

**Alaska Aviation Safety Project****FY2009 Request: \$500,000****Reference No: 40060****AP/AL:** Appropriation**Project Type:** Health and Safety**Category:** Public Protection**Location:** Statewide**Contact:** John Cramer**House District:** Statewide (HD 1-40)**Contact Phone:** (907)428-6009**Estimated Project Dates:** 07/01/2008 - 06/30/2014**Brief Summary and Statement of Need:**

The Alaska Aviation Safety Project (AASP) is a multi-faceted, multi-year research project funded primarily by NASA and has received national recognition. The mission of the AASP is to reduce aircraft related fatalities in Alaska. The National Institute of Occupational Safety & Health (NIOSH) reports for the time period 1990-2004, Alaska accounted for 21% of all commuter air taxi related fatalities in the United States. Alaska averaged 123 air crashes per year between 2001 and 2006. In the first 9 months of 2007 there were 59 air crashes in Alaska. The AASP supplied 3-D simulator data has been widely used by Alaskan pilots to increase terrain familiarity and decrease air crash incidents.

<b>Funding:</b>	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	Total
Gen Fund	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$3,000,000
<b>Total:</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$3,000,000</b>

<input type="checkbox"/> State Match Required	<input type="checkbox"/> One-Time Project	<input type="checkbox"/> Phased - new	<input checked="" type="checkbox"/> Phased - underway	<input type="checkbox"/> On-Going
0% = Minimum State Match % Required		<input type="checkbox"/> Amendment	<input type="checkbox"/> Mental Health Bill	

**Operating & Maintenance Costs:**

	<u>Amount</u>	<u>Staff</u>
Project Development:	0	0
Ongoing Operating:	150,000	2
One-Time Startup:	0	
<b>Totals:</b>	<b>150,000</b>	<b>2</b>

**Additional Information / Prior Funding History:**

Four federal research grants from NASA were received: \$300,000 in in-kind assistance from NASA plus funds for the following federal fiscal years: Phase I-FY01 - \$300,000; Phase II-FY04 - \$3,000,000; Phase III-FY05 - \$2,980,000; Phase IV-FY06 - \$1,500,000. A \$3 million NASA grant is anticipated in FFY09. Funding (GF) of \$500,000 was received for both FY07 and FY08.

**Project Description/Justification:**

The Alaska Aviation Safety Project (AASP) commenced in 2001 based upon a mandate from Senator Ted Stevens to reduce the number of aircraft fatalities resulting in Alaska. The AASP has been and continues to research the usefulness of repurposing existing technology to improve aviation safety.

The primary funding advocate of the AASP has been the National Aeronautics and Space Administration (NASA). The significant economic investment of this project has increased the local economy by \$12.12M due to instate spending and re-spending while creating an estimated payroll of \$4.84M. While matching funds have not been required in the past, the congressional delegation has requested the state have some level of financial participation in funding our element of this project as a good faith gesture.

Funds received to date have been used to rectify 12 high risk mountain passes, three high capacity airdromes and eight remote approach zones. These were then manipulated by software into 3-D renderings suitable for use in aviation simulators. These renderings have been made available to the general aviation community through the Medallion Foundation's flight simulators located throughout Alaska for training and familiarization purposes. The University of Alaska-Anchorage's school of aviation will also be provided the data for use in their simulators. The data sets completed thus far have more than adequately demonstrated proof of concept as acknowledged by NASA and confirmed by follow-on funding of research. Existing data sets, when exacted to ground truthing, will allow for dynamic real time in-cockpit display of an aircraft's positioning and orientation with respect to terrain regardless of weather or environmentally related conditions affecting visibility thereby increasing a pilot's situational awareness.

The next phase of the AASP research will examine primarily the interoperability between the GPS capabilities of E-911 mandated wireless commercial-off-the-shelf (COTS) devices and their ability to send and receive (in-cockpit) large quantities of data critical to aviation safety. Key to this is the XYZ GPS coordinates supplied by the E-911 enabled wireless COTS devices. Additionally, unmanned aerial vehicles (UAV) and unmanned aerial systems (UAS) figure prominently in this research. Of particular interest is the proposed broadband wireless connection between air and ground which provides a significant solution to command and control issues as well as air space deconfliction. The foundation of this important research lies in the successful demonstration that large amounts of data can be relayed wirelessly (IP) to and from an aircraft or UAV, in flight, from the terrestrial wireless network.

Finally, it is believed an airframe could become a highly mobile and very agile weather data gathering platform. It is conceivable that an aircraft, while in flight, could gather valuable weather data and relay that data to a central ground station for weather reporting and prediction purposes. This concept entails an IP wireless link to a satellite and/or terrestrial system connected to a control gate that would simultaneously ping all equipped aircraft and receive weather data with the precise associated GPS coordinates (longitude, latitude, and altitude). This data could then be used in a weather prediction model to improve weather reporting and prediction procedures. This is anticipated to be done in conjunction with partnering agencies FAA, NOAA, and NASA.

It is conceptually theorized and reasonably believed the repurposing of existing technology can and will substantiate the initiatives of the AASP, which then becomes the basis for the following advances in aviation safety:

- Interactive Cockpit Aide to Navigation
- Real Time Flight Monitoring
- Live In-Flight Weather Updates
- Mobile Weather Data Capture, and
- UAV/UAS: Command and Control, Air Traffic Deconfliction and Wireless Data Link.

#### **Key Milestones Along the Critical Path of Development:**

- 1. Designation of Alaska as Wireless Testing Area:** Alaska is the only state that can offer large remote areas of uncontrolled airdromes for research that does not harbor a substantial quantity of RF interference commonly associated with urban and metropolitan sprawl.
- 2. FCC COTS Waiver for Research in Alaska:** a waiver to the existing law regarding the use of wireless devices onboard aircraft must be secured with respect to research and development specific to Alaska. Upon securing that waiver, Alaska may attract other similar research and development activity and capture that economic investment.
- 3. Improved Weather Gathering and Prediction:** By improving the weather data gathering method, weather prediction is improved. The subsequent milestone would be to improve aviation weather reporting and distribution (i.e., wireless data link to and from the cockpit and ground).
- 4. Patent and Copyright Applications:** patent and copyright applications will be submitted in the name of the State of Alaska for the public good.

This illustrates both the social and economic advantages the AASP believe is possible through the research it is conducting. The AASP further believes the greatest value of its research is in saving and preserving lives while substantially reducing search and rescue expenses to the State of Alaska.