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# ANALYSIS OF BARRIERS TO THE UTILITY OF GENERAL AVIATION

TROY D. DOWNEN  
[DOWNEN@MIT.EDU](mailto:DOWNEN@MIT.EDU)

R. JOHN HANSMAN, JR.  
[RJHANS@MIT.EDU](mailto:RJHANS@MIT.EDU)

DEPARTMENT OF AERONAUTICS AND ASTRONAUTICS  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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- General Aviation is underutilized when compared to alternative forms of transportation

In 1998...

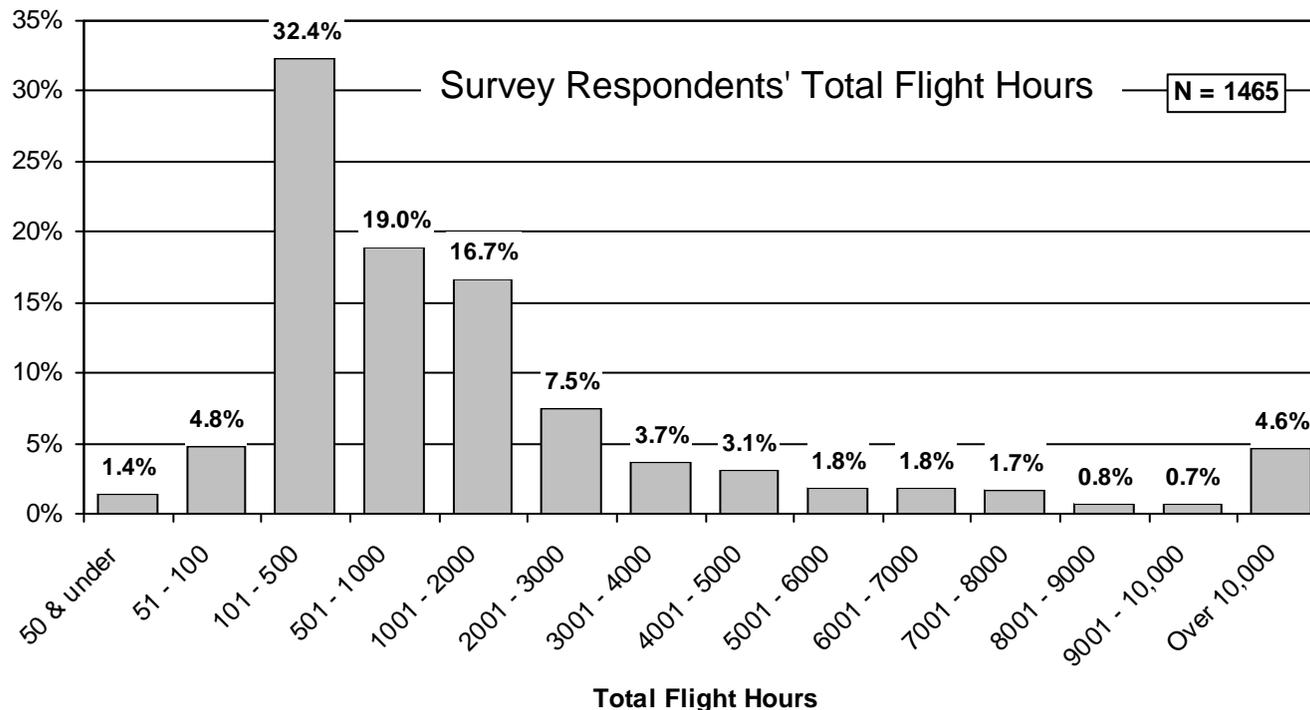
- there were nearly 185 million valid drivers licenses in the United States
  - there were 618,298 active U.S. pilot certificates
  - over 5.5 million cars were produced domestically
  - 2,220 units were shipped by general aviation manufacturers based in the United States
  - approximately 450 billion revenue passenger miles were flown domestically on scheduled and non-scheduled carriers
- What are the barriers causing GA to be underutilized?

*Sources:* US Federal Highway Administration, 2000  
General Aviation Manufacturers Association, 1998 and 2001  
US Bureau of Economic Analysis , 2000  
US Bureau of Transportation Statistics, 1999

# Survey of General Aviation Pilots



- Internet-based survey to identify major factors affecting the utility of general aviation travel
  - 20 questions addressing characteristics and use of the automobile, airlines and GA for transportation
  - 1,471 complete and distinct surveys submitted

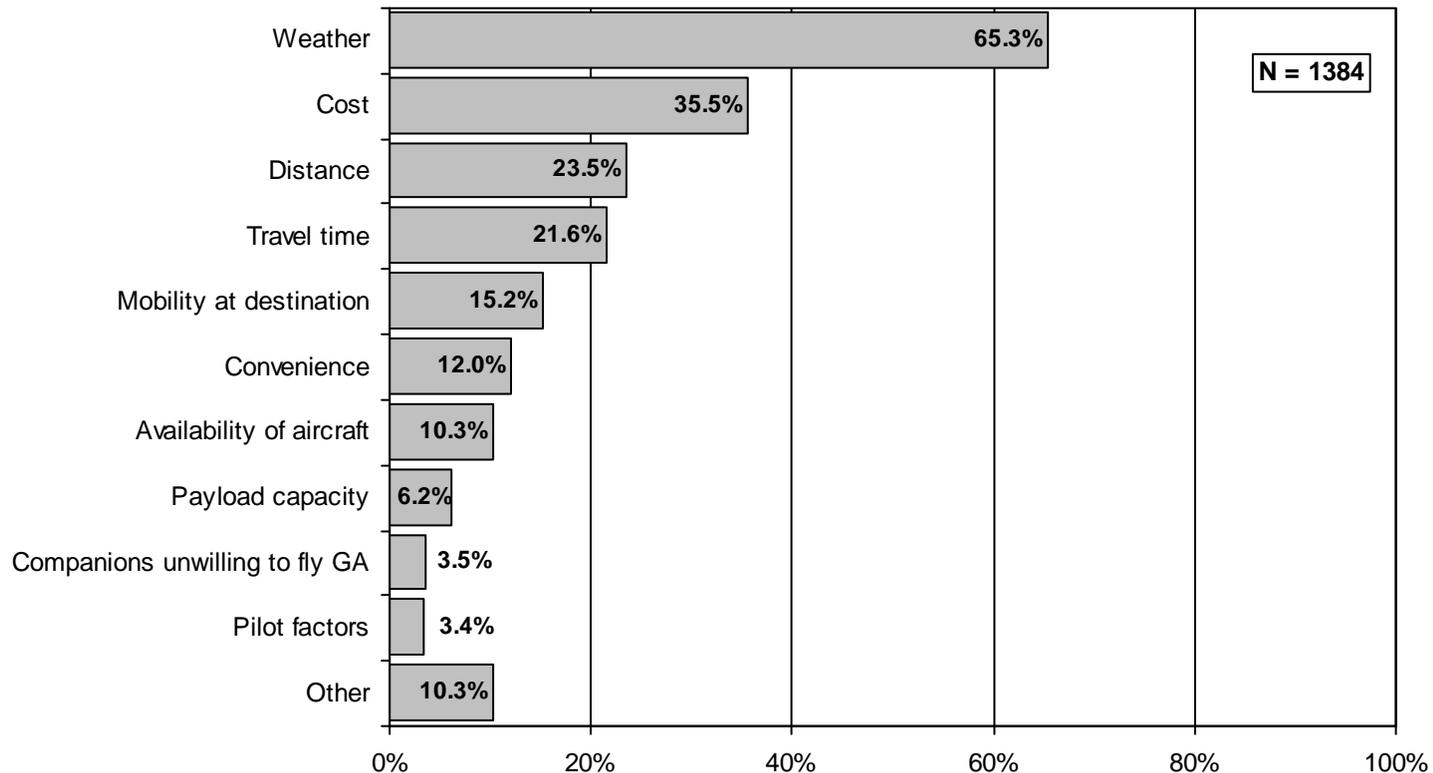


# Key Survey Results



- Four major barriers reducing the utility of GA were identified, typified by the responses to survey question 8:

*Please list what you consider to be the major reasons you would choose not to travel by GA aircraft on any given trip (both business and personal/leisure)?*



- Identified in survey as...
  - primary factor for delaying and canceling travel by GA
  - primary reason for choosing to travel by alternate mode
- Weather is a reliability issue
  - Survey indicates that use of GA for travel is significantly impaired due to uncertainty associated with weather, and the resulting uncertainty of completing the trip on schedule
  - Active GA pilots indicate that GA travel has low reliability compared to the automobile and major airlines vis-à-vis weather
- Better weather information is desired
  - Real-time weather in the cockpit identified as one of the top factors desired to reduce barriers to GA travel
- Mitigation strategies increase expense of GA travel
  - Purchase “backup” ticket on an airline, last minute tickets as weather turns bad, or refundable tickets in case weather clears

# Expense (1)

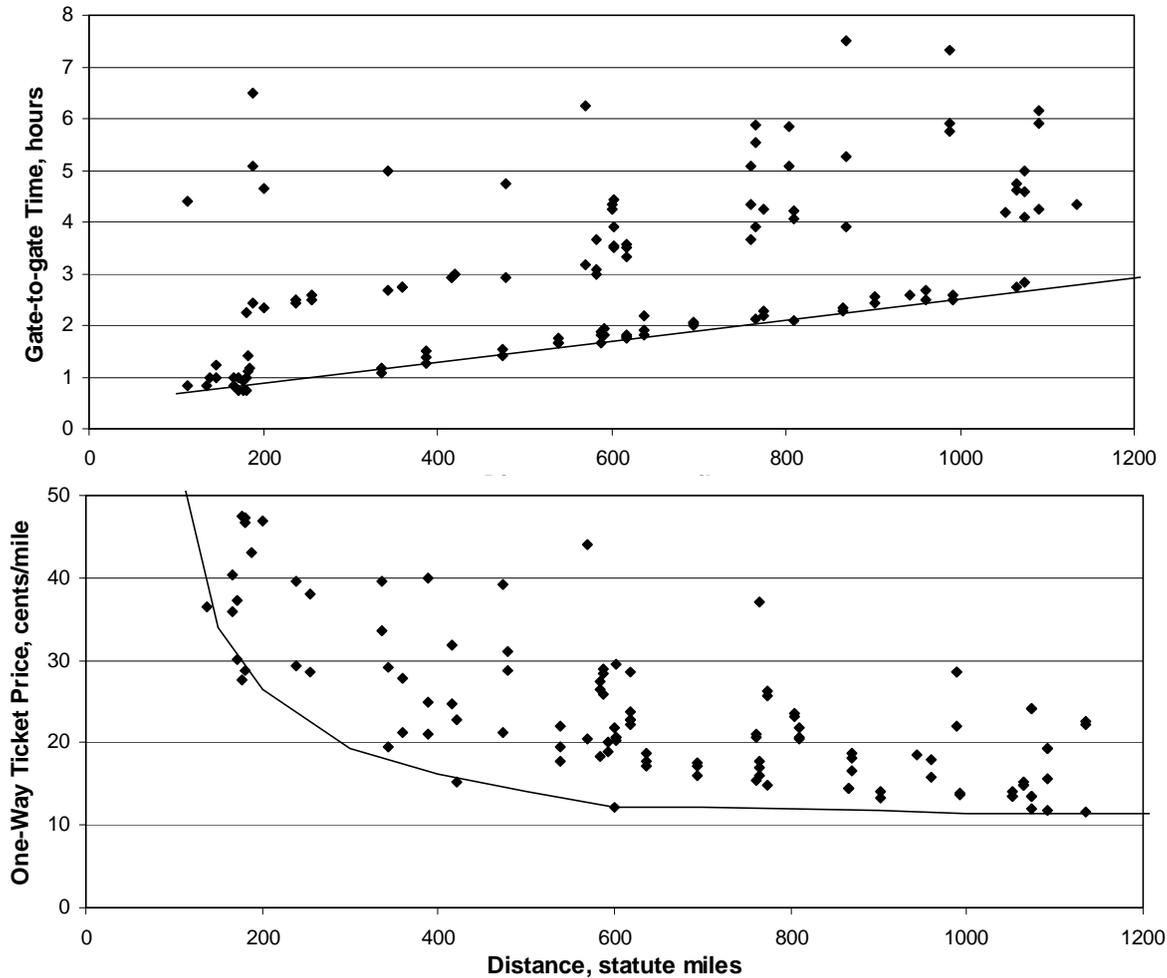


- Examine with aid of mode choice model
  - Simple model considers traveler preferences as they are influenced by the relationship of speed (or time) and price
  - The total price of a trip via any transportation mode:
$$P_{\text{total}} = \text{Cost} + \text{Time} \cdot (\text{Value of Time})$$
  - Indifference between two modes occurs when their prices are equal
$$C_{\text{mode A}} + T_{\text{mode A}} \cdot \text{VOT} = C_{\text{mode B}} + T_{\text{mode B}} \cdot \text{VOT}$$
  - The value of time (VOT) at which the traveler switches from mode A to mode B
$$\text{VOT} = \frac{C_{\text{mode A}} - C_{\text{mode B}}}{T_{\text{mode B}} - T_{\text{mode A}}}$$
  - VOT for mode choice may then be expressed as a function of travel distance

# Expense (2)



- Example: Airline mode data

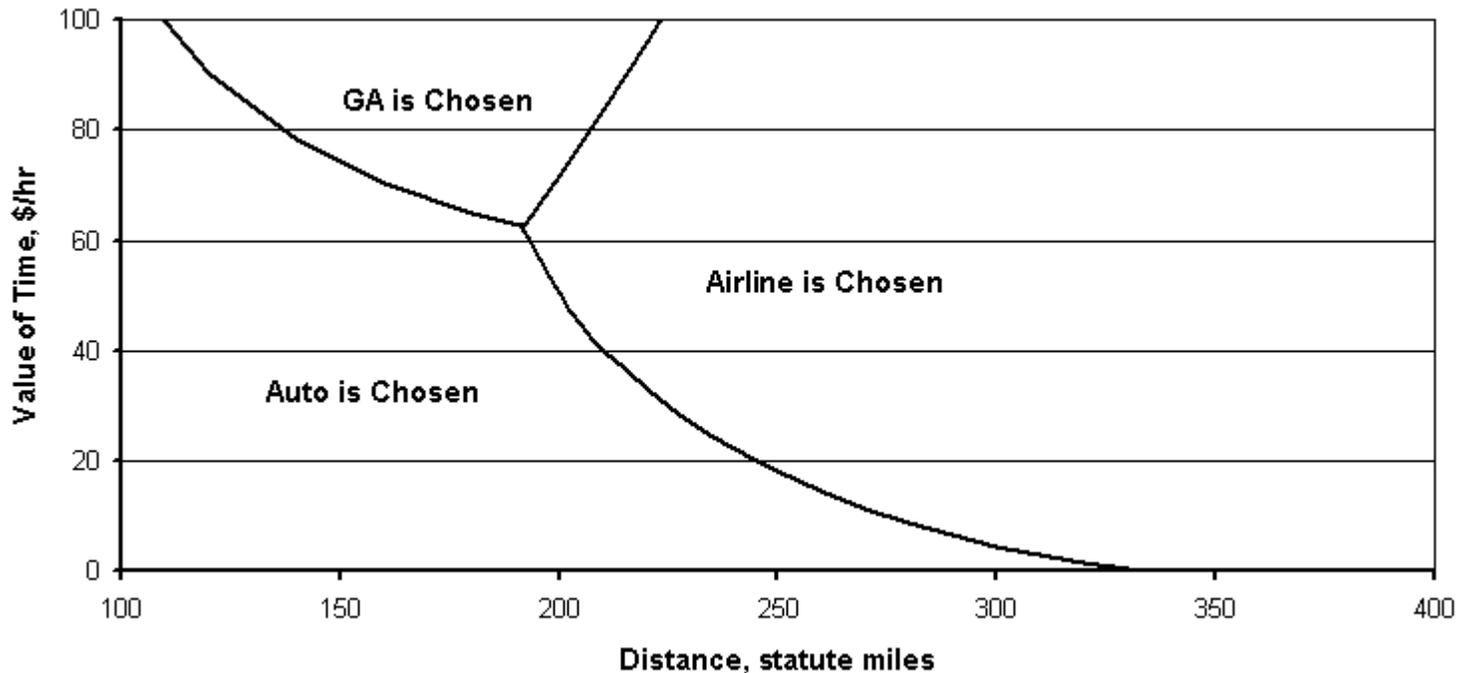


All data for major air carriers, from their web sites, July 2001

# Expense (3)



- Mode choice model shows where and why GA dominates

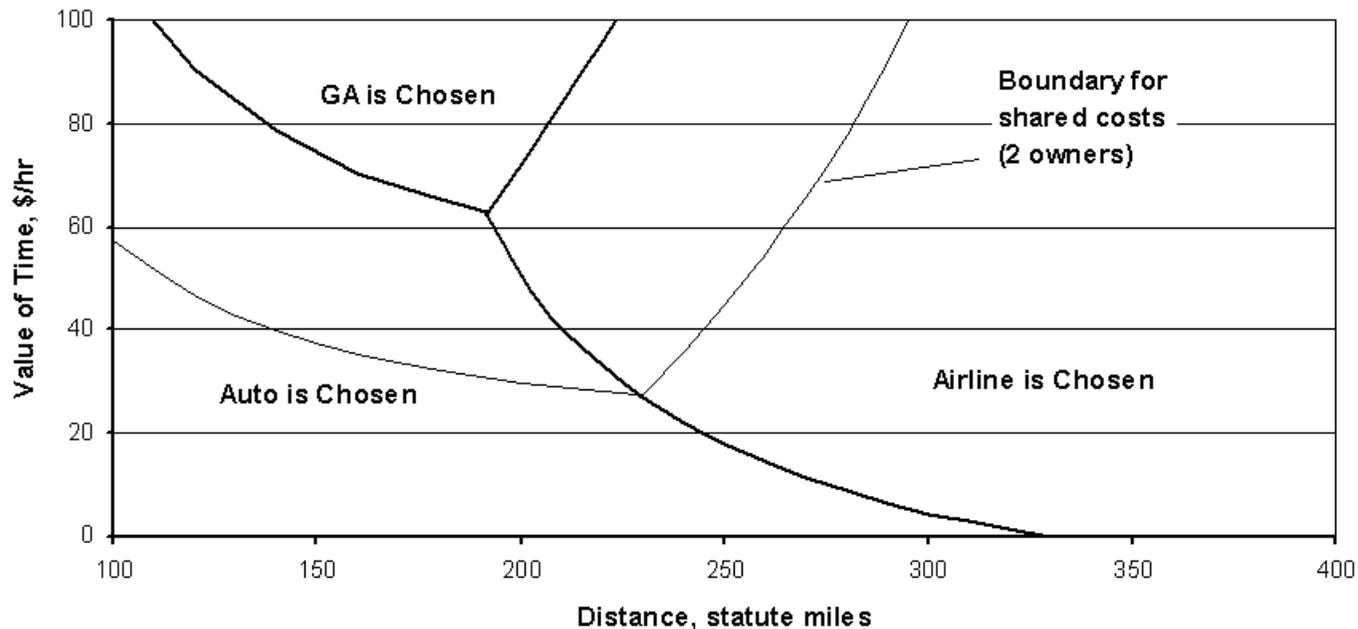


- One-way travel considered
- Costs for GA are representative of single-engine piston aircraft, 160 kt cruise speed (based on Business & Commercial Aviation, May 2000 and Federal Aviation Administration, *Economic Values for Evaluation of Federal Aviation Administration Investment and Regulatory Programs*, June 1998)
- Airline costs are averaged for major air carriers, July 2001
- Automobile costs via American Automobile Manufacturers Association, 1998

# Impact of Shared Ownership



- Modify the GA business model
  - Estimates indicate fixed costs of aircraft ownership are significantly higher than variable costs (40% to 100% higher)
  - Share fixed costs through shared ownership



- This is the basis for fractional ownership

# Mobility at the Destination



- Survey indicates ability to access ground transportation to complete a trip is important in choosing the travel mode
  - Includes access to public transportation, taxis, or rental cars
  - Access is considered significantly better at commercial airports (favoring travel via airlines)
  - Ground transportation at GA airports, if available, is considered more expensive
- Most frequently cited advantage of traveling by automobile over GA aircraft was the fact that travelers would have ready access to a car at their destination
- Not an obvious issue – warrants further study

# Doorstep-to-Destination Travel Time

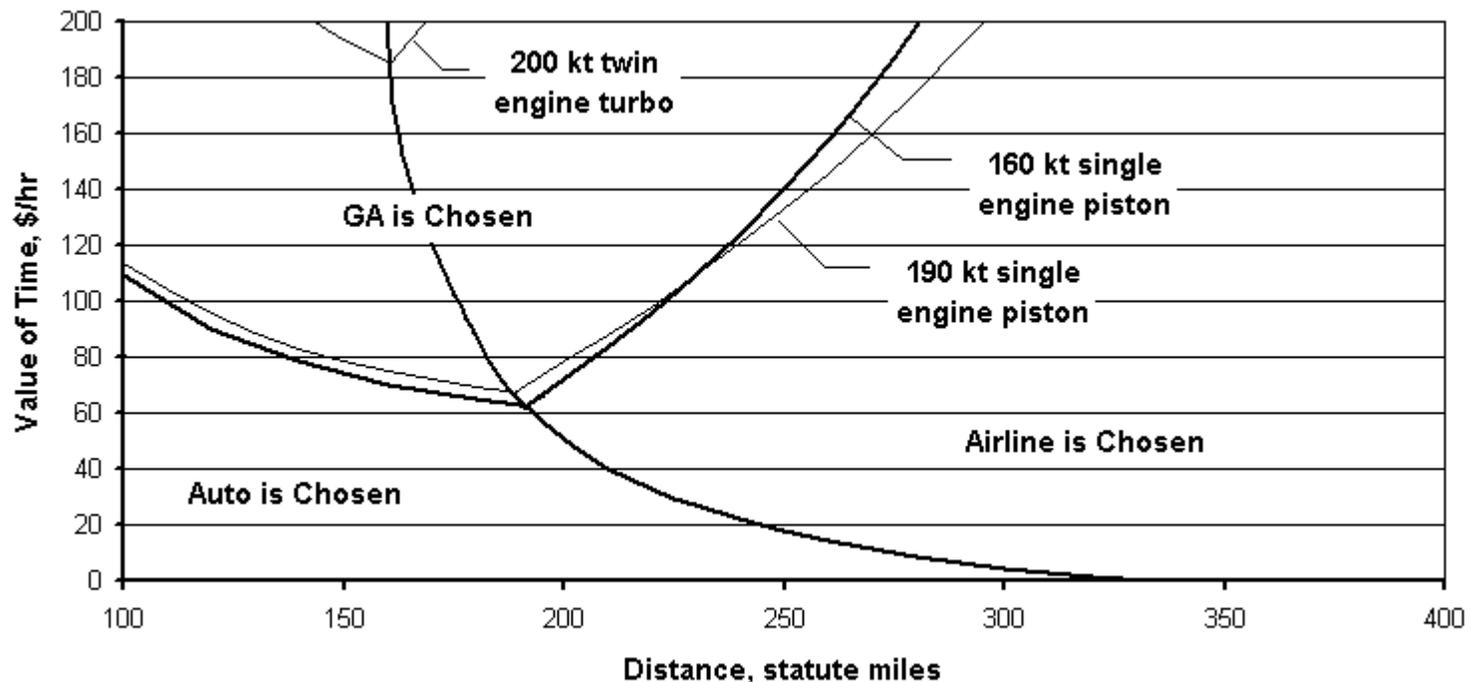


- Consistently cited throughout the survey as a factor in choosing travel mode
- Coupled with the issue of travel distance
- Works both for and against GA transportation
  - GA is considered faster than automobile, beyond certain distances
  - GA is considered faster than airline, up to certain distances
  - Results in a “sweet spot” where GA dominates as mode of choice
- Logical conclusion: build and fly faster GA aircraft
  - Survey indicates a strong desire for faster aircraft
  - Industry is offering jet engines suitable for GA category aircraft

# Tradeoff Between Speed & Cost



- Faster GA aircraft are more expensive
  - Higher speed does not necessarily improve utility



One-way travel considered

Costs for GA based on Business & Commercial Aviation, May 2000 and Federal Aviation Administration, *Economic Values for Evaluation of Federal Aviation Administration Investment and Regulatory Programs*, June 1998

# Conclusions



- Things that can be done to improve GA utility:
  - Better weather information and all-weather capability
  - Modify the GA business model
  - Better mobility at the destination for GA travel
- Greater speed does not equate to greater utility
- *Note:* Reducing expenses piecemeal via insurance rate reductions, lowering avgas prices, etc. is not likely to improve the utility of GA travel as much as we think
- This has been short & fast. For more detail, contact Troy.