TRANSPORTATION RESEARCH BOARD

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from NASA Langley

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'INTERSTATE SKYWAY' PROMISES RELIEF FROM TRAVEL DELAYS

Unless Star Trek's Captain Picard shares the secret for beaming humans through space, in the 21st Century we will be a nation with slower travel times -- precisely when time will be the scarce commodity. Both commercial air and automobile traffic are predicted to grow dramatically, adding to delays experienced by many travellers today.

For trips from 150 to 900 miles, an "interstate skyway" could significantly relieve pressure on the nation's transportation systems by providing an alternative form of transportation, panelists reported today during a session of the Transportation Research Board's 78th Annual Meeting.

The skyway, a virtual pathway selected by pilots of personal-sized aircraft of the future, represents one of the key concepts being developed by NASA and its partners for a revolutionary "small aircraft transportation system (SATS)." The system will include advanced 4-6 seat aircraft, "smart" airports and simplified pilot training.

"The vision for SATS is a safe travel alternative that frees people and products from transportation system delays by creating access to more communities in less time" noted Dr. Bruce J. Holmes of NASA’s General Aviation Program Office at NASA Langley and presiding officer for the TRB session. The specific goal is to reduce public travel times by half in ten years and two-thirds in 25 years at equivalent highway system costs, he added.

Most U.S. air traffic is now funneled through 45 airports, but there are 5,400 public-use airports in the U.S. If these small airports were equipped with all-weather capability and if small, quiet, safe, comfortable and relatively inexpensive airplanes were developed, travelers would have access to underutilized airspace. The benefit to the nation will be increased transportation mobility.

The initial concept of how SATS aircraft will operate in the system was discussed by John McKinley of Science Applications International Corp. As envisioned, a person would not need to be a pilot nor own an airplane to take advantage of the system. He or she could elect to take an "air taxi." An air taxi would enable unscheduled operations to many small airports at a fraction of today's airline costs while achieving nearly four times the speed of automobiles from doorstep-to-destination. Businesses and private citizens, alike, will be able to use air taxis for travel on a regular basis due to its projected low cost and convenience.

In addition to helping relieve transportation system delays, the SATS vision promises economic development for communities of all sizes enabled by localized air accessibility. Other benefits are an efficient means for intermodal connectivity between smaller landing facilities and the global aviation system, and an exportable transportation revolution with affordable "instant infrastructure" for developing nations around the world.

To develop the proposed system, NASA is partnering with the Federal Aviation Administration (FAA), the states and industry.

Richard Nehl of the FAA outlined the implications of the SATS concept for air transportation safety. SATS will need to be integrated into the existing National Airspace System to achieve the full benefit of the concept while maintaining today's high safety standards. Future certification guidelines for SATS-equipped aircraft will need to be addressed as well.

One of the goals of the SATS program is to showcase demonstrations of key technologies for vehicles, airports and airspace infrastructure. The purpose of these demonstrations is to provide state, local and federal public officials with the information and experiences needed to support public policy for deployment of SATS infrastructure throughout the suburban, rural and remote communities served by public use landing facilities.

State aviation organizations will play an important role in establishing SATS. Ken Wiegand, director of the Virginia Department of Aviation, discussed the importance of SATS to the future economic development of many small communities, especially those that are not easily reached by existing transportation systems. SATS will enable a reduction in the amount of land needed around local airports and update navigation equipment so that many more aircraft will be able to land during inclement weather.

Holmes pointed out that the integration of NASA synthetic vision technology with SATS interstate skyway capability potentially enables the use of existing runway protection-zoned land for all-weather approaches -- in other words, land that all airports already control. The avoided costs in land acquisition alone could exceed $5 to $25 billion on a national scale.

Other speakers addressed the technological developments needed to achieve the SATS vision. James Burley, NASA-Langley, discussed air vehicle technologies to enhance safety and affordability. John

Zuk of NASA Ames and Peter McHugh of the FAA discussed the operations and infrastructure developments needed to achieve seamless connectivity between SATS and today's air transport system while expanding capacity to meet future needs.

Plans call for development of "smart" landing facilities, automated flight concepts, optimally integrated cockpits, "airborne internet," runway independent aircraft operations, affordable manufacturing, advanced propulsion and "cyber" training. Technology already being worked include traffic and weather information in the cockpit, Global-Positioning-Satellite-based navigation and synthetic vision displays.

For more information on the SATS program visit http://sats.nasa.gov.