

## Cessna Grand Caravan EX vs Pilatus PC-12 NG

How do Cessna's Grand Caravan EX and Pilatus' PC-12 NG compare in the single-engine turboprop market? What are the advantages offered by each model, and to whom would they appeal? Mike Chase analyses the performance and productivity parameters...

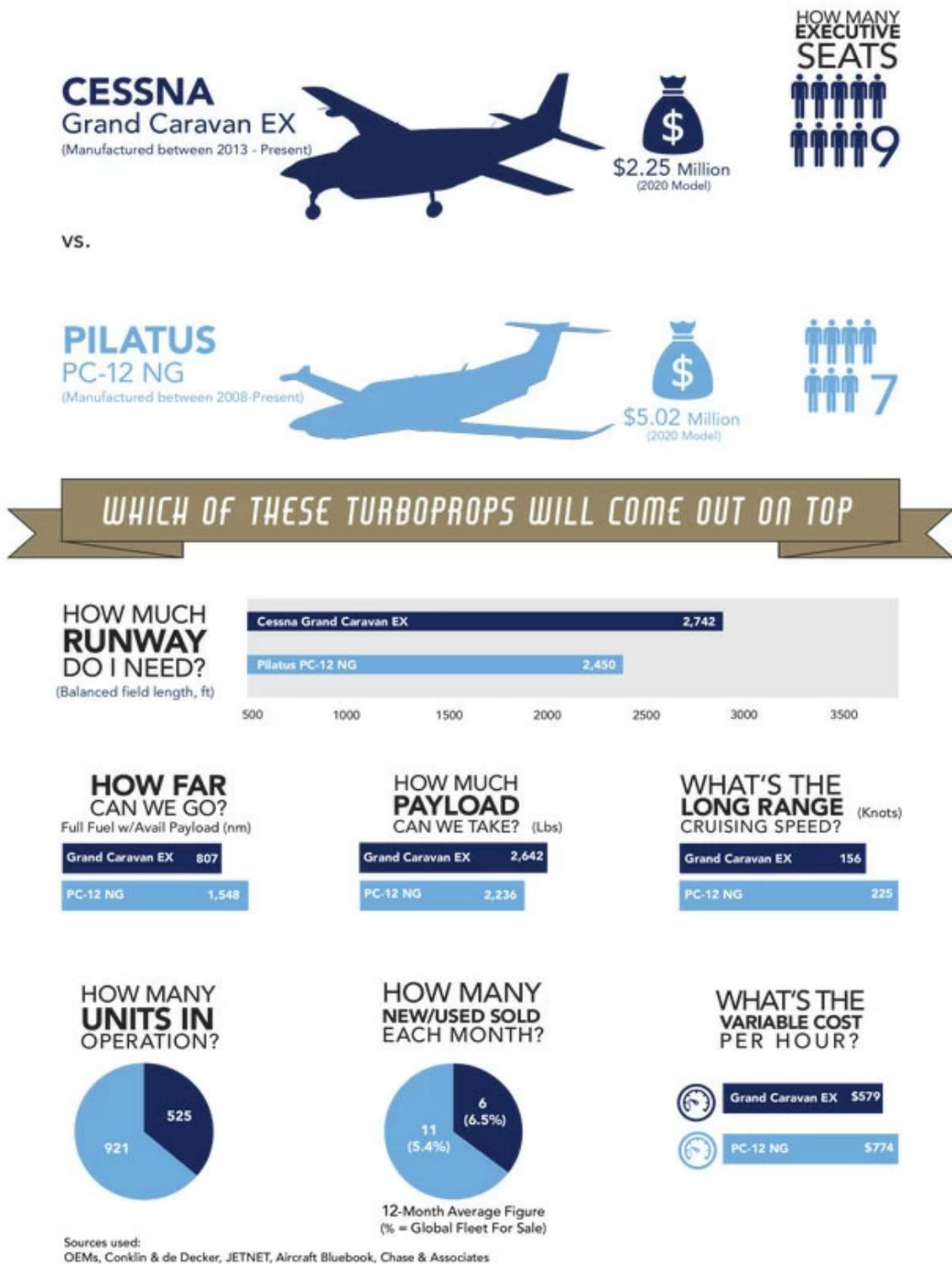
[Turboprops Compare](#)

Mike Chase | 01st December 2020



*In this Turboprop Comparison, we'll consider key productivity parameters for the Cessna Grand Caravan EX and the Pilatus PC-12 NG (including payload, range, speed, and cabin size) to establish which aircraft provides the better value in the single-engine turboprop market.*

How might a desire for higher speed and longer range influence an aircraft buying decision, particularly when that comes at a higher price and operating cost? It's hoped that the following turboprop comparison will help clarify.



### Cessna Grand Caravan EX

Three models of the Caravan have been produced since 1985, including the 208 (484 in operation), **208B Super Cargo Master** (1,562 in operation/production ended in 2013), and the **Grand Caravan EX** (525 in operation). Combined, a total 2,571 Caravans were in operation at the time of writing.

Cessna's Grand Caravan EX was certified in late 2012 and is still produced in 2020. It was engineered for challenging, rugged missions with high payloads, and is able to access short, rough runways. It has the agility of a much smaller aircraft, and can take off in under 1,399ft. The Grand Caravan EX can reach cruise speeds of 156kts and travel distances of up to 807nm.

Of the 525 Grand Caravan EX turboprops in operation, 523 are wholly-owned, with the other two being under shared ownership. Since production started, thirteen units have been retired.



### Pilatus PC-12 NG

Four models of the PC-12 have been produced since 1995. They are the PC-12/45 (553 in operation/production ended in 2005); the PC-12/47 (196 in operation/production ended in 2008); the **Pilatus PC-12 NG** (921 in operation) and the PC-12 NGX (entered service in 2020, 28 in operation).

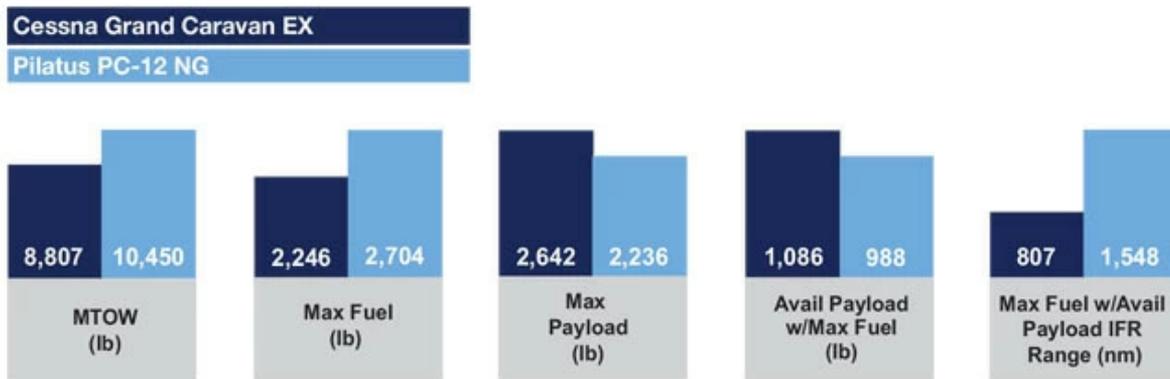
The Pilatus PC-12 model is a high-powered single-engine turboprop, and is equipped with both a passenger door and a cargo door. It is available in several configurations, including six-passenger executive, nine-passenger commuter, cargo, or a passenger/cargo combination.

Currently, there are 841 wholly owned PC-12 NGs in operation worldwide, with an additional 31 in shared ownership and 49 in fractional ownership. Nine have been retired.

### Payload & Range Comparison

When comparing business turboprops, an important area for potential operators to focus on is payload capability, especially the 'Available Payload with Maximum Fuel'. **Table A** shows the Grand Caravan EX 'Available Payload with Maximum Fuel' to be 1,086lbs, which is -10% greater than the 988lbs offered by the Pilatus PC-12 NG.

**TABLE A: Cessna Grand Caravan EX vs Pilatus PC-12 NG Payload Comparison**



Source: OEMs, B&CA

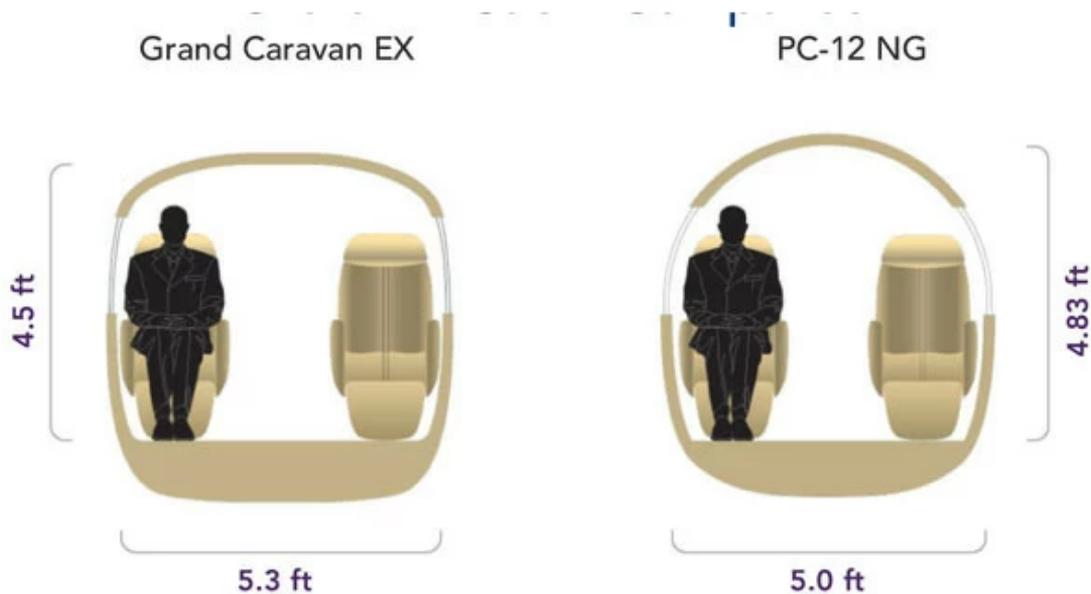
## Cabin Comparison

Chart A shows the cabin width of the Grand Caravan EX is 5.3ft., which is slightly wider than the PC-12 NG (5.0ft). However, the height of the Grand Caravan (4.5ft) is less than the PC-12 NG (4.83ft).

The PC-12 NG also has a slightly longer cabin than the Grand Caravan EX (16.92ft vs 16.75ft), and overall the PC-12 NG provides four cubic feet more of overall cabin volume than the Grand Caravan EX (356cu.ft. versus 352 cu.ft.).

In terms of luggage provision, the PC-12 NG provides more internal volume (40cu.ft.) than the Grand Caravan (32 cu ft). Neither offers external cabin volume, although cargo pods are available for the Grand Caravan EX as an option.

CHART A: Cessna Grand Caravan EX vs Pilatus PC-12 NG Cabin Comparison



## Range Comparison

Using Wichita, Kansas as the start point, Chart B (left) shows the Grand Caravan EX (with 807nm) offers just over half of the range coverage of the PC-12 NG (1,548nm), with each aircraft carrying full fuel and available payload.

Note: For business turboprops, 'Full Fuel with available payload' represents the maximum IFR range of the aircraft at long range cruise. The NBAA IFR fuel reserve calculation is for a 100nm alternate. This range does not include winds aloft or any other weather-related obstacles.

CHART B: Cessna Grand Caravan EX vs Pilatus PC-12 NG Payload Comparison

Grand Caravan EX  
PC-12 NG



807 (nm) Full Fuel w/avail PL  
1,548 (nm) Full Fuel w/avail PL



### Powerplant Details

Both aircraft in this field have a single Pratt & Whitney Canada powerplant. The Grand Caravan EX has a PT6A-140 engine with 867shp (which burns 66 gallons of fuel/hour (GPH)), whereas the PC-12 NG has a single PT6A-67P engine providing 1,200shp, and burning 60GPH fuel.

The PC-12 NG is certified to operate at a higher certified flight ceiling (30,000ft) than the Grand Caravan EX (25,000ft).

### Variable Cost Comparison

The 'Variable Cost', illustrated in **Chart C**, is defined as the estimated cost of fuel expense, maintenance labor expense, scheduled parts expense, and miscellaneous trip expense (hangar, crew and catering).

These costs DO NOT represent a direct source into every flight department and their trip support expenses. For comparative purposes, the costs presented are the relative differences, not the actual differences, since these may vary from one flight department to another.

The Grand Caravan EX (\$579) shows the lower variable cost per hour compared to the Pilatus PC-12 NG (\$774), a difference of 25%.

### CHART C: Cessna Grand Caravan EX vs Pilatus PC-12 NG Variable Cost Comparison



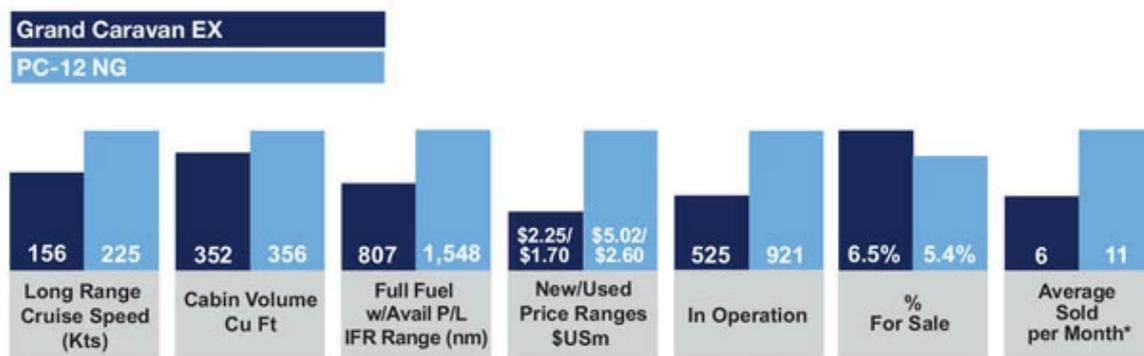
### Aircraft Comparison Table

**Table B** contains the used prices (per Aircraft Bluebook) for the Grand Caravan EX, which range between \$1.70m and \$2.25m. The PC-12 NG's price ranges between \$2.6m and \$5.02m.

The long-range cruise speed and range numbers listed are from B&CA, while the number of aircraft in-operation, the percentage for sale, and average sold are from JETNET.

At the time of writing, the Grand Caravan EX had 6.5% of its fleet 'for sale' on the used aircraft market. By comparison, the PC-12 NG had 5.4% 'for sale'. The average number of used transactions (units sold) per month over the previous 12 months was six for the Grand Caravan EX, and eleven for the PC-12 NG.

**TABLE B: Cessna Grand Caravan EX vs Pilatus PC-12 NG Market Comparison**



\*Average Full Sale Transactions in the past 12 months, as of Oct. 2020; Source: JETNET  
Data courtesy of BC&A; JETNET; Aircraft Bluebook

### Maximum Scheduled Maintenance Equity

**Chart D** and **Chart E** (below) depict (and project) the Maximum Maintenance Equity the Cessna Grand Caravan EX and Pilatus PC-12 NG (respectively) have available, based on their age.

- The Maximum Maintenance Equity figure is achieved the day an aircraft comes off the production line (since it has not accumulated any utilization toward maintenance events).
- The percent of the Maximum Maintenance Equity that an average aircraft will have available, based on its age, assumes:
  - Average annual utilization of 200 flight hours; and
  - All maintenance is completed when due.

**CHART D: Cessna Grand Caravan EX Maintenance Exposure to Ask Price Forecast**

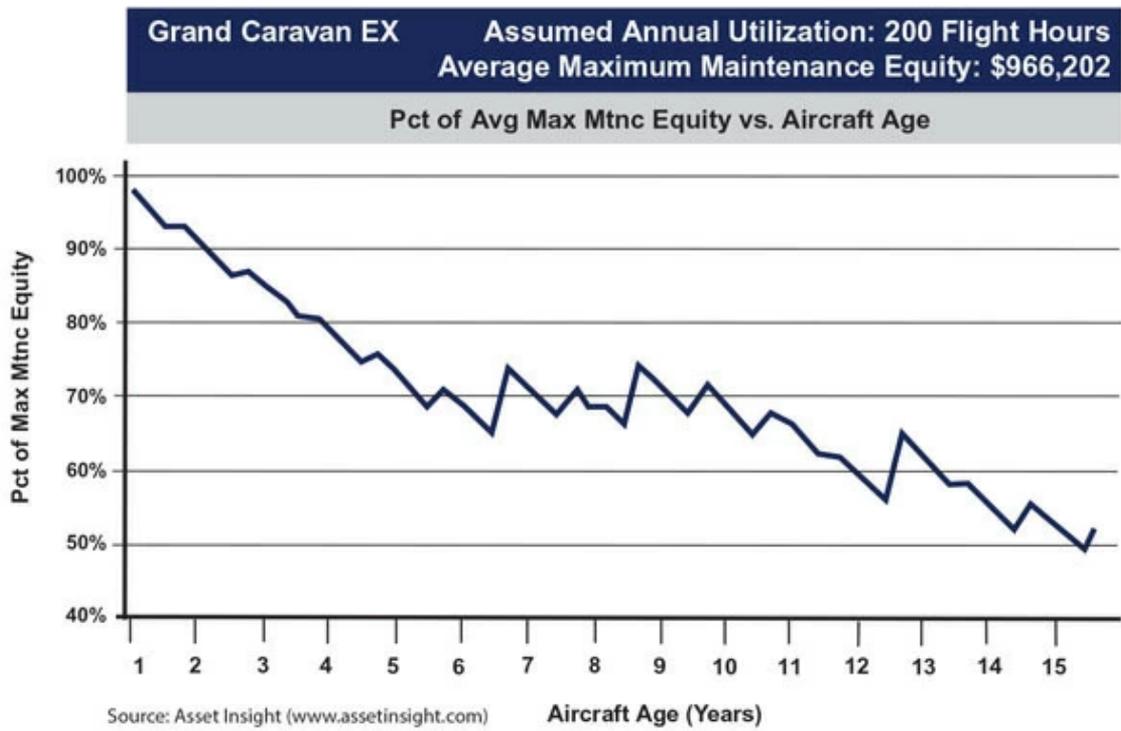
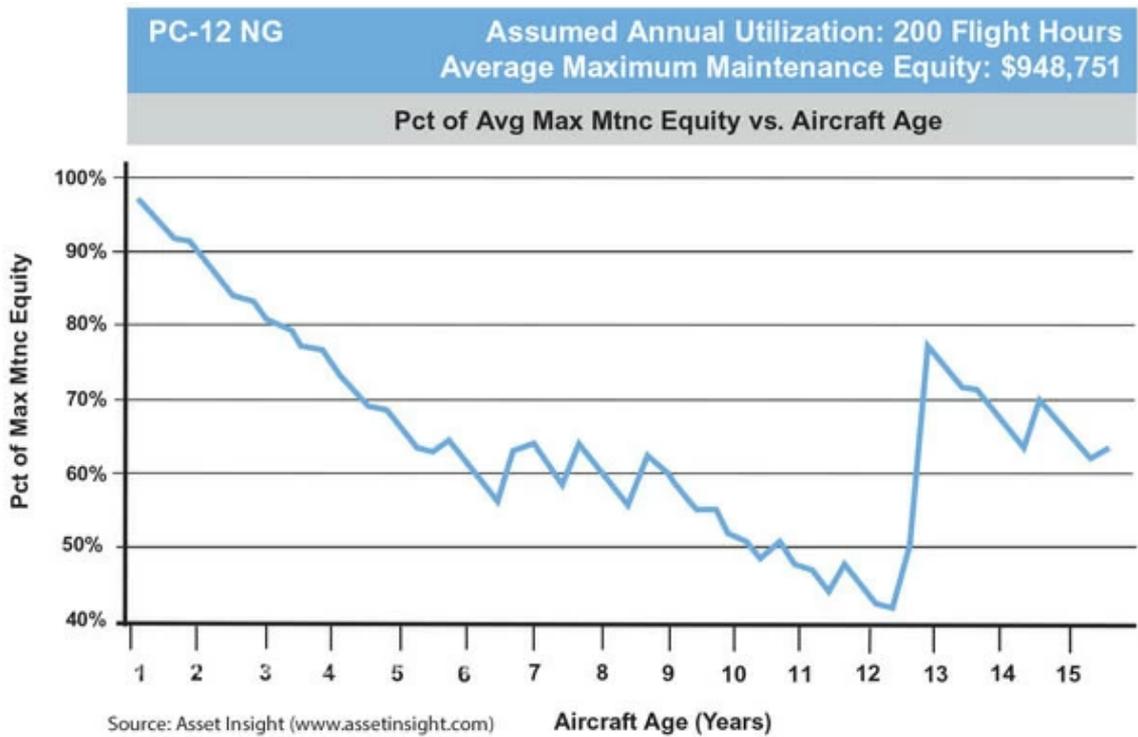


CHART E: Pilatus PC-12 NG Maintenance Exposure to Ask Price Forecast



### Depreciation Schedule

Aircraft that are owned and operated by businesses are often depreciable for income tax purposes under the Modified Accelerated Cost Recovery System (MACRS).

Under MACRS, taxpayers can use accelerated depreciation of assets by taking a greater percentage of the deduction during the first few years of the applicable recovery period (see **Table C**).

**TABLE C: Part 91 and Part 135 Business Aviation Tax Depreciation Schedules**

MACRS Schedule for PART 91							
Year	1	2	3	4	5	6	
Deduction	20.0%	32.0%	19.20%	11.52%	11.52%	5.76%	

MACRS Schedule for PART 135								
Year	1	2	3	4	5	6	7	8
Deduction	14.29%	24.49%	17.49%	12.49%	8.93%	8.92%	8.93%	4.46%

Source: NBAA

In certain cases, aircraft may not qualify under the MACRS system and must be depreciated under the less favorable Alternative Depreciation System (ADS), based on a straight-line method meaning that equal deductions are taken during each year of the applicable recovery period. In most cases, recovery periods under ADS are longer than recovery periods available under MACRS.

There is a variety of factors that taxpayers must consider in determining if an aircraft may be depreciated, and if so, the correct depreciation method and recovery period that should be utilized. For example, aircraft used in charter service (Part 135) are normally depreciated under MACRS over a seven-year recovery period, or under ADS using a twelve-year recovery period.

Aircraft used for qualified business purposes, such as Part 91 business use flights, are generally depreciated under MACRS over a period of five years or by using ADS with a seven-year recovery period. There are certain uses of the aircraft, such as non-business flights, that may have an impact on the allowable depreciation deduction available in any given year.

The US enacted the 2017 Tax Cuts & Jobs Act into law on December 22, 2017. Under the Act, taxpayers may be able to deduct up to 100% of the cost of a new or pre-owned aircraft purchased after September 27, 2017 and placed in service before January 1, 2023.

This 100% expensing provision is a huge bonus for aircraft owners and operators. After December 31, 2022 the Act decreases the percentage available each year by 20% to depreciate qualified business jets until December 31, 2026.

**Table D** depicts an example of using the MACRS schedule for a 2020-model Grand Caravan EX in private (Part 91) and charter (Part 135) operations over five- and seven-year periods. The price is as published by Aircraft Bluebook at the time of writing.

**TABLE D: Cessna Grand Caravan EX Sample Tax Depreciation Schedule**

2020 Grand Caravan EX - Private (Part 91)							
Full Retail Price - Million \$2.250							
Year	1	2	3	4	5	6	
Rate (%)	20.0%	32.0%	19.2%	11.5%	11.5%	5.8%	
Depreciation (\$M)	\$0.450	\$0.720	\$0.432	\$0.259	\$0.259	\$0.130	
Depreciation Value (\$M)	\$1.800	\$1.080	\$0.648	\$0.389	\$0.130	\$0.000	
Cum. Depreciation (\$M)	\$0.450	\$1.170	\$1.602	\$1.861	\$2.120	\$2.250	

2020 Grand Caravan EX - Charter (Part 135)								
Full Retail Price - Million \$2.250								
Year	1	2	3	4	5	6	7	8
Rate (%)	14.3%	24.5%	17.5%	12.5%	8.9%	8.9%	8.9%	4.5%
Depreciation (\$M)	\$0.322	\$0.551	\$0.394	\$0.281	\$0.201	\$0.201	\$0.201	\$0.100
Depreciation Value (\$M)	\$1.928	\$1.377	\$0.984	\$0.703	\$0.502	\$0.301	\$0.100	\$0.000
Cum. Depreciation (\$M)	\$0.322	\$0.873	\$1.266	\$1.547	\$1.748	\$1.949	\$2.150	\$2.250

Source: Aircraft Bluebook

**Table E** depicts an example of using the MACRS schedule for a 2020- edition Pilatus PC-12 NG in private (Part 91) and charter (Part 135) operations over five- and seven-year periods. The price is per Aircraft Bluebook.

TABLE E: Pilatus PC-12 NG Sample Tax Depreciation Schedule

2020 Pilatus PC-12 NG - Private (Part 91)							
Full Retail Price - Million \$5.019							
Year	1	2	3	4	5	6	
Rate (%)	20.0%	32.0%	19.2%	11.5%	11.5%	5.8%	
Depreciation (\$M)	\$1.004	\$1.606	\$0.964	\$0.578	\$0.578	\$0.289	
Depreciation Value (\$M)	\$4.015	\$2.409	\$1.445	\$0.867	\$0.289	\$0.000	
Cum. Depreciation (\$M)	\$1.004	\$2.610	\$3.574	\$4.152	\$4.730	\$5.019	

2020 Pilatus PC-12 NG - Charter (Part 135)								
Full Retail Price - Million \$5.019								
Year	1	2	3	4	5	6	7	8
Rate (%)	14.3%	24.5%	17.5%	12.5%	8.9%	8.9%	8.9%	4.5%
Depreciation (\$M)	\$0.717	\$1.229	\$0.878	\$0.627	\$0.448	\$0.448	\$0.448	\$0.224
Depreciation Value (\$M)	\$4.302	\$3.073	\$2.195	\$1.568	\$1.120	\$0.672	\$0.224	\$0.000
Cum. Depreciation (\$M)	\$0.717	\$1.946	\$2.824	\$3.451	\$3.899	\$4.347	\$4.795	\$5.019

Source: Aircraft Bluebook

### Asking Prices & Quantity

At the time of writing, 33 Grand Caravan EX business turboprops were available on the used aircraft market, and eight displayed prices that ranged between \$1.7m and \$2.395m. By comparison, there were 46 PC- 12 NGs for sale, and 23 showed asking prices ranging between \$2.850m and \$4.875m.

While each aircraft serial number is unique, the Airframe Total Time (AFTT) and age/condition will cause great variation in the price of a specific aircraft – even between two aircraft from the same year of manufacture.

The final negotiated price must ultimately be decided between the seller and buyer before the sale of an aircraft is completed.

### Productivity Comparison

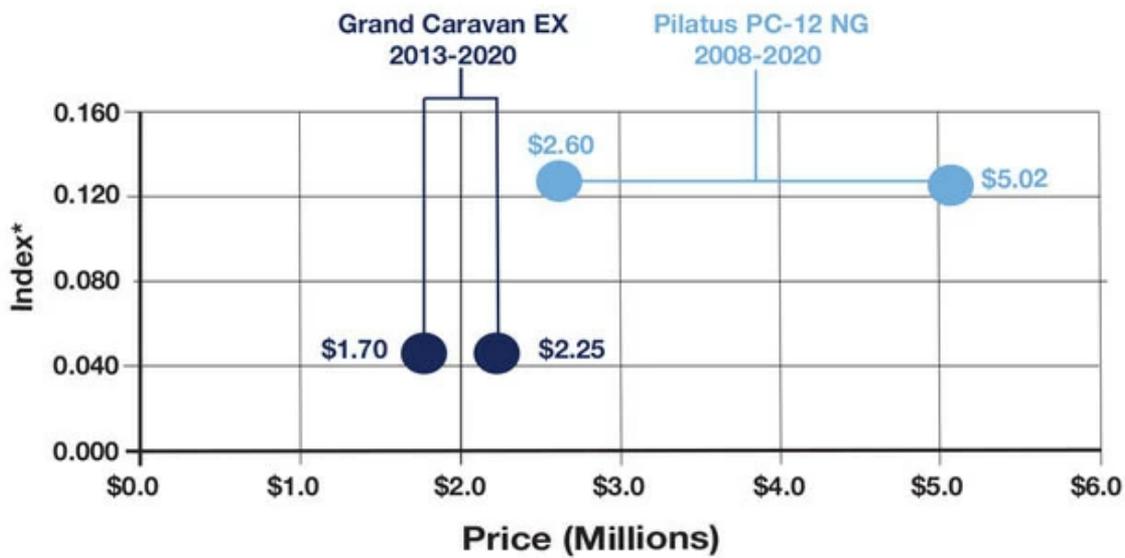
The points in **Chart F** are centered on the same aircraft. Pricing used in the horizontal axis is as published in Aircraft Bluebook. The productivity index requires further discussion in that the factors used can be somewhat arbitrary.

Productivity can be defined (and it is here) as the multiple of three factors:

1. Full Fuel w/Available Payload Range (nm);
2. The long-range cruise speed flown to achieve that range;
3. The cabin volume available for passengers and amenities.

Others may choose different parameters, but serious business aircraft buyers are usually impressed with price, range, speed, and cabin size.

### CHART F: Cessna Grand Caravan EX vs Pilatus PC-12 NG Productivity Comparison



Index\*(Speed x Range x Cabin Volume / 1,000,000,000)

### The Faster Speed and Longer-Range Question

The Pilatus PC-12 NG offers considerably faster speed and more range – plus a marginally larger cabin volume. However, the ‘Available Payload with Maximum Fuel’ is lower than that of the Grand Caravan EX.

While the slower speed and less range impacts its placement on our overall productivity chart, the **Grand Caravan EX** comes in with a lower new and pre-owned price, and has a lower variable hourly operating cost than the PC-12 NG model.

Would the time and cost of a fuel stop required by the Grand Caravan EX to cover the same distance be offset by its lower operating cost? What percentage of projected flights could be covered by the Grand Caravan EX, and how many could only be achieved with a longer-range, quicker Pilatus PC-12 NG?

These are all questions that should be considered with a consultant to help determine the complexities of which **turboprops for sale** are best suited to an individual operator’s unique needs.

Within the preceding paragraphs, we have touched upon several of the attributes that business turboprop operators value. There are other qualities such as airport performance, terminal are performance and time-to-climb that might factor in a buying decision, however.

Ultimately, there is plenty for a prospective buyer to consider when deciding which performance criteria is better suited to them in an aircraft.

Both business turboprops offer great value in the single-engine turboprop market today, serving their markets well.

### Read More:

Read the [Cessna Grand Caravan EX Price Guide](#) by AvBuyer Editor, Matt Harris

Read the [Cessna Grand Caravan EX Buyer’s Guide](#) by AvBuyer Editor, Matt Harris