Appendix D
Greenhouse Gas Inventory

D.1 Introduction

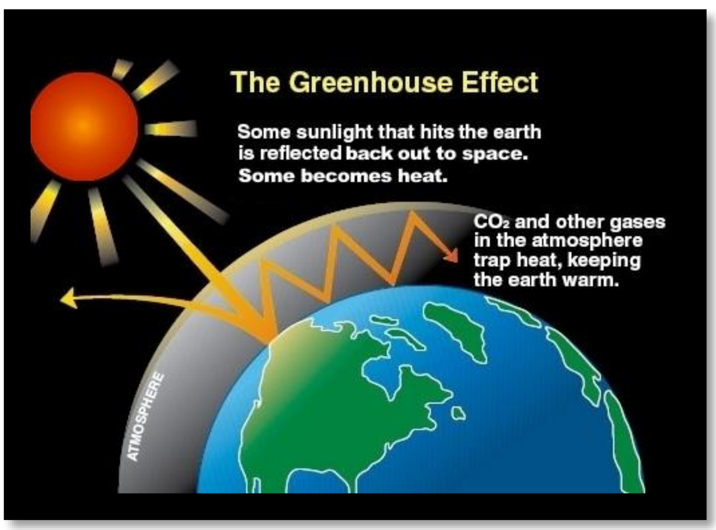
As a part of the Sustainable Master Plan, University Park Airport (UNV) elected to include a Greenhouse Gas (GHG) Inventory. As a result, in the future, the Airport will have the ability to institute energy efficiency improving projects, which can then be measured against this baseline.

The Airport, Federal Aviation Administration (FAA) databases, and airport tenants provided the data used to generate this baseline.

D.1.a Greenhouse Gas Emissions Inventory

Although, currently, no regulations are in place dictating the procedures for conducting a greenhouse gas inventory, there are several guidance publications available. This inventory relied heavily on the FAA/US Air Force's "*Air Quality Procedures for Civilian Airports and Air Force Bases*" as well as the ACRP Guidebook.

For the purpose of simplicity, this report uses the CO_2 equivalency method[1]. This method of simplifying greenhouse gasses is represented by the symbol CO_2e.



[1] The *IPCC Fourth Assessment Report* has assigned the following CO_2e values: 1 for CO_2, 25 for CH_4, and 298 for N_2O

The background section of this chapter contains detailed information as to the process used, assumptions made, and data sources used in the calculations summarized in **Table D-1**.

Table D-1: Baseline Greenhouse Gas Emissions Inventory (Tons/Year)

Source		CO_2e	Percent of Category	Percent of Total
Airport-owned or Controlled				
Airport Vehicles		143	17.9%	1.23%
Airport Buildings - Electric		491	61.4%	4.21%
Airport Buildings - Gas		131	16.3%	1.12%
Airport Employee Commute		32	4.0%	0.27%
Airport Generators		2	0.3%	0.02%
	Sub-Total	800	100.0%	6.84%
Tenant-owned or Controlled				
Tenant Aircraft - Airline only		3,891	98.7%	33.31%
Tenant Direct Fuel Consumption		49	1.2%	0.42%
Tenant Buildings - Electric		0	0.0%	0.00%
Tenant Employees Commute		3	0.1%	0.03%
	Sub-Total	3,943	100.0%	33.76%
Public				
Transportation to/from Airport - Personal vehicles		1,825	26.30%	15.62%
Transportation to/from Airport - Rental Vehicles		370	5.33%	3.16%
General Aviation Aircraft		4,744	68.37%	40.61%
	Sub-Total	6,939	100.0%	59.40%
	GRAND TOTAL	11,682	100.00%	

Source: Mead & Hunt, Inc.

D.2 Background

D.2.a Boundaries and Ownership

Before any calculations could be conducted, boundaries were established to associate the various entities with the appropriate emissions. Three distinct groups were established:

- Airport-owned or Controlled
- Tenant-owned or Controlled
- Public

By providing distinct boundaries for the ownership of the emissions, the Airport can take responsibility for the sources of emissions, which they have direct control over. The same is true for tenants and the public at large.

D.2.b Data Availability

While every effort was made to find and use the most appropriate and accurate information regarding sources of emissions, some assumptions and estimates had to be made. In some instances, complete historical data was unavailable or had not been collected. In these instances, available data was annualized to provide a complete year. The results presented here reflect the use of best available data and the guidance contained in the ACRP Guidebook. Additionally, an airport user survey was conducted. The surveys were sent to business tenants (airlines, rental car agencies, etc.), hangar tenants (corporate and T-hangar users), itinerant general aviation users, and commercial airline passengers to collect information on items such as annual electrical and natural gas/propane consumption, average round trip commute distance and frequency, and vehicle origin/destination distance from the Airport. Surveys were distributed to users through hard copies at the GA aviation terminal desk, as well as electronic means through e-mail and on the Airport website.

D.2.c Airport-owned and Controlled Emissions

Buildings – By far, the largest airport-owned or controlled source, which contributes to the airport's emissions, are the airport buildings. Accounting for nearly 77% of the airport-owned or controlled total and 6% of airport wide total, the airport-owned buildings are the easiest target for energy efficiency improvements.

In order to calculate the emissions associated with the electrical consumption at the Airport, an emissions factor was obtained for the local area. The U.S. Environmental Protection Agency (EPA) has reported that for 2010, the NPCC NYC/Westchester eGRID Sub-region had the following Carbon Dioxide Equivalent factor per megawatt hours (MWh):

eGRID Sub-Region	Carbon Dioxide Equivalent (lbs./MWh)
NPCC NYC/Westchester	623.78

Source: U.S. Environmental Protection Agency

The annual electrical consumption for airport-owned buildings multiplied by this region specific emissions factor provides the annual emissions associated with the Airport's electrical consumption. **Table D-2** breaks down the usage and emissions by building, while **Table D-3** provides the breakdown of usage and emissions associated with propane and fuel oil consumption per airport-owned building.

Table D-2: Airport-owned Buildings Natural Gas Consumption

Building area	Annual Fuel Consumption (gallons)	Fuel Type	kg CO_2 per gallon	g CH4 per gallon	g N20 per gallon	Total kg CO_2	Total Tons CO_2	Total Tons CH4	Total Tons N20	CH4 CO_2e (tons)	N20 CO_2e (tons)	**Sub-Total CO_2e (tons)**
Aircraft Maintenance Facility	5,674	Fuel Oil	10.18	0.42	0.08	57,761	64	0.00	0.00	0.07	0.15	**64**
Air Traffic Control Tower	718	Propane	5.72	0.27	0.05	4,107	5	0.00	0.00	0.01	0.01	**5**
General Aviation Terminal	3,968	Propane	5.72	0.27	0.05	22,697	25	0.00	0.00	0.03	0.07	**25**
Passenger Terminal	N/A											
SRE Building	5,869	Propane	5.72	0.27	0.05	33,571	37	0.00	0.00	0.04	0.10	**37**
GRAND TOTAL CO_2e (tons)												**131**

Source: Mead & Hunt, Inc.

Table D-3: Airport-owned Buildings Electrical Consumption

Building Area	**Estimated Annual Electricity Consumption (kWh)**	**Annual Consumption in MWh**	**CO_2e Emissions Factors (lb./MWhr)**	**Total CO_2e (pounds)**	**Total CO_2e (tons)**
Aircraft Maintenance Facility	198,720	198.72	623.78	123,958	62
Air Traffic Control Tower	296,581	296.581		185,001	93
General Aviation Terminal	133,750	133.75		83,431	42
Passenger Terminal	927,652	927.652		578,651	289
SRE Building	18,503	18.503		11,542	6
GRAND TOTAL (tons)					**491**

Source: U.S. EPA eGRID Emissions Factors for NPCC NYC/Westchester Sub-region

Airport-owned Vehicles – The Airport owns and operates a fleet of vehicles including pickup trucks, tractors, SRE apparatuses, and ARFF vehicles. **Table D-4** summarizes the fuel types and annual consumption for all airport-owned vehicles. The annual consumption was multiplied by the following fuel specific emissions factors:

- Diesel = 22.384 lbs. CO_2/gallon of fuel[2]
- Gasoline = 19.564 lbs. CO_2/gallon of fuel[3]

[2] Emissions rates provided in ACRP Report 11
[3] Emissions rates provided in ACRP Report 11

This equates to 286,720 pounds or 143 tons of CO_2e annually.

Table D-4: Airport-owned Vehicle Fuel Consumption

Fuel Type	Annual Consumption (gallons)	Lbs of CO_2 per gal. fuel	Total CO_2 from fuel (lbs)	Total CO_2 from fuel (tons)
Diesel	9,175	22.38	205,373	103
Unleaded Gasoline	4,158	19.56	81,347	41
			GRAND TOTAL CO_2e (tons)	**144**

Source: University Park Airport, Mead & Hunt, Inc.

Airport Employees – Airport employees commuting to work travel approximately 300 miles each workday. Using the average miles-per-gallon and emissions rates per gallon as suggested in the ACRP Guidebook, a total of 63,849 lbs. or 32 tons of CO_2e are directly attributable to airport employee commutes. **Table D-5** summarizes the factors used to calculate the associated emissions.

Table D-5: Airport Employee Commute

	Miles Traveled per day	Miles Traveled per year	Fuel Consumed (gallons)	Total CO_2 from fuel (lbs)	Total CO_2 from fuel (tons)
Passenger Vehicles	300	78,000	3,263.60	63,849	32

Source: U.S. EPA (2005)

D.2.d Airport Backup Generators

Data was not available at the time of this draft regarding standby generator usage at UNV. Substitution data was assumed based on past data collected from a similar size airport. The substitution data assumed the airport has two standby generators, one propane powered, and one diesel powered. This inventory assumes a minimal usage annual to comply with testing and readiness requirements. The applicable emissions rates for propane and diesel were obtained from the EPA and then applied to provide an annual total for the airport generators. A total of 2.02 tons of CO_2 are attributable to the Airport-owned backup generators as presented in **Table D-6**.

Table D-6: Airport-owned Backup Generators

	Fuel Consumed annually	Diesel Emissions Factor (lbs. CO_2/gal fuel)	Natural Gas Emissions Factor (lbs CO_2 per 1,000 cu/ ft. gas)	Total CO_2 from fuel (lbs)	Total CO_2 from fuel (tons)
Diesel Generator - gallons	200	22	NA	4477	2
Natural Gas Generator - cu. ft.	300	NA	120.59	36	0.02
			GRAND TOTAL CO_2 (tons)		**2.02**

Source: Mead & Hunt, Inc.

D.2.e Airline and Tenant Owned and Controlled Emissions

Airline Aircraft – In order to calculate the emissions associated with airlines at the Airport, data was gathered from FAA databases and the current airline schedule.

Airline aircraft and equipment were modeled using Emissions and Dispersion Modeling System (EDMS) version 5.1.3. The model adjusts the performance characteristics of each aircraft in relation with the runway lengths and airport configuration. The EDMS software assigns runtimes for various pieces of GSE and APUs appropriate for each aircraft type. CO2e for airline aircraft is summarized in **Table D-7.**

Table D-7: Airline Aircraft Emissions

Aircraft Type	Bombardier CRJ-200	Embraer ERJ-135	de Havilland DHC-8	**Grand Total**
CO_2e (tons)	1,855	996	1,039	**3,890**

Source: Emissions and Dispersion Modeling System (EDMS), version 5.1.3

Airline aircraft are responsible for approximately 3,890 tons of CO_2e*.* This equates to approximately 36% of all GHG emissions from the Airport.

It is important to note that the emissions reported for aircraft activity only account for emissions on the ground through climb out at 3,000 feet AGL. If the airport wishes to identify the emissions associated with aviation activity above 3,000 feet (cruise flight), it can be calculated by annualizing all aviation fuel records sales conducted at the Airport, calculating the appropriate emissions per gallon, and subtracting the ground through 3,000 feet totals. The resulting number will represent total emissions from aircraft above 3,000 feet[4].

Tenant Direct Fuel Consumption – The airlines also purchase diesel and gasoline from the Airport for use in their operations. Emissions from these activities is also accounted for in the tenant-owned or controlled portion of the inventory. **Table D-8** summarizes the calculations used for these emissions.

[4] This method will only account for emissions associated with fuel dispensed at the airport, not fuel tankering.

Table D-8: Tenant Fuel Consumption Emissions

Fuel Type	Annual Consumption (gallons)	Lbs of CO_2 per gal. fuel	Total CO_2 from fuel (lbs)	Total CO_2 from fuel (tons)
Diesel	3,070	22.38	68,719	34
Unleaded Gasoline	1,502	19.56	29,385	15
		GRAND TOTAL CO_2e (tons)		**49**

Source: University Park Airport; Mead & Hunt, Inc.

Electrical Consumption of Tenant-owned or Operated Buildings – Limited data was available regarding airport tenant electrical consumption. Assumptions we made based on the responses to the airport users survey. This inventory assumes 20 kWh of annual consumption for private airport hangars and 150 kWh annually for large corporate hangars. The same emissions factors were applied as used for the airport owned building electrical consumption. This negligible amount of consumption does not register any effect on the airport wide inventory. See **Table D-9**.

Table D-9: Tenant Owned Hangars – Electrical Consumption

Building Area	Estimated Annual Electricity Consumption (kWh)	Annual Consumption in MWh	CO_2e Emissions Factors (lb./MWhr)	Total CO_2e (pounds)	Total CO_2e (tons)
Private Hangars	20	0.02	623.78	0	0
Corporate Hangars	150	0.15		0	0
				GRAND TOTAL	**0**

Source: U.S. EPA eGRID Emissions Factors for NPCC NYC/Westchester Subregion

Tenant Employees – Only one tenant responded to the questionnaire regarding employee commute, thus this category's contribution to the overall inventory might be under reported. According to the one tenant's response, 30 miles of travel per workday are associated with the tenant's business. The same methodology was applied to these tenant employees as was used for airport employees. Using the average miles per gallon and emissions rates per gallon as suggested in the ACRP guidebook, a total of 3 tons of CO_2e could be attributed to the employees of the airport tenants (**Table D-10**).

Table D-10: Tenant Employee Commute

	Miles Traveled per day	Miles Traveled per year	Fuel Consumed (gallons)	Total CO_2 from fuel (lbs)	Total CO_2 from fuel (tons)
Passenger Vehicles	30	7,800	326.36	6,385	3
			GRAND TOTAL CO_2 (tons)		**3**

Source: Mead & Hunt, Inc.; U.S. EPA (2005)

D.2.f Public-owned and Controlled Emissions

The portion of the airport emissions, which can be attributed to the Public, is 6,939 tons of tons of CO_2e, or approximately 59.40% of airport total emissions.

Public Traveling to and From the Airport by Private Vehicle – Emissions associated with the traveling public were calculated by using average distances traveled as provided from the passenger survey in conjunction with total enplanements at the Airport. The percentage of survey respondents reporting to have used a personal vehicle to access the Airport was applied to the enplanements total. The same process was used to determine rental car usage to access the Airport. As presented in **Table D-11**, the traveling public arriving and departing the Airport is responsible for 2,193 tons of CO_2e, or approximately 30% of the total airport emissions.

Table D-11: Emissions by Private Vehicle

	Percent of Survey Responses	**Percent x Annual Enplanements**	**Average Miles Traveled**	Fuel Consumed (gallons)	**Total CO_2 from fuel (lbs)**	**Total CO_2 from fuel (tons)**
Private Vehicles	92%	127,409	35	186,582	3,650,293	1,825
Rental Cars	8%	11,079	82	37,780	739,128	370
				GRAND TOTAL CO_2 (tons)		**2,195**

Source: Mead & Hunt, Inc.

General Aviation Aircraft – Data gathered as part of this Master Plan effort as well as from the FAA databases provided the operations information used to derive the emissions associated with General Aviation (GA) at the Airport. A representative GA fleet mix was created for the purposes of this emissions inventory. Airport users, which are tenants, conduct GA operations nor are airport employees, thus the emissions, being categorized as “public”. General Aviation is responsible for 4,744 tons of CO_2e, or approximately 40% of the total airport emissions (**Table D-12**).

Table D-12: General Aviation Aircraft Emissions

Aircraft Type	CO_2e (tons)
Bombardier Challenger 300	14.3
Cessna 172 Skyhawk	27.5
Cessna 182	36.0
Cessna 208 Caravan	57.8
Cessna 441 Conquest II	21.4
Cessna 525 Citation Jet	32.8
Cessna 560 Citation V	28.2
Cessna 560 Citation XLS	996.0
Dassault Falcon 50	70.5
Dornier 328	60.5
Eclipse 500	21.8
Gulfstream G400	1,039.0
Hawker HS-125	302.5
Pilatus PC-12	1,292.0
Raytheon Beech Baron 58	205.3
Raytheon Beech Bonanza 36	166.4
Raytheon Beechjet 400	180.0
Raytheon Super King Air 200	107.8
Raytheon Super King Air 300	84.6
GRAND TOTAL CO_2e (tons)	**4,744.3**

Source: Mead & Hunt, Inc.

Additional information is contained in the following two appendices:

Appendix D-1: Glossary of Terms and Acronyms
Appendix D-2: Emissions and Dispersion Modeling System Outputs

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Appendix D-1: Glossary of Terms and Acronyms

AIR CARRIER: An operator (e.g., airline) in the commercial system of air transportation consisting of aircraft that hold certificates of Public Convenience and Necessity issued by the department of transportation to conduct scheduled or nonscheduled flights within the country or abroad.

AIR POLLUTION: One or more chemicals or substances in high enough concentrations in the air to harm humans, other animals, vegetation, or materials. Such chemicals or physical conditions (such as excess heat or noise) are called air pollutants.

APU: Auxiliary power unit.

ATMOSPHERE: The mixture of gases surrounding the Earth. The Earth's atmosphere consists of about 79.1% nitrogen (by volume), 20.9% oxygen, 0.036% carbon dioxide, and trace amounts of other gases. The atmosphere can be divided into a number of layers according to its mixing or chemical characteristics, generally determined by its thermal properties (temperature). The layer nearest the Earth is the troposphere, which reaches up to an altitude of about 8 km (about 5 mi) in the polar regions, and up to 17 km (nearly 11 mi) above the equator. The stratosphere, which reaches to an altitude of about 50 km (31 mi) lies atop the troposphere. The mesosphere extends from 80 to 90 km (50 to 56 mi) atop the stratosphere, and finally, the thermosphere, or ionosphere, gradually diminishes and forms a fuzzy border with outer space. There is relatively little mixing of gases between layers.

AVIATION GASOLINE: All special grades of gasoline for use in aviation reciprocating engines, as cited in ASTM Specification D 910. Includes all refinery products within the gasoline range that are to be marketed straight or in blends as aviation gasoline without further processing (any refinery operation except mechanical blending). Also included are finished components in the gasoline range, which will be used for blending or compounding into aviation gasoline.

BRITISH THERMAL UNIT (Btu): The quantity of heat required to raise the temperature of one pound of water one degree of Fahrenheit at or near 39.2 degrees Fahrenheit.

Btu: British thermal unit

C: Carbon

CARBON DIOXIDE: A colorless, odorless, nonpoisonous gas that is a normal part of the ambient air. Carbon dioxide is a product of fossil fuel combustion. Although carbon dioxide does not directly impair human health, it is a GHG that traps terrestrial (i.e., infrared) radiation and contributes to the potential for global warming.

CARBON EQUIVALENT (CE) OR CARBON DIOXIDE EQUIVALENT (CO2e): A metric measure used to compare the emissions of the different GHGs based upon their global warming potential (GWP). GHG emissions in the United States are most commonly expressed as "million metric tons of carbon equivalents" (MMTCE). Global warming potentials are used to convert GHGs to carbon dioxide equivalents.

CH_4: Methane

CO: Carbon monoxide

CO2e: Carbon dioxide equivalent

COMBUSTION: Chemical oxidation accompanied by the generation of light and heat.

CRITERIA POLLUTANT: A pollutant determined to be hazardous to human health and regulated under the USEPA's National Ambient Air Quality Standards. The 1970 amendments to the Clean Air Act require USEPA to describe the health and welfare impacts of a pollutant as the "criteria" for inclusion in the regulatory regime. In this report, emissions of the criteria pollutants are carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOCs), and sulfur oxides (SOx).

EDMS: Emissions and Dispersion Modeling System.

EMISSION FACTOR: The rate at which pollutants are emitted into the atmosphere by one source or a combination of sources.

EMISSIONS: Releases of gases to the atmosphere (e.g., the release of carbon dioxide during fuel combustion). Emissions can be either intended or unintended releases.

ENERGY: The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. In the United States, electrical energy is often measured in kilowatt hours (kWh), while heat energy is often measured in British thermal units (Btu).

ENPLANEMENTS: The number of passengers on a departing aircraft.

FIXED-BASED OPERATOR (FBO): A private operator that may conduct refueling, aircraft, or ground support equipment services for others at the airport.

ft3: Cubic feet

GAV: Ground access vehicle

GENERAL AVIATION: The portion of civil aviation that encompasses all facets of aviation except air carriers. It includes any air taxis, commuter air carriers, and air travel clubs that do not hold Certificates of Public Convenience and Necessity.

GHG: Greenhouse gas

GJ: Giga joules

GREENHOUSE GAS (GHG): Any gas that absorbs infrared radiation in the atmosphere. GHGs include, but are not limited to, water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrochlorofluorocarbons (HCFCs), ozone (O3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

GSE: Ground support equipment

GWP: Global warming potential

JET FUEL: Includes both naphtha-type and kerosene-type fuels meeting standards for use in aircraft turbine engines. Although most jet fuel is used in aircraft, some is used for other purposes such as generating electricity.

JOULE: The energy required to push with a force of one Newton for one meter.

kWh: Kilowatt hour

KYOTO PROTOCOL: An international agreement struck by nations attending the Third Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (held in December of 1997 in Kyoto, Japan) to reduce worldwide emissions of GHGs. If ratified and put into force, individual countries have committed to reduce their GHG emissions by a specified amount.

LANDING AND TAKEOFF CYCLE (LTO): One aircraft LTO is equivalent to two aircraft operations (one landing and one takeoff). The standard LTO cycle begins when the aircraft crosses into the mixing zone as it approaches the airport on its descent from cruising altitude, lands, and taxis to the gate. The cycle continues as the aircraft taxis back out to the runway for takeoff and climb out as it heads out of the mixing zone and back up to cruising altitude. The five specific operating modes in a standard LTO are: approach, taxi/idle-in, taxi/idle-out, takeoff, and climb out. Most aircraft go through this sequence during a complete standard operating cycle.

LTO: Landing and takeoff

METHANE (CH4): A hydrocarbon that is a GHG with a global warming potential most recently estimated at 21. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion. The atmospheric concentration of methane has been shown to be increasing at a rate of about 0.6% per year and the concentration of about 1.7 per million by volume (ppmv) is more than twice its pre-industrial value. However, the rate of increase of methane in the atmosphere may be stabilizing.

METRIC TON: Common international measurement for the quantity of GHG emissions. A metric ton is equal to 1,000 kg, 2,204.6 lbs, or 1.1023 short tons.

MIXING HEIGHT: The height of the completely mixed portion of atmosphere that begins at the earth's surface and extends to a few thousand feet overhead where the atmosphere becomes fairly stable.

mmBtu: Million British thermal units

MOBILE SOURCE: A moving vehicle that emits pollutants. Such sources include airplanes, cars, trucks, and ground support equipment.

MWh: Megawatt hour

NATURAL GAS: Underground deposits of gases consisting of 50% to 90% methane (CH4) and small amounts of heavier gaseous hydrocarbon compounds such as propane (C3H4) and butane (C4H10).

NITROGEN OXIDES (NOx): Gases consisting of one molecule of nitrogen and varying numbers of oxygen molecules. Nitrogen oxides are produced, for example, by the combustion of fossil fuels in vehicles and electric power plants. In the atmosphere, nitrogen oxides can contribute to formation of photochemical ozone (smog), impair visibility, and have health consequences; they are considered pollutants.

NITROUS OXIDE (N2O): A powerful GHG with a global warming potential most recently evaluated at 310. Major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.

N_2O: Nitrous oxide

NO_2: Nitrogen dioxide

NOx: Nitrogen oxides

O_3: Ozone

OZONE: A colorless gas with a pungent odor, having the molecular form of O3, found in two layers of the atmosphere, the stratosphere and the troposphere. Ozone is a form of oxygen found naturally in the stratosphere that provides a protective layer shielding the Earth from ultraviolet radiation's harmful health effects on humans and the environment. In the troposphere, ozone is a chemical oxidant and major component of photochemical smog. Ozone can seriously affect the human respiratory system.

PARTICULATE MATTER (PM): Solid particles or liquid droplets suspended or carried in the air.

PM: Particulate matter

PM2.5: Particulate matter with aerodynamic diameters less than 2.5 μm

PM10: Particulate matter with aerodynamic diameters less than 10 μm

SHORT TON: Common measurement for a ton in the United States. A short ton is equal to 2,000 lbs. or 0.907 metric tons.

SULFUR DIOXIDE (SO2): A compound composed of one sulfur and two oxygen molecules. Sulfur dioxide emitted into the atmosphere through natural and anthropogenic processes is changed in a complex series of chemical reactions in the atmosphere to sulfate aerosols. These aerosols are believed to result in negative radiative forcing (i.e., tending to cool the Earth's surface) and do result in acid deposition (e.g., acid rain).

TJ: Tera joules

Source: ACRP Report 11: Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories (2009)

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Appendix D-2: Emissions and Dispersion Modeling System Outputs

EDMS 5.1.4.1 Emissions Inventory Report
All Aircraft Emissions by Mode
Units: Short Tons Per Year

# Type	Engine	Mode	CO2	H2O	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
Bombardier CRJ-200	CF34-3B	Startup	N/A	N/A	N/A	0.455	0.526	0.523	0.526	N/A	N/A	N/A	N/A	N/A
Bombardier CRJ-200	CF34-3B	Taxi Out	841.506	329.934	13.225	1.303	1.507	1.499	1.507	0.94	0.345	0.059	0.059	266.721
Bombardier CRJ-200	CF34-3B	Takeoff	361.72	141.822	0	0.007	0.008	0.008	0.008	1.036	0.148	0.028	0.028	114.65
Bombardier CRJ-200	CF34-3B	Climb Out	69.8	27.367	0	0.001	0.002	0.002	0.002	0.198	0.029	0.004	0.004	22.124
Bombardier CRJ-200	CF34-3B	Approach	251.565	98.633	1.444	0.137	0.159	0.158	0.159	0.4	0.103	0.012	0.012	79.735
Bombardier CRJ-200	CF34-3B	Taxi In	331.027	129.788	4.922	0.485	0.561	0.558	0.561	0.385	0.136	0.023	0.023	104.921
Bombardier Challenger 300	AE3007A1 Type 2	Startup	N/A	N/A	N/A	0.004	0.004	0.004	0.004	N/A	N/A	N/A	N/A	N/A
Bombardier Challenger 300	AE3007A1 Type 2	Taxi Out	6.566	2.574	0.071	0.011	0.013	0.013	0.013	0.006	0.003	0	0	2.081
Bombardier Challenger 300	AE3007A1 Type 2	Takeoff	2.755	1.08	0	0	0	0	0	0.015	0.001	0	0	0.873
Bombardier Challenger 300	AE3007A1 Type 2	Climb Out	0.514	0.201	0	0	0	0	0	0.003	0	0	0	0.163
Bombardier Challenger 300	AE3007A1 Type 2	Approach	1.91	0.749	0.008	0.001	0.001	0.001	0.001	0.003	0.001	0	0	0.605
Bombardier Challenger 300	AE3007A1 Type 2	Taxi In	2.583	1.013	0.026	0.004	0.005	0.005	0.005	0.003	0.001	0	0	0.819
Cessna 172 Skyhawk	IO-320-D1AD	Startup	N/A	N/A	N/A	0.012	0.013	0.013	0.013	N/A	N/A	N/A	N/A	N/A
Cessna 172 Skyhawk	IO-320-D1AD	Taxi Out	11.947	4.684	0.521	0.199	0.23	0.229	0.23	0.006	0.005	0.004	0.004	3.787
Cessna 172 Skyhawk	IO-320-D1AD	Takeoff	6.34	2.486	0.021	0	0	0	0	0.013	0.003	0	0	2.01
Cessna 172 Skyhawk	IO-320-D1AD	Climb Out	1.162	0.456	0.003	0	0	0	0	0.003	0	0	0	0.368
Cessna 172 Skyhawk	IO-320-D1AD	Approach	3.456	1.355	0.105	0.03	0.035	0.035	0.035	0.002	0.001	0.001	0.001	1.095
Cessna 172 Skyhawk	IO-320-D1AD	Taxi In	4.604	1.805	0.197	0.075	0.086	0.086	0.086	0.002	0.002	0.002	0.002	1.459
Cessna 182	IO-360-B	Startup	N/A	N/A	N/A	0.013	0.015	0.014	0.015	N/A	N/A	N/A	N/A	N/A
Cessna 182	IO-360-B	Taxi Out	16.368	6.417	0.644	0.644	0.744	0.74	0.744	0.008	0.007	0.013	0.013	5.188

EDMS 5.1.4.1 Emissions Inventory Report
All Aircraft Emissions by Mode
Units: Short Tons Per Year

# Type	Engine	Mode	CO2	H2O	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
Cessna 182	IO-360-B	Takeoff	4.558	1.787	0.018	0.002	0.002	0.002	0.002	0.012	0.002	0	0	1.445
Cessna 182	IO-360-B	Climb Out	3.558	1.395	0.013	0.001	0.001	0.001	0.001	0.01	0.001	0.001	0.001	1.128
Cessna 182	IO-360-B	Approach	5.216	2.045	0.134	0.098	0.113	0.112	0.113	0.005	0.002	0.004	0.004	1.653
Cessna 182	IO-360-B	Taxi In	6.279	2.462	0.244	0.242	0.28	0.278	0.28	0.003	0.003	0.005	0.005	1.99
Cessna 208 Caravan	PT6A-114A	Startup	N/A	N/A	N/A	0.02	0.023	0.023	0.023	N/A	N/A	N/A	N/A	N/A
Cessna 208 Caravan	PT6A-114A	Taxi Out	26.287	10.307	1.035	1.034	1.195	1.189	1.195	0.013	0.011	0.021	0.021	8.332
Cessna 208 Caravan	PT6A-114A	Takeoff	7.32	2.87	0.03	0.003	0.004	0.004	0.004	0.02	0.003	0.001	0.001	2.32
Cessna 208 Caravan	PT6A-114A	Climb Out	5.714	2.24	0.021	0.002	0.002	0.002	0.002	0.016	0.002	0.001	0.001	1.811
Cessna 208 Caravan	PT6A-114A	Approach	8.378	3.285	0.215	0.157	0.181	0.18	0.181	0.007	0.003	0.006	0.006	2.655
Cessna 208 Caravan	PT6A-114A	Taxi In	10.085	3.954	0.392	0.388	0.449	0.447	0.449	0.005	0.004	0.008	0.008	3.197
Cessna 441 Conquest II	TPE331-10	Startup	N/A	N/A	N/A	0.01	0.011	0.011	0.011	N/A	N/A	N/A	N/A	N/A
Cessna 441 Conquest II	TPE331-10	Taxi Out	10.783	4.228	0.17	0.032	0.037	0.037	0.037	0.012	0.004	0.001	0.001	3.418
Cessna 441 Conquest II	TPE331-10	Takeoff	3.386	1.328	0.009	0	0	0	0	0.012	0.001	0	0	1.073
Cessna 441 Conquest II	TPE331-10	Climb Out	0.863	0.339	0.003	0	0	0	0	0.003	0	0	0	0.274
Cessna 441 Conquest II	TPE331-10	Approach	2.244	0.88	0.033	0.006	0.007	0.007	0.007	0.003	0.001	0	0	0.711
Cessna 441 Conquest II	TPE331-10	Taxi In	4.114	1.613	0.064	0.012	0.014	0.014	0.014	0.005	0.002	0	0	1.304
Cessna 525 CitationJet	JT15D-1 series	Startup	N/A	N/A	N/A	0.006	0.007	0.007	0.007	N/A	N/A	N/A	N/A	N/A
Cessna 525 CitationJet	JT15D-1 series	Taxi Out	10.96	4.297	0.132	0.016	0.018	0.018	0.018	0.014	0.004	0.001	0.001	3.474
Cessna 525 CitationJet	JT15D-1 series	Takeoff	5.388	2.112	0.004	0	0	0	0	0.032	0.002	0	0	1.708
Cessna 525 CitationJet	JT15D-1 series	Climb Out	3.471	1.361	0.003	0	0	0	0	0.021	0.001	0	0	1.1
Cessna 525 CitationJet	JT15D-1 series	Approach	8.708	3.414	0.009	0	0	0	0	0.039	0.004	0	0	2.76
Cessna 525 CitationJet	JT15D-1 series	Taxi In	4.283	1.679	0.049	0.006	0.007	0.007	0.007	0.006	0.002	0	0	1.357
Cessna 560 Citation V	JT15D-5, -	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

EDMS 5.1.4.1 Emissions Inventory Report
All Aircraft Emissions by Mode
Units: Short Tons Per Year

# Type	Engine	Mode	CO2	H2O	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
	5A, -5B													
Cessna 560 Citation V	JT15D-5, -5A, -5B	Taxi Out	12.844	5.036	0.253	0.161	0.186	0.185	0.186	0.011	0.005	0.003	0.003	4.071
Cessna 560 Citation V	JT15D-5, -5A, -5B	Takeoff	1.952	0.765	0.001	0	0	0	0	0.008	0.001	0	0	0.619
Cessna 560 Citation V	JT15D-5, -5A, -5B	Climb Out	4.07	1.596	0.001	0.001	0.001	0.001	0.001	0.017	0.002	0	0	1.29
Cessna 560 Citation V	JT15D-5, -5A, -5B	Approach	4.527	1.775	0.053	0.036	0.042	0.041	0.042	0.005	0.002	0.002	0.002	1.435
Cessna 560 Citation V	JT15D-5, -5A, -5B	Taxi In	4.836	1.896	0.095	0.061	0.07	0.07	0.07	0.004	0.002	0.001	0.001	1.533
Cessna 560 Citation XLS	JT15D-5, -5A, -5B	Startup	N/A	N/A	N/A	0.193	0.223	0.222	0.223	N/A	N/A	N/A	N/A	N/A
Cessna 560 Citation XLS	JT15D-5, -5A, -5B	Taxi Out	352.992	138.4	4.426	0.41	0.474	0.472	0.474	0.451	0.145	0.019	0.019	111.883
Cessna 560 Citation XLS	JT15D-5, -5A, -5B	Takeoff	132.868	52.094	0.031	0.001	0.002	0.002	0.002	0.666	0.054	0.006	0.006	42.113
Cessna 560 Citation XLS	JT15D-5, -5A, -5B	Climb Out	153.232	60.079	0.042	0.002	0.002	0.002	0.002	0.62	0.063	0.006	0.006	48.568
Cessna 560 Citation XLS	JT15D-5, -5A, -5B	Approach	212.596	83.354	0.259	0.002	0.003	0.003	0.003	0.552	0.087	0.007	0.007	67.384
Cessna 560 Citation XLS	JT15D-5, -5A, -5B	Taxi In	144.498	56.654	1.658	0.152	0.175	0.174	0.175	0.202	0.059	0.008	0.008	45.8
Dassault Falcon 50	TFE731-3	Startup	N/A	N/A	N/A	0.01	0.012	0.012	0.012	N/A	N/A	N/A	N/A	N/A
Dassault Falcon 50	TFE731-3	Taxi Out	36.948	14.486	0.348	0.014	0.016	0.016	0.016	0.031	0.015	0.001	0.001	11.711
Dassault Falcon 50	TFE731-3	Takeoff	5.869	2.301	0.002	0	0	0	0	0.027	0.002	0	0	1.86
Dassault Falcon 50	TFE731-3	Climb Out	7.088	2.779	0.003	0	0	0	0	0.027	0.003	0	0	2.247
Dassault Falcon 50	TFE731-3	Approach	6.37	2.498	0.041	0.001	0.001	0.001	0.001	0.006	0.003	0	0	2.019
Dassault Falcon 50	TFE731-3	Taxi In	14.209	5.571	0.131	0.005	0.006	0.006	0.006	0.012	0.006	0.001	0.001	4.504
Dornier 328 Jet	PW306B	Startup	N/A	N/A	N/A	0.019	0.022	0.022	0.022	N/A	N/A	N/A	N/A	N/A
Dornier 328 Jet	PW306B	Taxi Out	21.348	8.37	0.336	0.064	0.074	0.073	0.074	0.024	0.009	0.002	0.002	6.766
Dornier 328 Jet	PW306B	Takeoff	11.174	4.381	0.015	0	0	0	0	0.064	0.005	0.001	0.001	3.542
Dornier 328 Jet	PW306B	Climb Out	7.494	2.938	0.013	0	0	0	0	0.036	0.003	0	0	2.375
Dornier 328 Jet	PW306B	Approach	12.407	4.864	0.065	0.006	0.007	0.007	0.007	0.026	0.005	0.001	0.001	3.932

EDMS 5.1.4.1 Emissions Inventory Report
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Units: Short Tons Per Year

# Type	Engine	Mode	CO2	H2O	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
Dornier 328 Jet	PW306B	Taxi In	8.054	3.158	0.127	0.024	0.028	0.028	0.028	0.009	0.003	0.001	0.001	2.553
Eclipse 500	PW610F	Startup	N/A	N/A	N/A	0.008	0.009	0.009	0.009	N/A	N/A	N/A	N/A	N/A
Eclipse 500	PW610F	Taxi Out	10.416	4.084	0.41	0.41	0.474	0.471	0.474	0.005	0.004	0.008	0.008	3.301
Eclipse 500	PW610F	Takeoff	4.295	1.684	0.022	0.003	0.004	0.004	0.004	0.011	0.002	0	0	1.361
Eclipse 500	PW610F	Climb Out	0.787	0.309	0.003	0	0	0	0	0.002	0	0	0	0.249
Eclipse 500	PW610F	Approach	2.341	0.918	0.082	0.072	0.084	0.083	0.084	0.001	0.001	0.002	0.002	0.742
Eclipse 500	PW610F	Taxi In	3.974	1.558	0.155	0.154	0.178	0.177	0.178	0.002	0.002	0.003	0.003	1.26
Embraer ERJ135	AE3007A1E	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Embraer ERJ135	AE3007A1E	Taxi Out	197.589	77.47	0	0.693	0.801	0.797	0.801	0.122	0.081	0.02	0.02	62.627
Embraer ERJ135	AE3007A1E	Takeoff	30.674	12.027	0	0.013	0.015	0.015	0.015	0.124	0.013	0.006	0.006	9.722
Embraer ERJ135	AE3007A1E	Climb Out	48.433	18.989	0	0.015	0.017	0.017	0.017	0.218	0.02	0.008	0.008	15.351
Embraer ERJ135	AE3007A1E	Approach	53.497	20.975	0	0.149	0.173	0.172	0.173	0.043	0.022	0.009	0.009	16.956
Embraer ERJ135	AE3007A1E	Taxi In	75.349	29.543	0	0.262	0.303	0.301	0.303	0.047	0.031	0.008	0.008	23.882
Gulfstream G400	TAY 611-8C	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gulfstream G400	TAY 611-8C	Taxi Out	530.125	207.849	3.459	0.018	0.02	0.02	0.02	0.781	0.217	0.018	0.018	168.027
Gulfstream G400	TAY 611-8C	Takeoff	106.822	41.883	0.084	0	0	0	0	0.476	0.044	0.005	0.005	33.858
Gulfstream G400	TAY 611-8C	Climb Out	114.486	44.887	0.074	0	0	0	0	0.528	0.047	0.005	0.005	36.287
Gulfstream G400	TAY 611-8C	Approach	88.944	34.873	0.592	0.003	0.003	0.003	0.003	0.132	0.036	0.003	0.003	28.191
Gulfstream G400	TAY 611-8C	Taxi In	199.04	78.039	1.299	0.007	0.008	0.008	0.008	0.293	0.082	0.007	0.007	63.087
Hawker HS-125 Series 700	TFE731-3	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hawker HS-125 Series 700	TFE731-3	Taxi Out	9.853	3.863	2.011	0.117	0.102	0.098	0.115	0.01	0.004	0.003	0.003	3.123
Hawker HS-125 Series 700	TFE731-3	Takeoff	40.141	15.738	13.865	0.14	0.122	0.117	0.137	0.004	0.016	0.077	0.077	12.723
Hawker HS-125 Series 700	TFE731-3	Climb Out	136.352	53.46	47.657	0.482	0.421	0.403	0.472	0.015	0.056	0.168	0.168	43.218
Hawker HS-125 Series 700	TFE731-3	Approach	110.911	43.485	38.731	0.392	0.342	0.327	0.384	0.012	0.045	0.081	0.081	35.154
Hawker HS-125 Series 700	TFE731-3	Taxi In	5.204	2.04	1.281	0.049	0.043	0.041	0.048	0.004	0.002	0.001	0.001	1.649
Pilatus PC-12	PT6A-67	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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All Aircraft Emissions by Mode
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# Type	Engine	Mode	CO2	H2O	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
Pilatus PC-12	PT6A-67	Taxi Out	153.823	60.31	45.567	2.499	2.18	2.086	2.449	0.055	0.063	0.053	0.053	48.755
Pilatus PC-12	PT6A-67	Takeoff	268.03	105.088	97.109	0.808	0.705	0.675	0.792	0.057	0.11	0.456	0.456	84.954
Pilatus PC-12	PT6A-67	Climb Out	681.849	267.337	252.079	2.098	1.83	1.751	2.055	0.14	0.279	0.734	0.734	216.117
Pilatus PC-12	PT6A-67	Approach	181.475	71.152	66.478	0.553	0.483	0.462	0.542	0.038	0.074	0.107	0.107	57.52
Pilatus PC-12	PT6A-67	Taxi In	7.024	2.754	2.168	0.096	0.084	0.08	0.094	0.002	0.003	0.002	0.002	2.226
Raytheon Beech Baron 58	TIO-540-J2B2	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Raytheon Beech Baron 58	TIO-540-J2B2	Taxi Out	56.666	22.217	1.283	0.134	0.156	0.155	0.156	0.042	0.023	0.004	0.004	17.961
Raytheon Beech Baron 58	TIO-540-J2B2	Takeoff	29.292	11.485	0.01	0	0	0	0	0.065	0.012	0.004	0.004	9.284
Raytheon Beech Baron 58	TIO-540-J2B2	Climb Out	34.844	13.661	0.317	0.032	0.038	0.037	0.038	0.056	0.014	0.005	0.005	11.044
Raytheon Beech Baron 58	TIO-540-J2B2	Approach	63.552	24.917	0.081	0.003	0.004	0.004	0.004	0.105	0.026	0.002	0.002	20.143
Raytheon Beech Baron 58	TIO-540-J2B2	Taxi In	20.984	8.227	0.475	0.05	0.058	0.057	0.058	0.016	0.009	0.002	0.002	6.651
Raytheon Beech Bonanza 36	TIO-540-J2B2	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Raytheon Beech Bonanza 36	TIO-540-J2B2	Taxi Out	61.831	24.242	0.439	0.041	0.047	0.047	0.047	0.087	0.025	0.003	0.003	19.598
Raytheon Beech Bonanza 36	TIO-540-J2B2	Takeoff	30.436	11.933	0.026	0.001	0.002	0.002	0.002	0.103	0.012	0.002	0.002	9.647
Raytheon Beech Bonanza 36	TIO-540-J2B2	Climb Out	23.091	9.053	0.094	0.008	0.009	0.009	0.009	0.046	0.009	0.002	0.002	7.319
Raytheon Beech Bonanza 36	TIO-540-J2B2	Approach	28.031	10.99	0.202	0.019	0.022	0.022	0.022	0.04	0.011	0.002	0.002	8.885
Raytheon Beech Bonanza 36	TIO-540-J2B2	Taxi In	23.011	9.022	0.163	0.015	0.018	0.017	0.018	0.032	0.009	0.001	0.001	7.294
Raytheon Beechjet 400	JT15D-5, -5A, -5B	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Raytheon Beechjet 400	JT15D-5, -5A, -5B	Taxi Out	41.145	16.132	1.774	0.188	0.217	0.216	0.217	0.027	0.017	0.005	0.005	13.041
Raytheon Beechjet 400	JT15D-5, -5A, -5B	Takeoff	32.586	12.776	0.029	0	0	0	0	0.07	0.013	0.003	0.003	10.328
Raytheon Beechjet	JT15D-5, -	Climb Out	34.394	13.485	0.575	0.058	0.067	0.067	0.067	0.053	0.014	0.003	0.003	10.902

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# Type	Engine	Mode	CO2	H2O	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
400	5A, -5B													
Raytheon Beechjet 400	JT15D-5, -5A, -5B	Approach	56.55	22.172	0.269	0.004	0.004	0.004	0.004	0.08	0.023	0.002	0.002	17.924
Raytheon Beechjet 400	JT15D-5, -5A, -5B	Taxi In	15.275	5.989	0.659	0.07	0.081	0.08	0.081	0.01	0.006	0.002	0.002	4.842
Raytheon Super King Air 200	PT6A-42	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Raytheon Super King Air 200	PT6A-42	Taxi Out	19.793	7.761	8.458	0.445	0.388	0.371	0.436	0.002	0.008	0.009	0.009	6.274
Raytheon Super King Air 200	PT6A-42	Takeoff	9.303	3.648	4.021	0.042	0.037	0.035	0.041	0.003	0.004	0.019	0.019	2.949
Raytheon Super King Air 200	PT6A-42	Climb Out	38.944	15.269	17.069	0.179	0.156	0.149	0.175	0.011	0.016	0.081	0.081	12.344
Raytheon Super King Air 200	PT6A-42	Approach	31.162	12.218	13.673	0.143	0.125	0.119	0.14	0.009	0.013	0.025	0.025	9.877
Raytheon Super King Air 200	PT6A-42	Taxi In	8.632	3.384	3.692	0.17	0.148	0.142	0.167	0.001	0.004	0.004	0.004	2.736
Raytheon Super King Air 300	PT6A-60A	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Raytheon Super King Air 300	PT6A-60A	Taxi Out	13.855	5.432	5.921	0.312	0.272	0.26	0.305	0.002	0.006	0.006	0.006	4.392
Raytheon Super King Air 300	PT6A-60A	Takeoff	21.447	8.409	10.372	0.103	0.09	0.086	0.101	0.002	0.009	0.046	0.046	6.798
Raytheon Super King Air 300	PT6A-60A	Climb Out	16.717	6.554	8.013	0.158	0.138	0.132	0.155	0.001	0.007	0.036	0.036	5.298
Raytheon Super King Air 300	PT6A-60A	Approach	27.428	10.754	11.597	0.126	0.11	0.105	0.123	0.011	0.011	0.022	0.022	8.694
Raytheon Super King Air 300	PT6A-60A	Taxi In	5.144	2.017	2.198	0.116	0.101	0.097	0.113	0.001	0.002	0.002	0.002	1.63
Saab 340-A	CT7-5A2	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Saab 340-A	CT7-5A2	Taxi Out	129.981	50.962	3.292	0.748	0.864	0.86	0.864	0.084	0.053	0.019	0.019	41.198
Saab 340-A	CT7-5A2	Takeoff	55.725	21.848	0.054	0.001	0.001	0.001	0.001	0.112	0.023	0.003	0.003	17.662
Saab 340-A	CT7-5A2	Climb Out	124.674	48.882	0.735	0.002	0.002	0.002	0.002	0.163	0.051	0.008	0.008	39.516
Saab 340-A	CT7-5A2	Approach	95.645	37.5	2.126	0.321	0.372	0.37	0.372	0.066	0.039	0.003	0.003	30.315
Saab 340-A	CT7-5A2	Taxi In	48.277	18.928	1.223	0.277	0.321	0.319	0.321	0.031	0.02	0.007	0.007	15.302

EDMS 5.1.4.1 Emissions Inventory Report
All Aircraft Emissions by Mode
Units: Short Tons Per Year

# Type	Engine	Mode	CO2	H2O	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
de Havilland DHC-8-200	PW123	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
de Havilland DHC-8-200	PW123	Taxi Out	86.4	33.875	4.387	0.734	0.848	0.844	0.848	0.053	0.035	0.017	0.017	27.385
de Havilland DHC-8-200	PW123	Takeoff	31.734	12.442	0.118	0.003	0.004	0.004	0.004	0.051	0.013	0.002	0.002	10.058
de Havilland DHC-8-200	PW123	Climb Out	70.999	27.837	1.357	0.119	0.137	0.136	0.137	0.075	0.029	0.004	0.004	22.504
de Havilland DHC-8-200	PW123	Approach	54.467	21.355	2.798	0.467	0.54	0.537	0.54	0.033	0.022	0.003	0.003	17.264
de Havilland DHC-8-200	PW123	Taxi In	32.053	12.567	1.627	0.272	0.315	0.313	0.315	0.02	0.013	0.006	0.006	10.159

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