

Are You Used To Having Your Wings Rotate? A Comparison of Helicopter and Fixed-Wing Operating Costs Versus Mission Application

By David Wyndham, Vice President, Conklin & de Decker

So, what specifically are the cost differences between fixed-wing aircraft and helicopters? As a reference point, I selected seven aircraft from the Conklin & de Decker Aircraft Cost Evaluator database. These seven are representative of single-engine turbine and piston powered aircraft that might be seen in law enforcement activity:

Turbine:

Bell 206B3

EC 120

MD 600N

Cessna 208 Caravan

Piston:

R44 Raven II

Schweizer 300CBi

Cessna 182T

The light turbine helicopters have payloads between 1,108 to 1,602 lbs. The larger, single-engine Caravan has double to triple the payload of the helicopters, cruises 52 to 68 knots faster than the turbine helicopters and has a significantly larger cabin.

For the piston models, the payloads are quite similar. The speed difference still favors the fixed-wing by as much as 57 knots. The fixed-wing does have a larger cabin, which would be beneficial for bulky equipment or passengers.

In general, unless vertical maneuvering is needed, the fixed-wing airplanes tend to offer larger cabins, greater payload, and significantly faster speeds than do helicopters. But what of the costs? For an agency used to having its wings rotate, there are a few differences when considering fixed-wing airplanes. One area of importance is in understanding how the costs compare.

I'll confine my discussion to the acquisition costs and the variable costs. I will cover the current new and used prices (sans mission equipment). Variable costs are costs that vary with use. Thus, the cost per unit remains essentially constant, and the cost per time period varies with the level of activity during

that time. The variable costs that I will cover are fuel and maintenance. I will not go into the costs associated with the mission equipment, as that is a separate subject.

Acquisition Costs

If your agency is acquiring the aircraft new, the base prices for turbine fixed-wing are for an IFR equipped plane. For the helicopters, that equipment is usually extra. Our sample group has a range of new prices as shown in the table above.

In comparing the acquisition prices, note that with the turbine models, there is a wide price range in new models that accompanies the wide range in payload and other capabilities. Among the piston models, the base prices are closer in total dollars, but there is still a capability difference.

Used prices vary considerably, and different sources yield different numbers. Keep in mind that with any used model, mechanical condition will add or subtract from the average. And again, none of these take into account the required modifications needed for law enforcement missions.

The variable costs can differ quite a bit between helicopter and fixed-wing models. Fuel burn per hour will be similar among similar powered engines. A 300 HP piston or a 600 SHP turbine engine will burn the same fuel for the same power settings whether it is in a helicopter or airplane. It is in the area of maintenance costs that the two types differ.

Helicopters, due to the nature of their systems, are more complex and have higher maintenance costs than do similar fixed-wing airplanes. The helicopter gearbox, transmission and rotor blade systems contain many more moving parts under stress than do fixed-wing planes. Many of the components in the gearbox, transmission and rotor blade system have hard-time overhauls or retirement. Thus, the maintenance costs for helicopters are higher than for fixed-wing planes.

The fixed-wing airplanes tend to have fewer hard-time components, relying more on on-condition maintenance versus scheduled removal. What is difficult with helicopters is that the scheduled events happen with odd frequencies, such as 150/400/1800 hour intervals. With fewer components (and many of those are on-condition) the time a fixed-wing airplane spends in maintenance tends to be much less than for a helicopter.

The total annual variable costs will vary based upon how the aircraft are used. If flying an equal number of miles, such as point-to-point patrol work, the fixed-wing annual budget will be considerably less than the rotary-wing counterpart.

If the missions are “hour-driven,” such as on-station surveillance, and the annual utilization is for an equal number of hours, the annual operating cost budget will also favor the fixed-wing over the rotary-wing.

Given the lower relative operating costs of the fixed-wing airplane versus the helicopter, it should be given serious consideration in missions that do not demand the vertical component only a helicopter can provide. However, when the vertical mission is required, such as the insertion of teams or rooftop level pursuit of fugitives, the low-slow-vertical helicopter has no equal.