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Off The Radar

Air traffic control evolves as the FAA adopts GPS

BY MARK A. KELLNER
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Imagine how much easier the commute would be if you had the ability to see not just the traffic around you, but also for five miles ahead. Think of the notion that you could know what to expect when crossing the Woodrow Wilson Bridge or getting on the Beltway at Connecticut Avenue.

That's the basic idea behind an 18-month-old effort to upgrade the nation's air traffic control system.

After decades of dependence on radar, a new system based on global positioning technology that uses satellites to determine an object's place, time and velocity is making inroads.

ITT Corp.'s Defense business, based in McLean, is the lead contractor on the effort, which is called an Automatic Dependent Surveillance-Broadcast, or ADS-B, system, for the Federal Aviation Administration.

The effort, which began in 2007 and could be extended to 2025 by the FAA, might be worth as much as \$1.8 billion to ITT, said Vincent Capezzuto, the

agency's director of Surveillance and Broadcast Services.

"This is the beginning of a new infrastructure that's going to be around for 50 years. It's exciting to be a part of it," Mr. Capezzuto said. ITT has been "performing very well," he added.

The system, explained John T. Kefaliotis, ITT's vice president of Next Generation Transportation Systems, will deliver "at a lower cost, more accurate and more frequent updating" of positional information for aircraft, once a second versus once every 12 seconds with radar.

"We can also survey aircraft where previously it wasn't possible, such as from oil platforms in the Gulf of Mexico," he added. The system's ground receivers and transmitters can be placed in many different kinds of locations, allowing for greater expansion of the service, he said.

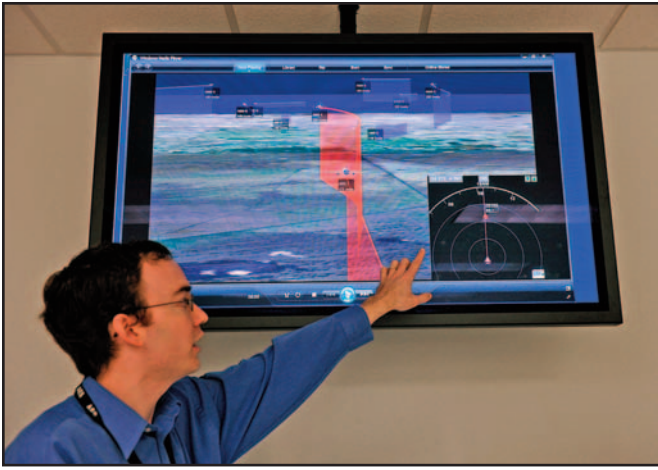
The new program, although carrying the overall tag of ADS-B, is actually composed of four services: GPS coverage from a plane back to the ground and adjacent aircraft on a 1090 MHz band for large planes; "universal" GPS access at 978 MHz for smaller planes known as general



SafeRoute by ACSS.

aviation aircraft; a Traffic Information Service, or TIS-B; and a Flight Information Service, or FIS-B, which covers weather and aeronautical data.

GPS signals are used because the technology is not only newer and more advanced, but it also covers more data. Each plane can be assigned a unique identifier, and the flight numbers can be matched and relayed to surrounding



David Stewart, a systems engineer with SAIC who is working with ITT, shows a 3-D simulation of airplanes flying along with the images that would appear on the pilot's radar screen using a new air traffic control system that ITT is building. The system, which uses radio towers to deliver location and altitude information to planes and air traffic controllers alike, is currently operational in Florida, but the FAA plans to have it operational nationwide by 2013.



John Kefaliotis, the vice president of ITT's Next Generation Transportation Systems, stands next to a model of one of the radio towers that are part of the new ADS-B system that the company has developed for air traffic controllers to improve safety in the airline industry.

planes, showing pilots "nearby" flights that might be above or below a given plane but still in the vicinity.

Initial deployment is in Florida, along with some additional sites in Alaska, accord-

ing to ITT and FAA officials. The program will roll out nationally over the next few years, ITT said.

For a carrier such as United Parcel Service Inc. — which operates 1,900 daily flights to and from its Louisville, Ky., flight hub using 266 aircraft domestically — more traffic information is better, says Mike Mangeot, a public-relations manager for the firm.

"You can get planes much more closely, particularly as they arrive, which allows for a greater number of planes to land within a fixed window of time," Mr. Mangeot said in a telephone interview. "On the departure side, there's increased awareness on the ground so that when planes are taxiing to go out, everybody knows where everyone is, so you can be more efficient as well."

There's even an environmental benefit to being able to better space incoming and outgoing flights, something UPS has tested with six of its aircraft, Mr. Mangeot added. The system allows UPS pilots to perform a "continuous descent" landing, he explained, which saves fuel and cuts emissions.

"Based on our limited test data, continuous descent approaches you can do using ADS-B will reduce fuel consumption by 40 to 70 gallons per landing, when you multiply in terms of daily flights, adds up over time. It also reduces nitrous oxide emissions by 34 percent and noise levels by about 30 percent over a typical step-down landing," Mr. Mangeot said.

The FAA's goal is to mandate placement of GPS-based equipment in all planes, including general aviation, by 2020. That's raised hackles among some general-aviation pilots, especially those whose small airplanes are under \$40,000 in value. The reason? If they install the gear necessary for full ADS-B service in a plane today, it can cost as much as \$16,000, critics and ITT both acknowledge.

"One of the challenges is to drive down the cost of equipage," said Michael R. Wilson, president of ITT's Advanced Engineering & Sciences unit, which is in charge of the program.

That's a view shared by Randy Kenagy, chief of staff for the government affairs division of the Aircraft Owners and Pilots Association in Frederick, Md., which claims 400,000 members in the general-aviation community. He wants to see costs for gear go down and the range of coverage increase.

"We would like to see ADS-B signals put in place at the thousands of general aviation airports," Mr. Kenagy said. "We believe FAA can take some steps to make the electronics much more affordable."

Some of those steps might be taking shape in McLean at a laboratory run by the MITRE Corp. There, Robert C. Strain is principal investigator for a project to develop low-cost ADS-B avionics for gliders, small rockets and unmanned aircraft. One prototype would have a materials cost of \$375 in quantities of 1,000 units, he said, and the possibility exists for other makers to develop products that meet FAA standards and don't break the budgets of weekend pilots, of which Mr. Strain said he's one.

"I think pilots in general are interested in traffic awareness and their personal safety, at a price they think is affordable," Mr. Strain said. "There's an opportunity for some entry-level equipment if we can get some regulatory guidance and they don't proliferate in a manner that creates an unsafe situation."

The FAA's Mr. Capezzuto empathizes on the cost issue but says safety is also a concern.

"The [National Transportation Safety Board] has been making recommendations for helicopter and general-aviation groups in Alaska that they equip with this [system] post haste," he said. "It provides value; you're flying knowing where you are and the grounds are and the other aircraft are."

Mr. Capezzuto said once final rules for ADS-B system implementation are published in April 2010, "manufacturers will ramp up because it's real, and that will drive the price down."