

COPA Guide to estimating aircraft operating costs



Photo courtesy Adam Hunt

This is an aircraft operating cost estimating program developed by Adam Hunt. It only operates on Microsoft Excel.

This is a small 22-kb program, which you can download. It will allow you to quickly figure out the costs of owning any particular type of airplane. You will need Microsoft Excel to run this. If you don't have Excel then it won't work. Open the program and enter values into the yellow spaces. It will flow calculations through the program and give you operating costs at the bottom, along with two graphs that plot costs versus hours per year.

How to complete the Excel Spreadsheet

Here are some specific points on each space:

Enter data in the yellow spaces! The program will calculate the rest.

- **Aircraft type** – this does not figure in the calculations. It is just so you will remember later what type you did the calculations for.
- **Number of Owners** – Enter the number of partners who own the aircraft. If the aircraft is owned by one person then leave the number as “1”. The program will calculate the cost per year and the cost per hour at the bottom of the page per owner.
- **Hull Insurance** – get this figure from an insurance company, for your type and individual pilot details (accident record, total flying time, etc) For a rough number use 3.5% of the hull value (purchase or replacement cost).
- **Liability Insurance** – get this figure from an insurance company also. COPA's insurance plan will sell you \$1M liability for \$200 per year (2007 cost).
- **Passenger Insurance** – get this figure from an insurance company also. COPA's plan will sell you \$100K for \$185 for one seat, \$275 for two seats and \$350 for three seats. (2007 cost)
- **NOTE** – If your insurance company quotes you one package price for all, don't bother trying to break it down – you can just enter it on the Total Insurance Cost line.
- **Monthly Storage Cost** – Cost of hangarage or tie-down per month. This is just the monthly fee, not the cost of buying a hangar (that comes later). These costs vary greatly so ask at the airport that you will be based at. If it is zero, then enter 0!
- **Hangar Insurance** – Enter the annual cost. COPA currently has hangar liability insurance available for \$175 (2007 cost).
- **Maintenance** – This is always an estimate. For owner maintenance aircraft (including amateur-builts, ultralights) enter the forecast cost of parts per year, for a non-owner maintained airplane don't forget to add in AME labour! Wild guess numbers – Ultralight, owner maintained - \$400, Cessna 182 - \$6000, if it is in good shape and needs very little major work each year!
- **Appreciation/Depreciation** – Enter the average amount that the aircraft is increasing or decreasing in value per year, assuming a constant engine time (that is added in later on). New aircraft depreciate for about 20 years and then start appreciating again. If the aircraft is appreciating in value use a negative number in this space. If it is depreciating use a positive number. These values vary greatly from aircraft to aircraft and year to year. Some ballpark numbers – 1975 Cessna 172 – appreciating \$1000 per year average, 1999 Diamond Katana depreciating \$7500 per year average, 2002 Cirrus SR-22 depreciating \$10,000 per year! Check the *Aircraft Blue Book* for current figures. *Blue Book* information is available from [COPA](#).
- **Nav Can ANS fee** – Ultralights, gliders, airplanes under 1362 lbs gross weight and balloons are free; enter \$0. All others pay \$71 per year starting 2007.
- **Publications Costs** – These costs can vary a lot depending on what publications you fly with and how often you update them. Currently VNC maps are \$14.95, a CFS is \$15.95 WAS is \$44.95 and CAP volumes are \$15.95 each. For just one CFS and one map per year enter \$37 when shipping and taxes are included!

- **GPS Databases** – These can also vary a lot and could be “not applicable” if you fly without GPS or don’t update it. Typically these run \$25-\$1500 per year, but have a look at www.jeppesen.com or your GPS manufacturer for more details for your actual contemplated GPS set.
- **Lifed Items** – These are all items that have a fixed service life. These will also vary greatly depending on the type of aircraft and how it is stored. Some guidance estimates are given below.
- **Exterior/paint** – Enter the cost of fixing the outside of the aircraft here. For metal painted aircraft this will be the cost of painting it and the frequency that it needs painting. For a metal aircraft stored outdoors figure on every 15 years. If stored indoors it may go a lot longer, perhaps 25 years. Average costs of repainting a Cessna 150 \$10,000, Cessna 182 (and similar sized four seaters) \$12,000. For fabric aircraft enter the cost of recovering the aircraft. For Dacron-covered ultralights and Powered Parachutes/Powered Paragliders add the wing cover or canopy cost and a reasonable life span.
- **Interior/seats** – Enter the cost of refurbishing the interior and the projected period between refurbishing. This will also vary greatly. For an aircraft stored outdoors and with cloth seats figure on every 10 years. For a leather interior stored indoors perhaps 20 years! Figure on a cost of \$4000 for a cloth interior or \$10,000 for leather! For ultralights add in the cost of new seats and interior items here.
- **Prop overhaul** – Variable pitch props must be overhauled no less than every ten years (CAR 625 Appendix “C”). Figure on \$4000 every ten years. Fixed pitch props can vary greatly, depending on factors such as corrosion and wear, usually they just require removing, inspecting and re-installing every five years.
- **Other Lifed Items** – Add in any other items that have a specified fixed life, like hydraulic actuators, rotor blades, balloon envelopes, BRS parachutes, etc
- **Financing costs** – This new section works out the cost of borrowing the money to buy the aircraft and hangar, using compound interest calculations. This does not include the actual purchase price, just the cost of borrowing the money. If you are not borrowing any money to buy the aircraft then enter \$0!
- **Aircraft and Hangar Purchase Cost** – Enter the total cost of the aircraft and hangar including taxes to be paid.
- **Less down payment** – enter the amount of the down payment (amount that you provide, that is not borrowed)
- **Fuel** – Enter your fuel flow in US gal per hour and the cost per litre. The program will calculate the rest. Good numbers for engines: Cessna 150 – 6 US GPH, Cessna 172, Piper Cherokee 160 hp – 8 US GPH, Cessna 182 13 US GPH, Cirrus SR-22 15 US GPH, Ultralights – Rotax 503 4 US GPH, Rotax 582 6 US GPH, Rotax 912UL – 3.5 US GPH.
- **Avgas** is currently about \$1.20 to \$1.50 per litre, for auto fuel use your local cost for premium gas or regular as applicable. Don’t forget to subtract your Mogas Rebate - enter if there is one in your province. Ontario is currently 12 cents per litre.
- **Oil** – Enter the number of litres per oil change (normal capacity). For two stroke engines enter 0, as they don’t get oil changes!
- **Enter the normal oil consumption per hour.** If you don’t know, then use 0.1 for all four stokes (that’s one litre in ten hours) and 0.3 for all two strokes, otherwise figure out the oil ratio for two strokes (A 50:1 ratio will use 1/50th as much oil per hour as fuel).
- **Cost per litre** – use actual figures where possible, current rates are \$5.35 for four stokes and \$7.50 for premium super two-stroke oil.
- **Oil change periodicity** is how many hours between oil changes. For two-stroke engines and other engines that do not have oil changes enter 1, not zero. If you enter zero then the calculation won’t work out!
- **TBO** – Enter the Time Between Overhauls (TBO) – some good numbers: Cessna 150 – 1800, Cessna 172/Cherokee 140 – 2000, Cessna 182 – 1500, Cirrus SR-22 - 2000, Rotax 503, 582 – 300, Rotax 912 – 1500.
- **Cost of overhaul** – This varies a lot. You should contact an overhaul shop for a current number. Current estimates: Cessna 150 – \$18,000; Cessna 172/Cherokee 140 – \$20,000; Cessna 182 – \$25,400; Cirrus SR-22 \$40,000; Rotax 503 – \$2200; 582 – \$2800; Rotax 912 – \$7000.
- Enter the number of engines the plane has.
- Hit return and the rest should happen automatically.
- Check the graphs at the bottom for a look at the costs per year and per hour.
- The program will calculate the cost per year and the cost per hour at the bottom of the page **per owner**, as indicated at the top of the page.

Any problems or questions about this program should be addressed to:

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