# Compare Private Planes Data Methodology

## Version 1

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# 1 Introduction

This document sets out to present a general methodology and overview to all the data and information presented in the Compare Private Planes premium subscription.

The objective of the Compare Private Planes premium subscription is to provide users with the information necessary to decide which private jet to purchase.

This document sets out where data is collected from, which data is included, and how figures are calculated. If you have any further questions please get in touch.

# 2 Key Facts

The Key Facts section for every aircraft aims to summarize the features and capabilities of the aircraft within 5 bullet points. Typically, this information is about the performance and interior features of the aircraft.

The aim is to provide additional, qualitative information that cannot be conveyed through numbers of the tools.

## 2.1 Description

The five bullet points are subjectively chosen by the Compare Private Planes team. The information comes direct from the manufacturers and the details deemed to be the most important are the ones that are included.

Of course, it is hard to summarize and judge an aircraft in just five bullet points. Therefore, it is important that you consider all the additional information when comparing and learning about the aircraft.

## 2.2 Exterior Diagrams

All aircraft have exterior drawings to illustrate how they look. The diagrams are inspired by the real aircraft. However, they are not guaranteed to be 100% accurate.

## 2.3 Floorplans

The floorplans for each aircraft are based on the typical configuration from the manufacturer. The exact floorplan will vary from aircraft to aircraft. Therefore, the floorplans used are for the most “common” layouts. Be sure to check the exact floorplan and cabin configuration of each specific aircraft.

# 3 Basic Info

Basic info contains data on the manufacture years, production figures, and serial number range for each aircraft.

The production start year is based on the year that the first customer aircraft of each model was delivered. The production end year is based on the year that the last customer aircraft was delivered. If the aircraft is currently still in production, the value "Present" will be displayed for the production end year.

The number made and number in service are important figures when you are considering how easy it will be to acquire an aircraft, sell an aircraft, or find parts & maintenance for the aircraft.

In its most basic form, the more aircraft that are in service the easier it will likely be to get parts, sell the aircraft, and acquire the aircraft.

The number made figure is collected from the number of aircraft that have ever been produced of the specific model. This is found by monitoring the number of aircraft that have ever been registered with official bodies.

The number in service figure is collected from the number of unique aircraft of the specific model that have been airborne in the past three years. This data is collected from ADS-B flight data for each model.

The serial number range is the range of serial numbers for the specific aircraft.

# 4 Performance Data

Performance data is available in both imperial and metric units. Imperial units is the default setting.

Range data is available in nautical miles, statute miles, and kilometers. Nautical miles are always available. The maximum range figure is collected directly from each manufacturer. The range figure displayed is the maximum range of each aircraft in its optimum configuration, optimum cruise speed, and optimum weather conditions.

Fuel burn figures are calculated from the calculation of the average distance covered in a flight hour. The optimum range figure is then divided by the average distance covered in a flight hour. This in turn results in the maximum flight duration of the aircraft. Manufacturer data results in knowing the maximum fuel that each aircraft can carry. This is then divided by the flight hour endurance to result in the estimated average gallons of fuel burnt per flight hour.

The maximum altitude is collected directly from the manufacturer, as is the rate of climb and initial cruise altitude.

The high speed cruise speed is the maximum cruise speed of each aircraft. The long range cruise speed is the optimum cruise speed for maximum range from the aircraft. Where the manufacturer has not presented the cruise speed in Mach, this has been calculated assuming the aircraft is flying in ISA (International Standard Atmosphere) conditions at the maximum cruise altitude of the aircraft.

Ground performance figures (take-off distance and landing-distance) are collected from the manufacturer. In the majority of conditions these figures are assumed at sea-level and ISA conditions. Take-off distance usually assumes MTOW and landing distance usually assumes typical landing weight. However, note that real-world figures will vary and are affected but not limited to factors such as weather conditions and weight.

# 5 Ownership Costs

Ownership costs demonstrate the estimated cost to own and operate your chosen aircraft per year. Entering your estimated annual flight hours will result in your total estimated annual operating cost. This is calculated from the fixed cost plus the hourly variable cost multiplied by the entered annual flight hours.

## 5.1 Fixed Costs

Fixed costs are the costs required to keep your aircraft on the ground before any flight hours have been introduced.

**Crew Salary & Benefits**

Crew salary and benefits are calculated using the average reported salaries by captains and first officers for each aircraft model. In the case that the aircraft is certified for single-pilot operation then the crew salaries is just for the captain.

The crew salary is adjusted depending on the region and relevant surveys and job requests in each region. Additionally, the crew benefits is calculated as a percentage of the crew salaries. This value is also adjusted depending on the region and the typical benefit rate in each region.

**Training**

Crew training figures are calculated based on the average of the initial type rating and annual recurrent training. The costs are calculated based on the average daily training rate and the hourly aircraft cost.

**Hangar**

Hangar costs are calculated from the footprint of each aircraft multiplied by the average square footage cost to rent an aircraft hangar in the chosen region. The square foot rental cost of a hangar is collected from the cost of a select group of airport hangars.

**Insurance (Hull)**
Insurance costs will vary depending on aircraft acquisition cost, region, owner details, and more. Therefore, the estimated hull insurance cost is using the industry average of 0.15% multiplied by the average pre-owned acquisition cost of each aircraft model.

**Insurance (Liability)**
Each aircraft is categorized into a liability insurance category. Light jets have a lower liability insurance cost than large jets, with aircraft in-between on a sliding scale. This cost is an assumed rate based on the typical risk profile for the aircraft type and crew.

**Management**
The cost to outsource all scheduling and logistics to an aircraft management firm. This cost is calculated through assuming a typical cost for each class of aircraft. This is then assigned to aircraft depending on their class.

**Depreciation**
The value that each aircraft loses in resale value year-on-year. This is calculated using the straight-line depreciation method based on the average percentage decrease in value every year for up to the past five years. The market value figure adjusted is the current average estimated market value for all model years of aircraft.

**Miscellaneous**
These costs are for subscriptions and unexpected costs that are likely to occur over one year of ownership. For example, navigational chart services are included in this cost and vary from aircraft class to aircraft class depending on the typical mission criteria.

## 5.2 Variable Costs

Variable costs are the costs that change depending on how much you use your aircraft. Our data provides this information on a per hour basis.

**Fuel**
This is the value amount for the volume of fuel that the aircraft will consume in a typical hour of flight – balanced out to minimize the impact of take-off, landing, and taxiing. This is calculated using the average cost of Jet A fuel in your chosen region then multiplied by the previously calculated hourly fuel consumption.

**Maintenance**
All aircraft need to follow a strict maintenance schedule dictated by the manufacturer. Hourly costs are calculated from the total estimated cost for the average maintenance inspection for the aircraft, divided by hourly intervals for each aircraft.

**Engine Overhaul**
Aircraft engines all require major maintenance know as an “overhaul”. In most cases this occurs on an hourly basis (e.g. every 4,000 hours the engines need to have an overhaul).

However, some aircraft operate on an "on-condition" basis. The engine overhaul cost here suggests the cost per hour that should be set aside to cover the cost of an engine overhaul when required. This is calculated from the total cost of an engine overhaul for the specific model of engines on the aircraft divided by the overhaul interval.

**Ground Fees**

Ground fees includes landing and handling fees as airfields away from the aircrafts homebase. For each region the published landing fees per 1,000 lbs for the most popular private jet airports are collected. The average is then taken across all airports. This is then multiplied by the maximum landing weight for the selected aircraft. Parking and handling fees are calculated in the same way. These values are then added together and adjusted for the average mission length for the selected aircraft. The average mission length is taken from real-world aircraft utilization data since 2019.

**Miscellaneous**

Hourly miscellaneous costs cover any potential unexpected costs or subscription services such as Wi-Fi or a cabin phone service.

# 6 Acquisition Costs

Acquisition costs represent the estimated market value for each individual year of each aircraft model. These values can be adjusted based on the number of airframe hours and the predicted estimated future values are also provided.

## 6.1 New Purchase Price

The new purchase price is the stated manufacturer list price for each aircraft before any options. These values are not adjusted for inflation and are for the final delivery year of aircraft only.

## 6.2 Pre-Owned Values

Pre-owned market values are collected from the stated sale price of each aircraft and is updated regularly.

## 6.3 Airframe Hours

Each aircraft model has an average hourly fleet figure. Based on the inputted airframe hours the current market value will be adjusted be a certain percentage depending on the number of hours above or below the average fleet hourly figure. This helps to provide an estimated adjusted value.

## 6.4 Predicted Future Values

Future values are estimated based on the previous depreciation curve and applied to the current average market values.

# 7 Historical Market Activity

Historical market activity is the number of times that the aircraft have “transacted” or “changed hands” over the past 50 years. Of course, for many aircraft there isn’t 50 years worth of data. In these cases, data begins from the deliveries of the first aircraft.

Data is obtained from the registry databases of the major government databases. This data identifies whenever a specific aircraft has been sold to another party. This is then collected for each specific aircraft model and presented on the graph.

# 8 Fleet Flight Hours

The fleet flight hours provides the collective hourly fleet data for all aircraft within a specific model grouping. Data is provided from ADS-B receivers and is updated once a month.

Individual flight hours are visible for each aircraft.

Total flight hours this year is the addition of all aircraft since the beginning of the current year.

Average mission length is calculated from the total number of hours flown by aircraft since 2019 divided by the number of individual missions.

Average annual hours by aircraft is the addition of all the recorded flight hours by aircraft in each year since 2019 to 2021. This is then divided by 3 to receive the average annual flight hours.

Average monthly hours by aircraft is calculated from the most recent complete year of data divided by 12.

# 9 Range Map

The interactive range map displays the maximum stated range for each aircraft. Refer to Chapter 4 to see how this value is calculated.

The distance can be adjusted depending on the number of passengers onboard. The adjustment is calculated from the difference between the maximum seat empty range and the maximum seat full range. This value is then divided by the typical passenger configuration number to receive a distance per passenger impact.

# 10 Maintenance Schedule

Maintenance schedules are informed by the manufacturers routine maintenance schedules for each aircraft model. This does not include unscheduled maintenance events.

Additionally, all maintenance events are displayed based on hours flown. However, in many cases the maintenance events are scheduled based on either the number of hours flown or the time since the last maintenance event. However, the time based maintenance events are not included in the maintenance schedules.

# 11 Interior

Interior data for each aircraft includes the maximum number of passengers, typical passenger configuration, the cabin noise, maximum cabin altitude, the sea level cabin, and the number of living zones.

The maximum number of passengers is the certified maximum for each aircraft. The typical passenger configuration is the expected number of passengers on the aircraft. For example, an aircraft with a belted lavatory will be included in the maximum passenger capacity but not the typical passenger capacity.

The cabin noise is the reported decibel noise level in the cabin at cruise altitude. This value is only available for some aircraft.

The maximum cabin altitude is the altitude pressure equivalent in the cabin when the aircraft is flying at its maximum certified altitude. The sea level cabin is the altitude that the aircraft can cruise at while maintaining a sea level altitude in the cabin. These values are calculated using the maximum pressure differential of each aircraft to establish the cabin altitude.

The number of living zones is the manufacturers stated maximum living zone configuration.

# 12 Features

The features section includes the minimum number of pilots required to operate the aircraft, if a toilet is available, a shower option is available, if the cabin can sleep passengers in a lie-flat configuration, the avionic suite, if the cabin has a flat floor, inflight baggage access, and if there is a dedicated bedroom option available.

# 13 Powerplant

The powerplant data includes the typical engine option for each aircraft. Information includes the engine make, engine model, the thrust per engine, along with the total thrust output. This data all comes straight from the aircraft manufacturer.

The exterior noise level data is the official data published by the EASA.

# 14 Weights

The weights for each aircraft include the maximum take-off weight, the maximum landing weight, maximum payload, the basic operating weight, the maximum ramp weight, the available fuel, useful payload, and the maximum baggage weight. This section also includes the total baggage capacity of each aircraft, with the split between internal and external baggage.

All the data is collected from the official manufacturer data.

See below for the definitions of each weight.

**Maximum Take-Off Weight** This is the maximum weight that the aircraft can take-off with, in order to still meet all airworthiness requirements. This is the total weight of the aircraft if you were to place it on scales.

**Maximum Landing Weight** This is the maximum weight that the aircraft can land with while maintaining all airworthiness requirements. If an aircraft is too heavy when landing it may cause structural damage to the aircraft.

**Maximum Payload** This is the maximum weight of all passengers and cargo that the aircraft can withstand.

**Basic Operating Weight** This is the weight of the aircraft with everything it requires for flight excluding payload or fuel. This, therefore, includes items such as oil and other standard items.

**Maximum Ramp Weight** This is the maximum weight of the aircraft in order to taxi or be towed around the airfield. This includes the fuel used for taxi and engine run ups.

**Available Fuel** This is the maximum fuel that the aircraft can hold.

**Useful Payload** This is the difference between the maximum gross weight and the empty weight.

**Maximum Baggage Weight** This is the maximum weight of any cargo or baggage.

# 15 Dimensions

The dimensions for each aircraft are available in both meters and feet. The exterior dimensions are the measurements from nose to tail (length), ground to the heights point (height), and from wingtip to wingtip (wingspan).

The internal dimensions of the aircraft are the total useable cabin space. The height is measured in center of the aircraft to represent its highest point. The width represents the widest part of the cabin. And the length represents the useable cabin space (excluding cockpit and luggage).

The door dimensions have only a height and width measurement.

# 16 Accident History

The accident history for each aircraft has been collected from a variety of public government accident databases. The following countries are included in the accident database:

- Argentina
- Bahamas
- Canada
- Croatia
- France
- Germany
- Iceland
- Ireland
- Japan
- Norway
- United Kingdom

# 17 Included Aircraft

The following aircraft are included in the premium subscription for Compare Private Planes. While every effort is made to provide complete data for every aircraft, some data and calculations are unobtainable for selected aircraft.

<u>Very Light Jets</u>

- Cessna Citation M2
- Cessna Citation Mustang
- Cirrus Vision Jet SF50
- Eclipse 500

- Eclipse 550
- Embraer Phenom 100
- Embraer Phenom 100E
- Embraer Phenom 100EV
- HondaJet Elite S
- HondaJet HA-420

Light Jets

- Beechcraft Premier I
- Beechcraft Premier IA
- Bombardier Learjet 31
- Bombardier Learjet 31A
- Bombardier Learjet 31AER
- Bombardier Learjet 35A
- Bombardier Learjet 36A
- Bombardier Learjet 40
- Bombardier Learjet 40XR
- Bombardier Learjet 45
- Bombardier Learjet 45XR
- Bombardier Learjet 70
- Bombardier Learjet 75
- Bombardier Learjet 75 Liberty
- Cessna Citation Bravo
- Cessna Citation CJ1
- Cessna Citation CJ1+
- Cessna Citation CJ2
- Cessna Citation CJ2+
- Cessna Citation CJ3
- Cessna Citation CJ3+
- Cessna Citation CJ4
- Cessna Citation Encore
- Cessna Citation Encore+
- Cessna Citation I
- Cessna Citation II
- Cessna Citation III
- Cessna Citation SII
- Dassault Falcon 10
- Dassault Falcon 100
- Embraer Phenom 300
- Embraer Phenom 300E
- Hawker 400XP
- Mitsubishi Diamond 1A
- Nextant 400XT
- Nextant 400XTi

Medium Jets

- Bombardier Learjet 55
- Bombardier Learjet 55C
- Bombardier Learjet 60
- Bombardier Learjet 60XR
- Cessna Citation Excel
- Cessna Citation Latitude
- Cessna Citation Sovereign
- Cessna Citation Sovereign+
- Cessna Citation V
- Cessna Citation V Ultra
- Cessna Citation VI
- Cessna Citation VII
- Cessna Citation XLS
- Cessna Citation XLS+
- Dassault Falcon 200
- Dassault Falcon 20F-5BR
- Embraer Legacy 450
- Embraer Legacy 500
- Embraer Praetor 500
- Gulfstream G100
- Gulfstream G150
- Gulfstream G200
- Hawker 1000
- Hawker 700
- Hawker 750
- Hawker 800A

- Hawker 800SP
- Hawker 800XP
- Hawker 800XPi
- Hawker 850XP
- IAI Westwind 1
- IAI Westwind 2
- Pilatus PC-24

Large Jets

- Bombardier Challenger 300
- Bombardier Challenger 350
- Bombardier Challenger 600
- Bombardier Challenger 601-1A
- Bombardier Challenger 601-3A
- Bombardier Challenger 601-3AER
- Bombardier Challenger 601-3R
- Bombardier Challenger 604
- Bombardier Challenger 605
- Bombardier Challenger 650
- Bombardier Challenger 850
- Bombardier Global 5000
- Bombardier Global 5500
- Bombardier Global 6000
- Bombardier Global 6500
- Bombardier Global 7500
- Bombardier Global Express
- Bombardier Global Express XRS
- Cessna Citation Longitude
- Cessna Citation X
- Cessna Citation X+
- Dassault Falcon 10X
- Dassault Falcon 2000
- Dassault Falcon 2000DX
- Dassault Falcon 2000EX
- Dassault Falcon 2000EX EASy
- Dassault Falcon 2000LX
- Dassault Falcon 2000LXS
- Dassault Falcon 2000S
- Dassault Falcon 50
- Dassault Falcon 50-40
- Dassault Falcon 50EX
- Dassault Falcon 6X
- Dassault Falcon 7X
- Dassault Falcon 8X
- Dassault Falcon 900
- Dassault Falcon 900B
- Dassault Falcon 900C
- Dassault Falcon 900DX
- Dassault Falcon 900EX
- Dassault Falcon 900EX EASy
- Dassault Falcon 900LX
- Embraer Legacy 600
- Embraer Legacy 650
- Embraer Legacy 650E
- Embraer Praetor 600
- Gulfstream G280
- Gulfstream G300
- Gulfstream G350
- Gulfstream G400
- Gulfstream G400
- Gulfstream G450
- Gulfstream G500
- Gulfstream G550
- Gulfstream G600
- Gulfstream G650
- Gulfstream G650ER
- Gulfstream G700
- Gulfstream G800
- Gulfstream GII
- Gulfstream GIII
- Gulfstream GIV
- Gulfstream GIVSP
- Gulfstream GV
- Hawker 4000
- Nextant 604XT

VIP Airliners

- Embraer Lineage 1000
- Embraer Lineage 1000E