



NASA STTR 2004 Phase I Solicitation

T7.01 Personal Air Vehicle (PAV) Research for Rural, Regional, and Intra-Urban On-Demand Transportation

Lead Center: LaRC

NASA is performing preliminary design studies of Personal Air Vehicle missions, concepts, and technologies for the purpose of augmenting on-demand personal transportation mobility and capacity. The intent of this research is to perform the analysis and demonstration required to provide radical improvements to the key metrics that currently inhibit market growth of these small, personal-use vehicles. Initial markets would build on the near-term existing General Aviation infrastructure with takeoff and landing field lengths of approximately 2500 feet. Next generation General Aviation markets will encompass a class of vehicles that have utility, comfort, public acceptance, efficiencies, cost, and ease of use which can be more closely associated with automobile-like characteristics. Long-term markets would involve mission concepts that are capable of much closer proximity operations and the ability to perform near door-to-door transportation service, but with significantly greater speed and reach. This PAV research will include focused technology efforts leading towards the following goals and objectives.

Reducing small aircraft certified flyover community noise by 24 dbA from the state-of-the-art values of approximately 84 dbA while still achieving reasonable cost, and efficiency with integrated vehicle concepts capable of 200 mph performance. This noise reduction equates to a tenfold reduction in the perceived noise so that these aircraft are no noisier than current motorcycle regulations. The intent of this effort is to demonstrate that significant increases in small aircraft operations can be acceptable to communities, as these vehicles are designed with technologies that permit them to be good neighbors. These community noise reductions should also provide a significant reduction in cabin noise, providing improved comfort levels for passengers.

Reducing the aircraft acquisition cost on the order of 60% from current price levels, while still at relatively modest production volumes of approximately 2000 units/year. This effort will include investigation of advanced quality assurance certification processes and procedures, instead of the current quality control methods. Significant industry investment has not occurred because a sizable market is not envisioned at cost levels where only a small fraction of the population can enter the market. Future production of such vehicles could be on the scale of limited production luxury cars, however the demonstration of affordable vehicles at relatively low volume is a critical step for market growth that would provide the capital for rapid expansion.

Simplify the operation of small aircraft such that the specialized skills, knowledge, and associated training are reduced to levels comparable to operating an automobile or boat. This reduction must be achieved during near-all-weather operations and with a level of safety that is superior to comparable operations today.

Additional mid-term and long-term technology investigations could also include efforts that provide improved performance, efficiency, and short field length takeoff and landing capability. Implicit to all these investigations will be enhancing the vehicle safety, versatility, ease of entry, interior environment, visibility, and maintenance and operations cost.

Information is desired on current research efforts in these focused areas for respondents interested in partnering with NASA on collaborative investigation. It is anticipated that subsystem design and testing will be performed on selected technologies or concepts.