Boeing Says Integrated Air Traffic Management System Could Save Billions of Dollars Annually

Integrating air traffic control systems on the ground with airline operation centers and the flight management systems aboard aircraft in flight could produce direct benefits to airline operations in the United States alone ranging from $4 billion to $8 billion annually, according to Boeing [NYSE: BA]. Globally, Boeing estimates the annual direct benefit to airlines could be as much as three times that amount.

"There's little question that the benefits of deploying a large-scale, network-enabled air traffic system are huge," John Hayhurst, president of Boeing's Air Traffic Management business unit, told reporters attending the Paris Air Show. "It's time we deployed such a system to deal more effectively with congestion and weather problems in the air traffic system."

Boeing has been working for the past two years on a design for a next-generation air traffic system with far more capacity than today's system and new safety, security and environmental benefits. Part of that effort included the development of a suite of software simulation tools for validating operational concepts and conducting cost-benefit analyses. The data on annual benefits to airlines are Boeing's first pass at quantifying the gains from increases in air traffic system capacity and efficiency. Boeing ATM will continue to refine these numbers as it refines its operational concept, architecture and transition plan.

"While air travel currently is down, traffic was at record levels only three years ago," Hayhurst said. "The system was overwhelmed, and it will be overwhelmed again in the future if we don't take decisive action now. By 2020, even by conservative estimates, we will have twice as much traffic as we have today."

To define a future solution, Boeing is following a systems engineering process - the same process it has used successfully to develop new airplanes and other complex systems. The process starts with defining future system requirements, which Boeing recently completed after 18 months of work with more than 100 aviation stakeholders around the world. The requirements document produced by the Boeing "Working Together Team" is global in scope and the first of its kind.

Now Boeing is defining a future operating concept and the system architecture needed to support the concept - all based on the stakeholder-established requirements. At the heart of this concept of operations is a network of networks that, for the first time, would give all stakeholders real-time, secure access to a vast amount of relevant data and other information that currently is "stove-piped." Such a common information network (CIN) would enable greater automation of routine tasks and more rapid, collaborative decision-making.

Controllers, pilots, and flight operation centers would all be plugged into the CIN. Security personnel also could be plugged in. Although each performs a distinct task and operates on a different timeline, all would have access to the same real-time, precision information and would be linked together for optimal performance.

Information flowing over the network would include up-to-the-minute weather information merged from multiple sources for a better weather picture than is currently available, flight plans, precision 4-D traffic information, airport and system status and security alerts.

The system would utilize a combination of ground and space assets to link the flight management systems aboard aircraft with the CIN so that data would flow freely between airplanes in flight and systems on the ground, either directly or via satellite. Satellites would make the system truly global, enabling communication, navigation and surveillance anywhere in the world.

"Much of this infrastructure already exists, which is why we're confident that this system is very affordable," Hayhurst said. "We are committed to finding a way to use existing satellite systems and ground systems to minimize costs to users and providers alike. We are confident that the benefits of the new system will outweigh the costs by a long shot."

Hayhurst gave several examples of the kind of operational changes possible with a network-enabled system. They include the more efficient procedure of climbing straight to cruise on takeoff and continuous descent to landing rather than the step-up and step-down profiles typically followed today. The satellite-enhanced system of the future also would enable curved, rather than straight, approaches to landing, and closer spacing in oceanic environments similar to spacing in radar environments over or near land. Other examples cited were the use of precision weather and 4-D traffic information to safely and efficiently route aircraft around and through storm systems, and the full utilization of parallel runways in instrument meteorological conditions.

"These and many other safety-, security-, and capacity-enhancing changes are possible if we put forward-looking, precision information in the hands of the professionals who fly in and manage the air traffic system," Hayhurst said. "What is needed, and needed urgently, is a collective will to proceed with the planning and

implementation of such changes. For the health of our industry, and for global economic growth, we need to get on with the job."

Boeing Estimate of Direct Savings to Airlines

Benefit category	How achieved	Metric	2020 vision target	Annual benefit in U.S. could range between
Flight path efficiency	• Ascent to cruise • Wind-optimized routes • Continuous descent	Time saved per flight due to flight path efficiency	4-8 minutes per flight	$1.5-3B
Delay reduction (Capacity)	• Precision procedural control • RTSP spacing • Integrated services • New runways	Delay reduction percentage	25-50%	$2-4B
Airplane utilization	• Reduce VMC delay • Increase flight path efficiency • Reduce block pad	Block time saved per flight	~10 minutes per flight	$.5-1B
Total annual savings				$4-8B

Forward-Looking Information Is Subject to Risk and Uncertainty

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For further information:
Tim Neale
mobile: 571-437-2407
Len Vraniak
McLean, Va. office
703-584-2702
Debbie Nomaguchi

Bellevue, Wash. office
425-373-2780