

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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Prepared for:

Adewale Oshinuga

South Coast Air Quality Management District

21865 Copley Drive

Diamond Bar, CA 91765

Prepared by:

Integra Environmental Consulting, Inc.

Zorik Pirveysian

649 Tufts Ave

Burbank, CA 91504

(818) 843-3107

zorikp@integraec.com

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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 | NOx | SOx | 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 | NOx | SOx | 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 |
| Cable | Mil | Mixed | 1.059 | 1.054 | 0.916 | 2.518 | 2.166 | 0.205 | 0.135 | 0.132 |
| | GA | Jet | 4.648 | 4.608 | 4.010 | 64.030 | 2.166 | 0.492 | 1.583 | 1.544 |
| Catalina | GA | Piston | 2.794 | 2.462 | 2.536 | 196.592 | 1.064 | 0.164 | 3.875 | 2.673 |
| | AT | Jet | 0.477 | 0.473 | 0.411 | 1.702 | 0.365 | 0.076 | 0.284 | 0.277 |
| Chino | 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 |
| | AC | Jet | 0.026 | 0.026 | 0.023 | 0.095 | 0.079 | 0.008 | 0.005 | 0.004 |
| Chiriaco Summit | 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 |
| | Mil | Mixed | 2.171 | 2.160 | 1.878 | 5.160 | 4.439 | 0.419 | 0.277 | 0.270 |
| Compton/Woodley | GA | Jet | 0.303 | 0.300 | 0.261 | 4.167 | 0.141 | 0.032 | 0.103 | 0.100 |
| | GA | Piston | 0.182 | 0.160 | 0.165 | 12.795 | 0.069 | 0.011 | 0.252 | 0.174 |
| Corona Municipal Airport | GA | Jet | 3.328 | 3.299 | 2.871 | 45.840 | 1.550 | 0.352 | 1.133 | 1.105 |
| | GA | Piston | 2.000 | 1.763 | 1.816 | 140.744 | 0.761 | 0.117 | 2.774 | 1.913 |
| Desert Air Sky Ranch | GA | Jet | 2.521 | 2.499 | 2.175 | 34.728 | 1.175 | 0.267 | 0.858 | 0.837 |
| | GA | Piston | 1.515 | 1.336 | 1.376 | 106.624 | 0.577 | 0.089 | 2.102 | 1.449 |
| Desert Center | 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 |
| El Monte | GA | Jet | 0.008 | 0.007 | 0.007 | 0.104 | 0.004 | 0.001 | 0.003 | 0.003 |
| | 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 |
| Ernst Field | GA | Piston | 2.520 | 2.221 | 2.287 | 177.295 | 0.959 | 0.148 | 3.495 | 2.410 |
| | Mil | Mixed | 0.385 | 0.383 | 0.333 | 0.915 | 0.787 | 0.074 | 0.049 | 0.048 |
| Ernst 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 |

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 |
| Lake Riverside Estates | Mil | Mixed | 1.346 | 1.339 | 1.164 | 3.200 | 2.753 | 0.260 | 0.172 | 0.168 |
| | GA | Jet | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Long Beach Airport | GA | Piston | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 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 |
| Ontario International Airport | GA | Piston | 0.269 | 0.237 | 0.244 | 18.934 | 0.102 | 0.016 | 0.373 | 0.257 |
| | 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 |
| Palm Springs International Airport | GA | Jet | 8.208 | 8.061 | 7.200 | 57.795 | 3.558 | 0.720 | 0.347 | 0.347 |
| | 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 |
| Palm Springs International Airport | 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 |
| | Mil | Mixed | 0.451 | 0.448 | 0.390 | 1.071 | 0.921 | 0.087 | 0.057 | 0.056 |
| San Bernardino International Airport | 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 |
| | GA | Piston | 0.744 | 0.656 | 0.676 | 52.378 | 0.283 | 0.044 | 1.032 | 0.712 |
| San Clemente Island Naval Air Station | 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 |
| Santa Monica Municipal Airport | Mil | Mixed | 22.522 | 22.405 | 19.479 | 121.960 | 51.337 | 4.840 | 25.726 | 25.726 |
| | 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 |
| Skylark Field | Mil | Mixed | 0.240 | 0.239 | 0.208 | 0.571 | 0.491 | 0.046 | 0.031 | 0.030 |
| | GA | Jet | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Van Nuys | GA | Piston | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 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 |
| Whiteman | Mil | Mixed | 0.271 | 0.263 | 0.240 | 1.392 | 0.244 | 0.035 | 0.008 | 0.008 |
| | 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 |
| Zamperini Field | Mil | Mixed | 0.328 | 0.326 | 0.283 | 0.779 | 0.670 | 0.063 | 0.042 | 0.041 |
| | 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 |
| 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 | 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 |
| Skylark Field | Mil | Mixed | 0.576 | 0.573 | 0.498 | 1.369 | 1.178 | 0.111 | 0.073 | 0.072 |
| | GA | Jet | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Van Nuys | GA | Piston | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 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 |
| Whiteman | Mil | Mixed | 0.237 | 0.230 | 0.209 | 1.215 | 0.213 | 0.031 | 0.007 | 0.007 |
| | 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 |
| All Airports Combined | Mil | Mixed | 1.764 | 1.755 | 1.526 | 4.193 | 3.607 | 0.341 | 0.225 | 0.220 |
| | | | 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 IIH | 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 | 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 Freighte | 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 | GEnx-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 200 | PT6A-41 | 14 |
| Raytheon Super King Air 200 | PT6A-42 | 286 |
| Raytheon Super King Air 200 | PT6A-61 | 2 |
| Raytheon Super King Air 300 | 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 Freighter | 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 Freighter | 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 Freighter | GE90-110B1 | 696 | 696 | 696 |
| Boeing 777-200 Series Freighter | 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 Dash | 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 Packag | 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 er | 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 K | 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 I/H | 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 (1RF | 2 |
| Lockheed Martin F-16 Fighting | 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 Horiz | 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 |