The Economic Case for

High Performance Single-Engine Piston Business Aircraft

–By Peter v. Agur, Jr.

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CIRRUS AIRCRAFT

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Turbine business aircraft are economically effective, as demonstrated in the study "The Compelling Case for Business Aviation" published in the October 2009 issue of Business & Commercial Aviation magazine. Using the same analysis and measurement tools, and even more compelling result is clear: High performance single-engine piston aircraft, such as Cirrus aircraft, can have an even stronger economic impact in business use.

Travel Needs

The travel needs for, and benefits from, a smaller business aircraft such as a Cirrus are at least as great as those of a business jet. The success of nearly every "small" business is reliant upon the direct impact of only a few key people. These crucial "doers" are the drivers of everything from service and product innovation to customer development and retention. In other words, they are the heart and soul of the businesses. Their time-place mobility is critical to the wellbeing of the business.

Most small companies conduct a great deal of their commerce regionally. However, regional travel on the airlines is extremely inefficient. There is a very high unproductive time penalty (at least 1.75 hours) associated with each airline leg that is spread over fewer miles. On top of that, the emergence of the airlines' hub and spoke route system means many regional destinations require time consuming connecting commercial flights.

Delivering Return on Investment

Three critical criteria determine business aircraft travel value. Those are:

1. Safety and Security
2. Service
3. Efficiency

High Performance Single-Engine Piston Airplane Safety

The safety record of business jets is statistically the same as that of the major air carriers. The safety record of high performance single-engine piston airplanes is not at that level. But with today's advanced avionics and systems there is only one reason that a high performance single would not be at least as safe as the airlines: the pilot. According to the National Transportation Safety Board (NTSB), pilot behavior is a major causal factor in about 70% of professionally flown aircraft accidents. This means your flying safety is predominately within your own control. Allow me to cite a personal example.

> *I have been flying airplanes and helicopters professionally for over 40 years. My fixed-wing flying included stints as a multi-engine instructor and factory demonstration pilot. About ten years ago I bought a light twin to use in my consulting business as well as for personal travel. I knew I would be flying in all kinds of weather and at night, so I liked the idea of two engines. But I found when my annual flying dropped below 125 hours per year I no longer felt comfortable with my proficiency. So, I sold the airplane. A few years later I became a partner in a Cirrus SR22 with all the latest avionics and safety features. I was comfortable again. And once more, the most dangerous part of my flying was the drive to and from the airport. The bottom line is I strongly believe I was safer in my single-engine plane than I was in my twin.*

High Performance Single-Engine Piston Service

Flying a Cirrus is all about going where you want, when you want, in the manner you want. At the heart of that are the issues of reliability, dependability and flexibility. Today's high performance single-engine aircraft fill those requirements for the business traveler, in spades.

There are about 500 airports in the continental US served by the airlines. There are about 5,000 general aviation airports. That means easier and closer access to your destinations. The Fixed Base Operators (FBOs) at these airports cater not only to the care and feeding of your airplane, but they are clearly focused on taking care of you and your passengers with rental cars, meals and even meeting rooms. All of these services are designed to make your ground time more productive and enjoyable.

My home territory, the Southeast, has a reputation for having some of the most challenging weather in the country. Yet, for decades I have been able to fly safely with only modest adjustments to my plans because I learned how to work around local and regional weather issues. Adjusting departure times by a few hours can take fast moving cold fronts out of the picture. An early routing change can make isolated thunderstorms a spectator's sport rather than a nasty learning experience. Picking the right routes and altitudes keeps me out of significant icing. And, if I cannot plan around thunderstorms or moderate or greater icing, I reschedule. It really is that simple.

An important safety and service choice to be considered is the effective use of professional safety pilot. A professional pilot adds business time to your day by taking care of all the flight planning, filing with ATC, preflight preparations, etc. All you have to do is tell him or her when to be ready. You benefit from reduced stress, fewer distractions and even greater time efficiency because you don't have to divide your attention between two extremely demanding arenas: your business and the business of flying. And as the economic analysis shows, the cost of the safety pilot is more than offset by the added productivity you can gain.

High Performance Single-Engine Piston Efficiency

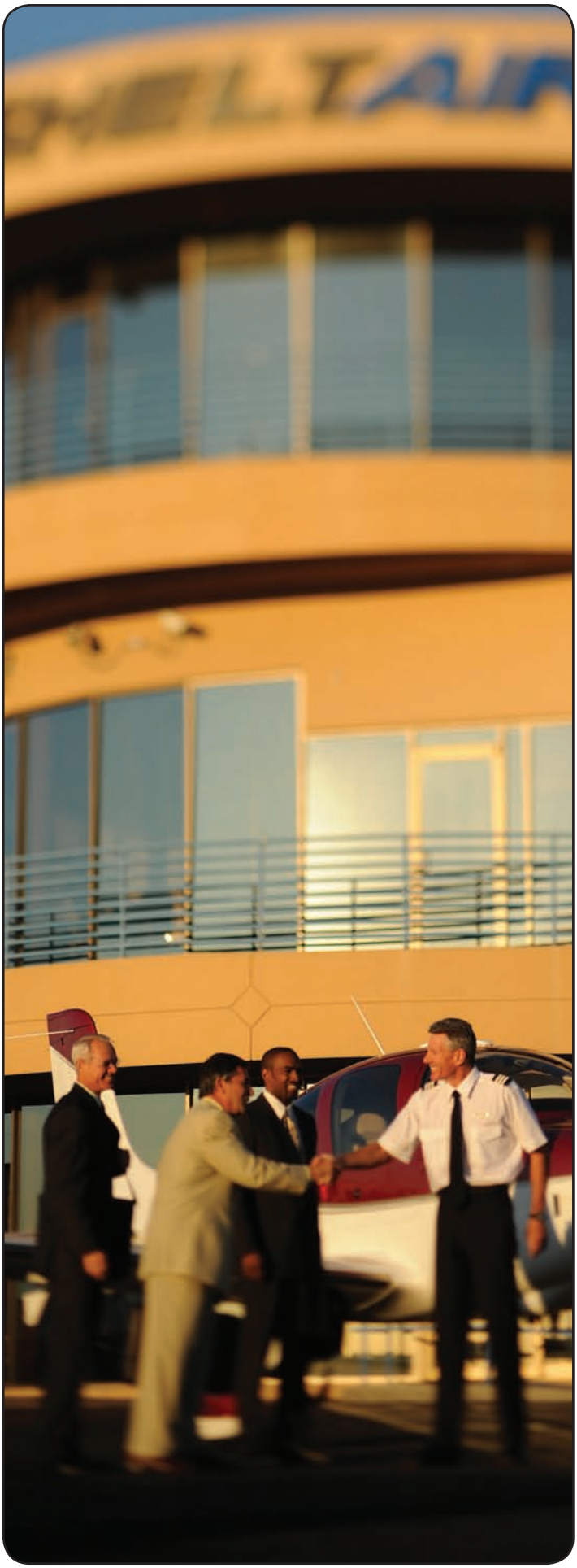
Efficiency focuses on the productivity of your time and dollars. As mentioned earlier, regional airline travel is so inefficient that many people drive if their destination is within 300 miles. Not surprisingly, the analysis proves this out. On the other hand, that first few hundred miles is where a high performance single can make its biggest impact for the business traveler.

When you travel by private air you avoid:

- airline airport parking problems and delays
- ticket lines and waiting
- security screening
- departure and boarding delays
- baggage space crunches
- the all too frequent air traffic control, maintenance and weather delays on the flight itself

The government's published airline numbers indicate about 25% of the time the airlines push back at least 15 minutes late. That does not include weather, Air Traffic Control and the other non-airline sourced delays. For the business traveler, the effective number is much higher, much more frustrating and much more expensive.

As an example, consider someone that flies domestically on about 100 airline legs each year. We all know we cannot rely on the airlines to get us to a morning meeting on time. So, many routinely leave the night before. The cost of this accommodation for poor airline service cost thousands of dollars and hundreds of hours of precious business and family time.



If much of your travel is within 600 miles, however, your economic benefits from the use of a Cirrus could be well beyond your expectations.

The Economics of Regional Flights in High Performance Single-Engine Piston Aircraft

For the piston aircraft study we assumed a passenger load of two i.e. pilot plus two passengers. The average annual income of a Cirrus owner is about $500,000 plus benefits. As with the turbine study, we assumed the second passenger's time is worth one-half that of the lead passenger. That equates to an hourly time cost of just under $470 per hour for an owner plus one passenger.

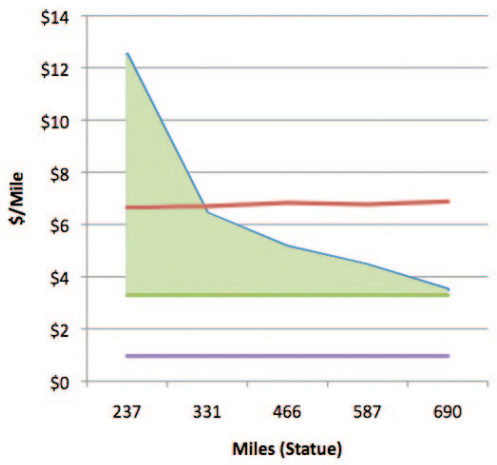
In order to gain a comprehensive comparison of the regional cost of travel options we analyzed five composite trip lengths ranging from 200 to 600 miles. We compiled the data for six geographically disparate routes per leg length. We then averaged the data to create a composite summary for each trip leg distance. The following are the criteria used as we flexed the economic model across the sample trips:

1. The lowest non-stop or one-stop, one week advanced refundable coach fare tickets as offered through Expedia.com.
2. *Conklin & de Decker's* fixed costs for a representative high performance single-engine airplane, plus 10% to more closely approximate real world budgets to assure a conservative perspective. Fixed costs are incurred even when the aircraft doesn't fly (crew salaries, if any, insurance, training, hangar costs, etc.).
3. *Conklin & de Decker's* variable costs (including fuel at $5.78/gal) for the representative high performance single-engine piston powered airplane. These are the costs that are directly attributable to the trip (fuel, landing fees, crew trip expenses, etc.). These costs were also directly taken from *Conklin & de Decker's* latest figures.
4. *Conklin & de Decker's* market depreciation rate of 6% per year for high performance single-engine piston powered airplanes was applied. This depreciation rate is reasonable over a typical ownership cycle.
5. Trip calculations were based on city center to city center.
6. Airline times were the average of the advertised block times from departure city to final destination.
7. Ground distances and driving times were calculated using Microsoft Streets and Trips. A direct auto cost of $0.55 per mile was used.
8. Private air flight times were calculated at an average block speed of 182 knots, per Conklin & de Decker, plus 0.2 of an hour for each leg for added maneuvering time.
9. The availability of closer in non-commercial airports afforded an average of one-tenth of an hour (6 minutes) ground time benefit for private air within our 30 city pairs.
10. In the Owner Flown calculations we reduced the private air ground time advantage by 0.75 hours, to compensate for additional pre- and post-flight activities.

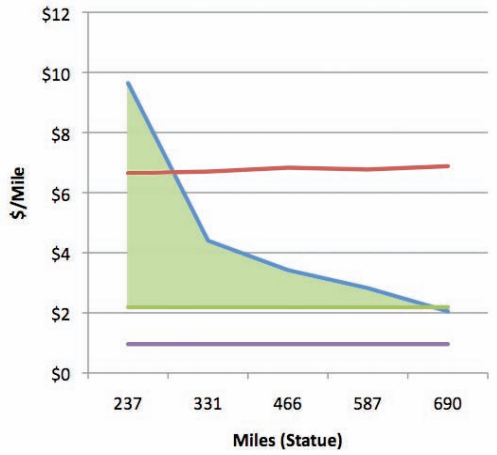
Cost Per Mile of Travel Various Modes of Transportation

Data Source: *Conklin & de Decker*, Cirrus TURBO

Professional Flown



Owner Flown



Economic Advantage of HP Piston over Airlines

Airline Cost

Automobile Cost

Total HP Piston Cost

HP Piston Direct Operating Costs

Costs include time value of two passengers @ 750 K Total Salary + benefits

11. For Owner Flown legs we did not include any time benefit for en route passenger productivity.
12. For the Professionally Flown single-engine piston powered aircraft trip calculations we used the original study's 1.75 hour pre- and post-flight time advantage over the airlines.
13. For Professionally Flown private air flights we included a 40% en route time benefit for passenger productivity.
14. The Professionally Flown annual budget included a pilot fully loaded compensation cost allowance of $47,375 less an insurance reduction of about $1,800, per Conklin & de Decker.
15. We did not include any credit for costs that can be avoided through the use of business aircraft (reduced number of hotel nights, meals and rental car fees, etc.). Again, this was perceived by our clients as adding to the conservative position and credibility of the analysis.

Taken all together, the annual fixed costs, variable costs and market depreciation equate to the yearly real or "green dollar" cost of business aircraft use. Once the commitment is made to own a business aircraft, the incremental cost of the next hour or mile is its marginal cost. Many decision makers we talked with use the marginal cost as the hurdle rate for considering additional application of the asset.

Our economic model was flexed to explore two cases: A. Owner Flown and B. Professionally Flown trip costs versus the airlines and automobile. You will note the Professionally Flown calculations for both private air and the airlines maintained their comparative ratios but the costs are higher. This is caused by increased cost of the pilot for private air and more than offsetting higher time cost differential allocated to the airlines due to improved private air in-flight passenger productivity.

Economic Model Notes:

- The green shaded area indicates the degree of the economic benefit a high performance single-engine piston airplane has over airline travel, using the stated assumptions.
- Airline time and ticket costs are frontloaded. This makes airline travel over distances of less than 600 miles very expensive.
- The direct and time cost of automobile travel is less than that of the airlines out to about a distance of 300 miles.
- The fully allocated cost of a high performance single-engine piston airplane is less than that of the airlines out to at least 600 miles.
- Even though a professional pilot raises the cost of flying by private air by about $1.10 per mile, the value of the time the

Regional Sample City Pairs

The "200 mile" Case Elements

Santa Monica, CA	–	Las Vegas, NV
Dallas, TX	–	San Antonio, TX
Oklahoma City, OK	–	Amarillo, TX
Orlando, FL	–	Savannah, GA
Raleigh-Durham, NC	–	Greenville, SC
White Plains, NY	–	Portland, ME

Average distance:	237 statute miles (sm) / 206 nm
Average airline block time:	2.8 hours (includes connections)
Average airfare:	$454
Ticket cost/sm:	$1.92/sm per passenger

The "300 mile" Case Elements

Santa Monica, CA	–	San Jose, CA
Dallas, TX	–	Wichita, KS
Oklahoma City, OK	–	Austin, TX
Orlando, FL	–	Augusta, GA
Raleigh-Durham, NC	–	Atlanta, GA
White Plains, NY	–	Norfolk, VA

Average distance:	331 statute miles (sm) / 288 nm
Average airline block time:	2.3 hours (includes connections)
Average airfare:	$338
Ticket cost/sm:	$1.02/sm per passenger

The "400 mile" Case Elements

Santa Monica, CA	–	Tucson, AZ
Dallas, TX	–	Kansas City, MO
Oklahoma City, OK	–	Des Moines, IA
Orlando, FL	–	Birmingham, AL
Raleigh-Durham, NC	–	Daytona, FL
White Plains, NY	–	Greensboro, NC

Average distance:	466 statute miles (sm) / 405 nm
Average airline block time:	3.3 hours (includes connections)
Average airfare:	$323
Ticket cost/sm:	$0.69/sm per passenger

The "500 mile" Case Elements

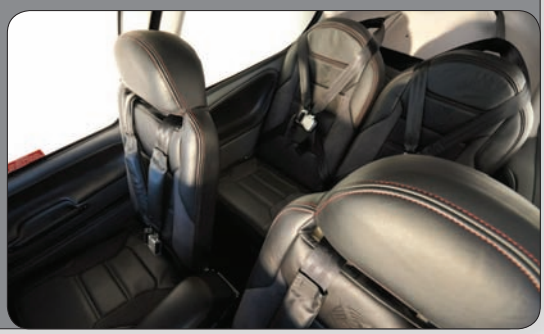
Santa Monica, CA	–	Salt Lake City, UT
Dallas, TX	–	Albuquerque, NM
Oklahoma City, OK	–	Champaign, IL
Orlando, FL	–	Nashville, TN
Raleigh-Durham, NC	–	Martha's Vineyard, MA
White Plains, NY	–	Lansing, MI

Average distance:	587 statute miles (sm)/ 510 nm
Average airline block time:	3.6 hours (including connections)
Average airfare:	$453
Ticket cost/sm:	$0.77/sm per passenger

The "600 mile" Case Elements

Santa Monica, CA	–	Eugene, OR
Dallas, TX	–	Atlanta, GA
Oklahoma City, OK	–	Minneapolis, MN
Orlando, FL	–	Norfolk, VA
Raleigh-Durham, NC	–	Milwaukee, WI
White Plains, NY	–	Charleston, SC

Average distance:	690 statute miles (sm) / 600 nm
Average airline block time:	3.6 hours (including connections)
Average airfare:	$443
Ticket cost/sm:	$0.64/sm per passenger



pilot liberates for the owner/passengers is about $2.87 per mile. In addition, there are numerous other intangible safety and service benefits of using a professional crew member.

- Each additional trip, after making the fixed cost commitment of a private airplane, costs less than a dollar per mile.

To further strengthen the case of economic effectiveness in the green shaded, the following aircraft were sampled for average trip distance in statue miles. Data was obtained from the FAA Enhanced Traffic Management System Counts (From Jan. to Nov. 2009):

King Air 90 (BE90) . . . . . 235 miles
Pilatus (PC12). . . . . 239 miles
Embraer Phenom 100. . . . 345 miles
Eclipse 500 (EA50) . . . . . 355 miles
Citation Jet CJ1 (C525) . . 395 miles
Socata TBM 850 (TBM8) 418 miles

Findings and Observations

The results of the analysis are dramatically clear. The economic benefit of using a high performance single-engine piston airplane for regional travel is compelling. The personal impact of using a Cirrus is extraoridinary.

Weekdays are streamlined by gettingmore done in less time for lower costs, yet you gain personal time and reduce stress, hassles and frustrations that are associated with commercial travel. Speaking of personal time, you also have the latitude to turn any normal weekend into a refreshing getaway for yourself and the ones you care for. That is why the freedom of flying private air is such a huge plus.

The facts are not only you can economically justify the ownership and use of a high performance single- engine piston aircraft, but do so under very reasonable conditions. The reality is most companies don't invest in business aviation to save money. They use business aircraft to give them more time to make money and to have more fun. When it comes down to the bottom line, Cirrus Aircraft can make a huge a difference.

Peter v. Agur, Jr. is the Managing Director and Founder of The VanAllen Group, a well known management consulting practice dedicated to business aviation. Recent publications include, "The Compelling Case for Business Aviation."

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While Cirrus Aircraft initiated the request for this research with The VanAllen Group, all research was conducted, completed and presented independent of Cirrus.