipal Airport	Riverside	PU	-117.602	33.898
63CA	Desert Air Sky Ranch	Riverside	PR	-115.874	33.481
L64	Desert Center	Riverside	PU	-115.323	33.749
EMT	El Monte	Los Angeles	PU	-118.035	34.086
86CL	Ernst Field	Riverside	PR	-116.883	33.597
RIR	Flabob	Riverside	PR	-117.411	33.99
F70	French Valley	Riverside	PU	-117.128	33.576
FUL	Fullerton Municipal Airport	Orange	PU	-117.98	33.872
HMT	Hemet-Ryan	Riverside	PU	-117.023	33.734
HHR	Jack Northrop Field/Hawthorne Muni	Los Angeles	PU	-118.335	33.923
TRM	Jacqueline Cochran Regional Airport	Riverside	PU	-116.16	33.627
SNA	John Wayne Airport	Orange	PU	-117.868	33.676
54CL	Lake Riverside Estates	Riverside	PR	-116.797	33.521
LGB	Long Beach Airport	Los Angeles	PU	-118.152	33.818
SLI	Los Alamitos Army Air Base	Orange	MR	-118.052	33.79
LAX	Los Angeles International Airport	Los Angeles	PU	-118.408	33.943
RIV	March Air Force Base	Riverside	MA	-117.26	33.881
ONT	Ontario International Airport	San Bernardino	PU	-117.601	34.056
PSP	Palm Springs International Airport	Riverside	PU	-116.507	33.83
L65	Perris Valley	Riverside	PR	-117.218	33.761
8CA5	Pines Airpark	Riverside	PR	-117.11	33.646
CL46	Quail Lake Sky Park	Los Angeles	PR	-118.732	34.768
REI	Redlands Municipal Airport	San Bernardino	PU	-117.146	34.085
L67	Rialto- Miro Municipal Air Field	San Bernardino	PU	-117.402	34.129
RAL	Riverside Municipal	Riverside	PU	-117.445	33.952
SBD	San Bernardino International Airport	San Bernardino	PU	-117.235	34.095
NUC	San Clemente Island Naval Air Station	Orange	MN	-118.587	33.023
SMO	Santa Monica Municipal Airport	Los Angeles	PU	-118.451	34.016
CA89	Skylark Field	Riverside	PR	-117.303	33.63
VNY	Van Nuys	Los Angeles	PU	-118.49	34.21
WHP	Whiteman	Los Angeles	PU	-118.413	34.259
TOA	Zamperini Field	Los Angeles	PU	-118.34	33.803

PU = Public; PR = Private; MR = Military (Army); MA = Military (Air Force); MN = Military (Navy)

3.2. 2012 Aircraft Activity Data

The commercial and military airports were contacted directly (by e-mail and phone) and were requested to provide detailed 2012 base year aircraft activity data (e.g., number of LTOs by aircraft and engine type, taxi times). The 2012 total number of aircraft operations for general aviation (GA) airports for air carrier, air taxi, GA, and military aircraft was primarily obtained from FAA’s databases (ATADS, TAF, GCR). Of the commercial airports, John Wayne Airport provided detailed 2012 activity data by aircraft/engine combinations. Palm Springs Airport provided detailed aircraft activity data for their air carrier operations. The Los Angeles World Airports (LAWA) also provided the 2012 activity and emissions data for LAX, Ontario and Van Nuys airports. For the other commercial airports (i.e., Bob Hope and Long Beach Airports) which could not provide detailed activity data, FAA’s BTS database, which contains the number of LTOs by aircraft model, was used. FAA’s databases were also utilized to validate and reconcile the reported activity data by airports. San Clemente Island Naval Air Station also provided 2012 activity and emission estimates. March Air Reserve Base (ARB) and Los Alamitos Army Air Base provided their 2012 aircraft operational data.

Table 3.2.1 lists the airport-specific taxi times and mixing heights for the commercial airports in SCAQMD. Table 3.2.2 includes the total number of LTOs by major aircraft types including air carrier (AC), air taxi, GA, and military for each airport in 2012 and the corresponding data source(s) for each airport.

Table 3.2.1. 2012 Taxi Time and Mixing Height for Commercial Airports

Airport	Taxi-In (min)	Taxi-Out (min)	Mixing Height (feet)
Bob Hope	1	10	1,796
John Wayne	5.8	9.6	2,104
Long Beach	4	5	2,101
Los Angeles International	9.9	15.4	1,806
Ontario International	4.5	9.9	2,402
Palm Springs International	5	8.5	1,847

Table 3.2.2. Number of Aircraft Operations (LTOs) by Airport in 2012

Facility Name	Air Carrier	Air Taxi	GA	Military	Total	Data Source
Agua Dulce Airpark			360		360	GCR
Banning Municipal Airport			2,299		2,299	TAF
Bermuda Dunes		3,000	10,500	10	13,510	GCR
Big Bear City			14,000	1,000	15,000	TAF
Bob Hope Airport	22,296	10,532	34,653	338	67,818	BTS/ATADS
Brackett Field	15	76	44,704	194	44,989	ATADS
Cable			46,095		46,095	TAF
Catalina		1,133	7,079	25	8,237	GCR
Chino	9	213	82,928	398	83,547	ATADS
Chiriaco Summit			3,000		3,000	GCR
Compton/Woodley			33,000		33,000	TAF
Corona Municipal Airport			25,000		25,000	TAF
Desert Air Sky Ranch			0		0	TAF/GCR
Desert Center			75		75	GCR
El Monte	12	417	41,570	71	42,069	ATADS
Ernst Field			0		0	TAF/GCR
Flabob			20,000		20,000	GCR
French Valley			49,093		49,093	TAF
Fullerton Municipal Airport	2	84	29,064	5	29,154	ATADS
Hemet-Ryan			37,722		37,722	TAF
Jack Northrop Field/Hawthorne Muni		790	35,520	212	36,522	ATADS
Jacqueline Cochran Regional Airport		250	37,500	500	38,250	TAF
John Wayne Airport	42,509	1,636	87,599	247	131,991	Airport/ATADS
Lake Riverside Estates			0		0	TAF/GCR
Long Beach Airport	14,812	2,475	111,655	447	129,388	BTS/ATADS
Los Alamitos Army Air Base		81	3,047	6,095	9,223	Airport
Los Angeles International Airport	240,669	51,580	9,167	1,325	302,740	Airport/ATADS
March Air Force Base	294		4,440	6,027	10,760	Airport
Ontario International Airport	27,158	7,011	7,395	113	41,676	Airport/ATADS
Palm Springs International Airport	6,761	9,389	12,206	694	29,049	Airport/ATADS
Perris Valley			13,750	25	13,775	GCR
Pines Airpark			0		0	TAF/GCR
Quail Lake Sky Park			0		0	TAF/GCR
Redlands Municipal Airport			22,000		22,000	TAF
Rialto- Miro Municipal Air Field			15,000		15,000	TAF
Riverside Municipal		88	35,843	83	36,013	ATADS
San Bernardino International Airport	139	189	12,281	110	12,719	TAF
San Clemente Island Naval Air Station	1,723		798	14,398	16,918	Airport
Santa Monica Municipal Airport	23	3,344	48,229	44	51,639	ATADS
Skylark Field			0		0	TAF/GCR
Van Nuys	129	5,391	126,254	201	131,974	Airport/ATADS
Whiteman			35,700	60	35,760	ATADS
Zamperini Field	11	231	68,646	1,049	69,937	ATADS
Total Operations	356,557	97,906	1,168,168	33,666	1,656,297	

ATADS - Air Traffic Activity Data System Database; TAF - Terminal Area Forecast

BTS - Bureau of Transportation Statistics (Form 41, Schedule T-100)

GCR - FAA's Airport Master Record Forms (5010-1 & 5010-2) Database hosted by GCR and Associates.

3.3. 2040 Activity Data

For commercial air carrier operations, SCAG provided the 2040 aviation operations forecast for several commercial airports (i.e., Bob Hope, Long Beach, Palm Springs airports) which included the number of projected aircraft operations by aircraft model and engine type (reflecting future fleet mix). SCAG’s forecast is based on the projected passenger/cargo demand level and regional aviation forecasts and is consistent with the forecast adopted in the 2016 Regional Transportation Plan (RTP). LAWA provided future aircraft activity data for LAX, Ontario and Van Nuys airports which were evaluated and determined to be consistent with SCAG’s forecast. John Wayne Airport also provided detailed activity data for 2016, 2021, and 2026 with 2026 representing the airport’s constrained level of operations (also consistent with SCAG’s forecast). For air taxi, GA, and military aircraft operations at commercial and GA airports, FAA’s data sources (Terminal Area Forecast, GCR) were used unless data was provided by the airports. San Clemente Island Naval Air Station provided activity and emission estimates for 2013 to 2040. For March Air Reserve Base and Los Alamitos Army Air Base, the future aircraft operations were assumed to remain at the 2012 level based on information from the Bases.

Table 3.3.1 lists the airport-specific taxi times and mixing heights for commercial airports in SCAQMD in 2040. Table 3.3.2 includes the total number of LTOs by major aircraft types including air carrier (AC), air taxi, GA, and military aircraft for each airport in 2040 along with the corresponding data source(s).

Table 3.3.1. 2040 Taxi Time and Mixing Height for Commercial Airports

Airport	Taxi-In (min)	Taxi-Out (min)	Mixing Height (feet)
Bob Hope	1	10	1,796
John Wayne	5.8	9.6	2,104
Long Beach	4	5	2,101
Los Angeles International	14.3	21.4	1,806
Ontario International	7.6	17.4	2,402
Palm Springs International	5	8.5	1,847

Table 3.3.2. Number of Aircraft Operations (LTOs) by Airport in 2040

Facility Name	Air Carrier	Air Taxi	GA	Military	Total	Data Source
Agua Dulce Airpark			360		360	GCR
Banning Municipal Airport			2,299		2,299	TAF
Bermuda Dunes		1,300	4,250	8	5,558	GCR
Big Bear City			14,000	1,000	15,000	TAF
Bob Hope Airport	34,816	9,369	41,752	506	86,442	BTS/ATADS
Brackett Field	17	120	54,053	33	54,221	ATADS
Cable			46,095		46,095	TAF
Catalina		1,133	7,079	25	8,237	GCR
Chino	24	170	95,780	1,195	97,168	ATADS
Chiriaco Summit			3,000		3,000	GCR
Compton/Woodley			33,000		33,000	TAF
Corona Municipal Airport			25,000		25,000	TAF
Desert Air Sky Ranch			0		0	TAF/GCR
Desert Center			75		75	GCR
El Monte	22	232	56,650	41	56,945	ATADS
Ernst Field			0		0	TAF/GCR
Flabob			5,250		5,250	GCR
French Valley			49,093		49,093	TAF
Fullerton Municipal Airport		13	36,728		36,741	ATADS
Hemet-Ryan			37,722		37,722	TAF
Jack Northrop Field/Hawthorne Muni	70	5,012	51,697	421	57,199	ATADS
Jacqueline Cochran Regional Airport		250	37,500	500	38,250	TAF
John Wayne Airport	61,237	1,708	61,791	456	125,192	Airport/ATADS
Lake Riverside Estates			0		0	TAF/GCR
Long Beach Airport	19,406	3,722	135,191	805	159,124	BTS/ATADS
Los Alamitos Army Air Base		81	3,047	6,095	9,223	Airport
Los Angeles International Airport	412,761	6,204	10,484	1,046	430,494	Airport/ATADS
March Air Force Base	294		4,440	6,027	10,760	Airport
Ontario International Airport	125,027	5,686	9,043	204	139,959	Airport/ATADS
Palm Springs International Airport	26,498	3,702	13,009	928	44,136	Airport
Perris Valley			13,750	25	13,775	GCR
Pines Airpark			0		0	TAF/GCR
Quail Lake Sky Park			0		0	TAF/GCR
Redlands Municipal Airport			22,000		22,000	TAF
Rialto- Miro Municipal Air Field			15,000		15,000	TAF
Riverside Municipal		1,412	58,597	275	60,284	ATADS
San Bernardino International Airport	139	189	12,281	110	12,719	TAF
San Clemente Island Naval Air Station	2,999		1,390	28,344	32,732	Airport
Santa Monica Municipal Airport	26	4,336	41,708	106	46,175	ATADS
Skylark Field			0		0	TAF/GCR
Van Nuys	59	11,831	119,627	175	131,692	Airport/ATADS
Whiteman			39,754	1	39,754	ATADS
Zamperini Field	25	181	63,450	323	63,978	ATADS
Total Operations	683,416	56,649	1,225,939	48,642	2,014,645	

ATADS - Air Traffic Activity Data System Database; TAF - Terminal Area Forecast

BTS - Bureau of Transportation Statistics (Form 41, Schedule T-100)

GCR - FAA's Airport Master Record Forms (5010-1 & 5010-2) Database hosted by GCR and Associates.

4. 2012 Base Year Emissions Inventory

Table 4.1 presents the 2012 emissions for each airport by major aircraft type (air carrier, air taxi, general aviation, and military).

For the four commercial airports namely Bob Hope, John Wayne, Long Beach, and Palm Springs airports, the FAA's EDMS model (version 5.1.4.1) was used to calculate aircraft and APU emissions based on the number of aircraft operations by aircraft model provided by airports or obtained through FAA's BTS database (Appendix C). For the majority of aircraft, the EDMS default engine was assigned to each aircraft model except for a few instances where more specific information was available from the airports. The specific taxi times and mixing heights for each airport were also applied in the model. Finally, the APU default assignments and usage times for each aircraft model in the EDMS model were utilized. The FAA's 2012 ATADS data for these airports was used to identify the number of aircraft operations which may not have been accounted for by the airport or not included in FAA's 2012 BTS database. For these remaining operations, the EPA's average emission factors listed in Appendix A along with FAA's survey results on engine types (Appendix B) were used to quantify the remaining emissions.

The 2012 emissions for LAX, Ontario and Van Nuys airports provided by LAWA which were based on EDMS model runs and other methodologies/assumptions were reviewed and validated. For San Clemente Island Naval Air Station, the 2012 emissions calculations provided by the Navy were also reviewed and validated.

For the remaining GA and two other military airports (March Air Force Base and Los Alamitos Army Air base), the 2012 aircraft emissions were calculated based on the number of aircraft operations obtained from FAA's databases (referenced in Table 3.2.2) in conjunction with EPA's latest average emission rates per LTO (Appendix A) and the average percentages of jet and piston type engines for GA and air taxi aircraft based on FAA's 2012 survey results (Appendix B).

Table 4.1. 2012 Emissions by Airport and Aircraft/Engine Type (tons per year)

Facility Name	Aircraft Type	Engine Type	TOG	VOC	THC	CO	NOx	SOx	PM10	PM2.5
Agua Dulce Airpark	GA	Jet	0.036	0.036	0.031	0.500	0.017	0.004	0.012	0.012
	GA	Piston	0.022	0.019	0.020	1.535	0.008	0.001	0.030	0.021
Banning Municipal Airport	GA	Jet	0.232	0.230	0.200	3.194	0.108	0.025	0.079	0.077
	GA	Piston	0.139	0.123	0.127	9.805	0.053	0.008	0.193	0.133
Bermuda Dunes	AT	Jet	1.263	1.252	1.088	4.507	0.966	0.202	0.751	0.733
	AT	Piston	0.048	0.043	0.040	7.176	0.040	0.004	0.154	0.106
	GA	Jet	1.059	1.050	0.914	14.586	0.493	0.112	0.361	0.352
	GA	Piston	0.636	0.561	0.578	44.782	0.242	0.037	0.883	0.609
	Mil	Mixed	0.055	0.054	0.047	0.130	0.112	0.011	0.007	0.007
Big Bear City	GA	Jet	1.412	1.400	1.218	19.447	0.658	0.149	0.481	0.469
	GA	Piston	0.849	0.748	0.770	59.710	0.323	0.050	1.177	0.812
	Mil	Mixed	5.461	5.433	4.723	12.981	11.167	1.055	0.697	0.680
Bob Hope Airport	AC	Jet	20.904	20.793	18.078	111.829	151.928	15.600	3.022	3.022
	AT	Jet	5.358	5.322	4.627	25.169	5.697	1.247	1.675	1.638
	AT	Piston	0.098	0.088	0.081	14.617	0.082	0.008	0.313	0.216
	GA	Jet	3.806	3.775	3.286	49.851	2.930	0.553	1.209	1.181
	GA	Piston	2.066	1.821	1.875	145.352	0.786	0.121	2.865	1.976
	Mil	Mixed	1.846	1.836	1.596	4.388	3.774	0.356	0.235	0.230
Brackett Field	AC	Jet	0.047	0.046	0.040	0.168	0.139	0.013	0.008	0.008
	AT	Jet	0.032	0.032	0.028	0.114	0.024	0.005	0.019	0.019
	AT	Piston	0.001	0.001	0.001	0.182	0.001	0.000	0.004	0.003
	GA	Jet	4.508	4.469	3.889	62.098	2.100	0.477	1.535	1.497
	GA	Piston	2.710	2.388	2.460	190.659	1.032	0.159	3.758	2.592
	Mil	Mixed	1.059	1.054	0.916	2.518	2.166	0.205	0.135	0.132
Cable	GA	Jet	4.648	4.608	4.010	64.030	2.166	0.492	1.583	1.544
	GA	Piston	2.794	2.462	2.536	196.592	1.064	0.164	3.875	2.673
Catalina	AT	Jet	0.477	0.473	0.411	1.702	0.365	0.076	0.284	0.277
	AT	Piston	0.018	0.016	0.015	2.710	0.015	0.001	0.058	0.040
	GA	Jet	0.714	0.708	0.616	9.833	0.333	0.076	0.243	0.237
	GA	Piston	0.429	0.378	0.389	30.190	0.163	0.025	0.595	0.410
	Mil	Mixed	0.137	0.136	0.118	0.325	0.279	0.026	0.017	0.017
Chino	AC	Jet	0.026	0.026	0.023	0.095	0.079	0.008	0.005	0.004
	AT	Jet	0.089	0.089	0.077	0.319	0.068	0.014	0.053	0.052
	AT	Piston	0.003	0.003	0.003	0.508	0.003	0.000	0.011	0.008
	GA	Jet	8.363	8.291	7.215	115.195	3.896	0.885	2.847	2.778
	GA	Piston	5.026	4.430	4.563	353.685	1.914	0.294	6.971	4.808
Chiriaco Summit	Mil	Mixed	2.171	2.160	1.878	5.160	4.439	0.419	0.277	0.270
	GA	Jet	0.303	0.300	0.261	4.167	0.141	0.032	0.103	0.100
Compton/Woodley	GA	Piston	0.182	0.160	0.165	12.795	0.069	0.011	0.252	0.174
	GA	Jet	3.328	3.299	2.871	45.840	1.550	0.352	1.133	1.105
Corona Municipal Airport	GA	Piston	2.000	1.763	1.816	140.744	0.761	0.117	2.774	1.913
	GA	Jet	2.521	2.499	2.175	34.728	1.175	0.267	0.858	0.837
Desert Air Sky Ranch	GA	Piston	1.515	1.336	1.376	106.624	0.577	0.089	2.102	1.449
	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Desert Center	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Jet	0.008	0.007	0.007	0.104	0.004	0.001	0.003	0.003
El Monte	GA	Piston	0.005	0.004	0.004	0.320	0.002	0.000	0.006	0.004
	AC	Jet	0.036	0.035	0.031	0.129	0.107	0.010	0.006	0.006
	AT	Jet	0.175	0.174	0.151	0.626	0.134	0.028	0.104	0.102
	AT	Piston	0.007	0.006	0.005	0.996	0.006	0.001	0.021	0.015
	GA	Jet	4.192	4.156	3.617	57.745	1.953	0.444	1.427	1.393
	GA	Piston	2.520	2.221	2.287	177.295	0.959	0.148	3.495	2.410
Ernst Field	Mil	Mixed	0.385	0.383	0.333	0.915	0.787	0.074	0.049	0.048
	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ernst Field	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 4.1. 2012 Emissions by Airport and Aircraft/Engine Type (tons per year)
(continued)

Flabob	GA	Jet	2.017	2.000	1.740	27.782	0.940	0.213	0.687	0.670
	GA	Piston	1.212	1.068	1.101	85.299	0.462	0.071	1.681	1.160
French Valley	GA	Jet	4.951	4.908	4.271	68.194	2.306	0.524	1.686	1.644
	GA	Piston	2.976	2.623	2.701	209.378	1.133	0.174	4.127	2.846
Fullerton Municipal Airport	AC	Jet	0.005	0.005	0.004	0.017	0.014	0.001	0.001	0.001
	AT	Jet	0.035	0.035	0.030	0.125	0.027	0.006	0.021	0.020
	AT	Piston	0.001	0.001	0.001	0.200	0.001	0.000	0.004	0.003
	GA	Jet	2.931	2.906	2.529	40.373	1.365	0.310	0.998	0.974
	GA	Piston	1.762	1.553	1.599	123.957	0.671	0.103	2.443	1.685
Hemet-Ryan	Mil	Mixed	0.027	0.027	0.024	0.065	0.056	0.005	0.003	0.003
	GA	Jet	3.804	3.771	3.282	52.400	1.772	0.403	1.295	1.264
Jack Northrop Field/Hawthorne Muni	GA	Piston	2.286	2.015	2.076	160.883	0.870	0.134	3.171	2.187
	AT	Jet	0.333	0.330	0.287	1.187	0.254	0.053	0.198	0.193
	AT	Piston	0.013	0.011	0.010	1.890	0.011	0.001	0.040	0.028
	GA	Jet	3.582	3.551	3.090	49.341	1.669	0.379	1.220	1.190
	GA	Piston	2.153	1.897	1.954	151.492	0.820	0.126	2.986	2.059
Jacqueline Cochran Regional Airport	Mil	Mixed	1.158	1.152	1.001	2.752	2.367	0.224	0.148	0.144
	AT	Jet	0.105	0.104	0.091	0.376	0.081	0.017	0.063	0.061
	AT	Piston	0.004	0.004	0.003	0.598	0.003	0.000	0.013	0.009
	GA	Jet	3.782	3.749	3.263	52.091	1.762	0.400	1.288	1.256
	GA	Piston	2.273	2.003	2.063	159.936	0.865	0.133	3.152	2.174
John Wayne Airport	Mil	Mixed	2.731	2.716	2.362	6.490	5.583	0.527	0.348	0.340
	AC	Jet	53.300	53.024	46.100	275.061	330.953	35.048	6.444	6.444
	AT	Jet	1.364	1.357	1.180	10.092	1.791	0.437	0.112	0.112
	GA	Jet	36.686	34.414	34.002	1,246.926	12.477	3.621	3.579	3.579
	Mil	Mixed	1.346	1.339	1.164	3.200	2.753	0.260	0.172	0.168
Lake Riverside Estates	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Long Beach Airport	AC	Jet	9.348	9.299	8.083	43.504	98.906	9.056	1.976	1.976
	AT	Jet	1.105	1.096	0.952	4.136	0.959	0.201	0.602	0.587
	AT	Piston	0.038	0.034	0.031	5.641	0.032	0.003	0.121	0.083
	GA	Jet	11.262	11.165	9.716	155.120	5.253	1.193	3.834	3.740
	GA	Piston	6.767	5.964	6.144	476.188	2.576	0.396	9.386	6.473
Los Alamitos Army Air Base	Mil	Mixed	2.438	2.426	2.109	5.796	4.986	0.471	0.311	0.304
	AT	Jet	0.034	0.034	0.029	0.122	0.026	0.005	0.020	0.020
	AT	Piston	0.001	0.001	0.001	0.194	0.001	0.000	0.004	0.003
	GA	Jet	0.307	0.305	0.265	4.233	0.143	0.033	0.105	0.102
	GA	Piston	0.185	0.163	0.168	12.995	0.070	0.011	0.256	0.177
Los Angeles International Airport	Mil	Mixed	33.284	33.110	28.786	79.112	68.055	6.427	4.245	4.143
	AC	Jet	501.161	498.539	433.431	3,477.783	3,510.940	354.290	61.815	61.815
	AT	Jet	51.928	51.434	45.155	320.306	89.074	17.504	4.165	4.165
	GA	Jet	30.118	29.940	26.064	88.275	17.356	3.489	1.052	1.052
March Air Force Base	Mil	Mixed	6.266	6.222	5.420	21.682	16.617	1.380	0.234	0.234
	AC	Jet	0.912	0.905	0.787	3.284	2.726	0.262	0.158	0.154
	GA	Jet	0.448	0.444	0.386	6.167	0.209	0.047	0.152	0.149
	GA	Piston	0.269	0.237	0.244	18.934	0.102	0.016	0.373	0.257
Ontario International Airport	Mil	Mixed	32.912	32.741	28.465	78.229	67.296	6.355	4.198	4.097
	AC	Jet	38.282	38.072	33.110	207.991	338.207	30.087	5.684	5.684
	AT	Jet	5.080	5.052	4.393	21.498	6.900	1.228	0.295	0.295
	GA	Jet	8.208	8.061	7.200	57.795	3.558	0.720	0.347	0.347
Palm Springs International Airport	Mil	Mixed	0.351	0.351	0.304	0.551	0.240	0.029	0.007	0.007
	AC	Jet	4.584	4.563	3.966	33.248	37.539	4.112	0.813	0.813
	AT	Jet	4.819	4.790	4.163	31.127	13.562	2.296	1.170	1.151
	GA	Jet	0.849	0.842	0.732	11.693	0.395	0.090	0.289	0.282
	GA	Piston	0.834	0.735	0.757	58.657	0.317	0.049	1.156	0.797
	Mil	Mixed	3.790	3.770	3.278	9.009	7.750	0.732	0.483	0.472

Table 4.1. 2012 Emissions by Airport and Aircraft/Engine Type (tons per year)
(continued)

Perris Valley	GA	Jet	1.387	1.375	1.196	19.100	0.646	0.147	0.472	0.461
	GA	Piston	0.833	0.735	0.757	58.643	0.317	0.049	1.156	0.797
	Mil	Mixed	0.137	0.136	0.118	0.325	0.279	0.026	0.017	0.017
Pines Airpark	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quail Lake Sky Park	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Redlands Municipal Airport	GA	Jet	2.219	2.199	1.914	30.560	1.034	0.235	0.755	0.737
	GA	Piston	1.333	1.175	1.211	93.829	0.508	0.078	1.849	1.276
Rialto- Miro Municipal Air Field	GA	Jet	1.513	1.500	1.305	20.837	0.705	0.160	0.515	0.502
	GA	Piston	0.909	0.801	0.825	63.975	0.346	0.053	1.261	0.870
Riverside Municipal	AT	Jet	0.037	0.037	0.032	0.131	0.028	0.006	0.022	0.021
	AT	Piston	0.001	0.001	0.001	0.209	0.001	0.000	0.004	0.003
	GA	Jet	3.615	3.583	3.118	49.789	1.684	0.383	1.231	1.201
	GA	Piston	2.173	1.915	1.972	152.867	0.827	0.127	3.013	2.078
San Bernardino International Airport	Mil	Mixed	0.451	0.448	0.390	1.071	0.921	0.087	0.057	0.056
	AC	Jet	0.432	0.428	0.373	1.555	1.291	0.124	0.075	0.073
	AT	Jet	0.080	0.079	0.069	0.284	0.061	0.013	0.047	0.046
	AT	Piston	0.003	0.003	0.002	0.452	0.003	0.000	0.010	0.007
	GA	Jet	1.238	1.228	1.068	17.060	0.577	0.131	0.422	0.411
San Clemente Island Naval Air Station	GA	Piston	0.744	0.656	0.676	52.378	0.283	0.044	1.032	0.712
	Mil	Mixed	0.601	0.598	0.520	1.428	1.228	0.116	0.077	0.075
	AC	Jet	0.202	0.200	0.174	1.628	0.996	0.165	0.195	0.195
	GA	Jet	1.434	1.422	1.236	20.136	0.354	0.119	0.232	0.232
	Mil	Mixed	22.522	22.405	19.479	121.960	51.337	4.840	25.726	25.726
Santa Monica Municipal Airport	AC	Jet	0.070	0.069	0.060	0.252	0.209	0.020	0.012	0.012
	AT	Jet	1.408	1.396	1.213	5.023	1.077	0.225	0.837	0.817
	AT	Piston	0.054	0.048	0.044	7.997	0.045	0.004	0.171	0.118
	GA	Jet	4.864	4.822	4.196	66.995	2.266	0.515	1.656	1.616
	GA	Piston	2.923	2.576	2.654	205.695	1.113	0.171	4.054	2.796
	Mil	Mixed	0.240	0.239	0.208	0.571	0.491	0.046	0.031	0.030
Skylark Field	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Van Nuys	AC	Jet	0.131	0.131	0.114	0.718	1.084	0.108	0.020	0.020
	AT	Jet	4.543	4.511	3.939	30.519	8.754	1.573	0.442	0.442
	GA	Jet	186.239	184.262	162.186	951.793	128.796	24.906	7.920	7.920
	Mil	Mixed	0.271	0.263	0.240	1.392	0.244	0.035	0.008	0.008
Whiteman	GA	Jet	3.600	3.569	3.106	49.591	1.677	0.381	1.226	1.196
	GA	Piston	2.164	1.907	1.964	152.259	0.824	0.127	3.001	2.070
	Mil	Mixed	0.328	0.326	0.283	0.779	0.670	0.063	0.042	0.041
Zamperini Field	AC	Jet	0.034	0.034	0.029	0.123	0.102	0.010	0.006	0.006
	AT	Jet	0.097	0.096	0.084	0.347	0.074	0.016	0.058	0.056
	AT	Piston	0.004	0.003	0.003	0.553	0.003	0.000	0.012	0.008
	GA	Jet	6.923	6.863	5.972	95.356	3.225	0.733	2.357	2.299
	GA	Piston	4.161	3.667	3.777	292.773	1.584	0.244	5.771	3.980
	Mil	Mixed	5.729	5.699	4.955	13.617	11.714	1.106	0.731	0.713
All Airports Combined			1,247.79	1,230.96	1,085.12	12,696.61	5,100.04	545.29	254.41	228.44

5. 2040 Forecast Emissions Inventory

Table 5.1 presents the 2040 emissions for each airport by major aircraft type (air carrier, air taxi, general aviation, and military).

For the three commercial airports namely Bob Hope, Long Beach, and Palm Springs airports, the FAA's EDMS model was used to calculate the 2040 aircraft and APU emissions based on SCAG's 2040 aircraft air carrier operations forecast. For some of the newer aircraft models in SCAG's forecast which were not in FAA's EDMS models, alternative aircraft models were selected in discussions with the airport operators. For the remaining aircraft operations at these airports (i.e., air taxi, GA, and military), the FAA's 2040 Terminal Area Forecast data was used in conjunction with EPA's emission factors and FAA's 2014 GA/Air Taxi survey results (latest available) to quantify these emissions. For John Wayne Airport (JWA), the EDMS model runs for 2016, 2021, and 2026 were conducted based on JWA's detailed operations forecast for these years which covered air carrier, air taxi, and GA operations. The military aircraft emissions for JWA were quantified based on the operations data obtained from FAA's TAF database using EPA's emission factors. Since 2026 represents the year in which JWA reaches its constrained levels, JWA's 2026 emissions were also used through 2040.

For LAX, Ontario, and Van Nuys airports, LAWA provided emissions (based on EDMS model runs) for several future years. Specifically, for LAX, emissions were provided for 2020, 2024, and 2030. The 2030 LAX emissions were also kept through 2040 since 2030 represents the year LAX reaches SCAG's projected forecast. For Ontario and Van Nuys Airports, emissions were provided for 2017, 2022, 2027, 2032, 2037, and 2040. The emissions calculations and assumptions for all three airports were reviewed and validated. For San Clemente Island Naval Air Station, the emissions for 2013 to 2040 provided by the Navy were also reviewed and validated.

For the remaining GA and two other military airports (March Air Force Base and Los Alamitos Army Air base), the 2040 aircraft emissions were calculated based on the number of aircraft operations obtained from FAA's database (Terminal Area Forecast) or the airports in conjunction with EPA's latest average emission rates per LTO (Appendix A) and the average percentages of jet and piston type engines for GA and air taxi aircraft based on FAA's 2014 survey results (Appendix B).

Table 5.1. 2040 Emissions by Airport and Aircraft/Engine Type (tons per year)

Facility Name	Aircraft Type	Engine Type	TOG	VOC	THC	CO	NOx	SOx	PM10	PM2.5
Agua Dulce Airpark	GA	Jet	0.039	0.038	0.033	0.535	0.018	0.004	0.013	0.013
	GA	Piston	0.021	0.019	0.019	1.492	0.008	0.001	0.029	0.020
Banning Municipal Airport	GA	Jet	0.248	0.246	0.214	3.414	0.115	0.026	0.084	0.082
	GA	Piston	0.135	0.119	0.123	9.529	0.052	0.008	0.188	0.130
Bermuda Dunes	AT	Jet	0.528	0.523	0.454	1.882	0.404	0.084	0.314	0.306
	AT	Piston	0.025	0.022	0.020	3.658	0.021	0.002	0.078	0.054
	GA	Jet	0.458	0.454	0.395	6.311	0.213	0.048	0.156	0.152
	GA	Piston	0.250	0.221	0.227	17.616	0.095	0.015	0.347	0.239
Big Bear City	Mil	Mixed	0.041	0.041	0.035	0.097	0.084	0.008	0.005	0.005
	GA	Jet	1.509	1.496	1.302	20.789	0.703	0.160	0.514	0.501
	GA	Piston	0.825	0.727	0.749	58.028	0.314	0.048	1.144	0.789
Bob Hope Airport	Mil	Mixed	5.461	5.433	4.723	12.981	11.167	1.055	0.697	0.680
	AC	Jet	24.999	24.868	21.622	191.244	208.845	23.262	3.829	3.829
	AT	Jet	3.802	3.770	3.275	13.566	2.908	0.609	2.261	2.207
Brackett Field	AT	Piston	0.178	0.159	0.145	26.364	0.148	0.014	0.565	0.390
	GA	Jet	4.501	4.462	3.883	61.998	2.097	0.476	1.532	1.495
	GA	Piston	2.459	2.168	2.233	173.055	0.936	0.144	3.411	2.353
	Mil	Mixed	2.761	2.746	2.388	6.562	5.645	0.533	0.352	0.344
	AC	Jet	0.051	0.051	0.044	0.185	0.153	0.015	0.009	0.009
Cable	AT	Jet	0.048	0.048	0.042	0.173	0.037	0.008	0.029	0.028
	AT	Piston	0.002	0.002	0.002	0.336	0.002	0.000	0.007	0.005
	GA	Jet	5.827	5.777	5.027	80.263	2.715	0.617	1.984	1.936
	GA	Piston	3.184	2.806	2.890	224.038	1.212	0.186	4.416	3.046
	Mil	Mixed	0.177	0.177	0.154	0.422	0.363	0.034	0.023	0.022
Catalina	GA	Jet	4.969	4.926	4.287	68.446	2.315	0.526	1.692	1.651
	GA	Piston	2.715	2.393	2.465	191.054	1.034	0.159	3.766	2.597
Chino	AT	Jet	0.460	0.456	0.396	1.641	0.352	0.074	0.273	0.267
	AT	Piston	0.021	0.019	0.018	3.188	0.018	0.002	0.068	0.047
	GA	Jet	0.763	0.756	0.658	10.511	0.355	0.081	0.260	0.253
	GA	Piston	0.417	0.367	0.379	29.339	0.159	0.024	0.578	0.399
	Mil	Mixed	0.137	0.136	0.118	0.325	0.279	0.026	0.017	0.017
Chiriaco Summit	AC	Jet	0.073	0.072	0.063	0.263	0.218	0.021	0.013	0.012
	AT	Jet	0.069	0.068	0.059	0.246	0.053	0.011	0.041	0.040
	AT	Piston	0.003	0.003	0.003	0.478	0.003	0.000	0.010	0.007
	GA	Jet	10.325	10.236	8.907	142.223	4.810	1.093	3.515	3.430
	GA	Piston	5.642	4.972	5.122	396.990	2.148	0.330	7.825	5.397
Compton/Woodley	Mil	Mixed	6.523	6.489	5.642	15.506	13.339	1.260	0.832	0.812
	GA	Jet	0.323	0.321	0.279	4.455	0.151	0.034	0.110	0.107
Corona Municipal Airport	GA	Piston	0.177	0.156	0.160	12.434	0.067	0.010	0.245	0.169
	GA	Jet	3.557	3.527	3.069	49.002	1.657	0.376	1.211	1.182
Desert Air Sky Ranch	GA	Piston	1.944	1.713	1.765	136.779	0.740	0.114	2.696	1.859
	GA	Jet	2.695	2.672	2.325	37.123	1.256	0.285	0.918	0.895
Desert Center	GA	Piston	1.473	1.298	1.337	103.621	0.561	0.086	2.042	1.409
	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
El Monte	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Jet	0.008	0.008	0.007	0.111	0.004	0.001	0.003	0.003
	GA	Piston	0.004	0.004	0.004	0.311	0.002	0.000	0.006	0.004
	AC	Jet	0.067	0.066	0.058	0.241	0.200	0.019	0.012	0.011
	AT	Jet	0.094	0.093	0.081	0.336	0.072	0.015	0.056	0.055
Ernst Field	AT	Piston	0.004	0.004	0.004	0.653	0.004	0.000	0.014	0.010
	GA	Jet	6.107	6.054	5.268	84.120	2.845	0.646	2.079	2.029
	GA	Piston	3.337	2.941	3.029	234.805	1.270	0.195	4.628	3.192
Ernst Field	Mil	Mixed	0.224	0.223	0.194	0.532	0.458	0.043	0.029	0.028
	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ernst Field	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 5.1. 2040 Emissions by Airport and Aircraft/Engine Type (tons per year)
(continued)

Flabob	GA	Jet	0.566	0.561	0.488	7.796	0.264	0.060	0.193	0.188
	GA	Piston	0.309	0.273	0.281	21.760	0.118	0.018	0.429	0.296
French Valley	GA	Jet	5.292	5.247	4.566	72.897	2.465	0.560	1.802	1.758
	GA	Piston	2.892	2.549	2.625	203.480	1.101	0.169	4.011	2.766
Fullerton Municipal Airport	AT	Jet	0.005	0.005	0.004	0.018	0.004	0.001	0.003	0.003
	AT	Piston	0.000	0.000	0.000	0.035	0.000	0.000	0.001	0.001
	GA	Jet	3.959	3.925	3.416	54.537	1.844	0.419	1.348	1.315
	GA	Piston	2.163	1.907	1.964	152.231	0.824	0.127	3.001	2.069
Hemet-Ryan	GA	Jet	4.066	4.031	3.508	56.013	1.894	0.430	1.385	1.351
	GA	Piston	2.222	1.958	2.017	156.351	0.846	0.130	3.082	2.126
Jack Northrop Field/Hawthorne Muni	AC	Jet	0.216	0.214	0.186	0.778	0.646	0.062	0.037	0.037
	AT	Jet	2.034	2.017	1.752	7.257	1.556	0.326	1.210	1.181
	AT	Piston	0.095	0.085	0.078	14.104	0.079	0.008	0.302	0.209
	GA	Jet	5.573	5.525	4.808	76.764	2.596	0.590	1.897	1.851
	GA	Piston	3.045	2.684	2.764	214.273	1.159	0.178	4.223	2.913
	Mil	Mixed	2.296	2.284	1.986	5.458	4.696	0.443	0.293	0.286
Jacqueline Cochran Regional Airport	AT	Jet	0.101	0.101	0.087	0.362	0.078	0.016	0.060	0.059
	AT	Piston	0.005	0.004	0.004	0.704	0.004	0.000	0.015	0.010
	GA	Jet	4.042	4.008	3.488	55.684	1.883	0.428	1.376	1.343
	GA	Piston	2.209	1.947	2.005	155.431	0.841	0.129	3.064	2.113
	Mil	Mixed	2.731	2.716	2.362	6.490	5.583	0.527	0.348	0.340
John Wayne Airport	AC	Jet	59.834	59.520	51.747	353.241	499.297	50.083	8.904	8.904
	AT	Jet	1.425	1.417	1.232	10.535	1.870	0.456	0.118	0.118
	GA	Jet	32.136	30.588	29.303	850.822	12.501	3.196	2.622	2.622
	Mil	Mixed	2.488	2.475	2.151	5.913	5.086	0.480	0.317	0.310
Lake Riverside Estates	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Long Beach Airport	AC	Jet	14.249	14.175	12.323	90.280	131.114	12.980	2.100	2.100
	AT	Jet	1.511	1.498	1.301	5.389	1.155	0.242	0.898	0.877
	AT	Piston	0.071	0.063	0.058	10.474	0.059	0.006	0.224	0.155
	GA	Jet	14.574	14.448	12.573	200.745	6.789	1.542	4.962	4.841
	GA	Piston	7.963	7.019	7.229	560.344	3.032	0.466	11.045	7.618
	Mil	Mixed	4.394	4.371	3.800	10.443	8.984	0.848	0.560	0.547
Los Alamitos Army Air Base	AT	Jet	0.033	0.033	0.028	0.117	0.025	0.005	0.020	0.019
	AT	Piston	0.002	0.001	0.001	0.228	0.001	0.000	0.005	0.003
	GA	Jet	0.328	0.326	0.283	4.524	0.153	0.035	0.112	0.109
	GA	Piston	0.179	0.158	0.163	12.629	0.068	0.011	0.249	0.172
	Mil	Mixed	33.284	33.110	28.786	79.112	68.055	6.427	4.245	4.143
Los Angeles International Airport	AC	Jet	793.456	789.319	686.242	7,333.246	5,068.359	621.337	97.030	97.030
	AT	Jet	33.816	33.640	29.247	98.889	9.518	2.470	0.916	0.916
	GA	Jet	54.474	54.190	47.114	143.511	19.549	4.911	1.986	1.986
	Mil	Mixed	7.221	7.183	6.245	14.080	3.976	0.847	0.225	0.225
March Air Force Base	AC	Jet	0.912	0.905	0.787	3.284	2.726	0.262	0.158	0.154
	GA	Jet	0.479	0.474	0.413	6.592	0.223	0.051	0.163	0.159
	GA	Piston	0.262	0.230	0.237	18.401	0.100	0.015	0.363	0.250
	Mil	Mixed	32.912	32.741	28.465	78.229	67.296	6.355	4.198	4.097
Ontario International Airport	AC	Jet	242.268	241.005	209.532	1874.610	1469.855	171.474	28.088	28.088
	AT	Jet	6.676	6.641	5.774	30.551	3.597	0.946	0.266	0.266
	GA	Jet	15.787	15.547	13.826	89.942	4.994	1.188	0.562	0.562
	Mil	Mixed	1.000	0.995	0.865	1.548	0.468	0.068	0.023	0.023
Palm Springs International Airport	AC	Jet	16.061	15.980	13.890	132.019	130.526	15.337	2.242	2.242
	AT	Jet	1.878	1.862	1.618	6.700	1.436	0.301	1.117	1.090
	GA	Jet	0.898	0.891	0.775	12.376	0.419	0.095	0.306	0.298
	GA	Piston	0.882	0.778	0.801	62.084	0.336	0.052	1.224	0.844
	Mil	Mixed	5.065	5.039	4.381	12.040	10.357	0.978	0.646	0.631

Table 5.1. 2040 Emissions by Airport and Aircraft/Engine Type (tons per year)
(continued)

Perris Valley	GA	Jet	1.482	1.469	1.279	20.417	0.691	0.157	0.505	0.492
	GA	Piston	0.810	0.714	0.735	56.991	0.308	0.047	1.123	0.775
	Mil	Mixed	0.137	0.136	0.118	0.325	0.279	0.026	0.017	0.017
Pines Airpark	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quail Lake Sky Park	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Redlands Municipal Airport	GA	Jet	2.372	2.351	2.046	32.668	1.105	0.251	0.807	0.788
	GA	Piston	1.296	1.142	1.176	91.186	0.493	0.076	1.797	1.240
Rialto- Miro Municipal Air Field	GA	Jet	1.617	1.603	1.395	22.274	0.753	0.171	0.551	0.537
	GA	Piston	0.884	0.779	0.802	62.172	0.336	0.052	1.225	0.845
Riverside Municipal	AT	Jet	0.573	0.568	0.493	2.044	0.438	0.092	0.341	0.332
	AT	Piston	0.027	0.024	0.022	3.972	0.022	0.002	0.085	0.059
	GA	Jet	6.317	6.262	5.450	87.011	2.943	0.668	2.151	2.098
	GA	Piston	3.452	3.042	3.133	242.875	1.314	0.202	4.787	3.302
San Bernardino International Airport	Mil	Mixed	1.502	1.494	1.299	3.570	3.071	0.290	0.192	0.187
	AC	Jet	0.432	0.428	0.373	1.555	1.291	0.124	0.075	0.073
	AT	Jet	0.077	0.076	0.066	0.274	0.059	0.012	0.046	0.045
	AT	Piston	0.004	0.003	0.003	0.532	0.003	0.000	0.011	0.008
	GA	Jet	1.324	1.312	1.142	18.236	0.617	0.140	0.451	0.440
San Clemente Island Naval Air Station	GA	Piston	0.723	0.638	0.657	50.903	0.275	0.042	1.003	0.692
	Mil	Mixed	0.601	0.598	0.520	1.428	1.228	0.116	0.077	0.075
	AC	Jet	0.350	0.347	0.302	2.840	1.730	0.290	0.340	0.340
	GA	Jet	2.500	2.478	2.155	35.050	0.620	0.210	0.410	0.410
	Mil	Mixed	40.610	40.398	35.123	227.980	99.680	10.940	48.340	48.340
	Santa Monica Municipal Airport	AC	Jet	0.081	0.080	0.070	0.291	0.241	0.023	0.014
AT		Jet	1.760	1.745	1.516	6.279	1.346	0.282	1.047	1.021
AT		Piston	0.082	0.074	0.067	12.202	0.069	0.007	0.261	0.181
GA		Jet	4.496	4.457	3.879	61.931	2.095	0.476	1.531	1.493
GA		Piston	2.457	2.165	2.230	172.870	0.935	0.144	3.407	2.350
Mil		Mixed	0.576	0.573	0.498	1.369	1.178	0.111	0.073	0.072
Skylark Field	GA	Jet	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	GA	Piston	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Van Nuys	AC	Jet	0.060	0.060	0.052	0.328	0.496	0.049	0.009	0.009
	AT	Jet	9.971	9.899	8.643	66.976	19.212	3.452	0.970	0.970
	GA	Jet	176.465	174.591	153.674	901.838	122.036	23.599	7.504	7.504
	Mil	Mixed	0.237	0.230	0.209	1.215	0.213	0.031	0.007	0.007
Whiteman	GA	Jet	4.285	4.248	3.697	59.030	1.996	0.454	1.459	1.423
	GA	Piston	2.342	2.064	2.126	164.771	0.891	0.137	3.248	2.240
	Mil	Mixed	0.003	0.003	0.002	0.006	0.006	0.001	0.000	0.000
Zamperini Field	AC	Jet	0.076	0.076	0.066	0.274	0.228	0.022	0.013	0.013
	AT	Jet	0.073	0.073	0.063	0.262	0.056	0.012	0.044	0.043
	AT	Piston	0.003	0.003	0.003	0.509	0.003	0.000	0.011	0.008
	GA	Jet	6.840	6.781	5.901	94.216	3.186	0.724	2.329	2.272
	GA	Piston	3.738	3.294	3.393	262.987	1.423	0.219	5.184	3.575
	Mil	Mixed	1.764	1.755	1.526	4.193	3.607	0.341	0.225	0.220
All Airports Combined			1,822.40	1,803.04	1,581.18	18,590.44	8,109.50	984.87	350.57	322.64

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Appendix A
EPA's Average Aircraft Emission Factors

	Air Taxi-Jet	Air Taxi-Piston	GA-Jet	GA-Piston	Military	Commercial
TOG	5.060E-04	9.474E-05	3.060E-04	8.537E-05	7.597E-04	3.276E-03
VOC	5.030E-04	8.484E-05	2.730E-04	7.524E-05	6.815E-04	2.934E-03
THC	4.370E-04	7.750E-05	3.000E-04	7.750E-05	6.170E-04	2.680E-03
CO	1.810E-03	1.407E-02	4.790E-03	6.007E-03	1.407E-02	1.119E-02
NOx	3.880E-04	7.900E-05	1.620E-04	3.250E-05	7.900E-05	9.288E-03
SOx	8.120E-05	7.500E-06	3.680E-05	5.000E-06	7.500E-06	8.910E-04
PM10	3.017E-04	3.015E-04	1.184E-04	1.184E-04	3.017E-04	5.385E-04
PM2.5	3.922E-05	3.920E-05	1.539E-05	1.539E-05	3.922E-05	5.256E-04

Reference: USEPA 2014 NEI Data

Appendix B
FAA's GA/Air Taxi Survey Results

Aircraft Type	% Jet		% Piston	
	2012	2014+	2012	2014+
Air Taxi	83%	80%	17%	20%
GA	29%	31%	71%	69%

Reference: FAA's 2012 and 2014 General Aviation and Part 135 Activity Surveys

Appendix C

Aircraft Operations Data for Commercial Airports

Burbank Bob Hope Airport

2012 FAA BTS Aircraft Operations for Bob Hope Airport

Aircraft Type	Aircraft	Engine	2012 Operations
1124A Westwind II	Israel IAI-1124-A Westwind II	TFE731-3	136
A300F4-600	Airbus A300F4-600 Series	PW4158	1,254
A300B4-600	Airbus A300B4-600 Series	CF6-80C2A3 1862M39	482
Airbus Industrie A310-200C/F	Airbus A310-200 Series	CF6-80C2A2 1862M39	2
Airbus Industrie A319	Airbus A319-100 Series	CFM56-5B5/P	298
Airbus Industrie A320-100/200	Airbus A320-200 Series	CFM56-5B4/P	2,128
Airbus Industrie A321	Airbus A321-200 Series	CFM56-5B3/P	8
Boeing 737-300	Boeing 737-300 Series	CFM56-3-B1	1,674
Boeing 737-400	Boeing 737-400 Series	CFM56-3C-1	28
Boeing 737-500	Boeing 737-500 Series	CFM56-3C-1	218
Boeing 737-700/700LR	Boeing 737-700 Series	CFM56-7B20	32,850
Boeing 737-800	Boeing 737-800 Series	CFM56-7B27	694
Boeing 737-900	Boeing 737-900 Series	CFM56-7B26 (8CM051)	2
Boeing 757-200	Boeing 757-200 Series	RB211-535E4 Phase 5	12
Bombardier BD-700 Global Express	Bombardier Global Express	BR700-710A2-20	6
Bombardier Challenger 604/605	Bombardier Challenger 604	CF34-3B	8
Canadair CRJ 900	Bombardier CRJ-900	CF34-8C5 LEC (8GE110)	1,930
Canadair RJ-200ER /RJ-440	Bombardier CRJ-200-ER	CF34-3B	7,932
Canadair RJ-700	Bombardier CRJ-700	CF34-8C1	3,120
Cessna Citation II/ Bravo	Cessna 550 Citation II	JT15D-4 series (1PW036)	18
Dassault Falcon 2000EX	Dassault Falcon 2000-EX	PW308C	2
De Havilland DHC8-400 Dash-8	de Havilland DHC-8-300	PW123	12
Embraer EMB-120 Brasilia	Embraer EMB120 Brasilia	PW118	464
Gulfstream Aerospace G-III/G-IV	Gulfstream IV-SP	TAY 611-8C	282
Gulfstream G150	Gulfstream G150	TFE731-3	58
Gulfstream G200	Gulfstream G200	PW306A	162
Gulfstream G450	Gulfstream G450	TAY 611-8C	174
Gulfstream III/V/ G-V Exec/ G-5/550	Gulfstream G550	BR700-710A1-10 (3BR001)	68
McDonnell Douglas DC-8-72	Boeing DC-8 Series 70	CFM56-2-C5	10
McDonnell Douglas DC9 Super 80/MC	Boeing MD-83	JT8D-219 Environmental Kit	176
McDonnell Douglas DC9 Super 87	Boeing MD-87	JT8D-217C	24
McDonnell Douglas DC-9-40	Boeing DC-9-40 Series	JT8D-11	80
Raytheon Beechcraft Hawker 800XP	Raytheon Hawker 800	TFE731-3	244
Tupolev TU-204-300	Tupolev 204	PS-90A	20
Total			54,576

2012 Bob Hope Airport Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2012 ATADS	44,591	21,063	69,305	676	135,635

Burbank Bob Hope Airport

2040 Bob Hope Airport Aircraft Operations (provided by SCAG)

Aircraft	Engine	2040 Operations
A319-100	CFM56 5B6/3	433
A319-100	CFM56 5B7/3	875
A320-200	CFM56 5B6/3	811
B737-700	CFM56 7B24E	28,630
B737-800	CFM56 7B24E	20,273
B737-700	CFM56 7B24E	636
A300B4-600	CF6-80C2A3	605
A300F4-600	PW4158	1,573
CRJ 900 ER	CF34 8C5 LEC	1,298
Emb 175	CF34 8E5 LEC	4,767
Emb 175 LR	CF34 8E5 LEC	9,729
Total		69,631

2040 Bob Hope Airport Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2040 TAF	69,631	18,738	83,504	1,011	172,884

John Wayne Airport

2012/2016/2021/2026 Operations for John Wayne Airport (provided by Airport)

Aircraft Name	Aircraft	Engine	2012 Operations	2016 Operations	2021 Operations	2026 Operations
A300	Airbus A300B4-600 Series	CF6-80C2A3	318	1,008	1,008	1,008
A306	Airbus A300F4-600 Series	CF6-80C2A3/PW4158	190	600	600	600
A310	Airbus A310-200 Series	JT9D-7R4E	4	10	10	10
A318	Airbus A318-100 Series	CFM56-5B8/P	28	28	32	32
A319	Airbus A319-100 Series	V2524-A5	10,668	10,978	12,332	12,332
A320	Airbus A320-200 Series	CFM56-5B4/P	7,476	7,694	8,642	8,642
A321	Airbus A321-200 Series	CFM56-5B3/P	658	676	760	760
B733	Boeing 737-300 Series	CFM56-3-B1	4	4	4	4
B734	Boeing 737-400 Series	CFM56-3C-1	72	74	84	84
B737	Boeing 737-700 Series	CFM56-7B22	45,968	55,546	59,972	66,242
B738	Boeing 737-800 with winglets	CFM56-7B27/ CFM56-7B26	11,100	11,422	12,832	12,832
B757AC	Boeing 757-200 Series	PW2037/ RB211-535E4	3,286	3,380	3,798	3,798
B757cargo	Boeing 757-200 Series Freighter	PW2037 (4PW072)	412	1,304	1,304	1,304
CRJ7	Bombardier CRJ-700	CF34-8C1	2,172	8,688	8,688	8,688
CRJ9	Bombardier CRJ-900	CF34-8C5 LEC (8GE110)	2,662	4,992	5,268	6,138
CL601	Bombardier Challenger 601	CF34-3A	3,272	3,120	3,268	3,416
LEAR35	Bombardier Learjet 35	TFE731-2-2B	4,014	3,826	4,008	4,190
CNA172	Cessna 172 Skyhawk	IO-360-B	12,138	10,164	9,078	8,070
CNA182	Cessna 182	IO-360-B	2,804	2,348	2,098	1,864
CNA206	Cessna 206	TIO-540-J2B2	2,048	1,714	1,532	1,362
CNA208	Cessna 208 Caravan	PT6A-114A	1,516	1,270	1,134	1,008
CNA441	Cessna 441 Conquest II	TPE331-8	1,598	1,338	1,196	1,062
CNA500	Cessna 500 Citation I	JT15D-1 series	3,590	3,422	3,586	3,748
CNA510	Cessna 501 Citation ISP	JT15D-1 series	866	826	864	904
CIT3	Cessna 650 Citation III	TFE731-3	1,180	1,124	1,178	1,232
CNA750	Cessna 750 Citation X	AE3007C Type 2	1,352	1,288	1,350	1,412
ECLIPSE500	Eclipse 500	PW610F	242	230	242	252
GIIB	Gulfstream II-B	SPEY Mk511 Transply IIIH	242	230	242	252
GIV	Gulfstream IV-SP	TAY 611-8C	1,830	1,744	1,828	1,910
GV	Gulfstream V-SP	BR700-710A1-10 (3BR001)	926	882	924	966
IA1125	Israel IAI-1125 Astra	TFE731-3	478	456	478	500
MU3001	Mitsubishi MU-300 Diamond	JT15D-4 series (1PW036)	4,038	3,850	4,032	4,216
P180	Piaggio P.180 Avanti	PT6A-66	598	500	448	398
PA28	Piper PA-28 Cherokee Series	IO-320-D1AD	1,014	850	758	674
BEC58P	Raytheon Beech Baron 58	TIO-540-J2B2	3,442	2,882	2,574	2,288
DHC6	de Havilland DHC-6-100 Twin Otter	PT6A-20	4,696	3,932	3,512	3,122
GASEPF	Cessna 172 Skyhawk	IO-360-B	119,244	99,852	89,182	79,272
GASEPV	Cessna 210 Centurion*	TIO-540-J2B2	7,342	6,148	5,492	4,880
Total			263,488	258,400	254,338	249,472

John Wayne Airport Total Aircraft Operations*

Year	Air Carrier	Air Taxi	GA	Military	Total
2012	85,018	3,272	175,198	493	263,981
2016	106,404	3,120	148,876	911	259,311
2021	115,334	3,268	135,736	911	255,249
2026	122,474	3,416	123,582	911	250,383

* All operations were provided by the Airport except for military operations which are based on FAA's ATADS (2012) and FAA's TAF (other years).

Long Beach Airport

2012 FAA BTS Aircraft Operations for Long Beach Airport

Aircraft Type	Aircraft	Engine	2012 Operations
Airbus Industrie A300-600/R/CF/RCF	Airbus A300F4-600 Series	PW4158	540
Airbus Industrie A319	Airbus A319-100 Series	CFM56-5B5/P	1,044
Airbus Industrie A320-100/200	Airbus A320-100 Series	CFM56-5-A1	20,152
Boeing 727-200/231A	Boeing 727-200 Series	JT8D-15 Reduced emissions	10
Boeing 737-100/200	Boeing 737-200 Series	JT8D-15A	4
Boeing 737-400	Boeing 737-400 Series	CFM56-3C-1	6
Boeing 737-700/700LR	Boeing 737-700 Series	CFM56-7B20	4
Boeing 737-800	Boeing 737-800 Series	CFM56-7B26 (8CM051)	16
Boeing 757-200	Boeing 757-200 Series	RB211-535E4 Phase 5	2
Boeing 757-300	Boeing 757-300 Series	RB211-535E4B Phase 5	2
Boeing 767-200/ER/EM	Boeing 767-200 Series	CF6-80A	6
Boeing 767-300/300ER	Boeing 767-300 ER	PW4060 Reduced smoke	506
Canadair CRJ 900	Bombardier CRJ-900	CF34-8C5 LEC (8GE110)	3,230
Canadair RJ-200ER /RJ-440	Bombardier CRJ-200	CF34-3B	362
Canadair RJ-700	Bombardier CRJ-700	CF34-8C1	3,910
Dassault-Breguet Mystere-Falcon	Dassault Falcon 20-C	CF700-2D	2
Gulfstream III/V/ G-V Exec/ G-5/550	Gulfstream G550	BR700-710A1-10 (3BR001)	6
Lockheed L100-30/L-382E	Lockheed L-1011 Tristar	RB211-524B series	2
McDonnell Douglas DC-8-62	Boeing DC-8 Series 60	JT3D-7 series Smoke fix 14-70KC	2
McDonnell Douglas DC9 Super 80/MD81	Boeing MD-83	JT8D-219 Environmental Kit (E_Ki	12
McDonnell Douglas DC9 Super 87	Boeing MD-87	JT8D-217C	36
McDonnell Douglas DC-9-15F	Boeing DC-9-10 Series	JT8D-7 series Reduced emissions	8
McDonnell Douglas DC-9-40	Boeing DC-9-40 Series	JT8D-11	2
Total			29,864

2012 Long Beach Airport Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2012 ATADS	29,623	4,950	223,310	893	258,776

Long Beach Airport

2040 Long Beach Airport Aircraft Operations (provided by SCAG)

Aircraft	Engine	2040 Operations
A319-100	CFM56 5B6/3	1,910
A319-100	CFM56 5B7/3	1,234
A320-200	CFM56 5B6/3	17,118
A321-200	CFM56 5B3/3	4,352
B767-300 ERF	CF6 80C2B7F 1862M39	832
B737-700	CFM56-7B20	6,564
B737-800	CFM56-7B27	1,641
Emb 175 LR	CF34 8E5 LEC	4,114
Emb 190 AR	CF34 10E6	1,048
Total		38,812

2040 Long Beach Airport Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2040 TAF	38,812	7,444	270,382	1,609	318,247

Los Angeles International Airport

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Agusta A-109	250B17B	154
Airbus A300B4-200 Series	CF6-50C2	1,278
Airbus A300B4-600 Series	CF6-80C2A5	848
Airbus A300B4-600 Series	CF6-80C2A5F	194
Airbus A300B4-600 Series	PW4158	584
Airbus A300F4-600 Series	CF6-80C2A5	160
Airbus A300F4-600 Series	CF6-80C2A5F	16
Airbus A310-200 Series	CF6-80C2A2	8
Airbus A310-200 Series	CF6-80C2B5F	2
Airbus A310-200 Series	JT9D-7R4E, -7R4E1	4
Airbus A318-100 Series	CFM56-5B6/P	2
Airbus A318-100 Series	CFM56-5B8/P	36
Airbus A318-100 Series	CFM56-5B9/3	6
Airbus A318-100 Series	CFM56-5B9/P	22
Airbus A319-100 Series	CFM56-5A5	2,056
Airbus A319-100 Series	CFM56-5B5/P	1,390
Airbus A319-100 Series	CFM56-5B6/3	812
Airbus A319-100 Series	CFM56-5B6/P	2,380
Airbus A319-100 Series	CFM56-5B7/3	2,192
Airbus A319-100 Series	CFM56-5B7/P	2
Airbus A319-100 Series	V2522-A5	6,764
Airbus A319-100 Series	V2524-A5	5,108
Airbus A319-100 Series	V2527M-A5	2,706
Airbus A320-200 Series	CFM56-5-A1	3,648
Airbus A320-200 Series	CFM56-5A3	3,364
Airbus A320-200 Series	CFM56-5B2/2	8
Airbus A320-200 Series	CFM56-5B4/3	8,422
Airbus A320-200 Series	CFM56-5B4/P	15,596
Airbus A320-200 Series	V2500-A1	534
Airbus A320-200 Series	V2527-A5	20,148
Airbus A320-200 Series	V2527E-A5	1,886
Airbus A321-200 Series	CFM56-5B3/3	912
Airbus A321-200 Series	CFM56-5B3/P	4,796
Airbus A321-200 Series	V2533-A5	4,122
Airbus A330-200 Series	CF6-80E1A2	332
Airbus A330-200 Series	CF6-80E1A3	140
Airbus A330-200 Series	CF6-80E1A4	2

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Airbus A330-200 Series	PW4168A	2,196
Airbus A330-200 Series	Trent 772	1,992
Airbus A330-300 Series	PW4168A	28
Airbus A330-300 Series	Trent 772	18
Airbus A340-200 Series	CFM56-5C3/P	4
Airbus A340-300 Series	CFM56-5C2	2
Airbus A340-300 Series	CFM56-5C4	1,688
Airbus A340-300 Series	CFM56-5C4/P	1,050
Airbus A340-500 Series	Trent 553-61	706
Airbus A340-600 Series	Trent 556-61	2,276
Airbus A380-800 Series	GP7270	1,122
Airbus A380-800 Series	Trent 970-84	898
Airbus A380-800 Series	Trent 972-84	1,310
Antonov 124 Ruslan	D-36	10
Aviat Husky A1B	IO-360-B	2
Boeing 707-100 Series	JT3D-3B	4
Boeing 727-100 Series	JT8D-217C	14
Boeing 727-200 Series	JT8D-15	34
Boeing 727-200 Series	JT8D-17	4
Boeing 727-200 Series	JT8D-217C	108
Boeing 727-200 Series	JT8D-9 series	16
Boeing 727-200 Series Super 80	JT8D-15	2
Boeing 737-200 Series	JT8D-15	30
Boeing 737-200 Series	JT8D-17	6
Boeing 737-200 Series	JT8D-17A	6
Boeing 737-300 Series	CFM56-3-B1	21,702
Boeing 737-300 Series	CFM56-3B-2	156
Boeing 737-300 Series	CFM56-3C-1	260
Boeing 737-400 Series	CFM56-3B-2	50
Boeing 737-400 Series	CFM56-3C-1	5,422
Boeing 737-500 Series	CFM56-3-B1	2,346
Boeing 737-500 Series	CFM56-3C-1	464
Boeing 737-600 Series	CFM56-7B22	16
Boeing 737-700 Series	CFM56-7B20	172
Boeing 737-700 Series	CFM56-7B22	5,912
Boeing 737-700 Series	CFM56-7B24	48,248
Boeing 737-700 Series	CFM56-7B24/3	3,704

Los Angeles International Airport (continued)

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Boeing 737-700 Series	CFM56-7B24E	742
Boeing 737-700 Series	CFM56-7B26	78
Boeing 737-700 Series	CFM56-7B27	20
Boeing 737-700 Series	CFM56-7B27E	2
Boeing 737-800 Series	CFM56-7B24	12,918
Boeing 737-800 Series	CFM56-7B24/3	10,326
Boeing 737-800 Series	CFM56-7B24E	3,134
Boeing 737-800 Series	CFM56-7B26	20,664
Boeing 737-800 Series	CFM56-7B26/3	1,632
Boeing 737-800 Series	CFM56-7B26E	548
Boeing 737-800 Series	CFM56-7B27	8,452
Boeing 737-800 Series	CFM56-7B27E	440
Boeing 737-800 Series	CFM56-7B27E/B1	248
Boeing 737-800 Series	CFM56-7B27E/B3	2,664
Boeing 737-900 Series	CFM56-7B26	4,526
Boeing 737-900 Series	CFM56-7B26/2	160
Boeing 737-900 Series	CFM56-7B26/3	1,424
Boeing 737-900 Series	CFM56-7B26E	624
Boeing 737-900 Series	CFM56-7B27E	18
Boeing 737-900 Series	CFM56-7B27E/B3	136
Boeing 747-200 Series	CF6-50E2	4
Boeing 747-200 Series	JT9D-7A	44
Boeing 747-200 Series	JT9D-7J	4
Boeing 747-200 Series	JT9D-7Q	388
Boeing 747-200 Series	JT9D-7R4G2	24
Boeing 747-200 Series Freigh	CF6-50E2	8
Boeing 747-400 Freighter	CF6-80C2B1F	1,470
Boeing 747-400 Freighter	PW4056	798
Boeing 747-400 Freighter	RB211-524G-T	394
Boeing 747-400 Series	CF6-80C2A5	4
Boeing 747-400 Series	CF6-80C2B1F	5,536
Boeing 747-400 Series	CF6-80C2B5F	1,182
Boeing 747-400 Series	PW4056	4,524
Boeing 747-400 Series	RB211-524G-T	2,442
Boeing 747-8	GEnx-2B67	44
Boeing 747-8 Freighter	GEnx-2B67	1,134
Boeing 747-SP	JT9D-7A	8

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Boeing 747-SP	RB211-524C2	10
Boeing 757-200 Series	PW2037	37,050
Boeing 757-200 Series	PW2040	10
Boeing 757-200 Series	RB211-535E4	168
Boeing 757-200 Series	RB211-535E4B	16,582
Boeing 757-300 Series	PW2043	2,530
Boeing 757-300 Series	RB211-535E4	6,964
Boeing 767-200 Series	CF6-80A	954
Boeing 767-200 Series	CF6-80A2	7,540
Boeing 767-200 Series	CF6-80C2B2	6
Boeing 767-200 Series	CF6-80C2B4	4
Boeing 767-200 Series	CF6-80C2B4F	54
Boeing 767-200 Series	CF6-80C2B7F	8
Boeing 767-200 Series	JT9D-7R4D, -7R4D1	20
Boeing 767-300 ER	CF6-80C2B4	6
Boeing 767-300 ER	CF6-80C2B6	128
Boeing 767-300 ER	CF6-80C2B6F	244
Boeing 767-300 ER	CF6-80C2B7F	902
Boeing 767-300 ER	PW4056	6
Boeing 767-300 ER	PW4060	168
Boeing 767-300 ER	PW4062	38
Boeing 767-300 ER Freighter	CF6-80C2B7F	16
Boeing 767-300 Series	CF6-80A2	8,380
Boeing 767-300 Series	CF6-80C2B6	390
Boeing 767-300 Series	CF6-80C2B6F	650
Boeing 767-300 Series	CF6-80C2B7F	1,172
Boeing 767-300 Series	PW4056	3,936
Boeing 767-300 Series	PW4060	278
Boeing 767-400	CF6-80C2B8FA	126
Boeing 767-400 ER	CF6-80C2B7F	6
Boeing 777-200 Series	GE90-90B	18
Boeing 777-200 Series	GE90-94B	1,040
Boeing 777-200 Series	PW4056	2,776
Boeing 777-200 Series	PW4090	286
Boeing 777-200 Series	Trent 875	58
Boeing 777-200 Series	Trent 892	3,526
Boeing 777-200 Series	Trent 895	16

Los Angeles International Airport (continued)

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Boeing 777-200 Series Freigh	GE90-110B1	476
Boeing 777-200-ER	GE90-92B	1,454
Boeing 777-200-ER	GE90-94B	26
Boeing 777-200-ER	PW4090	2,012
Boeing 777-200-ER	Trent 892	454
Boeing 777-200-ER	Trent 895	620
Boeing 777-200-LR	GE90-110B1	2,552
Boeing 777-200-LR Freigh	GE90-115B	116
Boeing 777-300 ER	GE90-115B	11,318
Boeing 777-300 Series	GE90-110B1	156
Boeing 777-300 Series	GE90-115B	54
Boeing 777-300 Series	Trent 892	18
Boeing 787-8 Dreamliner	GE9x-1B54	100
Boeing Business Jet (BBJ)	CFM56-7B26	4
Boeing C-17A	PW2040	34
Boeing DC-10-30 Series	CF6-50C	1,834
Boeing DC-10-30 Series	CF6-50C2	510
Boeing DC-8 Series 70	CFM56-2-C5	4
Boeing DC-8 Series 70	CFM56-2A series	314
Boeing DC-8 Series 70	CFM56-2B	32
Boeing DC-9-30 Series	JT8D-15	4
Boeing DC-9-30 Series	JT8D-9 series	6
Boeing F/A-18 Hornet	F404-GE-400	2
Boeing MD-10-1	CF6-6D	250
Boeing MD-11	CF6-80C2D1F	76
Boeing MD-11 Freighter	CF6-80C2D1F	3,178
Boeing MD-11 Freighter	PW4460	56
Boeing MD-11 Freighter	PW4460	694
Boeing MD-81	JT8D-217C	2
Boeing MD-82	JT8D-217C	2,356
Boeing MD-82	JT8D-219	548
Boeing MD-83	JT8D-217C	320
Boeing MD-83	JT8D-219	6,008
Boeing MD-87	JT8D-217C	18
Boeing MD-88	JT8D-217C	30
Boeing MD-88	JT8D-219	4
Boeing MD-90	V2525-D5	104

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Boeing MD-90	V2528-D5	26
Bombardier CRJ-100-LR	CF34-3A1	196
Bombardier CRJ-200	CF34-3A1	25,818
Bombardier CRJ-200	CF34-3B	1,168
Bombardier CRJ-700	CF34-8C1	19,918
Bombardier CRJ-700	CF34-8C5B1	14,042
Bombardier CRJ-900	CF34-8C5A2	13,120
Bombardier CRJ-900	CF34-8C5B1	62
Bombardier Challenger 300	AE3007A1	2
Bombardier Challenger 300	AS907-1-1A	524
Bombardier Challenger 300	HTF7000 (AS907-1-	112
Bombardier Challenger 600	ALF 502L-2	1,496
Bombardier Challenger 600	CF34-3B	290
Bombardier Challenger 601	CF34-3A	56
Bombardier Challenger 601	CF34-3B	4
Bombardier Challenger 604	CF34-3B	52
Bombardier Global Express	BR700-710A1-10	142
Bombardier Global Express	BR700-710A2-20	360
Bombardier Global Express	BR700-710A2-20	90
Bombardier Learjet 24	CJ610-6	2
Bombardier Learjet 25	CJ610-6	14
Bombardier Learjet 31	TFE731-2-2B	28
Bombardier Learjet 31	TFE731-3	26
Bombardier Learjet 35	TFE731-2-2B	104
Bombardier Learjet 35	TFE731-3	96
Bombardier Learjet 36	TFE731-2-2B	4
Bombardier Learjet 40	TFE731-2-2B	36
Bombardier Learjet 40	TFE731-2/2A	118
Bombardier Learjet 45	TFE731-2-2B	216
Bombardier Learjet 45	TFE731-2/2A	54
Bombardier Learjet 55	TFE731-3	144
Bombardier Learjet 60	PW306A	164
Bombardier Learjet 60	TFE731-2/2A	148
Bombardier de Havilland D	PW150A	6,580
Cessna 150 Series	O-200	8
Cessna 172 Skyhawk	IO-360-B	14
Cessna 172 Skyhawk	O-320	12

Los Angeles International Airport (continued)

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Cessna 172 Skyhawk	TSIO-360C	2
Cessna 182	IO-360-B	10
Cessna 206	TIO-540-J2B2	14
Cessna 208 Caravan	PT6A-114A	42
Cessna 210 Centurion	TIO-540-J2B2	10
Cessna 310	TIO-540-J2B2	74
Cessna 340	TIO-540-J2B2	20
Cessna 414	TIO-540-J2B2	4
Cessna 421 Golden Eagle	TIO-540-J2B2	18
Cessna 425 Conquest I	PT6A-60	6
Cessna 441 Conquest II	TPE331-10	8
Cessna 500 Citation I	JT15D-1 series	54
Cessna 500 Citation I	JT15D-4 series	2
Cessna 501 Citation ISP	JT15D-1 series	60
Cessna 525 CitationJet	JT15D-1 series	378
Cessna 550 Citation II	JT15D-4 series	194
Cessna 550 Citation II	PW530	54
Cessna 560 Citation Excel	JT15D-5, -5A, -5B	916
Cessna 560 Citation Excel	JT15D-5, -5A, -5B	32
Cessna 560 Citation V	JT15D-5, -5A, -5B	250
Cessna 560 Citation V	PW530	202
Cessna 650 Citation III	TFE731-3	76
Cessna 680 Citation Sovere	PW306B	332
Cessna 680 Citation Sovere	PW308C	102
Cessna 750 Citation X	AE3007A	66
Cessna 750 Citation X	AE3007C	356
Cessna 750 Citation X	AE3007C1	986
Cirrus SR20	IO-360-B	14
Cirrus SR22	TIO-540-J2B2	14
Convair CV-440	R-1820	390
Dassault Falcon 10	TFE731-2-2B	8
Dassault Falcon 10	TFE731-3	2
Dassault Falcon 20-C	CF700-2D	48
Dassault Falcon 20-C	TFE731-3	20
Dassault Falcon 20-D	CF700-2D	2
Dassault Falcon 20-E	CF700-2D	2
Dassault Falcon 20-F	CF700-2D	10

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Dassault Falcon 2000	PW308C	996
Dassault Falcon 2000-EX	PW308C	4
Dassault Falcon 50	TFE731-3	204
Dassault Falcon 50-EX	TFE731-3	2
Dassault Falcon 900	TFE731-3	24
Dassault Falcon 900-EX	TFE731-3	532
Dornier 328 Jet	PW306B	12
EADS Socata TBM-700	PT6A-64	4
EADS Socata TBM-850	PT6A-66	4
Embraer EMB120 Brasilia	PW118	36,768
Embraer EMB120 Brasilia	PW118B	4
Embraer ERJ135	AE3007A1/3	18,314
Embraer ERJ135	AE3007A1E	1,016
Embraer ERJ135	AE3007A1P	140
Embraer ERJ135 Legacy Bus	AE3007A1E	6
Embraer ERJ135 Legacy Bus	AE3007A1P	10
Embraer ERJ140-LR	AE3007A1/3	7,690
Embraer ERJ145	AE3007A1/1	106
Embraer ERJ145	AE3007A1E	8
Embraer ERJ145-LR	AE3007A1/1	728
Embraer ERJ170	CF34-8E5	162
Embraer ERJ190	CF34-10E5	4,522
Embraer ERJ190	CF34-10E5A1	136
Embraer ERJ190	CF34-10E6	606
Embraer ERJ190	CF34-10E7	4
Embraer ERJ190-LR	CF34-10E6	290
Embraer Legacy	AE3007A1/3	74
Embraer Legacy	AE3007A1P	354
Fairchild SA-226-T Merlin II	TPE331-3U	2
Fairchild SA-227-AC Metro I	TPE331-11U-601G	24
Falcon 7X	PW307A	124
Gulfstream G150	TFE731-3	76
Gulfstream G200	PW306A	8
Gulfstream G300	SPEY MK511-8	278
Gulfstream G300	SPEY MK511-8	54
Gulfstream G300	TAY Mk611-8	8
Gulfstream G400	TAY 611-8C	2

Los Angeles International Airport (continued)

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Gulfstream G400	TAY Mk611-8	44
Gulfstream G450	TAY 611-8C	14
Gulfstream G500	BR700-710A1-10	518
Gulfstream G500	BR700-710C4-11	640
Gulfstream G550	BR700-710C4-11	62
Gulfstream II-SP	SPEY Mk511	44
Gulfstream II-SP	SPEY Mk511	2
Gulfstream II-SP	TAY Mk611-8	90
Gulfstream IV-SP	TAY 611-8C	2,022
Gulfstream IV-SP	TAY Mk611-8	652
Gulfstream V-SP	BR700-710A1-10	36
Gulfstream V-SP	BR700-710C4-11	52
Hawker HS-125 Series 3	TFE731-3	1,302
Ilyushin 62 Classic	D-30KU	2
Ilyushin 76 Candid	PS-90A	2
Israel IAI-1125 Astra	TFE731-3	106
Israel IAI-1126 Galaxy	PW306A	764
Lockheed C-130 Hercules	501D22A	8
Lockheed C-5 Galaxy	TF39-GE-1C	26
Lockheed P-3 Orion	T56-A-14	2
Mitsubishi MU-2	TPE331-10	8
Mitsubishi MU-300 Diamond	JT15D-4 series	2
Mooney M20-K	TSIO-360C	4
Piaggio P.180 Avanti	PT6A-60	20
Piaggio P.180 Avanti	PT6A-66	400
Pilatus PC-12	PT6A-67	66
Pilatus PC-12	PT6A-67B	38
Piper PA-28 Cherokee Series	IO-320-D1AD	8
Piper PA-28 Cherokee Series	IO-360-B	2
Piper PA-31 Navajo	TIO-540-J2B2	2
Piper PA-31T Cheyenne	PT6A-28	4

2012 LAX Aircraft Operations (from LAWA)

Aircraft	Engine	2012 Operations
Piper PA-32 Cherokee Six	TIO-540-J2B2	24
Piper PA-34 Seneca	TSIO-360C	4
Piper PA-46 500TP	PT6A-42	38
Piper PA46-TP Meridian	PT6A-42	2
Raytheon Beech 1900-D	PT6A-67D	6,024
Raytheon Beech 55 Baron	TIO-540-J2B2	2
Raytheon Beech 60 Duke	TIO-540-J2B2	4
Raytheon Beech Baron 58	TIO-540-J2B2	24
Raytheon Beech Bonanza 3	TIO-540-J2B2	20
Raytheon Beech Bonanza 3	TIO-540-J2B2	2
Raytheon Beechjet 400	JT15D-1 series	24
Raytheon Beechjet 400	JT15D-5, -5A, -5B	452
Raytheon Beechjet 400	JT15D-5C	2
Raytheon Hawker 4000 Horizon	PW308A	28
Raytheon Hawker 800	TFE731-3	38
Raytheon Hawker 900XP	TFE731-2-2B	2
Raytheon King Air 100	TPE331-6	18
Raytheon King Air 90	PT6A-135A	42
Raytheon King Air 90	PT6A-28	110
Raytheon Premier I	JT15D-1 series	98
Raytheon Super King Air 20	PT6A-41	14
Raytheon Super King Air 20	PT6A-42	286
Raytheon Super King Air 20	PT6A-61	2
Raytheon Super King Air 30	PT6A-60A	134
Rockwell Commander 690	TPE331-10	12
Rockwell Sabreliner 60	CF700-2D	6
Rockwell Sabreliner 65	TFE731-3	108
Rockwell Sabreliner 75	CF700-2D	20
Sikorsky UH-60 Black Hawk	T700-GE-700	12
Total		589,000

2012 LAX Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2012 ATADS	481,338	103,159	18,334	2,649	605,480

Los Angeles International Airport (continued)

2020, 2024 and 2030 Aircraft Operations for LAX

Aircraft	Engine	Total Annual Operations		
		2020	2024	2030
Airbus A300F4-600 Series	CF6-80C2B5F	0	348	348
Airbus A319-100 Series	V2530-A5 SelectOne Upgrade	36,212	38,302	49,788
Airbus A320-200 Series	V2522-A5 SelectOne Upgrade	61,978	65,460	92,612
Airbus A320-200 Series	V2522-A5 SelectOne Upgrade	4,178	4,178	4,178
Airbus A321-100 Series	V2527-A5 SelectOne Upgrade	14,624	15,320	15,320
Airbus A321-100 Series	V2527-A5 SelectOne Upgrade	11,142	11,838	11,838
Airbus A321-100 Series	V2527-A5 SelectOne Upgrade	0	0	8,008
Airbus A330-200 Series	CF6-80E1A2	4,874	4,874	7,660
Airbus A340-300 Series	CFM56-5C4	2,786	2,786	1,392
Airbus A340-500 Series	Trent 556-61 Phase5 Tiled (6RR041)	696	696	696
Airbus A340-600 Series	Trent 556-61 Phase5 Tiled (8RR045)	696	696	696
Airbus A350-900 series	Trent XWB	2,090	2,090	2,786
Airbus A350-900 series	Trent XWB	696	696	696
Airbus A380-800 Series	GP7270	10,446	11,142	11,142
Boeing 737-300 Series	CFM56-3-B1	5,572	6,268	6,266
Boeing 737-300 Series	CFM56-3-B1	14,624	15,320	15,320
Boeing 737-400 Series	CFM56-3C-1	2,090	2,090	2,088
Boeing 737-700 Series	CFM56-7B26E	5,572	70,336	22,282
Boeing 737-700 Series	CFM56-7B26E	66,158	6,268	70,328
Boeing 737-800 Series	CFM56-7B26E	80,086	84,264	96,790
Boeing 737-800 with winglets	CFM56-7B26E	29,248	31,338	31,334
Boeing 737-900 Series	CFM56-7B26E	38,998	41,088	57,448
Boeing 737-900 Series	CFM56-7B26E	4,178	4,178	4,178
Boeing 747-200 Series	CF6-80E1A3	696	696	696
Boeing 747-200 Series Freighter	CF6-50E2 Low emissions fuel nozzle	696	696	696
Boeing 747-400 Freighter	CF6-80C2B1F 1862M39	3,482	4,526	4,874
Boeing 747-400 Series	CF6-80C2B1F 1862M39	4,874	4,874	3,482
Boeing 747-400 Series	CF6-80C2B1F 1862M39	696	696	696
Boeing 747-8	GENx-1B67/P1	1,392	1,392	2,088
Boeing 747-8 Freighter	GENx-1B67/P1	2,786	2,438	2,786
Boeing 757-200 Series	RB211-535E4 Phase 5	9,750	10,446	6,616
Boeing 757-200 Series	RB211-535E4 Phase 5	29,248	31,338	12,534
Boeing 757-200 Series	RB211-535E4 Phase 5	2,090	2,090	2,088

Los Angeles International Airport (continued)

Aircraft	Engine	Total Annual Operations		
		2020	2024	2030
Boeing 757-200 Series Freight	RB211-535C	1,392	1,044	1,044
Boeing 757-300 Series	RB211-535E4B Phase 5	6,964	7,660	5,918
Boeing 767-200 Series Freight	CF6-80A	2,090	1,742	2,088
Boeing 767-300 ER Freighter	CF6-80C2B7F 1862M39	3,482	3,482	4,178
Boeing 767-300 ER Freighter	CF6-80C2B7F 1862M39	4,178	4,178	4,526
Boeing 767-300 Series	PW4060 Phase III	11,142	11,838	4,874
Boeing 767-300 Series	PW4060 Phase III	5,572	5,572	5,570
Boeing 777-200 Series	GE90-90B DAC II (6GE090)	3,482	3,482	4,178
Boeing 777-200 Series	GE90-90B DAC II (6GE090)	6,268	6,964	7,660
Boeing 777-200 Series Freight	GE90-110B1	696	696	696
Boeing 777-200 Series Freight	GE90-110B1	0	0	696
Boeing 777-200-LR	GE90-110B1	1,392	1,392	1,392
Boeing 777-200-LR Freighter	GE90-110B1	1,392	1,742	2,088
Boeing 777-300 ER	GE90-115B	1,392	1,392	1,392
Boeing 777-300 ER	GE90-115B	9,054	9,750	10,444
Boeing 777-300 Series	GE90-110B1	4,874	4,874	5,570
Boeing 787-8 Dreamliner	Trent 1000-E Phase5 Tiled (12RR058	2,090	2,090	9,748
Boeing 787-9 Dreamliner	Trent 1000-E Phase5 Tiled (12RR058	0	0	2,786
Boeing MD-11	CF6-80E1A3	4,178	4,874	4,874
Boeing MD-83	JT8D-219 Environmental Kit (E_Kit)	5,572	6,268	3,134
Bombardier CRJ-200	CF34-3B	22,090	2,090	2,088
Bombardier CRJ-700-LR	CF34-8C1 Block 1	60,950	86,350	89,860
Bombardier CRJ-900-ER	CF34-8C5B1	29,248	30,642	34,120
Bombardier Challenger 300	HTF7000 (AS907-1-1A)	696	696	696
Bombardier Challenger 600	CF34-3B	1,392	2,092	2,052
Bombardier Global Express	BR700-710A2-20	696	696	696
Bombardier Global Express 50	BR700-710A2-20	696	696	696
Bombardier Learjet 45	TFE731-2-2B	696	696	696
Bombardier Learjet 55	TFE731-3	1,142	348	348
Bombardier Learjet 60	AE3007C Type 2	696	696	696
Bombardier de Havilland Das	PW150A	5,572	5,572	6,266
Cessna 560 Citation Excel	JT15D-5, -5A, -5B	696	696	696
Cessna 560 Citation Excel	JT15D-5, -5A, -5B	696	696	696
Cessna 560 Citation V	JT15D-5, -5A, -5B	696	696	696
Cessna 680 Citation Sovereign	PW308C	696	696	696
Cessna 750 Citation X	PW308A	696	1,044	1,392
Cessna 750 Citation X	PW308A	696	696	696

Los Angeles International Airport (continued)

Aircraft	Engine	Total Annual Operations		
		2020	2024	2030
Convair CV-580	501D22A	696	348	348
Dassault Falcon 2000	PW308C	696	696	696
Dassault Falcon 900	TFE731-3	696	696	696
Embraer ERJ145	AE3007A1P Type 3 (reduced emissio	22,442	696	696
Embraer ERJ175	CF34-8E5 LEC (8GE108)	33,966	59,542	62,322
Embraer Legacy	AE3007A1E	696	696	696
Embraer Legacy	AE3007A1E	696	696	696
Gulfstream G200	PW306A	696	696	696
Gulfstream G300	SPEY Mk511 (8RR043)	696	696	696
Gulfstream G350	TAY 611-8C	696	696	696
Gulfstream G400	TAY Mk611-8	1,392	2,090	2,786
Gulfstream G500	BR700-710A1-10 (4BR008)	696	1,464	1,512
Gulfstream G500	BR700-710A1-10 (4BR008)	1,392	572	576
Gulfstream V-SP	BR700-710C4-11	778	748	698
Hawker HS-125 Series 700	TFE731-3	1,392	1,044	1,044
Lockheed C-130 Hercules	T56-A-15	696	696	696
Raytheon Beech 1900-C	PT6A-65B	1,392	2,090	2,436
Raytheon Beech 1900-D	PT6A-67D	4,874	5,572	6,266
Raytheon Beechjet 400	JT15D-5, -5A, -5B	696	348	348
Sikorsky UH-60 Black Hawk	T700-GE-700	696	696	696
Total Air Carrier (AC)		658,296	740,262	825,522
Total Air Taxi (AT)		52,190	11,366	12,410
Total General Aviation (GA)		19,238	19,916	20,966
Total Military (MIL)		2,170	2,140	2,090
Total Aircraft Operations		731,894	773,684	860,988

2020, 2024, and 2030 LAX Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2020 TAF	658,417	52,199	19,242	2,171	732,029
FAA 2024 TAF	740,262	11,366	19,914	2,139	773,681
FAA 2030 TAF	825,521	12,408	20,967	2,091	860,987

Ontario International Airport

2012 Base Ontario Airport Operations

Aircraft	Engine	2012 Operations
Agusta A-109	250B17B	626
Agusta A-109	250B17B	26
Airbus A300B4-600 Series	CF6-80C2B5F	2,280
Airbus A300F4-600 Series	CF6-80C2B5F	64
Airbus A310-200 Series	CF6-80C2B5F	18
Airbus A319-100 Series	V2530-A5 SelectOne Upgr	2,214
Airbus A320-200 Series	V2522-A5 SelectOne Upgr	1,038
Airbus A321-200 Series	CFM56-5B3/3	8
Airbus A330-300 Series	CF6-80E1A2	12
Airbus A380-800 Series	Trent 972-84	2
Antonov 124 Ruslan	D-36	10
ATR 42-320	PW121	4
Aviat Husky A1B	IO-360-B	8
Bell 206 JetRanger	250B17B	272
Bell 222	TPE331-1	2
Boeing 727-100 Series	JT8D-15 Reduced emissio	6
Boeing 727-200 Series	JT8D-15 Reduced emissio	6
Boeing 727-200 Series Freigh	JT8D-15 Reduced emissio	132
Boeing 737-200 Series	JT8D-15 Reduced emissio	8
Boeing 737-200 Series Freigh	JT8D-15 Reduced emissio	2
Boeing 737-300 Series	CFM56-3-B1	1,128
Boeing 737-400 Series	CFM56-3C-1	1,252
Boeing 737-500 Series	CFM56-3C-1	794
Boeing 737-700 Series	CFM56-7B20E	13,234
Boeing 737-800 Series	CFM56-7B27E	1,884
Boeing 737-900 Series	CFM56-7B26E	366
Boeing 747-200 Series	CF6-50E2 Low emissions	34
Boeing 747-200 Series Freigh	CF6-50E2 Low emissions	0
Boeing 747-400 Freighter	CF6-80C2B1F 1862M39	490
Boeing 747-400 Series	CF6-80C2B1F 1862M39	22
Boeing 747-SP	RB211-524B series Packa	0
Boeing 757-200 Series	RB211-535E4 Phase 5	1,412
Boeing 757-200 Series Freigh	RB211-535E4 (3RR028)	38
Boeing 757-200 Series Freigh	RB211-535E4 Phase 5	694
Boeing 757-300 Series	RB211-535E4B Phase 5	2
Boeing 767-200 Series	PW4060 Phase III	4
Boeing 767-300 ER	PW4060 Phase III	14

2012 Base Ontario Airport Operations

Aircraft	Engine	2012 Operations
Boeing 777-200 Series	GE90-90B DAC II (6GE090)	4
Boeing 777-200-ER	GE90-90B DAC II (6GE090)	2
Boeing 777-200-LR	GE90-110B1	4
Boeing 787-8 Dreamliner	Trent 1000-E Phase5 Tilec	2
Boeing C-17A	PW2040 (4PW073)	6
Boeing DC-10-30 Series	CF6-50C Low emissions fu	260
Boeing DC-6	R-1820	0
Boeing DC-9-10 Series	JT8D-9 series Smoke fix	4
Boeing DC-9-30 Series	JT8D-9 series Reduced en	6
Boeing F/A-18 Hornet	F404-GE-400	8
Boeing KC-135 Stratotanker	CFM56-2B-1	2
Boeing MD-10-1	CF6-6D	14
Boeing MD-11	CF6-80C2D1F 1862M39	2,838
Boeing MD-11 Freighter	CF6-80C2D1F 1862M39	58
Boeing MD-82	JT8D-217C	1,514
Boeing MD-83	JT8D-219 Environmental H	864
Boeing MD-87	JT8D-217C	36
Bombardier Challenger 300	HTF7000 (AS907-1-1A)	124
Bombardier Challenger 600	CF34-3B	220
Bombardier Challenger 601	CF34-3A1	18
Bombardier CRJ-100-LR	CF34-3A1	2
Bombardier CRJ-200	CF34-3B	3,326
Bombardier CRJ-700	CF34-8C1	2,752
Bombardier CRJ-900	CF34-8C5A1	778
Bombardier de Havilland Da	PW150A	16
Bombardier Global Express	BR700-710A2-20	12
Bombardier Learjet 25	CJ610-6	6
Bombardier Learjet 31	TFE731-2-2B	2
Bombardier Learjet 31	TFE731-3	16
Bombardier Learjet 35	TFE731-2-2B	10
Bombardier Learjet 35	TFE731-3	54
Bombardier Learjet 40	TFE731-2/2A	2
Bombardier Learjet 40	TFE731-2-2B	28
Bombardier Learjet 45	TFE731-2/2A	92
Bombardier Learjet 45	TFE731-2-2B	10
Bombardier Learjet 55	TFE731-3	42
Bombardier Learjet 60	PW306A	116

Ontario International Airport (continued)

2012 Base Ontario Airport Operations

Aircraft	Engine	2012 Operations
Bombardier Learjet 60	TFE731-2/2A	14
CASA 212-200 Series	TPE331-10	8
CASA CN-235-200	CT7-9B	6
Cessna 150 Series	O-200	148
Cessna 172 Skyhawk	IO-360-B	36
Cessna 172 Skyhawk	O-320	538
Cessna 172 Skyhawk	TSIO-360C	10
Cessna 182	IO-360-B	342
Cessna 206	TIO-540-J2B2	282
Cessna 208 Caravan	PT6A-114	5,078
Cessna 210 Centurion	TIO-540-J2B2	220
Cessna 310	TIO-540-J2B2	12
Cessna 337 Skymaster	TSIO-360C	4
Cessna 340	TIO-540-J2B2	24
Cessna 402	TIO-540-J2B2	2
Cessna 414	TIO-540-J2B2	50
Cessna 421 Golden Eagle	TIO-540-J2B2	52
Cessna 425 Conquest I	PT6A-60	102
Cessna 441 Conquest II	TPE331-10	64
Cessna 500 Citation I	JT15D-1 series	30
Cessna 500 Citation I	JT15D-4 series (1PW036)	16
Cessna 501 Citation ISP	JT15D-1 series	10
Cessna 525 CitationJet	JT15D-1 series	244
Cessna 550 Citation II	JT15D-4 series (1PW036)	110
Cessna 550 Citation II	PW530	2
Cessna 560 Citation Excel	JT15D-5, -5A, -5B	308
Cessna 560 Citation V	JT15D-5, -5A, -5B	4
Cessna 560 Citation V	JT15D-5C	58
Cessna 560 Citation V	PW530	18
Cessna 650 Citation III	TFE731-3	72
Cessna 680 Citation Sovereign	PW306B	48
Cessna 680 Citation Sovereign	PW308C	6
Cessna 750 Citation X	AE3007A	20
Cessna 750 Citation X	AE3007C Type 1 (8AL025)	2
Cessna 750 Citation X	AE3007C1 Type 2	126
Cirrus SR20	IO-360-B	74
Cirrus SR22	TIO-540-J2B2	104

2012 Base Ontario Airport Operations

Aircraft	Engine	2012 Operations
Convair CV-440	501 D13 alternative 2	0
Dassault Falcon 10	TFE731-2-2B	20
Dassault Falcon 10	TFE731-3	2
Dassault Falcon 2000	PW308C	70
Dassault Falcon 2000-EX	PW308C	2
Dassault Falcon 20-C	CF700-2D	16
Dassault Falcon 20-C	TFE731-3	26
Dassault Falcon 50	TFE731-3	56
Dassault Falcon 900	TFE731-3	4
Dassault Falcon 900-EX	TFE731-3	54
Dornier 328-100 Series	PW119B	2
EADS Socata TBM-700	PT6A-64	10
EADS Socata TBM-850	PT6A-66	8
Eclipse 500	PW610F	86
Embraer EMB120 Brasilia	PW118	14
Embraer ERJ135	AE3007A1E	36
Embraer ERJ140-LR	AE3007A1/3 Type 3 (reduced)	0
Embraer ERJ145	AE3007A1P Type 3 (reduced)	4
Embraer ERJ170	CF34-8E5 LEC (8GE108)	204
Embraer ERJ190	CF34-10A18	0
Embraer Legacy	AE3007A1E	78
Fairchild SA-226-T Merlin III	TPE331-10UA	4
Fairchild SA-227-AC Metro III	TPE331-11U-601G	10
Grumman S-2E Tracker	TPE331-15AW	0
Gulfstream G150	TFE731-3	2
Gulfstream G200	PW306A	14
Gulfstream G300	SPEY MK511-8	76
Gulfstream G400	TAY Mk611-8	2
Gulfstream G500	BR700-710A1-10 (4BR008)	56
Gulfstream G500	BR700-710C4-11	12
Gulfstream G550	BR700-710C4-11	2
Gulfstream II-SP	SPEY Mk511 Transply IIH	16
Gulfstream II-SP	TAY Mk611-8	28
Gulfstream IV-SP	TAY 611-8C	142
Gulfstream IV-SP	TAY Mk611-8	92
Hawker HS-125 Series 3	TFE731-3	208
Hughes 500D	250B17B	6

Ontario International Airport (continued)

2012 Base Ontario Airport Operations

Aircraft	Engine	2012 Operations
Israel IAI-1124 Westwind I	TFE731-3	16
Israel IAI-1125 Astra	TFE731-3	14
Israel IAI-1126 Galaxy	PW306A	76
Lockheed C-130 Hercules	T56-A-15	20
Lockheed C-130 Hercules	T56-A-16	4
Lockheed L-1011 Tristar	RB211-22B Package 1 (1R)	2
Lockheed Martin F-16 Fighting Falcon	F100-PW-200	4
Mitsubishi MU-2	TPE331-10	10
Mitsubishi MU-300 Diamond	JT15D-4 series (1PW036)	2
Mooney M20-K	TSIO-360C	100
Piaggio P.180 Avanti	PT6A-66	20
Pilatus PC-12	PT6A-67	430
Piper PA-24 Comanche	TIO-540-J2B2	8
Piper PA-27 Aztec	TIO-540-J2B2	48
Piper PA-28 Cherokee Series	IO-320-D1AD	2
Piper PA-28 Cherokee Series	IO-360-B	46
Piper PA-28 Cherokee Series	O-320	176
Piper PA-30 Twin Comanche	IO-320-D1AD	4
Piper PA-31 Navajo	TIO-540-J2B2	34
Piper PA-31T Cheyenne	PT6A-28	16
Piper PA-32 Cherokee Six	TIO-540-J2B2	86
Piper PA-34 Seneca	TSIO-360C	50
Piper PA-42 Cheyenne Series	PT6A-61	2
Piper PA-42 Cheyenne Series	TPE331-10U	4
Piper PA-46 500TP	PT6A-42	548
Piper PA46-TP Meridian	PT6A-42	10
Raytheon Beech 1900-C	PT6A-65B	1,940
Raytheon Beech 1900-D	PT6A-67D	2
Raytheon Beech 55 Baron	TIO-540-J2B2	12

2012 Base Ontario Airport Operations

Aircraft	Engine	2012 Operations
Raytheon Beech 60 Duke	TIO-540-J2B2	12
Raytheon Beech 99	PT6A-36	1,884
Raytheon Beech Baron 58	TIO-540-J2B2	52
Raytheon Beech Bonanza 36	TIO-540-J2B2	246
Raytheon Beechjet 400	JT15D-1 series	2
Raytheon Beechjet 400	JT15D-5, -5A, -5B	80
Raytheon Beechjet 400	JT15D-5C	16
Raytheon Hawker 4000 Horizon	PW308A	8
Raytheon Super King Air 200	PT6A-42	114
Raytheon Hawker 800	TFE731-3	2
Raytheon King Air 100	TPE331-6	4
Raytheon King Air 90	PT6A-135A	8
Raytheon King Air 90	PT6A-28	4
Raytheon King Air 90	PT6A-41	10
Raytheon King Air 90	PT6A-60	56
Raytheon Premier I	JT15D-1 series	372
Raytheon Super King Air 200	PT6A-41	4
Raytheon Super King Air 200	PT6A-42	114
Raytheon Super King Air 200	PT6A-61	196
Raytheon Super King Air 300	PT6A-60A	48
Robinson R44 Raven	TIO-540-J2B2	4
Rockwell Commander 500	TIO-540-J2B2	2
Rockwell Commander 690	TPE331-10	4
Rockwell Commander 690	TPE331-10GT	4
Rockwell Sabreliner 65	TFE731-3	8
Saab 2000	AE3007A	10
Sikorsky S-76 Spirit	T700-GE-700	20
Sikorsky UH-60 Black Hawk	T700-GE-700	92
Total		59,816

2012 and 2040 Ontario Airport Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2012 ATADS	54,315	14,021	14,790	226	83,352
2040 SCAG/FAA TAF	250,054	11,372	18,085	407	279,918

Palm Springs Airport

2012 Palm Springs Airport Aircraft Operations (provided by Airport)

Aircraft Type	Aircraft	Engine	2012 Operations
Airbus A318-100 Series	Airbus A318-100 Series	CFM56-5B8/P	8
Airbus A319-100 Series	Airbus A319-100 Series	CFM56-5B5/P	440
Airbus A320-200 Series	Airbus A320-200 Series	CFM56-5B4/P	612
Boeing 737-400 Series	Boeing 737-400 Series	CFM56-3C-1	1,646
Boeing 737-600 Series	Boeing 737-600 Series	CFM56-7B20	8
Boeing 737-700 Series	Boeing 737-700 Series	CFM56-7B20	1,478
Boeing 737-800 Series	Boeing 737-800 Series	CFM56-7B27	1,746
Boeing 737-900 Series	Boeing 737-900 Series	CFM56-7B26 (8CM051)	138
Boeing MD-81	Boeing MD-81	JT8D-217C	1,828
Boeing MD-83	Boeing MD-83	JT8D-219 Environmental Kit	992
Bombardier CRJ-200-ER	Bombardier CRJ-200-ER	CF34-3A1	9,538
Bombardier CRJ-700	Bombardier CRJ-700	CF34-8C1	1,824
Bombardier CRJ-900	Bombardier CRJ-900	CF34-8C5 LEC (8GE110)	470
Bombardier de Havilland Dash 8	Bombardier de Havilland Dash 8	PW150A	788
de Havilland DHC-8-100	de Havilland DHC-8-100	PW121	324
Embraer EMB120 Brasilia	Embraer EMB120 Brasilia	PW118	5,192
Embraer ERJ190	Embraer ERJ190	CF34-10E5A1 SAC	10
Total			27,042

2012 Palm Springs Airport Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2012 ATADS	12,312	19,986	24,412	1,388	58,098

Palm Springs Airport (continued)

2040 Palm Springs Airport Aircraft Operations (provided by SCAG)

Aircraft	Engine	2040 Operations
A319-100	CFM56 5B6/3	478
A319-100	CFM56 5B6/3	1,992
A319-100	CFM56 5B6/3	415
A319-100	CFM56 5B7/3	969
A320-200	CFM56 5B6/3	1,613
A320-200	CFM56 5B6/3	630
A321-200	CFM56 5B3/3	631
B737-700	CFM56 7B24E	9,815
B737-800	CFM56 7B24E	6,255
B737-900	CFM56 7B24E	569
B737-700	CFM56 7B24E	2,347
CRJ 700 ER	CF34 8C5A3	16,650
CRJ 900 ER	CF34 8C5	10,055
Emb 175 LR	CF34 8E5 LEC	576
Total		52,996

2040 Palm Springs Airport Total Aircraft Operations

	Air Carrier	Air Taxi	GA	Military	Total
FAA 2040 TAF	52,996	7,403	25,838	1,855	88,092