



## **2020 National Emissions Inventory: Aviation Component**

### **Prepared for:**

U.S. Environmental Protection Agency  
National Vehicle and Fuel Emissions Laboratory  
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## **2020 NATIONAL EMISSIONS INVENTORY: AVIATION COMPONENT**

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Work Order No. 5-19

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## Table of Contents

1.0	Executive Summary .....	1-1
2.0	Introduction.....	2-1
2.1	Purpose and Objectives.....	2-1
2.2	Background.....	2-1
3.0	Data Sources for Activity Data.....	3-1
3.1	National Data Sources Airport Activities .....	3-1
3.2	State Provided Airport Activity Data.....	3-2
4.0	Summary of 2020 Emissions Development.....	4-1
4.1	Emission Estimation Methodology.....	4-1
4.1.1	Aircraft Specific Estimation Methodology (AEDT).....	4-1
4.1.2	Generic Emissions Estimating Procedures.....	4-2
4.1.3	In-Flight Lead Emissions .....	4-3
5.0	Summary of Airport Emissions .....	5-1
6.0	References.....	6-1
	Appendix A Instructions for State Review .....	6-1
	Appendix B State LTO data.....	B-1
	Appendix C Generic Aircraft Type Emission Factors .....	C-1
	Appendix D Total Annual Emissions by SCC.....	D-1

## List of Tables

Table 1-1. 2017 and 2020 LTO Comparison .....	1-2
Table 1-2. Total Annual Emissions from Airports .....	1-2
Table 3-1. Agencies That Provided Activity Data or Commented on Data .....	3-2
Table 3-2. 2017 and 2020 LTO Comparison .....	3-3
Table 4-1. Emission Factors for Aircraft Types (pounds per LTO) .....	4-3
Table 5-1. Total Annual 2020 Emissions from Airports .....	5-1

## List of Figures

Figure 2-1. Landing and Takeoff Cycle.....	2-3
Figure 5-1. Total Annual 2020 Airport VOC Emissions (tons) by SCC Descriptions.....	5-2

## Acronym List

<b>Acronym</b>	<b>Definition</b>
AC	Air Carrier
AEDT	Aviation Environmental Design Tool
AETC	Aircraft Engine Type Code
APU	Auxiliary Power Unit
ASIF	AEDT Standard Input File
AT	Air taxis
CO <sub>2</sub>	Carbon Dioxide
CO	Carbon Monoxide
EDMS	Emissions and Dispersion Modeling System
EIA	Energy Information Agency
EIAG	Emission Inventory and Analysis Group
EIS	Emissions Inventory System
EPA	Environmental Protection Agency
ERG	Easton Research Group, Inc.
FAA	Federal Aviation Administration
GA	General Aviation
GSE	Ground Support Equipment
HAP	Hazardous Air Pollutants
LTO	Landing and Take-off Cycle
NEI	National Emissions Inventory
NO <sub>x</sub>	Nitrogen Oxides
OAQPS	Office of Air Quality Planning and Standards
OPSNET	Operations Network
PM <sub>10</sub> -PRI	PM <sub>10</sub> Primary (Filt + Cond)
PM <sub>2.5</sub> -PRI	PM <sub>2.5</sub> Primary (Filt + Cond)
SCC	Source Classification Codes
SO <sub>2</sub>	Sulfur Dioxide
SQL	Structured Query Language
TAF	Terminal Aerodrome Forecasts
TGO	Touch and Go
VOC	Volatile Organic Compounds
WA	Work Assignment

## 1.0 Executive Summary

The Emission Inventory and Analysis Group (EIAG) at the United States Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards (OAQPS) triennially produces the National Emission Inventory (NEI). The NEI compiles comprehensive emissions data for criteria pollutants and hazardous air pollutants (HAPs) for mobile, point, and nonpoint sources, including mobile source; aviation, marine vessels, railroads, onroad vehicles and nonroad engines. These data are needed by states, tribal, and local agencies to evaluate emissions trends in each state and to compare emission trends between geographic areas. The NEI is also used as a basis for various EPA air quality modeling and regulatory analyses. The NEI uses the Emission Inventory System (EIS) to aid in the collection and distribution of inventory information. EPA uses the data in the NEI as a starting point to prepare National Emissions Modeling Platforms that are used to prepare emissions inputs that support air quality modeling studies. These studies support both regulatory and non-regulatory analyses and often require data to be created that represent years other than NEI years, including future years.

Eastern Research Group (ERG) developed the 2020 aviation component of the NEI for criteria and hazardous air pollutants (HAPs). The NEI will be used to support modeling activities, help with regulatory initiatives, state implementation programs to address concerns in nonattainment areas and address airport-related emission inquiries.

The emissions associated with airport activities are attributed to the following sources with associated source classification codes (SCC):

- Commercial aviation (SCC: 2275020000)
- Air taxis
  - Piston driven (SCC: 2275060011)
  - Turbine driven (SCC: 2275060012)
- General aviation
  - Piston driven (SCC: 2275050011)
  - Turbine driven (SCC: 2275050012)
- Military (SCC: 2275001000)
- Auxiliary Power Units (SCC: 2275070000)
- Ground Support Equipment
  - Diesel-fueled (SCC: 2270008005)
  - Gasoline-fueled (SCC: 2265008005).

To estimate emissions from these sources, 2020 activity data provided by states were compiled and supplemented with publicly available 2020 activity data as described in Section 3. Two approaches were used to estimate emissions from the compiled activity data. For activity that included aircraft-specific data, ERG used the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) to estimate emissions. If such detailed data were not available or AEDT did not import specific activity data or calculate emissions, ERG applied a

more general approach by different aircraft types (i.e., air taxis, general aviation, and military aircraft) using the EPA’s available generic emission estimating procedures for the NEI. Additional information on the methodology used is included Section 4 of this document.

Table 1-1 shows that aircraft activity in aggregate were lower (11%) in 2020 than in 2017. This is due to the Covid-19 Pandemic. Commercial air carriers accounted for a 30% decline in activity as well as air taxi piston, air taxi turbines, and general aviation piston (-50%, -29%, -20% respectively). However general aviation turbine increased by 30% which again is because of the pandemic with customers chartering flights for business and personal usage. Military aircraft had a slight decline in activity in 2020 compared to other aviation groups.

**Table 1-1. 2017 and 2020 LTO Comparison**

SCC	SCC Description	2017 LTO*	2020 LTO	Percent Difference
2275001000	Aircraft/Military	4,034,228	3,693,002	-8%
2275020000	Aircraft/Commercial	7,822,548	5,304,089	-32%
2275050011	Aircraft /General Aviation /Piston	27,945,914	22,432,799	-20%
2275050012	Aircraft /General Aviation /Turbine	12,059,215	15,671,335	30%
2275060011	Aircraft /Air Taxi /Piston	992,378	490,315	-51%
2275060012	Aircraft /Air Taxi /Turbine	4,569,582	3,233,536	-29%
Total		58,785,712	50,825,076	-11%

\* Reminder that 2017 Activity was a combination of 2017 aircraft specific and 2014 generic data.

It should also be noted that due to a rounding issue within the AEDT model, actual emissions may be slightly larger.

**Table 1-2. Total Annual Emissions from Airports**

Pollutant Name	2017 Emissions (Ton)	2020 Emissions (Ton)	Percent Difference
Carbon Dioxide*	28,012,538.41	28,503,168.55	2%
Carbon Monoxide	498,092.13	339,825.16	-32%
Nitrogen Oxides	123,415.22	85,524.48	-31%
PM <sub>10</sub> Primary (Filt + Cond)	10,006.17	8,704.46	-13%
PM <sub>2.5</sub> Primary (Filt + Cond)	8,764.17	7,711.24	-12%
Sulfur Dioxide	16,135.45	9,378.01	-42%
Volatile Organic Compounds	59,243.71	37,661.49	-36%

\* 2017 Inventory did not gap fill CO<sub>2</sub> for generic LTOs, therefore the Percent difference is inconsistent.

Summary of criteria and HAP emissions are provided in Section 5. A complete list of references is provided in Section 6.



## **2.0 Introduction**

### **2.1 Purpose and Objectives**

The U.S. EPA issued Work Assignment (WA) 4-19 and 5-19, “Mobile Source Emission Inventory Development for 2020 National Emission Inventory and National Modeling Platforms” under EPA Contract Number EPA-EP-C-17-011, to Eastern Research Group, Inc. (ERG) to support the development of the 2020 aircraft component of the NEI. This report documents procedures used to estimate 2020 aviation emissions and is a deliverable under this work assignment.

To develop the comprehensive inventories for the aircraft source category, ERG conducted the following tasks:

- Compiled aircraft landing and takeoff (LTO) data from several Federal Aviation Administration’s (FAA) data sources including the following:
  - For aircraft specific data: 2020 T-100 dataset<sup>2</sup>, and
  - For generic aircraft data: 2020 Terminal Area Forecast (TAF) data<sup>3</sup>, 2020 Operations Network (OPSNET)<sup>4</sup> and 2020 Airport Master Record (form 5010) data<sup>5</sup>.
- Compiled state submitted 2020 LTO data.
- Calculated emission estimates using FAA’s AEDT version 3d and generic emission factors.
- Summarized activity and emissions data.

It should be noted that the engine-specific factors used in the AEDT model were derived from testing data used to certify the engines and account for U.S. and international emissions standards at the time of manufacture.

Section 3.0 of this report identifies the national and state activity data sources included in this study. This section describes how ERG pulled from each activity data source to compile the 2020 activity dataset. This section also documents any assumptions or adjustments that were made to each data source to facilitate the development of the activity dataset.

Section 4.0 summarizes the emissions estimation methodology used to develop the 2020 airport inventory, various summary emissions tables for criteria pollutants, lessons learned and suggestions for future projects.

The criteria and HAP emissions associated with airport activities are included in the Access database files submitted with this report for 2020.

### **2.2 Background**

This report covers airport activities as point/facilities sources in the emission calculation and for the EPA’s EIS. The AEDT model treats airports as point/facilities. The aircraft source category

includes all aircraft types used for public, private, and military purposes. The emissions associated with airport activities are attributed to the following sources with associated SCC:

- Commercial aviation (SCC: 2275020000)
- Air taxis
  - Piston driven (SCC: 2275060011)
  - Turbine driven (SCC: 2275060012)
- General aviation
  - Piston driven (SCC: 2275050011)
  - Turbine driven (SCC: 2275050012)
- Military (SCC: 2275001000)
- Auxiliary Power Units (SCC: 2275070000)
- Ground Support Equipment
  - Diesel-fueled (SCC: 2270008005)
  - Gasoline-fueled (SCC: 2265008005).

Commercial air carriers (AC) transport passengers, freight, or both and tend to be larger aircraft that are driven with jet engines. Air taxis (AT), which are also considered to be commercial aircraft, are usually smaller aircraft (less than 60 passengers) that operate on a limited basis compared to larger commercial aircraft that carry between 60 and 800 passengers. General aviation (GA) includes most other aircraft used for recreational flying and personal transportation. Smaller aircraft that support business travel, usually on an unscheduled basis, are also included in the GA category.

Aircraft tend to emit significant amounts of air pollutants. The national AT and GA fleet includes both jet and propeller-driven aircraft. Most of the AT and GA fleet are comprised of piston- (or propeller-) driven aircraft, though these aircraft types also include smaller business jets and turboprops and helicopters equipped with piston or turboshaft engines. The piston-driven aircraft tend to have higher VOC emissions and lower NO<sub>x</sub> emissions than turbine-powered aircraft. For this inventory it is assumed that propeller-driven aircraft and turbine-driven aircraft account for 72.1% and 27.9%, respectively, of all generic GA emissions.<sup>1</sup> Propeller-driven aircraft and turbine-driven aircraft account for 21.8% and 78.2%, respectively, of all generic AT emissions.<sup>1</sup> These values were used as a national-scale default value obtained from published studies used to investigate lead emissions from aviation sources.

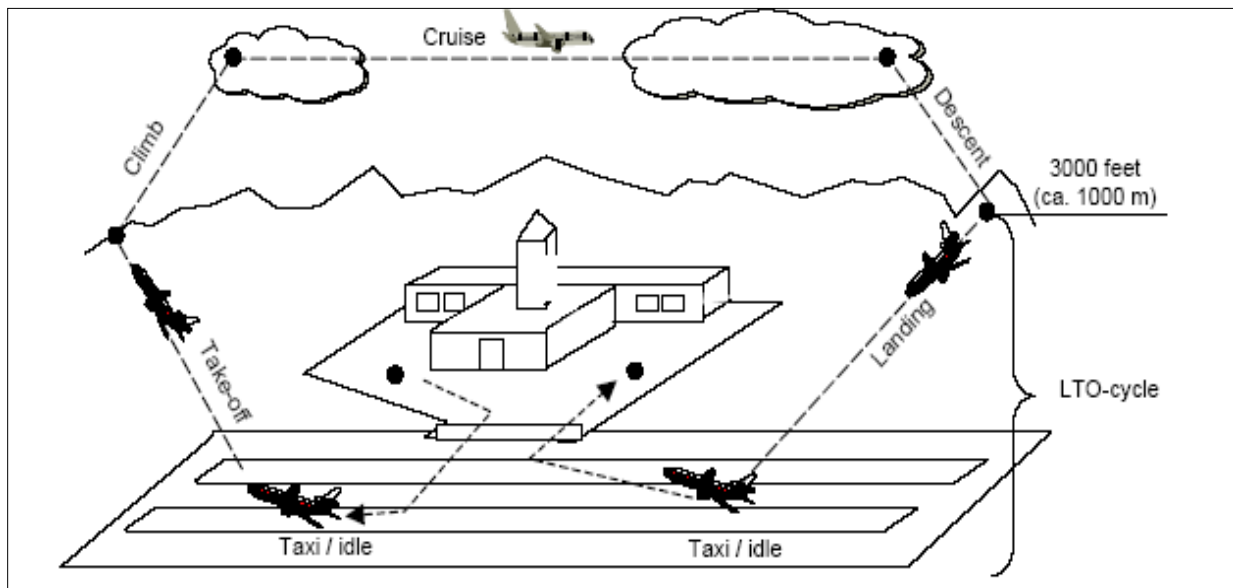
Military aircraft (MIL) comprise a wide range of aircraft types such as training aircraft, fighter jets, helicopters, and jet- and propeller-driven cargo planes of varying sizes. Because of limited information concerning the make-up of the military aircraft fleet, for this inventory it was assumed that most military aircraft are jet-powered.

Aircraft emissions are associated with an aircraft's landing and takeoff (LTO) cycle. The cycle begins when the aircraft approaches the airport on its descent from cruising altitude, then lands and taxis to the gate, where it idles during passenger deplaning. The cycle continues as the

aircraft idles during passenger boarding, taxis back onto the runway, takes off, and ascends (or climbs out) to cruising altitude. Figure 2-1 illustrates the six specific operating modes in an LTO cycle:

- Approach
- Taxi/idle-in
- Taxi/idle-out
- Idling
- Takeoff
- Climb out.

The LTO cycle provides a basis for calculating aircraft emissions associated with airports. During each mode of operation, an aircraft engine operates at a specific power setting and fuel consumption rate for a given aircraft make and model. Emissions for one complete cycle are calculated by multiplying emission factors for each operating mode for each specific aircraft engine and the typical period of time the aircraft is operating. It should be noted that AEDT estimates aircraft emissions based on a specified flight path. The flight path for this study is based on a single runway that represents the airports activities.



**Figure 2-1. Landing and Takeoff Cycle**

### **3.0 Data Sources for Activity Data**

To implement this project, ERG obtained aircraft activity data from various sources. There are two general sources of airport data; the preferred sources are local data from the states themselves. The other are publicly available national data sources from the FAA. Section 3.1 discusses the national data sources and Section 3.2 discusses the state provided data.

#### **3.1 National Data Sources Airport Activities**

ERG compiled aircraft landing and takeoff (LTO) data from several Federal Aviation Administration's (FAA) data sources including the following: 2020 T-100 dataset, 2020 (TAF, 2020 OPSNET, and 2020 5010 data.

The T-100 data is derived from commercial aviation operations, reported directly by the airlines and specifically includes very detailed information about large commercial air carriers and air taxis. Because the T-100 aircraft data are provided for individual aircraft specifying manufacturer and aircraft model, they can be matched to specific aircraft in the FAA's new Aviation Environmental Design Tool (AEDT) which is a SQL based software tool used to estimate emissions. Please note the previous FAA's Emission Dispersion and Modeling Systems (EDMS) emissions will not be accepted anymore for the NEI. Because of the details provided in T-100, it is also possible to identify which aircraft are typically used for air taxi services based on typical passenger capacity. All non-air taxi data in the T-100 data are assumed to be larger commercial aircraft.

The FAA's TAF and OPSNET datasets do not provide operations data at the aircraft manufacturer and model level of detail that the T-100 data does; instead, operations are provided for general aircraft types (i.e., AC, AT, GA and MIL). OPSNET includes actual operations at FAA controlled facilities, while TAF includes the OPSNET data and also modeled operations for other non-FAA control facilities. Note that the TAF and OPSNET data are provided as operations (separate operation counts for each landing and takeoff leg), such that the TAF and OPSNET operations need to be divided by 2 to get LTOs.

The TAF/ OPSNET data were adjusted because both the T-100 data and the TAF/ OPSNET data include AC and AT; these data needed to be adjusted to avoid issues of double counting when the two datasets were combined.

The 5010 forms are used for airport infrastructure planning and include a variety of information about airport operations and characteristics. Such information is particularly important for smaller facilities where data sources are sparse. The ERG reviewed the data reported in the 5010 submittals to estimate LTO activity for general aviation and air taxis. No additional adjustments were made to the 5010.

### 3.2 State Provided Airport Activity Data

The national LTO data were posted for states to review. Instructions that delineate the review process were included with the posted data and are provided in Appendix A. State/local/tribal agencies provided local LTO data as deletions, additions or changes to the national LTO data for their jurisdiction. State/local/tribal agency submitted data were evaluated and if appropriate, were included in the national LTO data file. Table 3-1 lists the state/local/tribal agencies that provided data or comments.

**Table 3-1. Agencies That Provided Activity Data or Commented on Data**

State	Affiliation
CT	Connecticut Department of Energy and Environmental Protection
DE	Delaware Department of Natural Resources and Environmental Control
FL	Florida Department of Environmental Protection
GA	Georgia Environmental Protection Division
MD	Maryland Department of the Environment
ME	Maine Department of Environmental Protection
MI	Michigan Department of Environment, Great Lakes, and Energy
NC	North Carolina Department of Environmental Quality
NH	New Hampshire Department of Administrative Services
NJ	State of New Jersey Department of Environmental Protection
NV	Washoe County Health District
SC*	South Carolina Department of Health and Environmental Control
TX**	Texas Commission on Environmental Quality
VA	Virginia Department of Environmental Quality

\* Submittal was late, but state accepted EPA estimates (no changes)

\*\* Submittal was late, data was unfortunately not incorporated due to timeframe.

Appendix B includes the detailed LTO data submitted by states and incorporated into the dataset.

The final LTO database with state data incorporated was then compared to the LTO data in the 2017 inventory. Table 3-2 summarizes the LTO comparison.

**Table 3-2. 2017 and 2020 LTO Comparison**

<b>SCC</b>	<b>SCC Description</b>	<b>2017 LTO*</b>	<b>2020 LTO</b>	<b>Percent Difference</b>
2275001000	Aircraft/Military	4,034,228	3,693,002	-8%
2275020000	Aircraft/Commercial	7,822,548	5,304,089	-32%
2275050011	Aircraft /General Aviation /Piston	27,945,914	22,432,799	-20%
2275050012	Aircraft /General Aviation /Turbine	12,059,215	15,671,335	30%
2275060011	Aircraft /Air Taxi /Piston	992,378	490,315	-51%
2275060012	Aircraft /Air Taxi /Turbine	4,569,582	3,233,536	-29%
	Total	57,423,865	50,825,076	-11%

## **4.0 Summary of 2020 Emissions Development**

### **4.1 Emission Estimation Methodology**

To develop the most accurate aircraft emission inventory possible, ERG took two different approaches. If aircraft-specific data were available, ERG used the FAA's AEDT model in conjunction with detailed aircraft activity data from T-100. If such detailed data were not available, then ERG applied a more general approach for different aircraft types (i.e., air taxis, general aviation, and military aircraft) using available generic emission estimating procedures. Using these two complementary approaches provides the most accurate emission estimates for the larger commercial jets, which tends to be the most significant aircraft emission source, while still providing estimates for smaller aircraft.

#### **4.1.1 Aircraft Specific Estimation Methodology (AEDT)**

AEDT was used for the aircraft-specific activity data. To pull the data into AEDT, ERG developed a standalone tool to create AEDT Standard Input Files (ASIF) that are directly imported into AEDT. ASIF is the only format AEDT uses for importation.

During the implementation of this project, there were cases where AEDT could not process data from specific airports or aircraft; these included:

- Importing airports not in AEDT
- Data for some airports in AEDT would not import
- Importing helicopter data
- Aircraft (not helicopters) located at heliports that did not have runways Taxi In and Taxi Out revisions were not used because AEDT now requires gate information to enter and edit taxi times.

Where airports were identified as having issues with importing activity data, these activity data were applied to the generic emission estimation methodology.

After confirming all operations had been successfully imported into AEDT, the model was run and exported into two .csv files, one file for aircraft operations, and criteria emissions, and one file for the summary of the model runs. In this most recent version of AEDT HAP emissions were aggregated to the airport level and were not detailed enough. Therefore only criteria emissions were estimated using AEDT. HAP speciation profiles used in the generic methodology were then used to calculate the HAP emissions for the AEDT data. Due to how the AEDT model is designed, multiple individual files must be exported and combined to build a complete inventory. These files were exported and formatted for the flight path below mixing height, APU operations, and GSE operations. The emissions were converted from grams to short tons and additional IDs were added to each file, including state facility identifiers, SCC codes, and aircraft

engine type codes. The emissions data were exported as emission factors and were then multiplied by the various operations to estimate total emissions by aircraft type and airport.

As with the previous inventory certain runway and flight path combinations did not result in emissions being calculated in AEDT. After identifying these airport aircraft engine combinations which included several larger airports, these data were rerun manually with AEDT. However the smaller airports or records with lower LTOs were not manually rerun but converted to generic activity and emissions were estimated using that approach.

Emissions for the remaining airport aircraft engine combinations were developed using the generic emissions methodology detailed in Section 4.1.2. 5.3% of the aircraft specific LTOs required using the generic emissions estimation methodology.

#### 4.1.2 Generic Emissions Estimating Procedures

AEDT can provide emission estimates if the aircraft make and model are known. Often this is not the case for air taxis, general aviation, and military aircraft activity in the TAF and 5010 datasets. For smaller airports without aircraft specific activity from the T100, ERG used the generic approach that relies upon representative criteria emission factors and HAP speciation profiles provided by EPA<sup>7,8,9</sup>, using the following equation:

$$E_{ixj} = LTO_i \times FR_x \times EF_{ij}$$

Where:

- $E_{ixj}$  = Emission estimate for aircraft type i equipped with engine type x and pollutant j (lbs/year)
- $LTO_i$  = Annual count of LTO cycles for aircraft type i
- $FR_x$  = Fraction of LTOs equipped with engine type x
- $EF_{ij}$  = Generic emission factor for aircraft type i equipped with engine type x and pollutant j (lbs/LTO)
- i = Aircraft type (i.e., air taxi, general aviation, and military)
- x = Engine type (i.e., jet or turboprop, and piston engine)
- j = Criteria pollutant j

Critical to the calculation is the application of representative emission factors that account for the different aircraft in the national fleet. Table 4-1 lists all of the criteria pollutant emission factors used for the generic approach. Appendix C lists all of the generic criteria and HAP emission factors by SCC.

As discussed above, when the GA and AT breakout is unknown, EPA assumed that 72.1% of all generic GA activity are powered by propeller-driven aircraft and 27.9% are jet- (or turbine)



driven; and 21.8% of all generic AT activity are powered by propeller-driven aircraft and 78.2% are jet- (or turbine) driven. The T-100 data had the piston and jet engines already disaggregated.

**Table 4-1. Emission Factors for Aircraft Types (pounds per LTO)**

Aircraft Type	Pollutant					
	CO	NO <sub>x</sub>	PM <sub>10</sub> -PRI	PM <sub>2.5</sub> -PRI	SO <sub>x</sub>	VOC
Commercial	22.38	18.58	1.08	1.05	1.78	6.16
Air Taxi (turbine)	3.61	0.78	0.60	0.59	0.16	1.01
Air Taxi (propeller)	28.13	0.16	0.60	0.42	0.02	0.17
General Aviation (turbine)	9.58	0.32	0.24	0.23	0.07	0.69
General Aviation (propeller)	12.01	0.07	0.24	0.16	0.01	0.15
Military	25.96	22.33	1.39	1.36	2.11	10.87

### 4.1.3 In-Flight Lead Emissions

In-flight emissions are estimated for lead from GA and AT use of aviation gas in piston powered aircraft. The in-flight lead calculation was based on the lead content (2.12 grams/ gal) and total 2020 aviation gas usage (193 million gallons<sup>1</sup>) minus the GA and AT LTO lead emissions (176.20 tons), providing an in-flight lead estimate of 251.84 tons of lead. The calculation used the following equation<sup>6</sup>:

$$IF_{pb} = (FC \times LC \times Rt \times CF) - LTO_{pb}$$

Where:

- IF<sub>pb</sub> = Inflight lead estimates (tons of lead /year)
- FC = 2020 aviation gas fuel consumption (gallons/year)
- LC = Lead content of aviation gas (2.12 g lead/ gallon of fuel)
- Rt = Adjustment for lead retention rate of 5% equates to 0.95 Rt factor equation
- CF = Conversion factor: g to ton
- LTO<sub>pb</sub> = Total lead emissions from GA and AT use of aviation gas associated with LTO activities (tons of lead / year)

<sup>1</sup> FAA, General Aviation and Part 135 Activity Surveys - CY 2020  
[https://www.faa.gov/data\\_research/aviation\\_data\\_statistics/general\\_aviation/cy2020](https://www.faa.gov/data_research/aviation_data_statistics/general_aviation/cy2020)

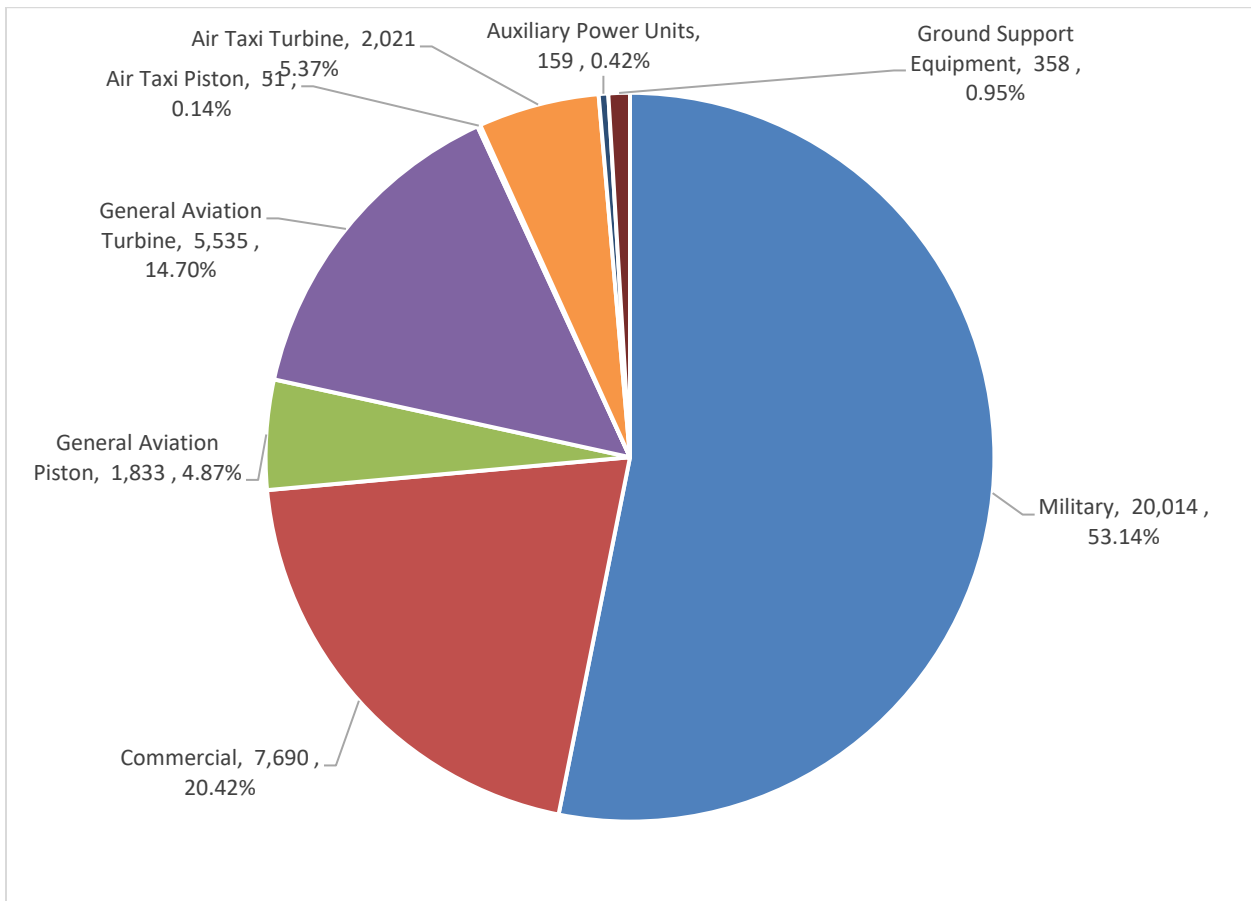
## 5.0 Summary of Airport Emissions

Table 5-1 summarizes the total annual emissions from airports; emissions disaggregated by SCCs, are provided in Appendix D. Figure 5-1 summarizes the VOC emissions as a pie chart by SCC descriptions. As is apparent, military operations are relatively stable relative to the other aircraft operations, the fraction of total emissions attributed to them increased in 2020. Most of the military emissions are derived from the generic approach which is a less accurate method, especially considering the range of aircraft types used by the military.

**Table 5-1. Total Annual 2020 Emissions from Airports**

Pollutant Name	Pollutant Code	Emissions (Ton)
Carbon Dioxide	CO2	28,503,168.55
Carbon Monoxide	CO	339,825.16
Nitrogen Oxides	NOX	85,524.48
PM <sub>10</sub> Primary (Filt + Cond)	PM10-PRI	8,704.46
PM <sub>2.5</sub> Primary (Filt + Cond)	PM25-PRI	7,711.24
Sulfur Dioxide	SO2	9,378.01
Volatile Organic Compounds	VOC	37,661.49
1,3-Butadiene	106990	619.55
2,2,4-Trimethylpentane	540841	7.31
2-Methyl Naphthalene	90120	73.07
Acenaphthene	83329	2.18
Acenaphthylene	208968	12.28
Acetaldehyde	75070	1,528.74
Acrolein	107028	870.01
Anthracene	120127	2.54
Benzo(a)anthracene	56553	0.30
Benzene	71432	683.63
Benzo(a)pyrene	50328	0.30
Benzo(b)fluoranthene	205992	0.36
Benzo(ghi)perylene	191242	0.78
Benzo(k)fluoranthene	207089	0.36
Chrysene	218019	0.30
Isopropylbenzene	98828	1.06
Dibenzo(ah)anthracene	53703	0.01
Ethylbenzene	100414	93.42
Fluoranthene	206440	2.72
Fluorene	86737	4.50
Formaldehyde	50000	4,424.64
N-Hexane	110543	15.09591911
Indeno(1,2,3-cd)pyrene	193395	0.24

Pollutant Name	Pollutant Code	Emissions (Ton)
Lead	7439921	176.20
Methanol	67561	640.27
M-Xylene And P-Xylene	108383	100.03
Naphthalene	91203	472.20
O-Xylene	95476	58.88
Phenanthrene	85018	7.61
Phenol	108952	257.5282907
Propionaldehyde	123386	259.1769488
Styrene	100425	116.94
Toluene	108883	452.01
Xylene	1330207	126.37



**Figure 5-1. Total Annual 2020 Airport VOC Emissions (tons) by SCC Descriptions**

## 6.0 References

1. U.S. EPA, *Calculating Piston-Engine Aircraft Activity for the Draft 2011 National Emissions Inventory*. June 2012.
2. Title 14 - Code of Federal Regulations - Part 241 Uniform System of Accounts and Reports for Large Certificated Air Carriers. T-100 Segment (All Carriers) - Published Online by Bureau of Transportation Statistics. [http://www.https://www.transtats.bts.gov/Fields.asp?gnoyr\\_VQ=GEE](http://www.https://www.transtats.bts.gov/Fields.asp?gnoyr_VQ=GEE). Accessed August 10, 2021.
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**Appendix A**  
**Instructions for State Review**

## 2020 Aircraft LTO Data Processing for the National Emission Inventory

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### **Purpose**

To assist state, local, and tribal agencies in their submittal of aircraft-related activity data, EPA has compiled the aircraft landing and takeoff (LTO) data from several Federal Aviation Administration's (FAA) data sources including the following: 2020 T-100 dataset, 2020 Terminal Area Forecast (TAF) data, 2020 Operations Network (OPSNET) data, and 2020 Airport Master Record (form 5010) data. These data are available for review and revision by agencies in order to accurately estimate activity data for all aircraft types. These compiled data, including local revisions, will be used to calculate the 2020 National Emission Inventory (NEI) aviation emissions.

Please note that by reviewing and correcting the LTO data in this dataset you will NOT need to submit an airport emissions file to EIS. If you send the revisions back to EPA now, EPA will perform the processing tasks required, such as matching EIS facility, unit, and process IDs for the airports, as well submitting the emissions inventory to the EIS Gateway. This will be the easiest way for agencies to submit local data into EIS; those who choose not to participate in this data gathering process, but still want local emissions data included in EIS, will be required to prepare their data to meet all EIS input requirements and submit it themselves.

### **Background**

The T-100 data is derived from commercial aviation operations, reported directly by the airlines and specifically includes very detailed information about large commercial air carriers and air taxis. Because the T-100 aircraft data are provided for individual aircraft specifying manufacturer and aircraft model, they can be matched to specific aircraft in the FAA's New Aviation Environmental Design Tool (AEDT) which is SQL based software tool used to estimate emissions. Please note the previous FAA's Emission Dispersion and Modeling Systems (EDMS) emissions will not be accepted by the EPA anymore for the NEI. Because of the details provided in T-100, it is also possible to identify which aircraft are typically used for air taxi services based on typical passenger capacity. All non-air taxi data in the T-100 data are assumed to be larger commercial aircraft.

The FAA's TAF and OPSNET datasets do not provide operations data at the aircraft manufacturer and model level of detail that the T-100 data does; instead, operations are provided for general aircraft types (i.e., air carriers, air taxis, general aviation and military). OPSNET includes actual operations at FAA controlled facilities, while TAF includes the OPSNET data and also modeled operations for other non-FAA control facilities. Note that the TAF and OPSNET data are provided as operations (separate operation counts for each landing and takeoff leg), such that the TAF and OPSNET operations need to be divided by 2 to get LTOs.

Previously the TAF/OPSNET data were adjusted because both the T-100 data and the TAF/OPSNET data are reported by the airports include commercial air carriers and air taxis, the data needs to be adjusted to avoid issues of double counting when the two datasets are combined. However due to resources, the 2014 data were used with no adjustments for the 2017 NEI with the assumption the overlap is not significant and cannot be quantified due to the differing years.

The 5010 forms are used for airport infrastructure planning include a variety of information about airport operations and characteristics. Such information is particularly important for smaller facilities where data sources are sparse. ERG reviewed the data reported in the 5010 submittals to estimate LTO activity for general aviation and air taxis. Again no additional adjustments were made to the 5010.

### **Reviewing/Revising Data**

The compiled LTO data are available for state/local/tribal (SLT) agency review. The data are presented as a Microsoft Access database. The database includes two drop-down menus: one for selecting data by state and one for selecting data by tribal code. Once the state/tribe has been selected, users have the option of viewing the data in Access (this is Read Only and for review ONLY) or exporting the data to a Microsoft Excel spreadsheet for further review and revisions. Agencies will need to review both the LTO data as well as facility information. The LTO data will include the Airport identification information, aircraft information, and LTO data. The facility data will include airport identification information, address, coordinates, description, and operating status.

Please note that to export the data to Excel, the user will first need to create a folder on the C drive of their computer called “2020 NEI LTO Review” (C:\2020 NEI LTO Review) The exported Excel file(s) will be generated in this folder. Revisions should be made in the Excel files as described below to facilitate EPA processing and avoid errors:

- **Revising Data:** Existing LTO data can be corrected by adding the new data value to the “Revised LTO” column and marking it as a “Revision” in the “Revisions Comment” field.
- **Removing Data:** Please DO NOT DELETE ANY ROWS in the Excel spreadsheet. If you want to remove LTO data, simply change the ”Revised LTO” column to 0 and mark it as a “Revision” in the “Revisions Comment” field.
- **Adding Data:** Rows can be added to account for new aircraft or engine type combination. Please make sure that the airport, aircraft, and engine combination does not already exist in the dataset before adding new rows, as adding an existing combination may cause double counting. When adding a row, fill in all other fields when possible, including the

EISFacilitySiteIdentifier where possible. Also, leave the “PrimaryKey” and the “EPA LTO” fields blank, as these fields are for internal record keeping.

- The EPA will assume a default taxi in time of 7 minutes and a default taxi out time of 19 minutes. If states want to revise the taxi in or out time for specific airports please add the correct times in revised taxi in time and revised taxi out time columns.
- Please note there are some airports in the dataset with limited information pertaining to the airport name, county FIPs, and addresses. Please add additional information if possible.
- There may also be issues with geographic data for airports. In many of the new airports the latitude and longitude are inconsistent with the FIP, city, state, and zip code. Please review and correct these issues if possible.

See Tables A-1, A-2, A-3, and A-4 for examples on how to correctly submit LTO revisions. See Tables A-5, A-6, and A-7 for examples on how to correctly submit airport revisions. Please note that some EIS-required fields (i.e., EISEmissionsUnitIdentifier and EISEmissionsProcessIdentifier) are not included in the database. These fields were removed to simplify the data revision process and will be added by EPA. The EISFacilitySiteIdentifier, which is unique, is included, however, to avoid errors resulting from duplication of the more common three digit alphanumeric airport code, FacilitySiteIdentifier. (Note that the FacilitySiteIdentifier indicated may be one of many alternate ones for a given airport). Some airports in the database currently do not have an EISFacilitySiteIdentifier; EPA will add these during processing. If your airport is not included in this database (either with or without an EISFacilitySiteIdentifier) please add the airport and be prepared to provide the airport’s street address, city, state, zip, and latitude/longitude coordinates in the airport revisions.

The AircraftEngineTypeCodes are available under the Reporting Code Tables link in the EIS gateway.

### **Submitting Data to EPA**

States must submit their changes by DATE to this email address managed by EPA’s contractor Eastern Research Group (ERG): [NEI-2020LTO@ERG.com](mailto:NEI-2020LTO@ERG.com). If no changes are required, you may indicate that you accept EPA’s estimates via an EIS support request (as you would for any category of data for which you accept EPA estimates), or by sending an email indicating acceptance to the above address. Note this email account has a 10 MB limit. If a state submittal is larger than 10 MB, a message can be left at this e-mail address requesting data transfer using a secure FTP site. A representative from ERG will respond to this request with instructions how to access the FTP site.



The EPA will review the state-submitted data to ensure that it is appropriate and reasonable. Once the LTO data have been finalized, then the aircraft specific LTO data will be run using the latest version of AEDT to estimate criteria and HAP emissions for aircraft engine exhaust, auxiliary power units, and ground support equipment. The remaining aircraft type data will be applied to generic emission factors.

If you need assistance, contact Janice Godfrey at - or [godfrey.janice@epa.gov](mailto:godfrey.janice@epa.gov).

**Note EPA strongly encourages agencies to review and, if necessary, submit their LTO data to the EPA via this review process. In doing so, then states need not submit EIS staging tables for the 2020 NEI.**

**Table A-1. Exported LTO Data from Access Database for Review (no changes)**

Primary Key	StateAnd County FIPSCode	Tribal Code	Airport	State	FacilitySite Identifier	EISFacility Site Identifier	Source Classification Code	Process Description	Aircraft Engine TypeCode	EPA LTO	Revised LTO	Revised_TGO	Revised_Taxi In (default_7_min)	Revised_Taxi Out (default_19_min)	Revision Comment
1	37001		Example Airport	NC	AAA	10000000	2275050011	Aircraft / General Aviation /Piston	999903	100					
2	37001		Example Airport	NC	AAA	10000000	2275020000	Aircraft/Commercial	1412	150					

**\*NOTE: Do not change the Primary Key, these are for internal tracking purposes.**

**Table A-2. Example of a LTO revision to an existing record**

Primary Key	StateAnd County FIPSCode	Tribal Code	Airport	State	FacilitySite Identifier	EISFacility Site Identifier	Source Classification Code	Process Description	Aircraft Engine TypeCode	EPA LTO	Revised LTO	Revised_TGO	Revised_Taxi In (default 7 min)	Revised_Taxi Out (default 19 min)	Revision Comment
1	37001		Example Airport	NC	AAA	10000000	2275050011	Aircraft /General Aviation /Piston	999903	100	82			12	Revision

**\*NOTE: Do not change the Primary Key, these are for internal tracking purposes.**

**Table A-3. Example of a LTO deletion of an existing record**

Primary Key	StateAnd County FIPSCode	Tribal Code	Airport	State	FacilitySite Identifier	EISFacility Site Identifier	Source Classification Code	Process Description	Aircraft Engine TypeCode	EPA LTO	Revised LTO	Revised_TGO	Revised_Taxi In (default_7_min)	Revised_Taxi Out (default_19_min)	Revision Comment
2	37001		Example Airport	NC	AAA	10000000	2275020000	Aircraft/ Commercial	1412	150	0				Revision

**\*NOTE: Do not change the Primary Key, these are for internal tracking purposes.**

**Table A-4. Example of a LTO additions to the existing dataset**

Primary Key	StateAnd County FIPSCode	Tribal Code	Airport	State	FacilitySite Identifier	EISFacility Site Identifier	Source Classification Code	Process Description	Aircraft Engine TypeCode	EPA LTO	Revised LTO	Revised TGO	Revised Taxi In (default 7 min)	Revised Taxi Out (default 19 min)	Revision Comment
	37001		Example Airport	NC	AAA	10000000	2275050011	Aircraft /General Aviation /Piston	1415		25			12	Addition
	37001		Example Airport	NC	AAB	10000001	2275020000	Aircraft/Co mmercial	1418		30		5		Addition

**\*NOTE: Primary Keys are null for additions.**

**Table A-5. Example of Airport Data to review**

AirportKey	StateAnd County FIPSCode	Tribal Code	Airport	City	State	ZIP	Latitude	Longitude	Facility SiteIdentifier	EISFacility SiteIdentifier	OpStatus	RevisionNotes
293	37001		Example Airport	City	NC	27703	54.14472	-165.60416	AAA		Open	

**\*NOTE: Do not change the Airport Key, these are for internal tracking purposes.**

**Table A-6. Example of Airport Data revised**

AirportKey	StateAnd County FIPSCode	Tribal Code	Airport	City	State	ZIP	Latitude	Longitude	Facility SiteIdentifier	EISFacility SiteIdentifier	OpStatus	RevisionNotes
293	37001		Example Airport	Town	NC	27703	99.999	9999.999	AAA		Open	Revised City, Lat, and Long

**\*NOTE: Do not change the Airport Key, these are for internal tracking purposes.**

**Table A-7. Example of Airport Data additional**

AirportKey	StateAnd County FIPSCode	Tribal Code	Airport	City	State	ZIP	Latitude	Longitude	Facility SiteIdentifier	EISFacility SiteIdentifier	OpStatus	RevisionNotes
	37001		New Airport	Place	NC	27703	55.5555	777.7777	ZZZ		New, since 2014 Inventory	New Airport

**\*NOTE: Airport Keys are null for additions.**

**Appendix B**  
**State LTO data**

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised_LTO	Revised_TGO
09001	Nonfacility Operations Fairfield County	2275060012	204125	3	
09001	Stamford Hospital	2275060012	204125	27	
09001	Danbury Muni	2275060011	999901	155	
09001	Danbury Muni	2275060012	999902	600	
09001	Danbury Muni	2275050011	999903	26750	
09001	Danbury Muni	2275050012	999904	8295	
09001	Igor I Sikorsky Memorial	2275060011	999901	164.5	
09001	Igor I Sikorsky Memorial	2275060012	999902	1067.5	
09001	Igor I Sikorsky Memorial	2275050011	999903	12782	
09001	Igor I Sikorsky Memorial	2275050012	999904	14002	
09001	Bridgeport Hospital	2275060012	204125	24	
09001	Bridgeport Hospital	2275060012	204124	3	
09001	Danbury Hospital	2275060012	204124	1	
09001	Danbury Hospital	2275060012	204125	18	
09001	Saint Vincent's Hospital	2275060012	204125	35	
09001	Saint Vincent's Hospital	2275060012	204124	1	
09001	Norwalk Hospital	2275060012	204125	11	
09001	FLYING RIDGE AIRSTRIP	2275050011	203161	12	
09003	Nonfacility Operations Hartford County	2275060012	204125	8	
09003	Nonfacility Operations Hartford County	2275060012	204124	4	
09003	The Hospital of Central CT Bradley Memorial	2275060012	204125	2	
09003	Connecticut Childrens Medical Center	2275060012	204124	5	
09003	Connecticut Childrens Medical Center	2275060012	204125	27	
09003	Marlborough Medical Center	2275060012	204125	4	
09003	Bradley Intl	2275020000	206542	1	
09003	Bradley Intl	2275020000	202089	73	
09003	Bradley Intl	2275020000	202078	416.5	
09003	Bradley Intl	2275020000	200991	2902.5	
09003	Bradley Intl	2275020000	202564	12.5	
09003	Bradley Intl	2275020000	202040	421	
09003	Bradley Intl	2275020000	202501	344.5	
09003	Bradley Intl	2275020000	206530	2477	
09003	Bradley Intl	2275020000	202559	179.5	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
09003	Bradley Intl	2275020000	203816	1376	
09003	Bradley Intl	2275020000	204831	483.5	
09003	Bradley Intl	2275020000	205171	16	
09003	Bradley Intl	2275020000	202547	1608.5	
09003	Bradley Intl	2275020000	201253	1093	
09003	Bradley Intl	2275020000	201705	1	
09003	Bradley Intl	2275020000	200083	241.5	
09003	Bradley Intl	2275020000	200108	17	
09003	Bradley Intl	2275020000	200147	5.5	
09003	Bradley Intl	2275020000	200154	252	
09003	Bradley Intl	2275020000	200176	1737	
09003	Bradley Intl	2275020000	200385	1081.5	
09003	Bradley Intl	2275020000	200538	1263	
09003	Bradley Intl	2275020000	200957	1434	
09003	Bradley Intl	2275020000	200989	321	
09003	Bradley Intl	2275020000	201049	32	
09003	Bradley Intl	2275020000	201341	10.5	
09003	Bradley Intl	2275020000	201359	9.5	
09003	Bradley Intl	2275020000	200704	476.5	
09003	Bradley Intl	2275060011	999901	0	
09003	Bradley Intl	2275060012	999902	3342.5	
09003	Bradley Intl	2275050011	999903	600	
09003	Bradley Intl	2275050012	999904	4645	
09003	Hartford-Brainard	2275060011	999901	29	
09003	Hartford-Brainard	2275060012	999902	188	
09003	Hartford-Brainard	2275050011	999903	21500	
09003	Hartford-Brainard	2275050012	999904	2496	
09003	Robertson Field	2275060011	999901	37	
09003	Robertson Field	2275060012	999902	238	
09003	Robertson Field	2275050011	999903	10000	
09003	Robertson Field	2275050012	999904	999	
09003	SALMON RIVER AIRFIELD	2275050011	999903	400	
09003	SALMON RIVER AIRFIELD	2275050012	999904	0	
09003	Simsbury	2275050011	999903	6388	
09003	Simsbury	2275050012	999904	0	
09003	SKYLARK AIRPARK	2275050011	999903	7960	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
09003	SKYLARK AIRPARK	2275050012	999904	0	
09003	Bristol Hospital	2275060012	204124	1	
09003	Bristol Hospital	2275060012	204125	5	
09003	Hartford Hospital	2275060012	204124	78	
09003	Hartford Hospital	2275060012	204125	485	
09003	UConn John Dempsey Hospital	2275060012	204124	3	
09003	UConn John Dempsey Hospital	2275060012	204125	7	
09003	The Hospital of Central CT New Britain General	2275060012	204124	7	
09003	The Hospital of Central CT New Britain General	2275060012	204125	26	
09003	Saint Francis Hospital	2275060012	204125	41	
09003	Saint Francis Hospital	2275060012	204124	25	
09003	KAMAN AEROSPACE CORP	2275050011	545	4.5	
09003	KAMAN AEROSPACE CORP	2275001000	200005	47.5	
09003	RAYTHEON TECHNOLOGIES FARMINGTON	2275050012	999904	20.5	
09003	RENTSCHLER	2275050012	999904	5	
09003	ULTIMATE	2275050011	203161	6	
09005	Nonfacility Operations Litchfield County	2275060012	204124	4	
09005	Nonfacility Operations Litchfield County	2275060012	204125	16	
09005	Charlotte Hungerford Hospital	2275060012	204124	17	
09005	Charlotte Hungerford Hospital	2275060012	204125	77	
09005	New Milford Hospital	2275060012	204125	4	
09005	Winsted Medical Center	2275060012	204125	5	
09005	Winsted Medical Center	2275060012	204124	8	
09005	CANDLELIGHT	2275050011	999903	30	
09005	CANDLELIGHT	2275050012	999904	0	
09005	CANDLELIGHT FARMS	2275050011	999903	6500	
09005	CANDLELIGHT FARMS	2275050012	999904	0	
09005	WATERBURY	2275050011	999903	7550	
09005	WATERBURY	2275050012	999904	0	
09005	WHELAN FARMS	2275050011	999903	43	
09005	WHELAN FARMS	2275050012	999904	0	
09005	Sharon Hospital	2275060012	204125	14	
09005	Sharon Hospital	2275060012	204124	7	
09005	GOOD HILL FARM	2275060011	999901	2	
09005	GOOD HILL FARM	2275060012	999902	1	
09005	GOOD HILL FARM	2275050011	999903	10	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
09005	Triumph Airfield LLC	2275050011	206311	15	
09005	Triumph Airfield LLC	2275050011	2056	20	
09005	Triumph Airfield LLC	2275050011	2081	15	
09005	SHINGLE MILL	2275050011	200026	4	
09005	WINGS AGO AIRSTRIP	2275050011	206312	10	
09005	WINGS AGO AIRSTRIP	2275050011	206311	30	
09007	Nonfacility Operations Middlesex County	2275060012	204125	5	
09007	Chester	2275060011	999901	945	
09007	Chester	2275060012	999902	105	
09007	Chester	2275050011	999903	4500	
09007	Chester	2275050012	999904	500	
09007	GOODSPEED	2275050011	999903	3115	
09007	GOODSPEED	2275050012	999904	0	
09007	MAPLEWOOD FARM	2275050011	999903	25	
09007	MAPLEWOOD FARM	2275050012	999904	0	
09007	Middlesex Hospital	2275060012	204125	17	
09007	Shoreline Medical Center	2275060012	204125	6	
09007	Shoreline Medical Center	2275060012	204124	1	
09009	Nonfacility Operations New Haven County	2275060012	204125	3	
09009	Saint Raphael's Hospital	2275060012	204125	1	
09009	Waterbury Hospital	2275060012	204125	14	
09009	Waterbury Hospital	2275060012	204124	2	
09009	HUMMINGBIRD	2275050011	999903	0	
09009	HUMMINGBIRD	2275050012	999904	0	
09009	Meriden Markham Muni	2275060011	999901	12	
09009	Meriden Markham Muni	2275060012	999902	78	
09009	Meriden Markham Muni	2275050011	999903	7500	
09009	Meriden Markham Muni	2275050012	999904	750	
09009	Tweed-New Haven	2275060011	999901	137	
09009	Tweed-New Haven	2275060012	999902	885	
09009	Tweed-New Haven	2275050011	999903	11500	
09009	Tweed-New Haven	2275050012	999904	2183	
09009	Waterbury-Oxford	2275060011	999901	217.5	
09009	Waterbury-Oxford	2275060012	999902	1410.5	
09009	Waterbury-Oxford	2275050011	999903	7000	
09009	Waterbury-Oxford	2275050012	999904	7623	



FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
09009	Midstate Medical Center	2275060012	204124	4	
09009	Midstate Medical Center	2275060012	204125	391.5	
09009	Saint Mary's Hospital	2275060012	204124	3	
09009	Saint Mary's Hospital	2275060012	204125	20	
09009	Yale New Haven Hospital	2275060012	204125	253	
09009	Yale New Haven Hospital	2275060012	204124	5	
09009	East Haven Rifle Range	2275001000	200021	1	1
09011	Nonfacility Operations New London County	2275060012	204125	46	
09011	Lawrence & Memorial Hospital	2275060012	204125	55	
09011	Lawrence & Memorial Hospital	2275060012	204124	1	
09011	Pequot Health Center	2275060012	204125	1	
09011	Groton-New London	2275060011	999901	99	
09011	Groton-New London	2275060012	999902	640	
09011	Groton-New London	2275050011	999903	17410	
09011	Groton-New London	2275050012	999904	400	
09011	Backus Hospital	2275060012	204124	3	
09011	Backus Hospital	2275060012	204125	414.5	
09011	Camp Nett	2275001000	200021	7	11
09011	Camp Nett	2275001000	200008	5	5
09011	Stones Ranch Military Reservation	2275001000	200021	5	21
09011	MILE CREEK	2275050011	999903	100	
09011	SPRUCE	2275050011	999903	10	
09011	THE SHORE	2275050011	203161	6	
09013	Nonfacility Operations Tolland County	2275060012	204124	7	
09013	Nonfacility Operations Tolland County	2275060012	204125	10	
09013	Johnson Memorial Medical Center	2275060012	204125	6	
09013	Johnson Memorial Medical Center	2275060012	204124	17	
09013	Rockville General Hospital	2275060012	204125	4	
09013	Rockville General Hospital	2275060012	204124	6	
09013	ELLINGTON	2275050011	999903	13400	
09013	ELLINGTON	2275050012	999904	160	
09015	Nonfacility Operations Windham County	2275060012	204124	1	
09015	Nonfacility Operations Windham County	2275060012	204125	7	
09015	Day Kimball Hospital	2275060012	204124	11	
09015	Day Kimball Hospital	2275060012	204125	35	
09015	Plainfield Emergency Care Center	2275060012	204124	1	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
09015	Plainfield Emergency Care Center	2275060012	204125	40	
09015	Danielson	2275060011	999901	18	
09015	Danielson	2275060012	999902	18	
09015	Danielson	2275050011	999903	6000	
09015	Danielson	2275050012	999904	6000	
09015	TOUTANT	2275050011	999903	100	
09015	TOUTANT	2275050012	999904	0	
09015	Windham	2275060011	999901	7	
09015	Windham	2275060012	999902	44	
09015	Windham	2275050011	999903	6300	
09015	Windham	2275050012	999904	600	
09015	Windham Hospital	2275060012	204124	4	
09015	Windham Hospital	2275060012	204125	91	
10001	CHANDELLE ESTATES	2275050011	999903	213.43674	
10001	CHANDELLE ESTATES	2275050012	999904	149.56326	
10001	CHORMAN	2275050011	999903	3155.68866	
10001	CHORMAN	2275050012	999904	2211.31134	
10001	Dover AFB Airport	2275020000	200322	1793.3389831	
10001	Dover AFB Airport	2275020000	202040	5931.8135593	
10001	Dover AFB Airport	2275020000	202369	413.84745763	
10001	Dover AFB Airport	2275001000	999905	14196	
10001	JENKINS	2275050011	999903	58.21002	
10001	JENKINS	2275050012	999904	40.78998	
10001	SMYRNA	2275050011	999903	329.85678	
10001	SMYRNA	2275050012	999904	231.14322	
10001	WILLAVIEW	2275050011	999903	82.7031	
10001	HRUPSA	2275050011	999903	86.1431	
10001	BAYHEALTH MEDICAL CENTER	2275050012	999904	33	
10001	BAYHEALTH MEDICAL CENTER	2275050011	999903	18	
10001	OUR DOMAIN	2275050011	999903	1	
10001	G W FARM	2275050011	999903	69.2227	
10001	DOYLE'S	2275050011	999903	79.2631	
10001	DELAWARE STATE POLICE	2275050012	999904	33	
10001	DELAWARE STATE POLICE	2275050011	999903	18	
10001	DOVER DOWNS HELISTOP	2275050012	999904	2.79	
10001	DOVER DOWNS HELISTOP	2275050011	999903	7.21	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
10001	NEWBERG	2275050011	999903	1	
10001	FLYING C	2275050011	999903	103.343	
10001	JOHNSONS	2275050011	999903	93.0231	
10001	ELLIOTT	2275050012	999904	33	
10001	ELLIOTT	2275050011	999903	18	
10001	BELFAIR	2275050012	999903	33	
10003	New Castle County	2275020000	202564	1.998738098	
10003	New Castle County	2275050012	205273	0.99936904898	
10003	New Castle County	2275050012	206070	0.99936904898	
10003	New Castle County	2275050012	204248	0.99936904898	
10003	New Castle County	2275050012	204205	0.99936904898	
10003	New Castle County	2275050012	204197	0.99936904898	
10003	New Castle County	2275020000	202078	0.99936904898	
10003	New Castle County	2275060012	201748	1.998738098	
10003	New Castle County	2275060012	201720	0.99936904898	
10003	New Castle County	2275050012	201248	8.9943214409	
10003	New Castle County	2275020000	200165	19.98738098	
10003	New Castle County	2275020000	200991	0.99936904898	
10003	New Castle County	2275060011	999901	200.87495772	
10003	New Castle County	2275060012	999902	1300.1773539	
10003	New Castle County	2275050011	999903	7713.8373237	
10003	New Castle County	2275050012	999904	5391.3887002	
10003	New Castle County	2275001000	999905	2775.7475336	
10003	A.I. DUPONT CHILDREN'S HOSPITAL	2275050012	999904	33	
10003	A.I. DUPONT CHILDREN'S HOSPITAL	2275050011	999903	18	
10003	MCKEOWN	2275050011	999903	82.7031	
10003	FULL THROTTLE FARM	2275050011	999903	113.56	
10003	ROLLINS BLDG	2275050011	999903	18	
10003	ROLLINS BLDG	2275050012	999904	33	
10003	DUFFY'S	2275050011	999903	0	
10003	SPIRIT AIRPARK	2275050011	999903	130.76	
10003	CHRISTINA HOSPITAL	2275050011	999903	18	
10003	CHRISTINA HOSPITAL	2275050012	999904	33	
10003	SCOTTY'S PLACE	2275050011	999903	82.7031	
10003	BRACEBRIDGE III	2275050011	999903	18	
10003	BRACEBRIDGE III	2275050012	999904	33	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
10003	GREENVILLE	2275050011	999903	18	
10003	GREENVILLE	2275050012	999904	33	
10003	OKOLONA PLANTATION	2275050011	999903	79.2631	
10003	TOWNSEND A	2275050011	999903	113.56	
10005	LAUREL	2275050011	999903	1474.65384	
10005	LAUREL	2275050012	999904	1033.34616	
10005	HUEY	2275050011	999903	82.0611	
10005	PEVEY	2275050011	999903	85.5011	
10005	SUGAR HILL	2275050011	999903	126.781	
10005	WEST PVT	2275050011	999903	82.0611	
10005	OCKEL FARMS	2275050011	999903	102.701	
10005	EAGLE CREST-HUDSON	2275050011	999903	116.461	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202539	1480	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	204006	370	
13063	Hartsfield-Jackson Atlanta International Airport	2275050011	202024	472	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200393	17015	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200335	924	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	204211	1295	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202085	11652	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	206227	1110	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	204368	370	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200553	740	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200374	2959	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202499	23118	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	206200	740	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201074	1849	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201111	185	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202456	26262	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200481	4623	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200962	7767	
13063	Hartsfield-Jackson Atlanta International Airport	2275060012	201250	25244	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	205314	2034	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202054	555	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202390	1295	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	203816	6103	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	203014	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202564	1110	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202559	1110	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202547	27557	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202503	24413	
13063	Hartsfield-Jackson Atlanta International Airport	2275060012	202397	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	204007	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202369	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050012	202105	472	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202089	4624	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202078	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	206530	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202501	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050012	205353	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	206542	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050012	206302	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	206483	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202040	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	206200	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	206394	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	205433	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	204038	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	205318	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	205287	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	205286	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	205171	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	204831	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050012	204197	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050012	206070	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200176	24598	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200704	740	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200665	370	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200538	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200525	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200385	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200957	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200322	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200154	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200173	0	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200083	35140	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200165	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200147	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	202000	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	206419	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200378	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275060012	201748	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200108	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200989	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275060012	201720	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050012	201907	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050012	201489	1102	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201359	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201341	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050012	201248	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201142	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201118	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201095	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	200991	14610	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201049	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201040	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	201253	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275060011	999901	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275060012	999902	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275050011	999903	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275001000	999905	0	
13063	Hartsfield-Jackson Atlanta International Airport	2275020000	999906	0	
22115	Polk AFB	2275001000	999905	37088	
24003	Deale Airport	2275050011	999903	50	
24003	Baltimore-Washington International	2275020000	202078	374	
24003	Baltimore-Washington International	2275020000	202547	832	
24003	Baltimore-Washington International	2275020000	202503	17	
24003	Baltimore-Washington International	2275020000	202501	1665	
24003	Baltimore-Washington International	2275060012	202397	743	
24003	Baltimore-Washington International	2275020000	202390	22	
24003	Baltimore-Washington International	2275020000	202089	117	
24003	Baltimore-Washington International	2275020000	203816	516	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
24003	Baltimore-Washington International	2275020000	202040	149	
24003	Baltimore-Washington International	2275050012	201925	2	
24003	Baltimore-Washington International	2275060012	201748	595	
24003	Baltimore-Washington International	2275050012	202105	3730	
24003	Baltimore-Washington International	2275020000	202559	43	
24003	Baltimore-Washington International	2275050012	202573	1	
24003	Baltimore-Washington International	2275020000	205286	12	
24003	Baltimore-Washington International	2275050012	204197	2	
24003	Baltimore-Washington International	2275050012	204804	1	
24003	Baltimore-Washington International	2275020000	204831	1683	
24003	Baltimore-Washington International	2275020000	205171	3071	
24003	Baltimore-Washington International	2275020000	206530	19670	
24003	Baltimore-Washington International	2275020000	205287	38	
24003	Baltimore-Washington International	2275050012	206062	1	
24003	Baltimore-Washington International	2275050012	206070	1	
24003	Baltimore-Washington International	2275060012	201720	626	
24003	Baltimore-Washington International	2275020000	202564	345	
24003	Baltimore-Washington International	2275020000	200989	1367	
24003	Baltimore-Washington International	2275020000	205433	1	
24003	Baltimore-Washington International	2275020000	200083	432	
24003	Baltimore-Washington International	2275020000	200108	4	
24003	Baltimore-Washington International	2275020000	200133	1	
24003	Baltimore-Washington International	2275020000	200147	11	
24003	Baltimore-Washington International	2275020000	200154	13	
24003	Baltimore-Washington International	2275020000	200176	35021	
24003	Baltimore-Washington International	2275020000	200322	24	
24003	Baltimore-Washington International	2275020000	200385	304	
24003	Baltimore-Washington International	2275020000	200525	2	
24003	Baltimore-Washington International	2275020000	200538	669	
24003	Baltimore-Washington International	2275060012	201718	1	
24003	Baltimore-Washington International	2275020000	200957	1979	
24003	Baltimore-Washington International	2275020000	200991	3678	
24003	Baltimore-Washington International	2275020000	201040	6	
24003	Baltimore-Washington International	2275020000	201095	4	
24003	Baltimore-Washington International	2275050012	201248	5	
24003	Baltimore-Washington International	2275020000	201253	474	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
24003	Baltimore-Washington International	2275050012	201308	1	
24003	Baltimore-Washington International	2275020000	201341	1	
24003	Baltimore-Washington International	2275050012	201489	561	
24003	Baltimore-Washington International	2275050012	201513	87	
24003	Baltimore-Washington International	2275060012	201654	1	
24003	Baltimore-Washington International	2275060012	201692	8	
24003	Baltimore-Washington International	2275020000	201705	7	
24003	Baltimore-Washington International	2275020000	200704	453	
24003	Baltimore-Washington International	2275060011	999901	1361.870532	
24003	Baltimore-Washington International	2275060012	999902	6861.129468	
24003	Baltimore-Washington International	2275050011	999903	2528.02001	
24003	Baltimore-Washington International	2275001000	999905	562	
24003	Baltimore-Washington International	2275020000	999906	1353.5	
24005	Medstar Franklin Square Medical Center Heliport	2275060012	999902	62	
24005	Martin State	2275050012	206070	1	
24005	Martin State	2275050012	201489	1	
24005	Martin State	2275050012	204205	1	
24005	Martin State	2275060011	999901	145.108594	
24005	Martin State	2275060012	999902	941.391406	
24005	Martin State	2275050011	999903	20122.73353	
24005	Martin State	2275050012	999904	14097.76647	
24005	Martin State	2275001000	999905	1164.5	
24005	Martin State	2275020000	999906	12	
24009	Calvert Memorial Hospital Heliport	2275060012	999902	226	
24009	Cove Point Business Center Heliport	2275060012	999902	6	
24009	CHESAPEAKE RANCH AIRSTRIP	2275060012	999902	12	
24009	CHESAPEAKE RANCH AIRSTRIP	2275050011	999903	300	30
24009	CHESAPEAKE RANCH AIRSTRIP	2275050012	999904	0	
24011	Magennis Farm	2275050011	999903	50	
24013	Carroll Hospital Heliport	2275060012	999902	127	
24013	RESERVOIR	2275050011	999903	0	1
24013	RESERVOIR	2275050012	999904	0	
24017	Nyce Airport	2275050011	999903	31	3
24019	Hidden Hills Airport	2275050012	999904	1000	
24019	Cambridge-Dorchester	2275050011	999903	11789	
24019	Cambridge-Dorchester	2275050012	999904	620.5	



FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
24019	Cambridge-Dorchester	2275001000	999905	0	
24021	National Emergency Training Center Heliport	2275060012	999902	9	
24023	Garrett County	2275020000	999906	140	
24023	Garrett County	2275060011	999901	0	
24023	Garrett County	2275060012	999902	125	
24023	Garrett County	2275050011	999903	5050	400
24023	Garrett County	2275050012	999904	825	
24023	Garrett County	2275001000	999905	160	
24025	Moxley's Airport	2275050011	999903	50	
24025	FOREST HILL	2275050011	999903	170	
24025	FOREST HILL	2275050012	999904	10	
24031	Federal Support Center Heliport	2275060012	999902	15	
24031	Suburban Heliport	2275060012	999902	15	
24031	Davis	2275050011	999903	1505	
24031	Davis	2275050012	999904	0	
24033	Freeway	2275050011	999903	10020	
24033	Freeway	2275050012	999904	2	
24035	Ashland Landing Farm	2275050011	999903	24	
24035	Flying Acres Airport	2275050011	999903	10	
24035	KENTMORR AIRPARK	2275050011	999903	980	
24035	KENTMORR AIRPARK	2275050012	999904	0	
24035	KENTMORR AIRPARK	2275001000	999905	20	
24035	KENTMORR AIRPARK	2275060012	999902	12	
24037	Wingfield Airport	2275050011	999903	45	
24037	Hampton Airport	2275050011	999903	125	25
24039	Anderson Airport	2275060012	999902	10	
24039	Anderson Airport	2275050011	999903	20	
24047	Boomers Field	2275050011	999903	45	
24047	Boomers Field	2275060012	999902	40	
24047	Beverly Airport	2275050011	999903	6	
24510	Sinai II Heliport	2275060012	999902	53	
32031	Northern Nevada Medical Center	2275060012		30	
32031	BLACK ROCK CITY	2275050011	999903	0	
32031	BLACK ROCK CITY	2275050012	999904	0	
32031	Reno/Stead Airport	2275050011	999903	16360.3	
32031	Reno/Stead Airport	2275050012	999904	3718.3	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
32031	Reno/Stead Airport	2275001000	999905	561.3	
32031	Reno/Tahoe International Airport	2275020000		2.0	
32031	Reno/Tahoe International Airport	2275020000		453.4	
32031	Reno/Tahoe International Airport	2275020000		134.5	
32031	Reno/Tahoe International Airport	2275020000		26.9	
32031	Reno/Tahoe International Airport	2275050011		35.7	
32031	Reno/Tahoe International Airport	2275050011		8478.6	
32031	Reno/Tahoe International Airport	2275050011		292.6	
32031	Reno/Tahoe International Airport	2275050011		111.8	
32031	Reno/Tahoe International Airport	2275050011		695.6	
32031	Reno/Tahoe International Airport	2275020000		17.2	
32031	Reno/Tahoe International Airport	2275020000		66.6	
32031	Reno/Tahoe International Airport	2275020000		112.5	
32031	Reno/Tahoe International Airport	2275020000		27.2	
32031	Reno/Tahoe International Airport	2275020000		3.0	
32031	Reno/Tahoe International Airport	2275020000		6.1	
32031	Reno/Tahoe International Airport	2275020000		0.5	
32031	Reno/Tahoe International Airport	2275020000		26.2	
32031	Reno/Tahoe International Airport	2275020000		1160.1	
32031	Reno/Tahoe International Airport	2275020000		1815.1	
32031	Reno/Tahoe International Airport	2275020000		13.1	
32031	Reno/Tahoe International Airport	2275020000		51.4	
32031	Reno/Tahoe International Airport	2275020000		149.4	
32031	Reno/Tahoe International Airport	2275050012		194.0	
32031	Reno/Tahoe International Airport	2275060012		0.5	
32031	Reno/Tahoe International Airport	2275060012		252.0	
32031	Reno/Tahoe International Airport	2275050012		1.1	
32031	Reno/Tahoe International Airport	2275060012		94.6	
32031	Reno/Tahoe International Airport	2275060012		69.2	
32031	Reno/Tahoe International Airport	2275050012		290.2	
32031	Reno/Tahoe International Airport	2275050012		7.1	
32031	Reno/Tahoe International Airport	2275050012		161.8	
32031	Reno/Tahoe International Airport	2275050012		31.7	
32031	Reno/Tahoe International Airport	2275050012		41.6	
32031	Reno/Tahoe International Airport	2275050012		42.2	
32031	Reno/Tahoe International Airport	2275050012		2.4	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
32031	Reno/Tahoe International Airport	2275050012		1.2	
32031	Reno/Tahoe International Airport	2275020000		1	
32031	Reno/Tahoe International Airport	2275060012		2.0	
32031	Reno/Tahoe International Airport	2275050012		157.9	
32031	Reno/Tahoe International Airport	2275020000		2.0	
32031	Reno/Tahoe International Airport	2275050012		1.2	
32031	Reno/Tahoe International Airport	2275050012		10.7	
32031	Reno/Tahoe International Airport	2275050012		1.2	
32031	Reno/Tahoe International Airport	2275050011		1379.5	
32031	Reno/Tahoe International Airport	2275050011		53.0	
32031	Reno/Tahoe International Airport	2275050011		101.2	
32031	Reno/Tahoe International Airport	2275050011		11.9	
32031	Reno/Tahoe International Airport	2275001000		312.2	
32031	Reno/Tahoe International Airport	2275050012		80.4	
32031	Reno/Tahoe International Airport	2275060012		312.2	
32031	Reno/Tahoe International Airport	2275060012		14.9	
32031	Reno/Tahoe International Airport	2275020000		800.8	
32031	Reno/Tahoe International Airport	2275020000		3.0	
32031	Reno/Tahoe International Airport	2275020000		405.5	
32031	Reno/Tahoe International Airport	2275020000		117.0	
32031	Reno/Tahoe International Airport	2275020000		31.2	
32031	Reno/Tahoe International Airport	2275020000		71.6	
32031	Reno/Tahoe International Airport	2275020000		515.3	
32031	Reno/Tahoe International Airport	2275020000		8.6	
32031	Reno/Tahoe International Airport	2275020000		1	
32031	Reno/Tahoe International Airport	2275020000		654.2	
32031	Reno/Tahoe International Airport	2275020000		1.0	
32031	Reno/Tahoe International Airport	2275020000		10.6	
32031	Reno/Tahoe International Airport	2275060012		41.8	
32031	Reno/Tahoe International Airport	2275020000		1	
32031	Reno/Tahoe International Airport	2275020000		50.0	
32031	Reno/Tahoe International Airport	2275020000		33.3	
32031	Reno/Tahoe International Airport	2275020000		70.6	
32031	Reno/Tahoe International Airport	2275020000		1.0	
32031	Reno/Tahoe International Airport	2275020000		1018.3	
32031	Reno/Tahoe International Airport	2275020000		220.0	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
32031	Reno/Tahoe International Airport	2275020000		37.8	
32031	Reno/Tahoe International Airport	2275020000		1.0	
32031	Reno/Tahoe International Airport	2275020000		53.8	
32031	Reno/Tahoe International Airport	2275020000		236.0	
32031	Reno/Tahoe International Airport	2275020000		7.1	
32031	Reno/Tahoe International Airport	2275060012		27.9	
32031	Reno/Tahoe International Airport	2275060012		4.4	
32031	Reno/Tahoe International Airport	2275060012		46.8	
32031	Reno/Tahoe International Airport	2275060012		232.2	
32031	Reno/Tahoe International Airport	2275020000		227.3	
32031	Reno/Tahoe International Airport	2275020000		95.3	
32031	Reno/Tahoe International Airport	2275020000		55.5	
32031	Reno/Tahoe International Airport	2275060012		1.0	
32031	Reno/Tahoe International Airport	2275060012		67.8	
32031	Reno/Tahoe International Airport	2275060012		1.0	
32031	Reno/Tahoe International Airport	2275060012		1.0	
32031	Reno/Tahoe International Airport	2275060012		12.5	
32031	Reno/Tahoe International Airport	2275060012		32.9	
32031	Reno/Tahoe International Airport	2275060012		1174.1	
32031	Reno/Tahoe International Airport	2275060012		9.8	
32031	Reno/Tahoe International Airport	2275060012		137.4	
32031	Reno/Tahoe International Airport	2275020000		0.5	
32031	Reno/Tahoe International Airport	2275060012		6.0	
32031	Reno/Tahoe International Airport	2275020000		448.3	
32031	Reno/Tahoe International Airport	2275060012		64.0	
32031	Reno/Tahoe International Airport	2275060012		3.0	
32031	Reno/Tahoe International Airport	2275060012		1.0	
32031	Reno/Tahoe International Airport	2275060012		3.0	
32031	Reno/Tahoe International Airport	2275060012		72.7	
32031	Reno/Tahoe International Airport	2275060012		13.9	
32031	Reno/Tahoe International Airport	2275060012		4.0	
32031	Reno/Tahoe International Airport	2275060012		1.0	
32031	Reno/Tahoe International Airport	2275060012		49.8	
32031	Reno/Tahoe International Airport	2275060012		506.1	
32031	Reno/Tahoe International Airport	2275060012		1.0	
32031	Reno/Tahoe International Airport	2275020000		1.0	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
32031	Reno/Tahoe International Airport	2275020000		1	
32031	Reno/Tahoe International Airport	2275060012		269.9	
32031	Reno/Tahoe International Airport	2275050012		3.8	
32031	Reno/Tahoe International Airport	2275050012		110.6	
32031	Reno/Tahoe International Airport	2275050012		4.8	
32031	Reno/Tahoe International Airport	2275050012		53.5	
32031	Reno/Tahoe International Airport	2275050012		91.5	
32031	Reno/Tahoe International Airport	2275050012		29.9	
32031	Reno/Tahoe International Airport	2275050012		5.6	
32031	Reno/Tahoe International Airport	2275001000		709.2	
32031	Reno/Tahoe International Airport	2275050012		2.4	
32031	Reno/Tahoe International Airport	2275001000		35.7	
32031	Reno/Tahoe International Airport	2275050012		3.7	
32031	Reno/Tahoe International Airport	2275050012		158.2	
32031	Reno/Tahoe International Airport	2275050012		396.1	
32031	Reno/Tahoe International Airport	2275050012		4.4	
32031	Reno/Tahoe International Airport	2275050012		10.7	
32031	Reno/Tahoe International Airport	2275050012		126.6	
32031	Reno/Tahoe International Airport	2275050012		1.2	
32031	Reno/Tahoe International Airport	2275050012		4.8	
32031	Reno/Tahoe International Airport	2275050012		17.8	
32031	Reno/Tahoe International Airport	2275050012		94.0	
32031	Reno/Tahoe International Airport	2275050012		1429.3	
32031	Reno/Tahoe International Airport	2275050012		256.8	
32031	Reno/Tahoe International Airport	2275050012		4.8	
32031	Reno/Tahoe International Airport	2275050012		0.6	
32031	Reno/Tahoe International Airport	2275060012		5.8	
32031	Reno/Tahoe International Airport	2275050012		7.1	
32031	Reno/Tahoe International Airport	2275050012		11.9	
32031	Reno/Tahoe International Airport	2275001000		21.2	
32031	Reno/Tahoe International Airport	2275001000		28.8	
32031	Reno/Tahoe International Airport	2275001000		36.4	
32031	Reno/Tahoe International Airport	2275001000		27.3	
32031	Reno/Tahoe International Airport	2275001000		60.2	
32031	Reno/Tahoe International Airport	2275001000		42.5	
32031	Reno/Tahoe International Airport	2275050012		361.5	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
32031	Reno/Tahoe International Airport	2275060012		35.7	
32031	Reno/Tahoe International Airport	2275050012		4.8	
32031	Reno/Tahoe International Airport	2275050012		1.2	
32031	Reno/Tahoe International Airport	2275050012		1.2	
32031	Reno/Tahoe International Airport	2275050012		170.0	
32031	Reno/Tahoe International Airport	2275050012		8.3	
32031	Reno/Tahoe International Airport	2275050012		199.8	
32031	Reno/Tahoe International Airport	2275050012		8.3	
32031	Reno/Tahoe International Airport	2275060011		42.6	
32031	Reno/Tahoe International Airport	2275050012		1.8	
32031	Reno/Tahoe International Airport	2275050012		2.4	
32031	Reno/Tahoe International Airport	2275060011		2.0	
32031	Reno/Tahoe International Airport	2275060011		2.0	
32031	Reno/Tahoe International Airport	2275060011		2.0	
32031	Reno/Tahoe International Airport	2275060011		4.0	
32031	Reno/Tahoe International Airport	2275060012		939.0	
32031	Reno/Tahoe International Airport	2275060012		5.0	
32031	Reno/Tahoe International Airport	2275050012		274.9	
32031	Reno/Tahoe International Airport	2275050012		195.0	
32031	Reno/Tahoe International Airport	2275050012	206062	87.6	
32031	Reno/Tahoe International Airport	2275060012	201720	0	
32031	Reno/Tahoe International Airport	2275050012	201907	0.0	
32031	Reno/Tahoe International Airport	2275050012	202031	0.0	
32031	Reno/Tahoe International Airport	2275020000	202040	0	
32031	Reno/Tahoe International Airport	2275020000	202501	0	
32031	Reno/Tahoe International Airport	2275020000	202503	0	
32031	Reno/Tahoe International Airport	2275020000	202547	71.7	
32031	Reno/Tahoe International Airport	2275020000	201705	0	
32031	Reno/Tahoe International Airport	2275020000	204831	0	
32031	Reno/Tahoe International Airport	2275020000	206200	1	
32031	Reno/Tahoe International Airport	2275050012	206302	0	
32031	Reno/Tahoe International Airport	2275020000	206483	0	
32031	Reno/Tahoe International Airport	2275020000	203816	3016.2	
32031	Reno/Tahoe International Airport	2275020000	200989	0	
32031	Reno/Tahoe International Airport	2275020000	200108	0	
32031	Reno/Tahoe International Airport	2275020000	200147	15.1	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
32031	Reno/Tahoe International Airport	2275020000	200154	101.9	
32031	Reno/Tahoe International Airport	2275020000	200176	1955.1	
32031	Reno/Tahoe International Airport	2275020000	200385	808.9	
32031	Reno/Tahoe International Airport	2275020000	200538	557.5	
32031	Reno/Tahoe International Airport	2275050012	201513	0.0	
32031	Reno/Tahoe International Airport	2275020000	200957	0	
32031	Reno/Tahoe International Airport	2275020000	200991	1	
32031	Reno/Tahoe International Airport	2275020000	201040	17.7	
32031	Reno/Tahoe International Airport	2275020000	201253	0	
32031	Reno/Tahoe International Airport	2275050012	201308	1.2	
32031	Reno/Tahoe International Airport	2275020000	206530	0	
32031	Reno/Tahoe International Airport	2275050012	201489	0.0	
32031	Reno/Tahoe International Airport	2275020000	200704	0	
32031	Reno/Tahoe International Airport	2275060011	999901	15.9	
32031	Reno/Tahoe International Airport	2275060012	999902	13.0	
32031	Reno/Tahoe International Airport	2275050011	999903	4718.9	
32031	Reno/Tahoe International Airport	2275050012	999904	53.5	
32031	Reno/Tahoe International Airport	2275001000	999905	0	
32031	Reno/Tahoe International Airport	2275020000	999906	0	
32031	Renown Regional Medical Center	2275060012		831	
32031	ST MARY'S RGNL MEDICAL CENTER	2275060012		88	
33011	Manchester	2275020000	200154	16	
33011	Manchester	2275060012	201748	1180	
33011	Manchester	2275020000	206530	0	
33011	Manchester	2275020000	204038	0	
33011	Manchester	2275020000	203816	0	
33011	Manchester	2275020000	202559	0	
33011	Manchester	2275020000	202547	0	
33011	Manchester	2275060012	202397	0	
33011	Manchester	2275020000	202078	0	
33011	Manchester	2275020000	202040	0	
33011	Manchester	2275020000	200147	0	
33011	Manchester	2275020000	201359	0	
33011	Manchester	2275020000	201253	0	
33011	Manchester	2275020000	200991	0	
33011	Manchester	2275020000	200704	0	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
33011	Manchester	2275020000	200538	0	
33011	Manchester	2275050012	201489	0	
33011	Manchester	2275020000	200176	0	
33011	Manchester	2275020000	200385	0	
33011	Manchester	2275020000	200083	0	
33011	Manchester	2275060011	999901	0	
33011	Manchester	2275060012	999902	0	
33011	Manchester	2275050011	999903	0	
33011	Manchester	2275050012	999904	0	
33011	Manchester	2275001000	999905	0	
33011	Manchester	2275020000	999906	0	
33011	Manchester	2275060012	203117	32	
33011	Manchester	2275020000	200203	1475	
33011	Manchester	2275020000	203998	1537	
33011	Manchester	2275020000	205285	1803	
33011	Manchester	2275020000	203639	2465	
33011	Manchester	2275020000	200180	2775	
33011	Manchester	2275060012	202117	45	
33011	Manchester	2275060012	201641	45	
33011	Manchester	2275060012	204677	37	
33011	Manchester	2275060012	203047	385	
33011	Manchester	2275060012	204804	133	
33011	Manchester	2275060012	203974	146	
33011	Manchester	2275060012	201298	128	
33011	Manchester	2275060012	201920	114	
33011	Manchester	2275060012	202022	104	
33011	Manchester	2275060012	205358	83	
33011	Manchester	2275060012	201292	30	
33011	Manchester	2275060012	204276	64	
33011	Manchester	2275060012	200032	56	
33011	Manchester	2275060012	202573	29	
33011	Manchester	2275060012	201318	26	
33011	Manchester	2275060012	202580	37	
33011	Manchester	2275020000	204302	331	
33011	Manchester	2275060012	204872	6535	
33011	Manchester	2275060012	203122	513	



FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
33011	Manchester	2275060012	203045	324	
33011	Manchester	2275060012	201238	323	
33011	Manchester	2275020000	202077	19	
33011	Manchester	2275020000	204899	23	
33011	Manchester	2275020000	200555	32	
33011	Manchester	2275020000	205270	37	
33011	Manchester	2275020000	202375	57	
33011	Manchester	2275020000	200714	965	
33011	Manchester	2275020000	201768	182	
33011	Manchester	2275060012	201316	133	
33011	Manchester	2275020000	201252	433	
33011	Manchester	2275060012	201238	303	
33011	Manchester	2275060012	201972	24	
33011	Manchester	2275050012	201325	1189	
33011	Manchester	2275060012	202013	263	
33011	Manchester	2275060012	204917	215	
33011	Manchester	2275060012	204275	201	
33011	Manchester	2275060012	201927	186	
33011	Manchester	2275020000	200390	12	
33011	Manchester	2275020000	203130	140	
33011	Manchester	2275050012	201261	306	
33011	Manchester	2275050012	204764	335	
33011	Manchester	2275050012	203034	222	
33011	Manchester	2275050012	201469	79	
33011	Manchester	2275050012	202024	528	
33011	Manchester	2275050012	201276	84	
33011	Manchester	2275050012	201196	99	
33011	Manchester	2275050012	201465	321	
33011	Manchester	2275050012	201271	187	
33011	Manchester	2275050012	202102	449	
33011	Manchester	2275050012	203806	217	
33011	Manchester	2275050012	201898	883	
33011	Manchester	2275060012	202033	48	
33011	Manchester	2275001000	201218	124	
33011	Manchester	2275050012	201639	1293	
33011	Manchester	2275060012	201320	22	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
33011	Manchester	2275060012	201235	22	
33011	Manchester	2275050012	203171	138	
33011	Manchester	2275050012	201262	109	
33011	Manchester	2275060012	201776	22	
33011	Manchester	2275060012	204215	22	
33011	Manchester	2275060012	202025	21	
33011	Manchester	2275050012	201498	3965	
33011	Manchester	2275050012	203042	3488	
33011	Manchester	2275001000	201403	361	
33011	Manchester	2275001000	200804	170	
34005	McGuire AFB Airport	2275020000	202369	33.75	
34005	McGuire AFB Airport	2275020000	205171	221.785714285714	
34005	McGuire AFB Airport	2275020000	200322	9.64285714285714	
34005	McGuire AFB Airport	2275020000	200991	4.82142857142857	
34005	McGuire AFB Airport	2275001000			150.4249559
34005	McGuire AFB Airport	2275001000			46.72022161
34005	McGuire AFB Airport	2275050011		538	
34005	McGuire AFB Airport	2275001000		1101.81855955679	
34005	McGuire AFB Airport	2275001000			657
34005	McGuire AFB Airport	2275001000			3.539410728
34005	McGuire AFB Airport	2275001000		145.29281037522	
34005	McGuire AFB Airport	2275001000		614.618672878368	
34005	McGuire AFB Airport	2275001000			108.6599093
34005	McGuire AFB Airport	2275001000		1185.17168219592	
34005	McGuire AFB Airport	2275001000		64.5942457819189	
34005	McGuire AFB Airport	2275001000		507.728468899522	
34005	McGuire AFB Airport	2275001000		103.527763787459	
34005	McGuire AFB Airport	2275001000		295.363825232939	
34005	McGuire AFB Airport	2275001000		213.957378494082	
34005	McGuire AFB Airport	2275001000			3089.905565
34005	McGuire AFB Airport	2275001000			50.96751448
34005	McGuire AFB Airport	2275001000			774.0691262
34005	McGuire AFB Airport	2275001000			156.0880131
34005	McGuire AFB Airport	2275001000			580.8173004
34005	McGuire AFB Airport	2275001000			699.3875598
34005	McGuire AFB Airport	2275001000			1303.918912

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
34005	McGuire AFB Airport	2275001000		23.7140518761017	
34005	McGuire AFB Airport	2275001000			23.71405188
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		1	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		33.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		6	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		209	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		11	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		2537.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		8	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		1.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		1	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		176	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		57.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		54	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		1	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		316	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		54	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		44	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		79	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		1	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		2952	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		72	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		64	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		10	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		17.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		4	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		72	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		316	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		8	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		1	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		2537.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		11	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		44	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		209	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275050011		637.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		17.5	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		10	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		64	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		2952	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		4	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		57.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		176	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		1	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		1.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		33.5	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		6	
34029	LAKEHURST NAES /MAXFIELD FIELD	2275001000		79	
37091	Rat Landing Seaplane Base	2275050011	999903	179	
37091	Rat Landing Seaplane Base	2275050012	999904	126	
37141	BRICKHOUSE FLD	2275050011	999903	89.66695	
37141	BRICKHOUSE FLD	2275050012	999904	62.83305	
51033	A P HILL AAF (FORT A P HILL)	2275001000		4	
51033	A P HILL AAF (FORT A P HILL)	2275001000		62	
51033	A P HILL AAF (FORT A P HILL)	2275001000		8	
51033	A P HILL AAF (FORT A P HILL)	2275001000		972	
51033	A P HILL AAF (FORT A P HILL)	2275001000		64	
51033	A P HILL AAF (FORT A P HILL)	2275001000		84	
51033	A P HILL AAF (FORT A P HILL)	2275001000		10	
51033	A P HILL AAF (FORT A P HILL)	2275001000		47	
51033	A P HILL AAF (FORT A P HILL)	2275001000		23	
51033	A P HILL AAF (FORT A P HILL)	2275001000		51	
51033	A P HILL AAF (FORT A P HILL)	2275001000		24	
51033	A P HILL AAF (FORT A P HILL)	2275001000		3	
51033	A P HILL AAF (FORT A P HILL)	2275001000		2	
51033	A P HILL AAF (FORT A P HILL)	2275001000		4	
51033	A P HILL AAF (FORT A P HILL)	2275001000		2	
51033	A P HILL AAF (FORT A P HILL)	2275001000		2	
51033	A P HILL AAF (FORT A P HILL)	2275001000		39	
51033	A P HILL AAF (FORT A P HILL)	2275001000		31	
51033	A P HILL AAF (FORT A P HILL)	2275001000		6	
51179	QUANTICO MCAF /TURNER FIELD	2275050011		1	
51179	QUANTICO MCAF /TURNER FIELD	2275050012		1	1

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
51179	QUANTICO MCAF /TURNER FIELD	2275001000		12.5	6
51179	QUANTICO MCAF /TURNER FIELD	2275001000		872	1544
51179	QUANTICO MCAF /TURNER FIELD	2275001000		1	1
51179	QUANTICO MCAF /TURNER FIELD	2275001000		9.5	19
51179	QUANTICO MCAF /TURNER FIELD	2275001000		6.5	8
51179	QUANTICO MCAF /TURNER FIELD	2275001000		1164	2047
51179	QUANTICO MCAF /TURNER FIELD	2275050011		1	2
51179	QUANTICO MCAF /TURNER FIELD	2275001000		1	2
51179	QUANTICO MCAF /TURNER FIELD	2275001000		58	18
51179	QUANTICO MCAF /TURNER FIELD	2275001000		1	2
51179	QUANTICO MCAF /TURNER FIELD	2275050011		1	1
51179	QUANTICO MCAF /TURNER FIELD	2275050011		1	
51179	QUANTICO MCAF /TURNER FIELD	2275050011		1	1
51179	QUANTICO MCAF /TURNER FIELD	2275050011		1	
51179	QUANTICO MCAF /TURNER FIELD	2275050011		15	8
51179	QUANTICO MCAF /TURNER FIELD	2275001000		370	307
51179	QUANTICO MCAF /TURNER FIELD	2275001000		1	
51179	QUANTICO MCAF /TURNER FIELD	2275001000		248	373
51179	QUANTICO MCAF /TURNER FIELD	2275001000		6.5	4
51550	FENTRESS NALF	2275001000		3030	
51550	FENTRESS NALF	2275001000		449	
51550	FENTRESS NALF	2275001000		546	
51550	FENTRESS NALF	2275001000		1.5	
51650	Langley AFB Airport	2275001000	201795	13221	
51650	Langley AFB Airport	2275001000	201862	15933	
51700	Felker Air Field at JBLE-Eustis	2275001000		8302	
51700	Felker Air Field at JBLE-Eustis	2275001000		2306	
51700	Felker Air Field at JBLE-Eustis	2275001000		30210.5	
51700	Felker Air Field at JBLE-Eustis	2275001000		924.5	
51700	Felker Air Field at JBLE-Eustis	2275001000		3459	
51700	Felker Air Field at JBLE-Eustis	2275001000		922	
51710	Norfolk Ns	2275050012		201	
51710	Norfolk Ns	2275001000		1	
51710	Norfolk Ns	2275050012		2	
51710	Norfolk Ns	2275050012		1	
51710	Norfolk Ns	2275050012		12	

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
51710	Norfolk Ns	2275050012		79	
51710	Norfolk Ns	2275050012		14	
51710	Norfolk Ns	2275001000		29	
51710	Norfolk Ns	2275001000		53	
51710	Norfolk Ns	2275001000		1	
51710	Norfolk Ns	2275001000		195	
51710	Norfolk Ns	2275001000		1	
51710	Norfolk Ns	2275001000		270	
51710	Norfolk Ns	2275001000		5	
51710	Norfolk Ns	2275001000		6	
51710	Norfolk Ns	2275001000		5	
51710	Norfolk Ns	2275050012		54	
51710	Norfolk Ns	2275001000		33	
51710	Norfolk Ns	2275001000		100	
51710	Norfolk Ns	2275001000		4	
51710	Norfolk Ns	2275001000		34855	
51710	Norfolk Ns	2275050011		466	
51710	Norfolk Ns	2275050012		39	
51710	Norfolk Ns	2275050012		31	
51710	Norfolk Ns	2275001000		1	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		5	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		4	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		3.5	1
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		13	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		7.5	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		97	13
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		85.5	2
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		60.5	6
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		109.5	9
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		1	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		87	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		11295.5	1267
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		11	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		132.5	3
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		37	9
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		69	21

FIPSCode	Airport	SCC	AircraftEngineTypeCode	Revised LTO	Revised TGO
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		12.5	4
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		31	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		25	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		3	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		6.5	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		13	
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		489	20
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		451.5	7
51810	OCEANA NAS /APOLLO SOUCEK FIELD/	2275001000		2	

**Appendix C**  
**Generic Aircraft Type Emission Factors**



### Appendix C. Generic Aircraft Type Emission Factors

SCC	Process Description	CAS No.	Pollutant	Emission factors (tons/LTO)
2275060011	Aircraft /Air Taxi /Piston	100425	Styrene	3.221E-07
2275060011	Aircraft /Air Taxi /Piston	108883	Toluene	9.853E-06
2275060011	Aircraft /Air Taxi /Piston	540841	2,2,4-Trimethylpentane	3.394E-08
2275060011	Aircraft /Air Taxi /Piston	1330207	Xylene	5.552E-06
2275050011	Aircraft /General Aviation /Piston	VOC	VOC	7.524E-05
2275050011	Aircraft /General Aviation /Piston	NO <sub>x</sub>	Nitrogen Oxides	3.250E-05
2275050011	Aircraft /General Aviation /Piston	CO	Carbon Monoxide	6.007E-03
2275050011	Aircraft /General Aviation /Piston	SO <sub>2</sub>	Sulfur Dioxide	5.000E-06
2275050011	Aircraft /General Aviation /Piston	PM <sub>10</sub> -PRI	PM <sub>10</sub> Primary (Filt + Cond)	1.184E-04
2275050011	Aircraft /General Aviation /Piston	PM <sub>2.5</sub> -PRI	PM <sub>2.5</sub> Primary (Filt + Cond)	8.166E-05
2275050011	Aircraft /General Aviation /Piston	83329	Acenaphthene	8.640E-08
2275050011	Aircraft /General Aviation /Piston	208968	Acenaphthylene	4.876E-07
2275050011	Aircraft /General Aviation /Piston	75070	Acetaldehyde	5.874E-07
2275050011	Aircraft /General Aviation /Piston	107028	Acrolein	5.684E-08
2275050011	Aircraft /General Aviation /Piston	120127	Anthracene	1.006E-07
2275050011	Aircraft /General Aviation /Piston	71432	Benzene	3.837E-06
2275050011	Aircraft /General Aviation /Piston	56553	Benzo(a)anthracene	1.184E-08
2275050011	Aircraft /General Aviation /Piston	50328	Benzo(a)pyrene	1.184E-08
2275050011	Aircraft /General Aviation /Piston	205992	Benzo(b)fluoranthene	1.420E-08
2275050011	Aircraft /General Aviation /Piston	191242	Benzo(ghi)perylene	3.077E-08
2275050011	Aircraft /General Aviation /Piston	207089	Benzo(k)fluoranthene	1.420E-08
2275050011	Aircraft /General Aviation /Piston	106990	1,3-Butadiene	9.285E-07
2275050011	Aircraft /General Aviation /Piston	218019	Chrysene	1.184E-08
2275050011	Aircraft /General Aviation /Piston	53703	Dibenzo(ah)anthracene	0.000E+00
2275050011	Aircraft /General Aviation /Piston	100414	Ethylbenzene	1.393E-06
2275050011	Aircraft /General Aviation /Piston	206440	Fluoranthene	1.077E-07

### Appendix C. Generic Aircraft Type Emission Factors

SCC	Process Description	CAS No.	Pollutant	Emission factors (tons/LTO)
2275050011	Aircraft /General Aviation /Piston	86737	Fluorene	1.787E-07
2275050011	Aircraft /General Aviation /Piston	50000	Formaldehyde	2.549E-06
2275050011	Aircraft /General Aviation /Piston	193395	Indeno(1,2,3-cd)pyrene	9.468E-09
2275050011	Aircraft /General Aviation /Piston	98828	Isopropylbenzene	0.000E+00
2275050011	Aircraft /General Aviation /Piston	67561	Methanol	0.000E+00
2275050011	Aircraft /General Aviation /Piston	91576	2-Methyl Naphthalene	0.000E+00
2275050011	Aircraft /General Aviation /Piston	91203	Naphthalene (gas phase)	4.327E-07
2275050011	Aircraft /General Aviation /Piston	91203	Naphthalene (solid phase)	1.073E-05
2275050011	Aircraft /General Aviation /Piston	110543	N-Hexane	6.632E-07
2275050011	Aircraft /General Aviation /Piston	85018	Phenanthrene	3.006E-07
2275050011	Aircraft /General Aviation /Piston	108952	Phenol	0.000E+00
2275050011	Aircraft /General Aviation /Piston	123386	Propionaldehyde	5.684E-08
2275050011	Aircraft /General Aviation /Piston	100425	Styrene	3.221E-07
2275050011	Aircraft /General Aviation /Piston	108883	Toluene	9.853E-06
2275050011	Aircraft /General Aviation /Piston	540841	2,2,4-Trimethylpentane	3.394E-08
2275050011	Aircraft /General Aviation /Piston	1330207	Xylene	5.552E-06
2275001000	Aircraft/Military	VOC	VOC	5.433E-03
2275001000	Aircraft/Military	NO <sub>x</sub>	Nitrogen Oxides	1.117E-02
2275001000	Aircraft/Military	CO	Carbon Monoxide	1.298E-02
2275001000	Aircraft/Military	SO <sub>2</sub>	Sulfur Dioxide	1.055E-03
2275001000	Aircraft/Military	PM <sub>10</sub> -PRI	PM <sub>10</sub> Primary (Filt + Cond)	6.965E-04
2275001000	Aircraft/Military	PM <sub>2.5</sub> -PRI	PM <sub>2.5</sub> Primary (Filt + Cond)	6.798E-04
2275001000	Aircraft/Military	83329	Acenaphthene	0.000E+00
2275001000	Aircraft/Military	208968	Acenaphthylene	0.000E+00
2275001000	Aircraft/Military	75070	Acetaldehyde	2.333E-04
2275001000	Aircraft/Military	107028	Acrolein	1.337E-04
2275001000	Aircraft/Military	120127	Anthracene	0.000E+00
2275001000	Aircraft/Military	71432	Benzene	9.180E-05
2275001000	Aircraft/Military	56553	Benzo(a)anthracene	0.000E+00

### Appendix C. Generic Aircraft Type Emission Factors

SCC	Process Description	CAS No.	Pollutant	Emission factors (tons/LTO)
2275001000	Aircraft/Military	50328	Benzo(a)pyrene	0.000E+00
2275001000	Aircraft/Military	205992	Benzo(b)fluoranthene	0.000E+00
2275001000	Aircraft/Military	191242	Benzo(ghi)perylene	0.000E+00
2275001000	Aircraft/Military	207089	Benzo(k)fluoranthene	0.000E+00
2275001000	Aircraft/Military	106990	1,3-Butadiene	9.213E-05
2275001000	Aircraft/Military	218019	Chrysene	0.000E+00
2275001000	Aircraft/Military	53703	Dibenzo(ah)anthracene	0.000E+00
2275001000	Aircraft/Military	100414	Ethylbenzene	9.503E-06
2275001000	Aircraft/Military	206440	Fluoranthene	0.000E+00
2275001000	Aircraft/Military	86737	Fluorene	0.000E+00
2275001000	Aircraft/Military	50000	Formaldehyde	6.723E-04
2275001000	Aircraft/Military	193395	Indeno(1,2,3-cd)pyrene	0.000E+00
2275001000	Aircraft/Military	98828	Isopropylbenzene	1.638E-07
2275001000	Aircraft/Military	67561	Methanol	9.858E-05
2275001000	Aircraft/Military	91576	2-Methyl Naphthalene	1.125E-05
2275001000	Aircraft/Military	108383	M-Xylene And P-Xylene	1.540E-05
2275001000	Aircraft/Military	91203	Naphthalene	2.955E-05
2275001000	Aircraft/Military	110543	N-Hexane	0.000E+00
2275001000	Aircraft/Military	95476	O-Xylene	9.066E-06
2275001000	Aircraft/Military	85018	Phenanthrene	0.000E+00
2275001000	Aircraft/Military	108952	Phenol	3.965E-05
2275001000	Aircraft/Military	123386	Propionaldehyde	3.970E-05
2275001000	Aircraft/Military	100425	Styrene	1.688E-05
2275001000	Aircraft/Military	108883	Toluene	3.506E-05
2275001000	Aircraft/Military	540841	2,2,4-Trimethylpentane	0.000E+00
2275050011	Aircraft /General Aviation /Piston	7439921	Lead	7.686E-06
2275060011	Aircraft /Air Taxi /Piston	7439921	Lead	7.686E-06
2275020000	Aircraft/Commercial	VOC	VOC	3.082E-03
2275020000	Aircraft/Commercial	NO <sub>x</sub>	Nitrogen Oxides	9.288E-03
2275020000	Aircraft/Commercial	CO	Carbon Monoxide	1.119E-02
2275020000	Aircraft/Commercial	SO <sub>2</sub>	Sulfur Dioxide	8.910E-04
2275020000	Aircraft/Commercial	PM <sub>10</sub> -PRI	PM <sub>10</sub> Primary (Filt + Cond)	5.385E-04
2275020000	Aircraft/Commercial	PM <sub>2.5</sub> -PRI	PM <sub>2.5</sub> Primary (Filt + Cond)	5.256E-04
2275020000	Aircraft/Commercial	83329	Acenaphthene	0.000E+00
2275020000	Aircraft/Commercial	208968	Acenaphthylene	0.000E+00
2275020000	Aircraft/Commercial	75070	Acetaldehyde	1.328E-04
2275020000	Aircraft/Commercial	107028	Acrolein	7.613E-05

### Appendix C. Generic Aircraft Type Emission Factors

SCC	Process Description	CAS No.	Pollutant	Emission factors (tons/LTO)
2275020000	Aircraft/Commercial	120127	Anthracene	0.000E+00
2275020000	Aircraft/Commercial	71432	Benzene	5.226E-05
2275020000	Aircraft/Commercial	56553	Benzo(a)anthracene	1.297E-09
2275020000	Aircraft/Commercial	50328	Benzo(a)pyrene	9.621E-10
2275020000	Aircraft/Commercial	205992	Benzo(b)fluoranthene	1.892E-09
2275020000	Aircraft/Commercial	191242	Benzo(ghi)perylene	1.726E-11
2275020000	Aircraft/Commercial	207089	Benzo(k)fluoranthene	1.892E-09
2275020000	Aircraft/Commercial	106990	1,3-Butadiene	5.245E-05
2275020000	Aircraft/Commercial	218019	Chrysene	1.313E-09
2275020000	Aircraft/Commercial	53703	Dibenzo(ah)anthracene	2.551E-09
2275020000	Aircraft/Commercial	100414	Ethylbenzene	5.409E-06
2275020000	Aircraft/Commercial	206440	Fluoranthene	2.492E-09
2275020000	Aircraft/Commercial	86737	Fluorene	0.000E+00
2275020000	Aircraft/Commercial	50000	Formaldehyde	3.827E-04
2275020000	Aircraft/Commercial	193395	Indeno(1,2,3-cd)pyrene	2.050E-09
2275020000	Aircraft/Commercial	98828	Isopropylbenzene	9.326E-08
2275020000	Aircraft/Commercial	67561	Methanol	5.611E-05
2275020000	Aircraft/Commercial	91576	2-Methyl Naphthalene	6.404E-06
2275020000	Aircraft/Commercial	108383	M-Xylene And P-Xylene	8.767E-06
2275020000	Aircraft/Commercial	91203	Naphthalene	1.682E-05
2275020000	Aircraft/Commercial	110543	N-Hexane	0.000E+00
2275020000	Aircraft/Commercial	95476	O-Xylene	5.161E-06
2275020000	Aircraft/Commercial	85018	Phenanthrene	1.112E-08
2275020000	Aircraft/Commercial	108952	Phenol	2.257E-05
2275020000	Aircraft/Commercial	123386	Propionaldehyde	2.260E-05
2275020000	Aircraft/Commercial	100425	Styrene	9.606E-06
2275020000	Aircraft/Commercial	108883	Toluene	1.996E-05
2275020000	Aircraft/Commercial	540841	2,2,4-Trimethylpentane	1.466E-06
2275060012	Aircraft /Air Taxi /Turbine	VOC	VOC	5.029E-04
2275060012	Aircraft /Air Taxi /Turbine	NO <sub>x</sub>	Nitrogen Oxides	3.877E-04
2275060012	Aircraft /Air Taxi /Turbine	CO	Carbon Monoxide	1.806E-03
2275060012	Aircraft /Air Taxi /Turbine	SO <sub>2</sub>	Sulfur Dioxide	8.124E-05
2275060012	Aircraft /Air Taxi /Turbine	PM <sub>10</sub> -PRI	PM <sub>10</sub> Primary (Filt + Cond)	3.017E-04
2275060012	Aircraft /Air Taxi /Turbine	PM <sub>2.5</sub> -PRI	PM <sub>2.5</sub> Primary (Filt + Cond)	2.944E-04
2275060012	Aircraft /Air Taxi /Turbine	83329	Acenaphthene	0.000E+00
2275060012	Aircraft /Air Taxi /Turbine	208968	Acenaphthylene	0.000E+00
2275060012	Aircraft /Air Taxi /Turbine	75070	Acetaldehyde	2.167E-05

### Appendix C. Generic Aircraft Type Emission Factors

SCC	Process Description	CAS No.	Pollutant	Emission factors (tons/LTO)
2275060012	Aircraft /Air Taxi /Turbine	107028	Acrolein	1.242E-05
2275060012	Aircraft /Air Taxi /Turbine	120127	Anthracene	1.331E-10
2275060012	Aircraft /Air Taxi /Turbine	71432	Benzene	8.528E-06
2275060012	Aircraft /Air Taxi /Turbine	56553	Benzo(a)anthracene	2.014E-11
2275060012	Aircraft /Air Taxi /Turbine	50328	Benzo(a)pyrene	1.103E-11
2275060012	Aircraft /Air Taxi /Turbine	205992	Benzo(b)fluoranthene	0.000E+00
2275060012	Aircraft /Air Taxi /Turbine	191242	Benzo(ghi)perylene	1.829E-12
2275060012	Aircraft /Air Taxi /Turbine	207089	Benzo(k)fluoranthene	0.000E+00
2275060012	Aircraft /Air Taxi /Turbine	106990	1,3-Butadiene	8.558E-06
2275060012	Aircraft /Air Taxi /Turbine	218019	Chrysene	1.876E-11
2275060012	Aircraft /Air Taxi /Turbine	53703	Dibenzo(ah)anthracene	0.000E+00
2275060012	Aircraft /Air Taxi /Turbine	100414	Ethylbenzene	8.827E-07
2275060012	Aircraft /Air Taxi /Turbine	206440	Fluoranthene	2.784E-10
2275060012	Aircraft /Air Taxi /Turbine	86737	Fluorene	0.000E+00
2275060012	Aircraft /Air Taxi /Turbine	50000	Formaldehyde	6.245E-05
2275060012	Aircraft /Air Taxi /Turbine	193395	Indeno(1,2,3-cd)pyrene	0.000E+00
2275060012	Aircraft /Air Taxi /Turbine	98828	Isopropylbenzene	1.522E-08
2275060012	Aircraft /Air Taxi /Turbine	67561	Methanol	9.157E-06
2275060012	Aircraft /Air Taxi /Turbine	91576	2-Methyl Naphthalene	1.045E-06
2275060012	Aircraft /Air Taxi /Turbine	108383	M-Xylene And P-Xylene	1.431E-06
2275060012	Aircraft /Air Taxi /Turbine	91203	Naphthalene	2.745E-06
2275060012	Aircraft /Air Taxi /Turbine	110543	N-Hexane	0.000E+00
2275060012	Aircraft /Air Taxi /Turbine	95476	O-Xylene	8.421E-07
2275060012	Aircraft /Air Taxi /Turbine	85018	Phenanthrene	1.238E-09
2275060012	Aircraft /Air Taxi /Turbine	108952	Phenol	3.683E-06
2275060012	Aircraft /Air Taxi /Turbine	123386	Propionaldehyde	3.688E-06
2275060012	Aircraft /Air Taxi /Turbine	100425	Styrene	1.568E-06
2275060012	Aircraft /Air Taxi /Turbine	108883	Toluene	3.257E-06
2275060012	Aircraft /Air Taxi /Turbine	540841	2,2,4-Trimethylpentane	1.915E-07
2275050012	Aircraft /General Aviation /Turbine	VOC	VOC	3.447E-04
2275050012	Aircraft /General Aviation /Turbine	NO <sub>x</sub>	Nitrogen Oxides	1.619E-04
2275050012	Aircraft /General Aviation /Turbine	CO	Carbon Monoxide	4.789E-03
2275050012	Aircraft /General Aviation /Turbine	SO <sub>2</sub>	Sulfur Dioxide	3.679E-05
2275050012	Aircraft /General Aviation /Turbine	PM <sub>10</sub> -PRI	PM <sub>10</sub> Primary (Filt + Cond)	1.184E-04
2275050012	Aircraft /General Aviation /Turbine	PM <sub>2.5</sub> -PRI	PM <sub>2.5</sub> Primary (Filt + Cond)	1.155E-04

### Appendix C. Generic Aircraft Type Emission Factors

SCC	Process Description	CAS No.	Pollutant	Emission factors (tons/LTO)
2275050012	Aircraft /General Aviation /Turbine	83329	Acenaphthene	0.000E+00
2275050012	Aircraft /General Aviation /Turbine	208968	Acenaphthylene	0.000E+00
2275050012	Aircraft /General Aviation /Turbine	75070	Acetaldehyde	1.486E-05
2275050012	Aircraft /General Aviation /Turbine	107028	Acrolein	8.516E-06
2275050012	Aircraft /General Aviation /Turbine	120127	Anthracene	5.221E-11
2275050012	Aircraft /General Aviation /Turbine	71432	Benzene	5.846E-06
2275050012	Aircraft /General Aviation /Turbine	56553	Benzo(a)anthracene	7.903E-12
2275050012	Aircraft /General Aviation /Turbine	50328	Benzo(a)pyrene	4.327E-12
2275050012	Aircraft /General Aviation /Turbine	205992	Benzo(b)fluoranthene	0.000E+00
2275050012	Aircraft /General Aviation /Turbine	191242	Benzo(ghi)perylene	7.178E-13
2275050012	Aircraft /General Aviation /Turbine	207089	Benzo(k)fluoranthene	0.000E+00
2275050012	Aircraft /General Aviation /Turbine	106990	1,3-Butadiene	5.866E-06
2275050012	Aircraft /General Aviation /Turbine	218019	Chrysene	7.359E-12
2275050012	Aircraft /General Aviation /Turbine	53703	Dibenzo(ah)anthracene	0.000E+00
2275050012	Aircraft /General Aviation /Turbine	100414	Ethylbenzene	6.051E-07
2275050012	Aircraft /General Aviation /Turbine	206440	Fluoranthene	1.092E-10
2275050012	Aircraft /General Aviation /Turbine	86737	Fluorene	0.000E+00
2275050012	Aircraft /General Aviation /Turbine	50000	Formaldehyde	4.281E-05
2275050012	Aircraft /General Aviation /Turbine	193395	Indeno(1,2,3-cd)pyrene	0.000E+00
2275050012	Aircraft /General Aviation /Turbine	98828	Isopropylbenzene	1.043E-08
2275050012	Aircraft /General Aviation /Turbine	67561	Methanol	6.277E-06
2275050012	Aircraft /General Aviation /Turbine	91576	2-Methyl Naphthalene	7.163E-07
2275050012	Aircraft /General Aviation /Turbine	108383	M-Xylene And P-Xylene	9.806E-07
2275050012	Aircraft /General Aviation /Turbine	91203	Naphthalene	1.881E-06
2275050012	Aircraft /General Aviation /Turbine	110543	N-Hexane	0.000E+00

### Appendix C. Generic Aircraft Type Emission Factors

SCC	Process Description	CAS No.	Pollutant	Emission factors (tons/LTO)
2275050012	Aircraft /General Aviation /Turbine	95476	O-Xylene	5.773E-07
2275050012	Aircraft /General Aviation /Turbine	85018	Phenanthrene	4.858E-10
2275050012	Aircraft /General Aviation /Turbine	108952	Phenol	2.525E-06
2275050012	Aircraft /General Aviation /Turbine	123386	Propionaldehyde	2.528E-06
2275050012	Aircraft /General Aviation /Turbine	100425	Styrene	1.075E-06
2275050012	Aircraft /General Aviation /Turbine	108883	Toluene	2.233E-06
2275050012	Aircraft /General Aviation /Turbine	540841	2,2,4-Trimethylpentane	1.313E-07
2275060011	Aircraft /Air Taxi /Piston	VOC	VOC	8.484E-05
2275060011	Aircraft /Air Taxi /Piston	NO <sub>x</sub>	Nitrogen Oxides	7.900E-05
2275060011	Aircraft /Air Taxi /Piston	CO	Carbon Monoxide	1.407E-02
2275060011	Aircraft /Air Taxi /Piston	SO <sub>2</sub>	Sulfur Dioxide	7.500E-06
2275060011	Aircraft /Air Taxi /Piston	PM <sub>10</sub> -PRI	PM <sub>10</sub> Primary (Filt + Cond)	3.017E-04
2275060011	Aircraft /Air Taxi /Piston	PM <sub>2.5</sub> -PRI	PM <sub>2.5</sub> Primary (Filt + Cond)	2.081E-04
2275060011	Aircraft /Air Taxi /Piston	83329	Acenaphthene	2.202E-07
2275060011	Aircraft /Air Taxi /Piston	208968	Acenaphthylene	1.243E-06
2275060011	Aircraft /Air Taxi /Piston	75070	Acetaldehyde	5.874E-07
2275060011	Aircraft /Air Taxi /Piston	107028	Acrolein	5.684E-08
2275060011	Aircraft /Air Taxi /Piston	120127	Anthracene	2.564E-07
2275060011	Aircraft /Air Taxi /Piston	71432	Benzene	3.837E-06
2275060011	Aircraft /Air Taxi /Piston	56553	Benzo(a)anthracene	3.017E-08
2275060011	Aircraft /Air Taxi /Piston	50328	Benzo(a)pyrene	3.017E-08
2275060011	Aircraft /Air Taxi /Piston	205992	Benzo(b)fluoranthene	3.620E-08
2275060011	Aircraft /Air Taxi /Piston	191242	Benzo(ghi)perylene	7.843E-08
2275060011	Aircraft /Air Taxi /Piston	207089	Benzo(k)fluoranthene	3.620E-08
2275060011	Aircraft /Air Taxi /Piston	106990	1,3-Butadiene	9.285E-07
2275060011	Aircraft /Air Taxi /Piston	218019	Chrysene	3.017E-08
2275060011	Aircraft /Air Taxi /Piston	53703	Dibenzo(ah)anthracene	0.000E+00
2275060011	Aircraft /Air Taxi /Piston	100414	Ethylbenzene	1.393E-06
2275060011	Aircraft /Air Taxi /Piston	206440	Fluoranthene	2.745E-07
2275060011	Aircraft /Air Taxi /Piston	86737	Fluorene	4.555E-07
2275060011	Aircraft /Air Taxi /Piston	50000	Formaldehyde	2.549E-06
2275060011	Aircraft /Air Taxi /Piston	193395	Indeno(1,2,3-cd)pyrene	2.413E-08
2275060011	Aircraft /Air Taxi /Piston	98828	Isopropylbenzene	0.000E+00
2275060011	Aircraft /Air Taxi /Piston	67561	Methanol	0.000E+00

### Appendix C. Generic Aircraft Type Emission Factors

SCC	Process Description	CAS No.	Pollutant	Emission factors (tons/LTO)
2275060011	Aircraft /Air Taxi /Piston	91576	2-Methyl Naphthalene	0.000E+00
2275060011	Aircraft /Air Taxi /Piston	91203	Naphthalene (gas phase)	4.327E-07
2275060011	Aircraft /Air Taxi /Piston	91203	Naphthalene (solid phase)	2.736E-05
2275060011	Aircraft /Air Taxi /Piston	110543	N-Hexane	6.632E-07
2275060011	Aircraft /Air Taxi /Piston	85018	Phenanthrene	7.662E-07
2275060011	Aircraft /Air Taxi /Piston	108952	Phenol	0.000E+00
2275060011	Aircraft /Air Taxi /Piston	123386	Propionaldehyde	5.684E-08



**Appendix D**  
**Total Annual Emissions by SCC**

SCC	Process Description	Pollutant	Pollutant CAS	Emissions (Ton)
2265008005	GSE, 4 Stroke Gasoline	Carbon Monoxide	CO	9,239.08
2265008005	GSE, 4 Stroke Gasoline	Nitrogen Oxides	NOX	549.79
2265008005	GSE, 4 Stroke Gasoline	PM10 Primary (Filt + Cond)	PM10-PRI	33.85
2265008005	GSE, 4 Stroke Gasoline	PM2.5 Primary (Filt + Cond)	PM25-PRI	31.12
2265008005	GSE, 4 Stroke Gasoline	Sulfur Dioxide	SO2	4.94
2265008005	GSE, 4 Stroke Gasoline	Volatile Organic Compounds	VOC	242.21
2270008005	GSE, Diesel	Carbon Monoxide	CO	194.50
2270008005	GSE, Diesel	Nitrogen Oxides	NOX	500.43
2270008005	GSE, Diesel	PM10 Primary (Filt + Cond)	PM10-PRI	26.36
2270008005	GSE, Diesel	PM2.5 Primary (Filt + Cond)	PM25-PRI	25.53
2270008005	GSE, Diesel	Sulfur Dioxide	SO2	1.10
2270008005	GSE, Diesel	Volatile Organic Compounds	VOC	115.89
2275001000	Aircraft/Military	1,3-Butadiene	106990	339.40
2275001000	Aircraft/Military	1-Methylnaphthalene	90120	41.44
2275001000	Aircraft/Military	Acetaldehyde	75070	859.46
2275001000	Aircraft/Military	Acrolein	107028	492.70
2275001000	Aircraft/Military	Benzene	71432	338.19
2275001000	Aircraft/Military	Carbon Dioxide	CO2	4,930,743.17
2275001000	Aircraft/Military	Carbon Monoxide	CO	47,969.46
2275001000	Aircraft/Military	Cumene	98828	0.60
2275001000	Aircraft/Military	Ethyl Benzene	100414	35.01
2275001000	Aircraft/Military	Formaldehyde	50000	2,476.59
2275001000	Aircraft/Military	Methanol	67561	363.14
2275001000	Aircraft/Military	m-Xylene	108383	56.73
2275001000	Aircraft/Military	Naphthalene	91203	108.84
2275001000	Aircraft/Military	Nitrogen Oxides	NOX	41,453.89
2275001000	Aircraft/Military	o-Xylene	95476	33.40
2275001000	Aircraft/Military	Phenol	108952	146.06
2275001000	Aircraft/Military	PM10 Primary (Filt + Cond)	PM10-PRI	2,566.86
2275001000	Aircraft/Military	PM2.5 Primary (Filt + Cond)	PM25-PRI	2,505.44
2275001000	Aircraft/Military	Propionaldehyde	123386	146.26
2275001000	Aircraft/Military	Styrene	100425	62.17
2275001000	Aircraft/Military	Sulfur Dioxide	SO2	3,902.54
2275001000	Aircraft/Military	Toluene	108883	129.16
2275001000	Aircraft/Military	Volatile Organic Compounds	VOC	20,013.54
2275020000	Aircraft/Commercial	1,3-Butadiene	106990	130.48
2275020000	Aircraft/Commercial	1-Methylnaphthalene	90120	15.93
2275020000	Aircraft/Commercial	2,2,4-Trimethylpentane	540841	3.66

SCC	Process Description	Pollutant	Pollutant CAS	Emissions (Ton)
2275020000	Aircraft/Commercial	Acetaldehyde	75070	330.41
2275020000	Aircraft/Commercial	Acrolein	107028	189.41
2275020000	Aircraft/Commercial	Benz[a]Anthracene	56553	0.00
2275020000	Aircraft/Commercial	Benzene	71432	130.01
2275020000	Aircraft/Commercial	Benzo[a]Pyrene	50328	0.00
2275020000	Aircraft/Commercial	Benzo[b]Fluoranthene	205992	0.00
2275020000	Aircraft/Commercial	Benzo[g,h,i]Perylene	191242	0.00
2275020000	Aircraft/Commercial	Benzo[k]Fluoranthene	207089	0.00
2275020000	Aircraft/Commercial	Carbon Dioxide	CO2	11,346,582.17
2275020000	Aircraft/Commercial	Carbon Monoxide	CO	53,202.38
2275020000	Aircraft/Commercial	Chrysene	218019	0.00
2275020000	Aircraft/Commercial	Cumene	98828	0.23
2275020000	Aircraft/Commercial	Dibenzo[a,h]Anthracene	53703	0.01
2275020000	Aircraft/Commercial	Ethyl Benzene	100414	13.46
2275020000	Aircraft/Commercial	Fluoranthene	206440	0.01
2275020000	Aircraft/Commercial	Formaldehyde	50000	952.09
2275020000	Aircraft/Commercial	Indeno[1,2,3-c,d]Pyrene	193395	0.01
2275020000	Aircraft/Commercial	Methanol	67561	139.60
2275020000	Aircraft/Commercial	m-Xylene	108383	21.81
2275020000	Aircraft/Commercial	Naphthalene	91203	41.84
2275020000	Aircraft/Commercial	Nitrogen Oxides	NOX	36,390.27
2275020000	Aircraft/Commercial	o-Xylene	95476	12.84
2275020000	Aircraft/Commercial	Phenanthrene	85018	0.03
2275020000	Aircraft/Commercial	Phenol	108952	56.15
2275020000	Aircraft/Commercial	PM10 Primary (Filt + Cond)	PM10-PRI	509.57
2275020000	Aircraft/Commercial	PM2.5 Primary (Filt + Cond)	PM25-PRI	505.12
2275020000	Aircraft/Commercial	Propionaldehyde	123386	56.23
2275020000	Aircraft/Commercial	Styrene	100425	23.90
2275020000	Aircraft/Commercial	Sulfur Dioxide	SO2	4,209.69
2275020000	Aircraft/Commercial	Toluene	108883	49.65
2275020000	Aircraft/Commercial	Volatile Organic Compounds	VOC	7,690.29
2275050011	Aircraft/General Aviation Piston	1,3-Butadiene	106990	20.68
2275050011	Aircraft/General Aviation Piston	2,2,4-Trimethylpentane	540841	0.76
2275050011	Aircraft/General Aviation Piston	Acenaphthene	83329	2.06
2275050011	Aircraft/General Aviation Piston	Acenaphthylene	208968	11.63
2275050011	Aircraft/General Aviation Piston	Acetaldehyde	75070	13.08
2275050011	Aircraft/General Aviation Piston	Acrolein	107028	1.27
2275050011	Aircraft/General Aviation Piston	Anthracene	120127	2.40
2275050011	Aircraft/General Aviation Piston	Benz[a]Anthracene	56553	0.28

SCC	Process Description	Pollutant	Pollutant CAS	Emissions (Ton)
2275050011	Aircraft/General Aviation Piston	Benzene	71432	85.45
2275050011	Aircraft/General Aviation Piston	Benzo[a]Pyrene	50328	0.28
2275050011	Aircraft/General Aviation Piston	Benzo[b]Fluoranthene	205992	0.34
2275050011	Aircraft/General Aviation Piston	Benzo[g,h,i,]Perylene	191242	0.73
2275050011	Aircraft/General Aviation Piston	Benzo[k]Fluoranthene	207089	0.34
2275050011	Aircraft/General Aviation Piston	Carbon Dioxide	CO2	2,147,727.37
2275050011	Aircraft/General Aviation Piston	Carbon Monoxide	CO	137,754.50
2275050011	Aircraft/General Aviation Piston	Chrysene	218019	0.28
2275050011	Aircraft/General Aviation Piston	Ethyl Benzene	100414	31.02
2275050011	Aircraft/General Aviation Piston	Fluoranthene	206440	2.57
2275050011	Aircraft/General Aviation Piston	Fluorene	86737	4.26
2275050011	Aircraft/General Aviation Piston	Formaldehyde	50000	56.76
2275050011	Aircraft/General Aviation Piston	Hexane	110543	14.77
2275050011	Aircraft/General Aviation Piston	Indeno[1,2,3-c,d]Pyrene	193395	0.23
2275050011	Aircraft/General Aviation Piston	Lead	7439921	172.43
2275050011	Aircraft/General Aviation Piston	Naphthalene	91203	265.67
2275050011	Aircraft/General Aviation Piston	Nitrogen Oxides	NOX	724.97
2275050011	Aircraft/General Aviation Piston	Phenanthrene	85018	7.17
2275050011	Aircraft/General Aviation Piston	PM10 Primary (Filt + Cond)	PM10-PRI	2,633.96
2275050011	Aircraft/General Aviation Piston	PM2.5 Primary (Filt + Cond)	PM25-PRI	1,818.50
2275050011	Aircraft/General Aviation Piston	Propionaldehyde	123386	1.27
2275050011	Aircraft/General Aviation Piston	Styrene	100425	7.17
2275050011	Aircraft/General Aviation Piston	Sulfur Dioxide	SO2	115.55
2275050011	Aircraft/General Aviation Piston	Toluene	108883	219.44
2275050011	Aircraft/General Aviation Piston	Volatile Organic Compounds	VOC	1,832.83
2275050011	Aircraft/General Aviation Piston	Xylenes (Mixed Isomers)	1330207	123.64
2275050012	Aircraft/General Aviation Turbine	1,3-Butadiene	106990	94.18
2275050012	Aircraft/General Aviation Turbine	1-Methylnaphthalene	90120	11.50
2275050012	Aircraft/General Aviation Turbine	2,2,4-Trimethylpentane	540841	2.11
2275050012	Aircraft/General Aviation Turbine	Acetaldehyde	75070	238.50
2275050012	Aircraft/General Aviation Turbine	Acrolein	107028	136.72
2275050012	Aircraft/General Aviation Turbine	Anthracene	120127	0.00
2275050012	Aircraft/General Aviation Turbine	Benz[a]Anthracene	56553	0.00
2275050012	Aircraft/General Aviation Turbine	Benzene	71432	93.85
2275050012	Aircraft/General Aviation Turbine	Benzo[a]Pyrene	50328	0.00
2275050012	Aircraft/General Aviation Turbine	Benzo[g,h,i,]Perylene	191242	0.00
2275050012	Aircraft/General Aviation Turbine	Carbon Dioxide	CO2	7,667,035.91
2275050012	Aircraft/General Aviation Turbine	Carbon Monoxide	CO	74,325.29
2275050012	Aircraft/General Aviation Turbine	Chrysene	218019	0.00

SCC	Process Description	Pollutant	Pollutant CAS	Emissions (Ton)
2275050012	Aircraft/General Aviation Turbine	Cumene	98828	0.17
2275050012	Aircraft/General Aviation Turbine	Ethyl Benzene	100414	9.71
2275050012	Aircraft/General Aviation Turbine	Fluoranthene	206440	0.00
2275050012	Aircraft/General Aviation Turbine	Formaldehyde	50000	687.25
2275050012	Aircraft/General Aviation Turbine	Methanol	67561	100.77
2275050012	Aircraft/General Aviation Turbine	m-Xylene	108383	15.74
2275050012	Aircraft/General Aviation Turbine	Naphthalene	91203	30.20
2275050012	Aircraft/General Aviation Turbine	Nitrogen Oxides	NOX	2,538.23
2275050012	Aircraft/General Aviation Turbine	o-Xylene	95476	9.27
2275050012	Aircraft/General Aviation Turbine	Phenanthrene	85018	0.01
2275050012	Aircraft/General Aviation Turbine	Phenol	108952	40.53
2275050012	Aircraft/General Aviation Turbine	PM10 Primary (Filt + Cond)	PM10-PRI	1,819.85
2275050012	Aircraft/General Aviation Turbine	PM2.5 Primary (Filt + Cond)	PM25-PRI	1,776.23
2275050012	Aircraft/General Aviation Turbine	Propionaldehyde	123386	40.59
2275050012	Aircraft/General Aviation Turbine	Styrene	100425	17.25
2275050012	Aircraft/General Aviation Turbine	Sulfur Dioxide	SO2	580.17
2275050012	Aircraft/General Aviation Turbine	Toluene	108883	35.84
2275050012	Aircraft/General Aviation Turbine	Volatile Organic Compounds	VOC	5,534.89
2275060011	Aircraft/Air Taxi Piston	1,3-Butadiene	106990	0.46
2275060011	Aircraft/Air Taxi Piston	2,2,4-Trimethylpentane	540841	0.02
2275060011	Aircraft/Air Taxi Piston	Acenaphthene	83329	0.12
2275060011	Aircraft/Air Taxi Piston	Acenaphthylene	208968	0.65
2275060011	Aircraft/Air Taxi Piston	Acetaldehyde	75070	0.29
2275060011	Aircraft/Air Taxi Piston	Acrolein	107028	0.03
2275060011	Aircraft/Air Taxi Piston	Anthracene	120127	0.14
2275060011	Aircraft/Air Taxi Piston	Benz[a]Anthracene	56553	0.02
2275060011	Aircraft/Air Taxi Piston	Benzene	71432	1.89
2275060011	Aircraft/Air Taxi Piston	Benzo[a]Pyrene	50328	0.02
2275060011	Aircraft/Air Taxi Piston	Benzo[b]Fluoranthene	205992	0.02
2275060011	Aircraft/Air Taxi Piston	Benzo[g,h,i,]Perylene	191242	0.04
2275060011	Aircraft/Air Taxi Piston	Benzo[k]Fluoranthene	207089	0.02
2275060011	Aircraft/Air Taxi Piston	Carbon Dioxide	CO2	131,622.32
2275060011	Aircraft/Air Taxi Piston	Carbon Monoxide	CO	6,935.31
2275060011	Aircraft/Air Taxi Piston	Chrysene	218019	0.02
2275060011	Aircraft/Air Taxi Piston	Ethyl Benzene	100414	0.69
2275060011	Aircraft/Air Taxi Piston	Fluoranthene	206440	0.14
2275060011	Aircraft/Air Taxi Piston	Fluorene	86737	0.24
2275060011	Aircraft/Air Taxi Piston	Formaldehyde	50000	1.25
2275060011	Aircraft/Air Taxi Piston	Hexane	110543	0.33

SCC	Process Description	Pollutant	Pollutant CAS	Emissions (Ton)
2275060011	Aircraft/Air Taxi Piston	Indeno[1,2,3-c,d]Pyrene	193395	0.01
2275060011	Aircraft/Air Taxi Piston	Lead	7439921	3.77
2275060011	Aircraft/Air Taxi Piston	Naphthalene	91203	14.63
2275060011	Aircraft/Air Taxi Piston	Nitrogen Oxides	NOX	38.73
2275060011	Aircraft/Air Taxi Piston	Phenanthrene	85018	0.40
2275060011	Aircraft/Air Taxi Piston	PM10 Primary (Filt + Cond)	PM10-PRI	147.77
2275060011	Aircraft/Air Taxi Piston	PM2.5 Primary (Filt + Cond)	PM25-PRI	102.03
2275060011	Aircraft/Air Taxi Piston	Propionaldehyde	123386	0.03
2275060011	Aircraft/Air Taxi Piston	Styrene	100425	0.16
2275060011	Aircraft/Air Taxi Piston	Sulfur Dioxide	SO2	3.79
2275060011	Aircraft/Air Taxi Piston	Toluene	108883	4.85
2275060011	Aircraft/Air Taxi Piston	Volatile Organic Compounds	VOC	50.98
2275060011	Aircraft/Air Taxi Piston	Xylenes (Mixed Isomers)	1330207	2.73
2275060012	Aircraft/Air Taxi Turbine	1,3-Butadiene	106990	34.36
2275060012	Aircraft/Air Taxi Turbine	1-Methylnaphthalene	90120	4.20
2275060012	Aircraft/Air Taxi Turbine	2,2,4-Trimethylpentane	540841	0.77
2275060012	Aircraft/Air Taxi Turbine	Acetaldehyde	75070	87.00
2275060012	Aircraft/Air Taxi Turbine	Acrolein	107028	49.88
2275060012	Aircraft/Air Taxi Turbine	Anthracene	120127	0.00
2275060012	Aircraft/Air Taxi Turbine	Benz[a]Anthracene	56553	0.00
2275060012	Aircraft/Air Taxi Turbine	Benzene	71432	34.23
2275060012	Aircraft/Air Taxi Turbine	Benzo[a]Pyrene	50328	0.00
2275060012	Aircraft/Air Taxi Turbine	Benzo[g,h,i]Perylene	191242	0.00
2275060012	Aircraft/Air Taxi Turbine	Carbon Dioxide	CO2	2,279,457.62
2275060012	Aircraft/Air Taxi Turbine	Carbon Monoxide	CO	8,773.68
2275060012	Aircraft/Air Taxi Turbine	Chrysene	218019	0.00
2275060012	Aircraft/Air Taxi Turbine	Cumene	98828	0.06
2275060012	Aircraft/Air Taxi Turbine	Ethyl Benzene	100414	3.54
2275060012	Aircraft/Air Taxi Turbine	Fluoranthene	206440	0.00
2275060012	Aircraft/Air Taxi Turbine	Formaldehyde	50000	250.70
2275060012	Aircraft/Air Taxi Turbine	Methanol	67561	36.76
2275060012	Aircraft/Air Taxi Turbine	m-Xylene	108383	5.74
2275060012	Aircraft/Air Taxi Turbine	Naphthalene	91203	11.02
2275060012	Aircraft/Air Taxi Turbine	Nitrogen Oxides	NOX	2,091.52
2275060012	Aircraft/Air Taxi Turbine	o-Xylene	95476	3.38
2275060012	Aircraft/Air Taxi Turbine	Phenanthrene	85018	0.00
2275060012	Aircraft/Air Taxi Turbine	Phenol	108952	14.79
2275060012	Aircraft/Air Taxi Turbine	PM10 Primary (Filt + Cond)	PM10-PRI	804.97
2275060012	Aircraft/Air Taxi Turbine	PM2.5 Primary (Filt + Cond)	PM25-PRI	785.99

SCC	Process Description	Pollutant	Pollutant CAS	Emissions (Ton)
2275060012	Aircraft/Air Taxi Turbine	Propionaldehyde	123386	14.81
2275060012	Aircraft/Air Taxi Turbine	Styrene	100425	6.29
2275060012	Aircraft/Air Taxi Turbine	Sulfur Dioxide	SO2	391.95
2275060012	Aircraft/Air Taxi Turbine	Toluene	108883	13.07
2275060012	Aircraft/Air Taxi Turbine	Volatile Organic Compounds	VOC	2,021.41
2275070000	Aircraft/Auxiliary Power Unit	Carbon Monoxide	CO	1,430.96
2275070000	Aircraft/Auxiliary Power Unit	Nitrogen Oxides	NOX	1,236.65
2275070000	Aircraft/Auxiliary Power Unit	PM10 Primary (Filt + Cond)	PM10-PRI	161.29
2275070000	Aircraft/Auxiliary Power Unit	PM2.5 Primary (Filt + Cond)	PM25-PRI	161.29
2275070000	Aircraft/Auxiliary Power Unit	Sulfur Dioxide	SO2	168.27
2275070000	Aircraft/Auxiliary Power Unit	Volatile Organic Compounds	VOC	159.46