3. AIRCRAFT CAPACITY AND UTILIZATION FACTORS

3.1 INTRODUCTION

Aircraft capacity and utilization factors apply primarily to the evaluation of FAA investment and regulatory programs that affect time spent in air transportation, system capacity and aircraft utilization. The utilization of available capacity affects the benefits and costs that accrue directly to aircraft operators and indirectly to users and society.

3.1.1. User Group Concept and Definitions

In this report, data are presented for four user groups together with the sub-groupings shown below.[1] The air carrier sub-groupings are based on the reporting requirements of 14 CFR Part 241, which prescribe reporting requirements for large certificated air carriers.[2] In some years, there could be additional air carrier groups for Part 135 carriers that are required to report financial and traffic data per 14 CFR Part 241. However, in 2013, no Part 135 carriers were required to report.[3]

User Groups

Group 1: Part 121 air carrier operations of passenger aircraft
- A: Air carriers filing Schedule P-5.2[1]
- B: Air carriers filing Schedule P-5.1[1]

Group 2: Part 121 air carrier operations of all-cargo aircraft
- A: Air carriers filing Schedule P-5.2
- B: Air carriers filing Schedule P-5.1

Group 3: General aviation aircraft by the Federal Aviation Regulation (FAR) that the activity was conducted under:
- A: General aviation only
- B: Air taxi only

Group 4: Military aircraft

The overall user group structure is similar to that used in the prior economic values report (Final Report, Revised October 3, 2007); however, some aircraft categories have changed to reflect the current fleet. Details are provided in the sections below. In addition, an effort was made to align the data with the certification category of aircraft and the operating regulations that

[1] In some cases, more disaggregate data are presented.
[2] Large certificated air carriers hold Certificates of Public Convenience and Necessity issued by the U.S. Department of Transportation authorizing the performance of air transportation with annual operating revenues of $20 million or more.
[3] One carrier that filed Schedule P-5.1 holds joint Part 121 and Part 135 operating authority.

apply to them. This was done to provide a better basis for the evaluation of investment or regulatory programs affecting portions of the aircraft fleet.

3.1.2. Regulatory Structure

Title 14 of the Code of Federal Regulations (CFR) covers Aeronautics and Space. There are two types of regulations in Title 14 with direct applicability to this report: aircraft airworthiness certification, and aircraft operations regulations. Aircraft may be grouped by the FAR Part under which they are certificated for one type of analysis, and by the Part (or Parts) under which they are operated for another, or both.[4] These data also may be used in the analysis of investment and regulatory decisions not affecting aircraft certification or operating regulations.

3.1.2.1 Aircraft Certification Part—In order for an aircraft to be flown in the United States, it must be considered airworthy.[5] To obtain standard airworthiness certificate, an aircraft must conform to a type certificate and be in a condition for safe operation. A type certificate is a document issued by the FAA to an applicant who has proven that an aircraft meets the requirements of the pertinent FAR(s). The issuance of a type certificate approves the type design. There are four Parts under Title 14 which deal with airworthiness standards for aircraft:[6]

- **Part 23** covers "Normal, Utility, Acrobatic and Commuter Category Airplanes." Normal, Utility and Acrobatic aircraft are limited to a maximum of nine passenger seats and a maximum takeoff weight (MTOW) of 12,500 pounds. Commuter airplanes, which must have two or more propeller-driven engines, are limited to a maximum of 19 passenger seats and a MTOW of 19,000 pounds.
- **Part 25** covers "Transport Category Airplanes," which applies to all fixed-wing aircraft that do not meet the standards of Part 23.[7]
- **Part 27** covers "Normal Category Rotorcraft." These rotorcraft are limited to a MTOW of 7,000 pounds[8] and nine passenger seats. They may be piston- or turbine-powered, and have single or multiple engines.

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[4] These are the principal regulations affecting U.S. aircraft manufacturers and aircraft operators that are used to categorize the population of civil aircraft. For the purposes of presentation, we have grouped aircraft certified under the older Civil Air Regulations (CARs) with the same size and category of aircraft under the current Federal Aviation Regulations (FARs). This distinction would likely only arise in an evaluation for a regulatory specific aircraft make-model at which point the exact certification basis could be determined.

[5] There are exceptions to this for homebuilt and experimental aircraft. Such aircraft may not be sold or operated commercially. They are generally small, piston-powered aircraft that would otherwise be certificated under FAR Part 23 (fixed-wing) or FAR Part 27 (rotorcraft) regulations.

[6] Some aircraft were certified to the regulations—Civil Air Regulations—that preceded the FARs. In this report, these aircraft are classified into the current regulatory structure. These account for a small part of aviation activity.

[7] In general terms, piston-powered fixed-wing aircraft are certificated under Part 23, as are turboprops with fewer than 20 seats. Larger turboprops and all jet-powered airplanes are certificated under Part 25.

[8] While the maximum certified takeoff weight for Part 27 is at 7,000 pounds, the weights assigned for aircraft in the GA Survey were developed through an analysis of secondary source data. Thus, it is possible that some rotorcraft with weights less than (but close to) 7,000 pounds are included in Part 29, which applies to larger rotorcraft. However, we do not believe that this has a large impact on the reported results.

- **Part 29** covers "Transport Category Rotorcraft," which applies to all rotary-wing aircraft that do not meet the standards of Part 27.

3.1.2.2 Operating FAR—Standards for conducting civilian flights in the United States are contained in several parts of Title 14:[9]

- **Part 91** contains general regulations for the operation of powered aircraft (excluding ultralights). Part 91 regulations are sometimes referred to as "General Aviation" operations. It is the least restrictive category of operation for such aircraft. Operations that do not include activities that are regulated under one of the other parts operate by default under Part 91.
- **Part 121** contains standards applicable to the domestic and flag operations of the holders of air carrier or operating certificates under Part 119. Domestic and flag operations involve common carriage, the transportation of people or goods for compensation, in aircraft with more than nine passenger seats or a cargo capacity of more than 7,500 pounds. This is the structure under which most large airlines operate.
- **Part 125** regulates non-commercial operations conducted with fixed-wing aircraft with 20 or more seats, which do not fit into Parts 121, 129, 135 or 137. Part 125 applies when common carriage is not involved.
- **Part 133** governs the operation of any rotary wing aircraft carrying an external load.
- **Part 135** covers commuter (using aircraft of nine seats or less and a maximum payload of 7,500 pounds or less) or on-demand operations by holders of air carrier or other operating certificates, which are required for certain activities: transportation of mail, certain sightseeing or air tour flights, air taxi (on-demand) flights, and commuter flights. Scheduled passenger carrying operations with turbojet aircraft having one or more seats must be conducted under Part 121.
- **Part 137** applies to all operations involving the aerial application of substances. This application may be in support of agriculture, firefighting, public health sprayings or cloud seeding.

3.1.3. Aircraft Groupings

Aircraft are placed into groups likely to be relevant to conducting regulatory analyses. Within each group, data are reported by generic aircraft classifications. Groupings are discussed in the following sections, and detailed in the tables. Finally, user profiles are constructed for selected user groupings.

The factors in Table 3-1 are reported for air carrier, general aviation, and military user types, respectively, with differences based on data limitations.

[9] In order to conduct operations on a commercial basis, an operator must have an air carrier or other operating certificate, issued under Part 119, Certification: Air Carriers and Commercial Operators.

Table 3-1: Factors Presented by User Type

Factor	Air Carrier	General Aviation	Military
Aircraft seating capacity	x	x	-
Number of crew (including flight attendants)	x	-	-
Cargo capacity	x	-	-
Passenger load factor	x	x	-
Cargo load factor	x	-	-
Aircraft utilization	x (day)	x (year)	x (hours)
Average speed	x	-	-
Average gross weight	x	x	-

The air carrier sub-groupings for passenger and freight are defined by aircraft operator. All-cargo operators are those that report no passenger traffic. In 2013, there were a small number of operators that predominantly operated all-cargo flights with a small number of passenger flights. These operators were classified as all-cargo operators for this report. Passenger operators can produce both passenger and cargo services by using empty space in the aircraft divided into a number of compartments to carry air freight.

General aviation capacity data are also divided into a number of subgroups depending on the type of operation. In this section, GA aircraft and activity are also categorized by the parts of aircraft certification and operating regulations that the activity falls under.

Information on capacity and utilization factors for military aircraft is also presented in this section. From a regulatory or system investment standpoint, FAA actions will primarily affect military flight time; the costs of military operations are covered in Sections 4 and 5.

Data limitations do not allow for complete analysis of each capacity factor for each aircraft type or classification. The most complete data are available for the large air carriers, while small commuter air carriers report less detailed data, and general aviation activity data are somewhat limited. The individual tables show specific definitions for each data element.

3.2 AIR CARRIER AIRCRAFT

One of the objectives for this report update was to align the aircraft group structure more closely to the FAA regulatory structure. Table 3-2 shows the air carrier aircraft categories used in this report, and how they relate to the categories used in the prior economic values report. The groups in this report cover both the operating and certification standards relevant for each category.[10]

[10] Aircraft certified under Part 23 and Part 25 were recorded based on *Jane's All the World's Aircraft* (various editions). If no certification part is listed in a table, they are assumed to be certified to Part 25 (or predecessor regulations).

Table 3-2: Air Carrier Aircraft Categories

2007 Passenger and Cargo	2015 Passenger	2015 Cargo
Two-engine narrow-body	Narrow-body 160 seats and below	Narrow-body 160 seats equivalent and below
Three-engine narrow-body	Narrow-body more than 160 seats	Narrow-body more than 160 seats equivalent
Four-engine narrow-body		
Two-engine wide-body	Wide-body 300 seats and below	Two-engine wide-body
Three-engine wide-body	Wide-body more than 300 seats	Three-engine wide-body
Four-engine wide-body		Four-engine wide-body
RJ under 70 seats	RJ 60 seats and below	RJ 60 seat equivalent and below
RJ 70-100 seats	RJ more than 60 seats	RJ more than 60 seat equivalent
Turboprops under 20 seats (Part 23)	Turboprop under 20 seats (Part 23)	Turboprop under 20 seats equivalent (Part 23)
Turboprops under 20 seats (Part 25)	Turboprop under 20 seats (Part 25)	Turboprop under 20 seats equivalent (Part 25)
Turboprops with 20 or more seats	Turboprop 20 - 60 seats	Turboprop 20 - 60 seats equivalent
	Turboprop more than 60 seats	Turboprop more than 60 seats equivalent
Piston engine (Part 23)	Piston engine (Part 23)	Piston engine (Part 23)
Piston engine (Part 25)	Piston engine (Part 25)	Piston engine (Part 25)

3.2.1. Air Carrier Aircraft Groups, Certification and Operating FARs

Aircraft capacity and utilization factors for calendar year 2013 were obtained from Schedule T-100 data submitted by air carriers to the Bureau of Transportation Statistics (BTS).[11] Data Base Products summarized the data by aircraft type, carrier, and other appropriate categories using BTS quarterly data for calendar year 2013. Data are summarized in the following tables for aircraft classification groups and for the total fleet.

As noted above, air carriers were divided into two groups: Part 121 air carriers that filed Schedule P-5.2 and Part 121 air carriers that filed Schedule P-5.1. Table 3-3 provides a summary of block hour (gate to gate) activity for all air carriers considered in this study. The vast majority of hours were operated by air carriers that filed Schedule P-5.2. The table also notes those aircraft that were certified under Part 23 versus Part 25. Aircraft without an aircraft certification basis noted are Part 25 aircraft.

[11] All large certificated U.S. air carriers are required to file Schedule T-100. Large certificated air carriers are defined as air carriers holding a certificate issued under 49 U.S.C. 41102, as amended, that: (1) Operates aircraft designed to have a maximum passenger capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds; or (2) conducts operations where one or both terminals of a flight stage are outside the 50 states of the United States, District of Columbia, the Commonwealth of Puerto Rico and the U.S. Virgin Islands.

Table 3-3: Block Hours by Aircraft Certification and Reporting Group

Aircraft Category	Part 121 Air Carriers Filing Schedule P-5.2		Part 121 Air Carriers Filing Schedule P-5.1		Total	
	Passenger	All-Cargo	Passenger	All-Cargo	Passenger	All-Cargo
Wide-body more than 300 seats	191,834		NR		191,834	
Wide-body 300 seats and below	2,006,089		NR		2,006,089	
Four-engine wide-body		235,903		1,439		237,342
Three-engine wide-body		365,601		NR		365,601
Two-engine wide-body		534,015		9,579		543,594
Narrow-body more than 160 seats	2,260,009	132,880	NR	NR	2,260,009	132,880
Narrow-body 160 seats and below	8,959,309	16,125	6,427	22,445	8,965,736	38,570
RJ more than 60 seats	2,156,423	NR	NR	NR	2,156,423	NR
RJ 60 seats and below	2,596,269	2,684	NR	NR	2,596,269	2,684
Turboprop more than 60 seats	210,338	7,855	4,379	NR	214,717	7,855
Turboprop 20 - 60 seats	112,295	0	1,016	8,960	113,311	8,960
Turboprop under 20 seats (Part 25)	NR	NR	NR	NR	NR	NR
Turboprop under 20 seats (Part 23)	4,605	90,966	NR	1,093	4,605	92,059
Piston engine (Part 25)	NR	NR	NR	4,568	NR	4,568
Piston engine (Part 23)	NR	56,945	NR	NR	NR	56,945
Total	**18,497,171**	**1,442,974**	**11,822**	**48,084**	**18,508,993**	**1,491,058**

Source: GRA analysis of T-100 data

NR = none reported

A number of capacity and utilization factors useful for understanding the air carrier industry were calculated using 2013 T-100 data. Table 3-4 provides an overview of how the various factors were derived.

Table 3-4: Air Carrier Capacity and Utilization Factors

Factor	Derivation
Number of Aircraft	"Aircraft Days Assigned to Service" divided by 365
Departures	"Revenue Aircraft Departures Performed"
Passenger Capacity*	"Available Seat Miles" divided by "Revenue Aircraft Miles Flown"
Passenger Load Factor*	"Revenue Passenger Miles" divided by "Available Seat Miles"
Capacity (tons)	"Available Ton Miles" divided by "Revenue Aircraft Miles Flown"
Capacity Load Factor	"Revenue Ton Miles" divided by "Available Ton Miles"
Crew Size	Flight deck crew size from FAA Type Certificate Data Sheets (TCDS) database; Flight attendants estimated as one per 50 passenger seats (for aircraft with more than 9 seats)
Block Hours	"Aircraft Hours, Ramp to Ramp"
Average Block Speed (MPH)	"Revenue Aircraft Miles Flown" divided by "Aircraft Hours, Ramp to Ramp"
Daily Utilization (hours)	"Aircraft Hours, Ramp to Ramp" divided by "Aircraft Days Assigned to Service"
Fuel Burn per Hour (gallons)	"Aircraft Fuel" divided by "Aircraft Hours, Ramp to Ramp"

* Calculated only for passenger air carriers

Factors related to passenger air carriers that filed Schedule P-5.2 are shown in Table 3-5. There was an average of 5,456 in-service aircraft reported for these carriers. The crew size includes both flight deck crew and cabin crew. The number of flight deck crew for the aircraft in each grouping was identified using the FAA Type Certificate Data Sheets (TCDS) database. The number of cabin crew was estimated as one flight attendant per 50 passenger seats.[12] The actual number of flight attendants varies based on the size of the aircraft and staffing policy of individual carriers.

As can be seen, the 5,456 aircraft accounted for 8.2 million departures in 2013. These aircraft were utilized for 9.3 hours per day on average and had an average capacity of 146 passenger seats. The average passenger load factor was 83 percent.

[12] FAR 121.391(a) generally requires a minimum of one flight attendant for each 50 installed seats for aircraft with more than 9 seats.

Table 3-5: Passenger Air Carriers Filing Schedule P-5.2 Capacity and Utilization Factors

Aircraft Category	Number Of Aircraft	Departures	Passenger Capacity	Passenger Load Factor	Capacity (tons)	Capacity Load Factor	Crew Size	Block Hours	Average Block Speed (MPH)	Daily Utilization (Hours)	Fuel Burn Per Hour (Gallons)
Wide-body more than 300 seats	48	20,659	359	84%	55	71%	10	191,834	505	11.1	3,389
Wide-body 300 seats and below	466	257,367	243	83%	46	57%	7	2,006,089	477	11.8	1,889
Narrow-body more than 160 seats	611	650,825	180	87%	24	65%	6	2,260,009	409	10.1	1,015
Narrow-body 160 seats and below	2,475	3,786,074	144	83%	18	67%	5	8,959,309	372	9.9	774
RJ more than 60 seats	672	1,182,452	74	79%	10	60%	4	2,156,423	329	8.8	507
RJ 60 seats and below	1,056	2,058,796	49	79%	6	62%	3	2,596,269	340	6.7	506
Turboprop more than 60 seats	83	170,285	75	79%	9	67%	4	210,338	234	6.9	345
Turboprop 20-60 seats	42	107,089	30	67%	4	53%	3	112,295	167	7.3	160
Turboprop under 20 seats (Part 23)	4	5,561	19	76%	2	83%	3	4,605	154	3.3	115
All Aircraft	**5,456**	**8,239,108**	**146**	**83%**	**21**	**63%**	**5**	**18,497,171**	**377**	**9.3**	**874**

Sources: 2013 Form 41 Schedule T-100 traffic data and FAA Type Certificate Data Sheets Database

Table 3-6 shows capacity and utilization figures for all-cargo air carriers that filed Schedule P-5.2. In 2013, 1,070 all-cargo aircraft were reported by these carriers. As can be seen, these aircraft have much lower levels of daily utilization (3.7 block hours per day on average) than the passenger aircraft.

Table 3-6: 2013 All-Cargo Air Carriers Filing Schedule P-5.2 Capacity and Utilization Factors

Aircraft Category	Number of Aircraft	Departures	Capacity (tons)	Capacity Load Factor	Crew Size	Block Hours	Average Block Speed (MPH)	Daily Utilization (Hours)	Fuel Burn per Hour (Gallons)
Four-engine wide-body	81	35,878	125	63%	2	235,903	475	8.0	3,643
Three-engine wide-body	170	112,701	90	58%	2	365,601	428	5.9	2,241
Two-engine wide-body	289	191,690	72	58%	2	534,015	412	5.1	1,642
Narrow-body more than 160 seats	171	75,769	35	47%	2	132,880	357	2.1	1,023
Narrow-body 160 seats and below	17	8,170	27	37%	3	16,125	351	2.6	843
RJ 60 seats and below	7	1,346	3	17%	2	2,684	247	1.1	248
Turboprop more than 60 seats	7	3,157	24	30%	3	7,855	305	3.1	549
Turboprop under 20 seats (Part 23)	237	84,563	2	36%	1	90,966	138	1.1	NR
Piston engine (Part 23)	92	38,710	7	37%	1	56,945	204	1.7	NR
All Aircraft	**1,070**	**551,984**	**81**	**59%**	**2**	**1,442,974**	**394**	**3.7**	**1,878**

Sources: 2013 Form 41 Schedule T-100 traffic data and FAA Type Certificate Data Sheets Database

NR: Not reported

Data on capacity and utilization for passenger air carriers that filed Schedule P-5.1 are reported in Table 3-7. The average aircraft had 126 passenger seats. These aircraft accounted for almost 12,000 block hours in 2013.

Table 3-7: 2013 Passenger Air Carriers Filing Schedule P-5.1 Capacity and Utilization Factors

Aircraft Category	Number of Aircraft	Departures	Passenger Capacity	Passenger Load Factor	Capacity (tons)	Capacity Load Factor	Crew Size	Block Hours	Average Block Speed (MPH)	Daily Utilization (Hours)	Fuel Burn per Hour (Gallons)
Narrow-body 160 seats and below	2	4,017	150	60%	15	59%	5	6,427	301	7.7	229
Turboprop more than 60 seats	1	7,188	64	57%	7	52%	4	4,379	133	10.5	181
Turboprop 20-60 seats	0	1,815	37	63%	4	59%	3	1,016	129	11.3	217
All Aircraft	**4**	**13,020**	**126**	**60%**	**13**	**58%**	**4**	**11,822**	**224**	**8.8**	**210**

Sources: 2013 T-100 traffic data and FAA Type Certificate Data Sheets Database

Table 3-8 shows capacity and utilization factors for all-cargo air carriers that filed Schedule P-5.1. There were 57 aircraft in service on average in 2013. These aircraft accounted for 48,000 block hours in 2013.

Table 3-8: 2013 All-Cargo Air Carriers Filing Schedule P-5.1 Capacity and Utilization Factors

Aircraft Category	Number of Aircraft	Departures	Capacity (tons)	Capacity Load Factor	Crew Size	Block Hours	Average Block Speed (MPH)	Daily Utilization (Hours)	Fuel Burn per Hour (Gallons)
Four-engine wide-body	1	298	123	6%	2	1,439	398	3.9	7,837
Two-engine wide-body	2	2,416	63	58%	2	9,579	436	10.6	1,498
Narrow-body 160 seats and below	25	18,648	19	41%	2	22,445	355	2.5	1,157
Turboprop 20-60 seats	16	6,348	8	42%	2	8,960	238	1.5	317
Turboprop under 20 seats (Part 23)	2	921	1	47%	1	1,093	165	1.5	64
Piston engine (Part 25)	10	3,593	12	49%	3	4,568	191	1.3	336
All Aircraft	**57**	**32,224**	**32**	**45%**	**2**	**48,084**	**331**	**2.3**	**1,165**

Sources: 2013 T-100 traffic data and FAA Type Certificate Data Sheets Database

3.3 GENERAL AVIATION AIRCRAFT

Data from the 2013 GA Survey by FAA's Office of Aviation Policy and Plans (APO-100) was used to estimate the number of active aircraft and annual utilization.[13] The actual sample size for the 2013 GA Survey was 85,490 aircraft.[14] There were responses representing 37,060 aircraft received,[15] of which 30,866 indicated that the aircraft was active (flew at least once) during 2013. Using the GA Survey's weighting methodology, these 30,866 records represent 199,927 U.S.-registered active GA aircraft.

3.3.1. Aircraft Categories

The GA Survey puts each aircraft into one of 18 aircraft types based on criteria such as engine type and number of seats, as shown in Table 3-9. However, an objective of this report was to disaggregate information based on the aircraft certification and operating regulations. For purposes of this report, new categories were created to align with the aircraft certification regulatory structure, and which consider factors like aircraft weight (for jets and rotorcraft).[16]

Table 3-9: GA Survey Aircraft Classification Groups

GA Survey Group	Aircraft Description
1	Single-Engine Fixed Wing - Piston: 1 - 3 seats
2	Single-Engine Fixed Wing - Piston: 4+ seats
3	Twin-Engine Fixed Wing - Piston: 1 - 6 seats
4	Twin-Engine Fixed Wing - Piston: 7+ seats
6	Single-Engine Fixed Wing - Turboprop
7	Twin-Engine Fixed Wing - Turboprop: 1 - 12 seats
8	Twin-Engine Fixed Wing - Turboprop: 13+ seats
10	Twin-Engine Fixed Wing - Turbojet
12	Piston-Engine Rotorcraft
13	Single-Engine Turbine Rotorcraft
14	Multi-Engine Turbine Rotorcraft
15	Gliders
16	Lighter-than-air
17	Experimental Amateur
18	Experimental Exhibition
19	Experimental Other
20	Light Sport Experimental
21	Light Sport Special

Source: FAA, *General Aviation and Part 135 Activity Survey CY 2013.*
Groups 5, 9 and 11 are no longer used.

[13] *General Aviation and Part 135 Activity Survey* (Washington, DC: Federal Aviation Administration, 2014).
[14] Data provided by TetraTech.
[15] A survey response may be for a single aircraft or a fleet of many aircraft.
[16] The expansion of the GA Survey sample to groups not included in the original sample design may reduce the level of reliability of some estimates. However, the provision of detailed data by aircraft certification regulation and type of operating authority provides data more relevant to regulatory evaluations. Readers should be cautious when using data from strata with few active aircraft.

The mapping of the GA Survey categories to those used in this report is illustrated in Table 3-10. All aircraft were also grouped into categories based on year of manufacture: pre-1984, and 1984 and later. Piston and turboprop aircraft were grouped into categories based on number of seats and number of engines. Jet aircraft and rotorcraft were grouped into weight categories based on data in various aircraft reference sources.[17]

The GA Survey aircraft groups, as shown on the right hand side of Table 3-10, were used to develop the 18 Economic Values aircraft categories. Some GA Survey categories have aircraft in more than one economic values category. Given that aircraft are assigned on a make-model basis, these are mapped to the relevant economic values category.

Table 3-10: Relationship between GA Survey and Economic Values Aircraft Categories

Aircraft Category	Certification	GA Survey Groups		
Piston engine airplanes, 1-3 seats	Part 23	1		
Piston engine airplanes, 4-9 seats one-engine	Part 23	2		
Piston engine airplanes, 4-9 seats multi-engine	Part 23	3	4	
Piston engine airplanes 10 or more seats	Part 23	4		
Turboprop airplanes, 1-9 seats one-engine	Part 23	6		
Turboprop airplanes, 1-9 seats multi-engine	Part 23	7		
Turboprop airplanes, 10-19 seats	Part 23	6	7	8
Turboprop airplanes, 20 or more seats	Part 25	8		
Turbojet/turbofan airplanes, <= 12,500 lbs.	Part 23/25	10		
Turbojet/turbofan airplanes, > 12,500 lbs. and <= 65,000 lbs.	Part 25	10		
Turbojet/turbofan airplanes, > 65,000 lbs.	Part 25	10		
Rotorcraft piston <= 6,000 lbs.	Part 27	12		
Rotorcraft turbine <= 6,000 lbs.	Part 27	13	14	
Rotorcraft piston > 6,000 lbs.	Part 29	12		
Rotorcraft turbine > 6,000 lbs.	Part 29	13	14	
Other		15	16	
Experimental		17	18	19
Light Sport		20	21	

Source: GRA analysis

3.3.2. Flight Hours by Activity Type and Aircraft Age

The GA Survey asked respondents how many total hours the aircraft flew during 2013, and the percentage of hours that were flown in each of 15 activity types. GRA grouped these activity types into the operating regulation parts that cover them to produce the percentage of time each aircraft flew under each part.

[17] *Jane's All the World's Aircraft* (Couldson, Surrey, UK: Jane's Information Group, various editions); *The Complete Encyclopedia of World Aircraft* (New York: Barnes & Noble, 2002); various on-line sources.

The following GA survey categories were assigned to the operating authorities to develop the following groups:[18]

- **Part 91**—Personal, business, instructional, corporate, sightseeing and work
- **Part 125**—Airplanes (not rotorcraft) 20 or more seats and not Part 135 or 137
- **Part 133**—Rotorcraft hours reported as external lift
- **Part 135**—Air taxi, air tours and medical
- **Part 137**—Aerial application in agriculture and forestry and other aerial application

The GA Survey provides a weighting factor for each record, which allows projection of the sample data to the aircraft population. The reported hours flown were multiplied by the weighting factor, and the percentages calculated for each of the above groups to produce the number of hours flown by the population under each operating regulation. In addition to the regulatory structure above, selected aircraft and hours flown information was tabulated from the GA Survey responses, and reported for the following categories:[19]

- **Fractional Ownership**—Percentage of time the aircraft was operated as part of a Fractional Ownership program
- **Public**—Percentage of time the aircraft was operated in a public use

Table 3-11 shows the active general aviation aircraft by aircraft category. The 199,927 estimated active aircraft accounted for 22.9 million flight hours in 2013. It also shows the number of aircraft that reported air taxi usage as well as those that reported public (fulfilling a government function) usage. There were 13,391 aircraft that reported some air taxi use and over 10,900 reporting some public use in 2013. Also shown are the average annual hours flown for each aircraft category. Overall, general aviation aircraft averaged 114 hours of flight time in 2013. The more sophisticated aircraft had much higher levels of utilization.

Table 3-11: 2013 Estimated Active General Aviation Aircraft and Hours Flown

Aircraft Category	Certification	Col. 1 All Aircraft	Col. 2 Taxi Aircraft	Col. 3 Public Aircraft	Col. 4 Fractionally-Owned Aircraft	Col. 5 GA Survey Total Hours	Col. 6 Average Annual Hours All Aircraft
Piston engine airplanes 1-3 seats	Part 23	29,046	763	708	-	2,310,812	80
Piston engine airplanes 4-9 seats one-engine	Part 23	93,817	2,230	2,414	-	8,189,504	87
Piston engine airplanes 4-9 seats multi-engine	Part 23	12,896	1,132	904	-	1,605,273	124
Piston engine airplanes 10 or more seats	Part 23	453	167	89	-	75,187	166

[18] All assignments based on reported actual use in GA Survey. While the categories used in the GA Survey do not exactly correspond to the operating regulations, this allows a reasonable estimate of the activity levels under each part.
[19] The aircraft or hours reported are not additive with other aircraft data in the GA Survey.

Aircraft Category	Certification	Col. 1 All Aircraft	Col. 2 Taxi Aircraft	Col. 3 Public Aircraft	Col. 4 Fractionally-Owned Aircraft	Col. 5 GA Survey Total Hours	Col. 6 Average Annual Hours All Aircraft
Turboprop airplanes 1-9 seats one-engine	Part 23	3,828	134	390	5	934,051	244
Turboprop airplanes 1-9 seats multi-engine	Part 23	803	79	131	18	145,694	181
Turboprop airplanes 10-19 seats	Part 23	5,384	1,684	1,293	110	1,436,405	267
Turboprop airplanes 20 or more seats	Part 25	425	279	236	-	165,922	390
Turbojet/turbofan airplanes <= 12,500 lbs.	Part 23/25	1,706	288	26	48	304,557	179
Turbojet/turbofan airplanes >12,500 lbs. and <= 65,000 lbs.	Part 25	8,384	3,185	449	774	2,613,719	312
Turbojet/turbofan airplanes 65,000 lbs.	Part 25	1,764	732	107	117	616,849	350
Rotorcraft piston <= 6,000 lbs.	Part 27	2,977	251	575	-	605,688	203
Rotorcraft turbine <= 6,000 lbs.	Part 27	4,067	1,265	2,045	49	1,423,017	350
Rotorcraft piston > 6,000 lbs.	Part 29	10	-	-	-	441	44
Rotorcraft turbine > 6,000 lbs.	Part 29	2,088	986	1,263	-	652,844	313
Other		4,326	-	18	-	137,537	32
Experimental		21,721	201	230	2	1,348,022	62
Light Sport		6,232	16	33	-	310,431	50
All Aircraft		**199,927**	**13,391**	**10,909**	**1,122**	**22,875,950**	**114**

Source: Analysis of responses to FAA's *General Aviation and Part 135 Activity Survey CY 2013.*
Certification regulations assigned based on the current regulatory structure; many GA aircraft are certified to regulations which pre-date these.
Columns are not additive; aircraft may be used for multiple purposes during a year.
Col 1: Aircraft reported
Col 2: Aircraft for which Air Taxi hours reported. The number of aircraft in this category is significantly higher than the number of aircraft for which air taxi operations are their **primary** use
Col 3: Aircraft for which Public hours reported
Col 4: Aircraft for which Fractional Ownership hours reported
Col 5: Total hours reported
Col 6: Column 5 divided by Column 1

Table 3-12 shows the estimated general aviation hours flown by operating and certification part. As can be seen, the largest proportions of the hours were flown under Part 91, the general flight rules. Activities under Part 135 (air taxi and some types of air tours and air medical services) and Part 137 (aerial application) are the next two most prevalent uses of general aviation aircraft. The total hours distributed by FAR part differ slightly from the total hours reported in the survey due to rounding error in the reported survey totals.

Air Taxi vs. Part 135

It is important to note the distinction between the terms "air taxi" and "Part 135," since they are often used interchangeably. The GA Survey queries aircraft owners on the three types of activity conducted under Part 135:

1. Air Taxi – FAR Part 135 on-demand passenger and all cargo operations (excluding air tours, air medical services, or scheduled passenger service). There were 2.4 million hours flown in 2013.
2. Air Tours – Commercial sight-seeing conducted under FAR Part 135. 343,000 hours flown.
3. Air Medical Services – Air ambulance services, rescue, human organ transportation, and emergency medical services conducted under FAR Part 135. 645,000 hours flown.

All three types of hours are included in Column 5 of Table 3-12, while only air taxi hours are included in Column 4 of Table 3-14. Column 2 of Table 3-11 counts aircraft that have air taxi hours; an aircraft with only air tours or air medical services hours would not be included.

Table 3-12: 2013 GA Hours Flown by Operating Rule and Aircraft Type

Aircraft Category	Col. 1 GA Survey Total Hours	Operating Rules					Col. 7 Total Hours by FAR Part
		Col. 2 Part 91	Col. 3 Part 125	Col. 4 Part 133	Col. 5 Part 135	Col. 6 Part 137	
Piston engine airplanes 1-3 seats	2,310,812	2,066,523	-	-	58,304	185,982	2,310,809
Piston engine airplanes 4-9 seats one-engine	8,189,504	7,860,256	-	-	298,412	30,823	8,189,491
Piston engine airplanes 4-9 seats multi-engine	1,605,273	1,371,931	-	-	217,050	16,292	1,605,273
Piston engine airplanes 10 or more seats	75,187	11,727	4,079	-	57,722	1,659	75,187
Turboprop airplanes 1-9 seats one-engine	934,051	273,373	-	-	9,837	650,839	934,049
Turboprop airplanes 1-9 seats multi-engine	145,694	100,491	-	-	27,948	17,255	145,694
Turboprop airplanes 10-19 seats	1,436,405	847,239	-	-	550,154	38,992	1,436,384
Turboprop airplanes 20 or more seats	165,922	22,053	33,090	-	105,789	4,981	165,913
Turbojet/turbofan airplanes <= 12,500 lbs.	304,557	246,559	-	-	57,991	7	304,557
Turbojet/turbofan airplanes > 12,500 lbs. and <=65,000 lbs.	2,613,719	1,590,597	262,183	-	760,833	106	2,613,719
Turbojet/turbofan airplanes > 65,000 lbs.	616,849	166,521	316,423	-	131,854	2,051	616,849
Rotorcraft piston <= 6,000 lbs.	605,688	510,529	-	2,564	26,934	65,659	605,685
Rotorcraft turbine <= 6,000 lbs.	1,423,017	550,900	-	120,807	617,279	133,655	1,422,641

Aircraft Category	Col. 1 GA Survey Total Hours	Operating Rules					Col. 7 Total Hours by FAR Part
		Col. 2 Part 91	Col. 3 Part 125	Col. 4 Part 133	Col. 5 Part 135	Col. 6 Part 137	
Rotorcraft piston 6,000 lbs.	441	35	-	-	-	406	441
Rotorcraft turbine > 6,000 lbs.	652,844	284,344	-	41,790	261,140	65,152	652,426
Other	137,537	137,032	-	-	505	-	137,537
Experimental	1,348,022	1,133,841	-	669	200,517	12,991	1,348,018
Light Sport	310,431	309,000	-	-	1,326	105	310,431
All Aircraft	**22,875,950**	**17,482,951**	**615,775**	**165,830**	**3,383,594**	**1,226,955**	**22,875,105**

Source: Analysis of responses to FAA's General Aviation and Part 135 Activity Survey CY 2013

Individual responses were sorted to classifications and expanded. Totals may not add due to rounding.
The GA Survey provided total hours flown (GA Survey Total Hours) and hours by category which are grouped here into FAR parts.
Col 1: Total hours reported

Cols 2 - 6: Hours reported under categories which correspond to Operating Rules shown

Table 3-13 shows the active general aviation aircraft and hours flown distributed by aircraft age. The general line of demarcation is aircraft built before 1984, and those built in 1984 and beyond. In the mid-1980s, most general aviation aircraft production in the United States ceased, especially for piston engine airplanes. It is interesting to note that about 65 percent of the active aircraft were built before 1984. However, the majority of turboprop and jet hours were flown in aircraft produced after 1983.

Table 3-13: 2013 Active Aircraft and Hours Flown by Age Category

Aircraft Category	Certification	Total Hours Flown			Active Aircraft		
		Col. 1 All Aircraft	Col. 2 Aircraft Built Before 1984	Col. 3 Aircraft Built in 1984 and Beyond	Col. 4 All Aircraft	Col. 5 Aircraft Built Before 1984	Col. 6 Aircraft Built in 1984 and Beyond
Piston engine airplanes 1-3 seats	Part 23	2,310,812	1,892,588	418,223	29,046	25,829	3,216
Piston engine airplanes 4-9 seats one-engine	Part 23	8,189,504	5,592,066	2,597,438	93,817	77,312	16,505
Piston engine airplanes 4-9 seats multi-engine	Part 23	1,605,273	1,308,637	296,636	12,896	11,688	1,208
Piston engine airplanes 10 or more seats	Part 23	75,187	69,636	5,551	453	426	27
Turboprop airplanes 1-9 seats one-engine	Part 23	934,051	84,229	849,822	3,828	587	3,241
Turboprop airplanes 1-9 seats multi-engine	Part 23	145,694	104,991	40,703	803	625	178
Turboprop airplanes 10-19 seats	Part 23	1,436,405	523,876	912,528	5,384	2,091	3,294
Turboprop airplanes 20 or more seats	Part 25	165,922	58,970	106,952	425	177	248

Aircraft Category	Certification	Total Hours Flown			Active Aircraft		
		Col. 1 All Aircraft	Col. 2 Aircraft Built Before 1984	Col. 3 Aircraft Built in 1984 and Beyond	Col. 4 All Aircraft	Col. 5 Aircraft Built Before 1984	Col. 6 Aircraft Built in 1984 and Beyond
Turbojet/turbofan airplanes <= 12,500 lbs.	Part 23/25	304,557	33,080	271,477	1,706	336	1,369
Turbojet/turbofan airplanes 12,500 lbs and <= 65,000 lbs.	Part 25	2,613,719	290,153	2,323,566	8,384	1,355	7,029
Turbojet/turbofan airplanes > 65,000 lbs.	Part 25	616,849	34,047	582,802	1,764	175	1,589
Rotorcraft piston <= 6,000 lbs.	Part 27	605,688	95,855	509,833	2,977	748	2,229
Rotorcraft turbine <= 6,000 lbs.	Part 27	1,423,017	467,917	955,099	4,067	1,642	2,425
Rotorcraft piston > 6,000 lbs.	Part 29	441	441	0	10	10	0
Rotorcraft turbine > 6,000 lbs.	Part 29	652,844	255,151	397,692	2,088	969	1,118
Other		137,537	39,607	97,930	4,326	1,164	3,162
Experimental		1,348,022	248,907	1,099,115	21,721	4,319	17,402
Light Sport		310,431	160	310,271	6,232	10	6,223
All Aircraft		**22,875,950**	**11,100,312**	**11,775,638**	**199,927**	**129,463**	**70,464**

Source: Analysis of responses to FAA's *General Aviation and Part 135 Activity Survey CY 2013*
Individual responses were sorted to classifications and expanded. Totals may not add due to rounding.
Col 1: Total hours reported
Col 2: Total hours reported for aircraft built in 1983 or earlier
Col 3: Total hours reported for aircraft built in 1984 or later
Col 4: Aircraft reported
Col 5: Aircraft reported which were built in 1983 or earlier
Col 6: Aircraft reported which were built in 1984 or later

Table 3-14 shows the number of reported air taxi aircraft and hours flown from the GA Survey. As noted above, there were approximately 13,400 aircraft with at least some air taxi operations, which flew an estimated 2.4 million flight hours. The relatively few turboprops with 20 or more seats and piston airplanes with 10 or more seats have the highest percentages of air taxi hours flown.

Table 3-14: Estimated Total Active Aircraft and Hours Flown for All Aircraft and Reported Air Taxi Aircraft

Economic Values Category	Certification	Col. 1 Active Aircraft	Col. 2 Air Taxi Aircraft	Col. 3 Estimated Total Hours Flown	Col. 4 Estimated Air Taxi Hours Flown	Col. 5 Percent Air Taxi Hours	Col. 6 Estimated Average Hours Total	Col. 7 Estimated Average Hours-Air Taxi
Piston engine airplanes 1-3 seats	Part 23	29,046	763	2,310,812	55,152	2%	80	72
Piston engine airplanes 4-9 seats one-engine	Part 23	93,817	2,230	8,189,504	249,400	3%	87	112
Piston engine airplanes 4-9 seats multi-engine	Part 23	12,896	1,132	1,605,273	201,888	13%	124	178
Piston engine airplanes 10 or more seats	Part 23	453	167	75,187	45,796	61%	166	274
Turboprop airplanes 1-9 seats one-engine	Part 23	3,828	134	934,051	9,083	1%	244	68
Turboprop airplanes 1-9 seats multi-engine	Part 23	803	79	145,694	10,948	8%	181	139
Turboprop airplanes 10-19 seats	Part 23	5,384	1,684	1,436,405	395,155	28%	267	235
Turboprop airplanes 20 or more seats	Part 25	425	279	165,922	98,294	59%	390	352
Turbojet/turbofan airplanes <= 12,500 lbs.	Part 23/25	1,706	288	304,557	52,094	17%	179	181
Turbojet/turbofan airplanes > 12,500 lbs. and <= 65,000 lbs.	Part 25	8,384	3,185	2,613,719	695,667	27%	312	218
Turbojet/turbofan airplanes > 65,000 lbs.	Part 25	1,764	732	616,849	129,672	21%	350	177
Rotorcraft piston <= 6,000 lbs.	Part 27	2,977	251	605,688	19,989	3%	203	80
Rotorcraft turbine <= 6,000 lbs.	Part 27	4,067	1,265	1,423,017	264,515	19%	350	209
Rotorcraft piston > 6,000 lbs.	Part 29	10	0	441	0	0%	44	N/A
Rotorcraft turbine > 6,000 lbs.	Part 29	2,088	986	652,844	111,434	17%	313	113
Other		4,326	0	137,537	0	0%	32	N/A
Experimental		21,721	201	1,348,022	55,098	4%	62	274
Light Sport		6,232	16	310,431	1,253	0%	50	76
All Aircraft		**199,927**	**13,391**	**22,875,950**	**2,395,436**	**10%**	**114**	**179**

Source: Analysis of responses to FAA's *General Aviation and Part 135 Activity Survey CY 2013.*

Individual responses were sorted to classifications and expanded. Totals may not add due to rounding.

Note: N/A indicates that the population for which costs were available was insufficient to provide reliable results.

Col 1: Active aircraft are those flown at least once during the year

Col 2: Active aircraft reporting air taxi use

Col 3: Total hours flown by active aircraft, including air taxi

Col 4: Reported air taxi hours (also included in Column 3). The number of aircraft in this category is significantly higher than the number of aircraft for which air taxi operations are their **primary** use

Col 5: Column 4 divided by Column 3

Col 6: Column 3 divided by Column 1

Col 7: Column 4 divided by Column 2

Table 3-15 shows a distribution by five-year increments of age for the active general aviation aircraft in the fleet and hours flown by operating regulation. As can be seen, many of the aircraft hours flown are by aircraft produced decades ago. Aircraft manufactured between 1974 and 1978 flew more hours in total than aircraft produced in any subsequent 5-year increment.

Table 3-15: 2013 Hours Flown Distribution of GA Aircraft by 5-Year Increments of Age

Age Increment	Col. 1	Hours Flown					
Year of Manufacture	Active Aircraft	Col. 2 Part 91	Col. 3 Part 125	Col. 4 Part 133	Col. 5 Part 135	Col. 6 Part 137	Col. 7 Total Hours by FAR Part
2009 - 2013	13,301	1,636,237	98,117	5,153	365,039	203,881	2,308,426
2004 - 2008	19,239	2,479,997	147,502	7,466	643,622	105,872	3,384,460
1999 - 2003	15,914	1,951,465	183,031	8,128	416,374	103,969	2,662,968
1994 - 1998	9,558	912,911	72,716	7,214	333,879	173,475	1,500,195
1989 - 1993	6,616	601,113	46,302	9,961	268,231	144,181	1,069,788
1984 - 1988	5,836	481,659	28,870	12,319	278,748	47,855	849,450
1979 - 1983	18,573	1,888,357	15,265	56,450	452,780	130,800	2,543,653
1974 - 1978	32,805	3,287,285	6,385	23,807	311,078	94,075	3,722,632
1969 - 1973	17,800	1,322,642	6,368	10,043	137,350	110,855	1,587,257
1964 - 1968	21,647	1,245,656	6,421	16,110	77,498	69,984	1,415,669
1959 - 1963	11,644	521,891	206	9,043	25,156	30,392	586,689
1954 - 1958	7,516	319,100	765	128	41,874	6,856	368,724
1953 or Earlier	19,478	834,638	3,826	7	31,963	4,760	875,194
All Aircraft	**199,927**	**17,482,951**	**615,775**	**165,830**	**3,383,594**	**1,226,955**	**22,875,105**

Source: Analysis of responses to FAA's *General Aviation and Part 135 Activity Survey CY 2013.*
Col 1: Aircraft reported
Cols 2 - 6: Hours reported under categories which correspond to Operating Rules shown
Col 7: Sum of hours reported under all categories

3.3.3. GA Capacity and Utilization

Table 3-16 shows the average capacity (in seats and gross weight) as well as the average percentage of seats occupied for each aircraft group. These data were tabulated from the NTSB accident database for the 1982 to 2013 time period. In this time period, there were 62,299 accidents and incidents with sufficient aircraft characteristic data to assign the aircraft to an economic values aircraft category. This period was selected to provide a large number of observations. The analysis assumes that number of seats, occupants, and gross weight of accident aircraft apply to the population of aircraft within each group. The average GA aircraft had about 3.7 seats and flew about half-full during the period. It should be noted that the “turbojet/turbofan airplanes > 65,000 pounds” category includes airline-type aircraft that were flown under Part 91.

Table 3-16: 1982-2013 GA Capacity and Utilization

Economic Values Category	Certification	Col. 1 Average Seats Occupied	Col. 2 Percent of Seats Occupied	Col. 3 Average Gross Weight
Piston engine airplanes 1-3 seats	Part 23	1.4	74.7%	2,469
Piston engine airplanes 4-9 seats one-engine	Part 23	2.1	47.0%	2,768
Piston engine airplanes 4-9 seats multi-engine	Part 23	2.4	41.3%	6,121
Piston engine airplanes 10 or more seats	Part 23	4.3	29.1%	11,201
Turboprop airplanes 1-9 seats one-engine	Part 23	1.3	62.3%	7,330
Turboprop airplanes 1-9 seats multi-engine	Part 23	2.5	42.5%	12,545
Turboprop airplanes 10-19 seats	Part 23	4.1	35.7%	11,217
Turboprop airplanes 20 or more seats	Part 25	6.7	25.1%	21,312
Turbojet/turbofan airplanes <= 12,500 lbs.	Part 23/25	2.6	51.3%	10,206
Turbojet/turbofan airplanes > 12,500 lbs. and <= 65,000 lbs.	Part 25	3.8	43.4%	23,087
Turbojet/turbofan airplanes > 65,000 lbs.	Part 25	24.3	29.8%	236,700
Rotorcraft piston <= 6,000 lbs.	Part 27	1.6	67.9%	2,055
Rotorcraft turbine <= 6,000 lbs.	Part 27	2.4	49.3%	3,615
Rotorcraft piston > 6,000 lbs.	Part 29	1.5	30.4%	11,558
Rotorcraft turbine > 6,000 lbs.	Part 29	2.8	41.5%	11,485
Other		N/A	N/A	N/A
Experimental		N/A	N/A	N/A
Light Sport		1.5	75.5%	1,257
All Aircraft		**1.9**	**51.3%**	**3,595**

Source: GRA analysis of NTSB accident and incident data for the 1982 to 2013 time period
Only data reported for accidents/incidents that were operating under Part 91, 125, 133, 135, and 137 are included
Col 1: Average (weighted) number of seats for aircraft in NTSB accident and incident data from 1982 to 2013

Col 2: Number of seats divided by number of passengers

Col 3: Weighted average gross weight (pounds)

3.3.4. Alternate Estimate of Air Taxi Hours

Table 3-17 shows an alternative estimate of air taxi hours flown using FAA data that report the number of aircraft that are authorized to conduct on-demand operations under Part 135 and the activity data for aircraft with Part 135 hours from the 2013 GA Survey. Using this method produces an estimate of 1.9 million hours for on-demand Part 135 operations. This can be contrasted with the 2.4 million "air taxi" or 3.4 million Part 135 hours tabulated from the GA Survey. The difference in hours is driven by the difference in aircraft; there are approximately 10,500 aircraft certificated to conduct on-demand operations, but nearly 13,400 (based on weighted survey responses) indicating some air taxi use. There is clearly uncertainty about the actual levels of on-demand Part 135 activity. Analysts can consult APO-110 staff analysts to get further information on Part 135 activity.

Table 3-17: 2013 Alternate Estimate of Air Taxi Hours Flown

Aircraft Type	Col. 1 Unique Aircraft	Col. 2 Average Annual Total Hours	Col. 3 Estimated Annual Total Hours	Col. 4 Average Annual Air Taxi Hours	Col. 5 Estimated Annual Air Taxi Hours
Single-Engine Piston	1,332	211	281,476	102	135,529
Multiengine Piston	1,083	251	272,246	191	206,521
Turboprop	1,938	391	758,328	236	457,432
Jet	3,275	408	1,334,965	209	683,499
Rotorcraft Piston	211	272	57,427	80	16,826
Rotorcraft Turbine	2,684	408	1,094,656	167	448,285
All Aircraft	**10,523**	**N/A**	**3,799,099**	**N/A**	**1,948,091**

Source: Unique aircraft from FAA Operating Specification Subsystem (data as of December 2013); average total and air taxi hours from 2013 GA Survey
Col 1: Total unique Part 135 aircraft in FAA Operating Specification Subsystem, by aircraft type. Two aircraft (one balloon and one blimp/dirigible) are excluded from analysis
Col 2: Average annual hours from GA Survey
Col 3: Column 1 multiplied by column 2
Col 4: Average annual air taxi hours from GA Survey, by aircraft type
Col 5: Column 1 multiplied with column 4

3.4 MILITARY AIRCRAFT

Military aircraft can impact FAA investment decisions because they utilize the resources in the national airspace system. The data for the U.S. military aircraft fleet came from Flight Global's World Air Forces 2015. The fleet counts were adjusted to reflect only those aircraft types reported in Department of Defense (DOD) reimbursement rate data. Data on annual hours flown by aircraft type were obtained from the military services either via the worldwide web or through telephone interviews with relevant DOD and FAA staff during the prior economic

values study. However, DOD would not provide certain data which has been identified as "For Official Use Only" because it could not be published in a report available to all.

Aircraft were assigned to the same categories as were used in the prior economic values publication. As shown in Table 3-18, the total military fleet contained almost 13,000 aircraft in FY2014. These aircraft averaged almost 400 hours a year in flight time. The largest aircraft category was rotary wing aircraft. The aircraft types with the largest number of average annual hours flown were turbojet and turbofan aircraft with three or more engines. These typically were transport, tanker or surveillance aircraft. There were limited data available for piston-engine, UAV and glider aircraft.

Table 3-18: FY2014 U.S. Military Fleet and Utilization Levels

Aircraft Type	Col. 1 Total Fleet	Col. 2 Average Flight Hours	Col. 3 Total Flight Hours
Turbojet/fan 3+ Engine	834	993	828,210
Turbojet/fan Attack/Fighter	3,256	313	1,017,719
Turbojet/fan Other	977	452	441,506
Turboprop	1,569	489	766,610
Piston	32	N/A	N/A
Rotary Wing Aircraft	6,030	303	1,824,114
UAV	301	N/A	N/A
Glider	N/A	N/A	N/A
All Aircraft	**12,999**	**385**	**4,878,160**

Sources: Fleet data from Flightglobal's *World Air Forces 2015.* Number of aircraft based on aircraft types in DOD reimbursement rate data. Used Average Flight Hours by aircraft from 2007 to obtain Total Flight Hours.
Col 1: Total number of aircraft (by aircraft type) in military service
Col 2: Average annual flight hours, weighted by fleet
Col 3: Total flight hours