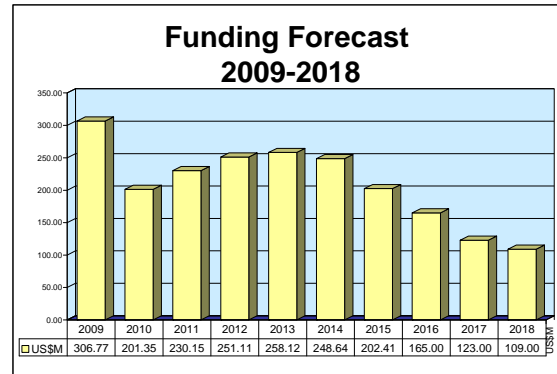# ARCHIVED REPORT

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# ADS-B (U.S. FAA) - Archived 12/2010

## Outlook

- First regions in the U.S. to receive ADS-B capabilities will be Louisville, Kentucky; Philadelphia, Pennsylvania; the Gulf of Mexico region; and Juneau, Alaska

- In November 2008, FAA announced that 11 ground stations were deployed in Florida; ultimately, 794 ground stations will be deployed around the U.S.

- Non-commercial jet fuel taxes increased from 21.9 cents per gallon to 36 cents per gallon to pay for ADS-B upgrades

**Funding Forecast 2009-2018**

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|
| US$M | 306.77 | 201.35 | 230.15 | 251.11 | 258.12 | 248.64 | 202.41 | 165.00 | 123.00 | 109.00 |

## Orientation

**Description.** The Automatic Dependent Surveillance-Broadcast (ADS-B) system is a system of systems that consists of GPS receivers, datalinks, and ground stations. It is designed to eventually replace ground-based radar used for air traffic control. The U.S. FAA has begun a comprehensive program to overhaul the air traffic control system in the United States with ADS-B technology.

### Sponsor

U.S. Federal Aviation Administration
  800 Independence Ave SW
  Washington, DC 20591
  USA
  Tel: + 1 (202) 267-3484
  Web site: www.faa.gov

**Status.** The FAA plans to replace the current air traffic control system with ADS-B technology over the next five years. The program is currently in the design phase. The FAA has begun to deploy ground stations and upgrade control centers with the capability to incorporate ADS-B data for air traffic controllers.

**Application.** ADS-B receiver/transmitters will equip commercial aircraft. Ground stations will receive information from these aircraft. Data are gathered from GPS satellites.

## Contractors

## Prime

| ITT Corp | http://www.itt.com, 1133 Westchester Ave, White Plains, NY 10604 United States, Tel: + 1 (914) 641-2000, Fax: + 1 (914) 696-2950, Prime (ADS-B Integration and Engineering) |
|---|---|

## ADS-B (U.S. FAA)

## Subcontractor

| Thales North America Inc | http://www.thalesgroup.com/usa, 675 N Washington St, Suite 400, Alexandria, VA 22314 United States, Tel: + 1 (703) 838-9685, Fax: + 1 (703) 838-1688 (Lifecycle Support of ADS-B Radios) |
|---|---|

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

# Technical Data

The FAA's Automatic Dependent Surveillance-Broadcast (ADS-B) system is intended to completely transform the air traffic control system in the United States. The system will replace radar with GPS navigation equipment nationwide as part of the NextGen program to upgrade the nation's air traffic control capabilities.

As the FAA envisions the program, aircraft equipped with ADS-B systems will receive signals from GPS satellites that pinpoint their precise location. The same devices will then transmit that data to ground stations. Air traffic controllers will use that information to guide airplanes. Pilots flying aircraft equipped with ADS-B "In" systems will also have the ability to see the information, allowing them to follow more efficient routes.

The FAA describes ADS-B as an advanced system that provides accurate and comprehensive surveillance information and flight data about every aircraft flying in U.S. airspace via a communication link. Air traffic controllers determine an aircraft's position (longitude, latitude, altitude, and time) via GPS, internal navigational reference systems, etc. The ADS-B equipment on the aircraft processes this position information into a periodic broadcast transmission, typically once per second. Any airborne and/or ground-based ADS-B-capable receiver within range of the broadcast can receive and process the information.

The FAA believes that ADS-B information will be more accurate than that provided by radar. Also, ADS-B information will be refreshed more frequently, updated every second compared to current radar systems that take between 3 and 12 seconds to scan 360 degrees. Because modern jet airliners can travel large distances in that timeframe, air traffic controllers must ensure that there is a distance of about five miles between each aircraft, which reduces the number of aircraft that can be in the sky at any one time. Because the new technology, based on satellite information, is updated every second, a much more timely picture of the sky is provided. The information is therefore much more accurate, giving air traffic controllers more confidence in determining the location of an aircraft at any given time. The FAA also estimates that ADS-B datalinks will be cheaper to maintain than radar stations and processing centers.

The system has already been installed in Alaska under the Capstone Project, which the U.S. FAA began in the late 1990s. Alaska was determined to be a good environment for ADS-B because there is little radar coverage in rural parts of the state. Since the system was deployed in 2000, there has been a 40 percent drop in fatal accidents. It is unlikely that those numbers will be duplicated in the Continental United States, since radar coverage is already extensive. However, it will reduce congestion in the skies.

After reviewing various technical and economic evaluations, the FAA determined in 2002 that ADS-B architecture will consist of a 1,090-MHz Extended Squitter link for commercial aircraft and a Universal Access Transceiver link for general aviation aircraft.

# Program Review

In March 2007, the U.S. Federal Aviation Administration began seeking proposals to develop and manage an Automatic Dependent Surveillance-Broadcast (ADS-B) network. Three companies – ITT Corp, Lockheed Martin, and Raytheon – led teams that submitted proposals for the ADS-B contract.

The FAA awarded a contract to ITT Corp on August 30, 2007. The contract, initially worth $207 million, contained options that could bring the value up to $1.86 billion. The plan called for ITT to integrate and engineer the system, which includes field radio sites, data processing centers, network operations centers, and

other equipment, over the next three years. Exercising the options would allow the company to maintain the system through 2025.

Although many in the industry believe the new system will be better than the current, radar-based, system, the FAA's plan to upgrade its air traffic control system is not without controversy. Upgrading the entire air traffic control network in the United States is an enormous undertaking, and will require substantial amounts of money. Some believe the new system could cost up to $15 or even $20 billion over the life of the new system. To pay for the new system, the FAA has proposed replacing the current 7.5 percent tax on airline tickets with a combination of fees and taxes that would charge airlines, as well as general aviation operators.

### *New Funding Plan Gaining Support*

However, that plan was met with huge opposition. The Alliance for Aviation Across America, a trade group representing general aviation fliers, said that it would place an unfair burden on hobbyists, rural communities, charities, and small businesses. As a compromise, an increase in non-commercial jet fuel taxes was proposed. Under the plan, taxes for the fuel would increase from 21.9 cents per gallon to 36 cents per gallon. The National Business Aviation Association supports the compromise in the belief that it is less onerous than the user fee plan. The Air Transport Association feels that it is a move in the right direction, but still fully supports the user fee plan originally proposed by the FAA.

Another controversy is brewing. This one surrounds an FAA requirement introduced in the fall of 2008. Under the FAA's plan, all operators in U.S. airspace will be required to equip their aircraft with ADS-B transponders by 2020. These transponders, known as ADS-B "Out," will transmit aircraft information to ground-based ADS-B stations. Another set of equipment, known as ADS-B "In," will allow aircraft to have access to the same information as the FAA-operated ground stations. No requirements have been set for ADS-B "In" equipment.

The plans introduced by the FAA have come under scrutiny by many in the aviation industry. Some feel that the plans are not ambitious enough. The ADS-B network is expected to become operational in 2013. However, air traffic controllers will not be able to take advantage of the system until 2020, when all aircraft will be equipped with ADS-B "Out."

Airlines, on the other hand, doubt that ADS-B will vastly increase their bottom line and will serve as an added expense. The ATA estimates that adding ADS-B "Out" equipment could cost an airline up to $136,000 per aircraft.

The ATA also wants the FAA to release more information on proposed ADS-B "In" requirements, which would allow airlines to upgrade their aircraft once with both capabilities. Many airlines believe that ADS-B "In" will increase profits by allowing pilots to see a complete picture of the sky around them, therefore reducing the distance between each aircraft required for safe operation.

Concerns over ADS-B "In" and "Out" requirements may force the FAA to adjust its plans. The final rule is scheduled to be published to the federal register in the spring of 2010.

The FAA plans to obtain Initial Operational Capability of ADS-B at a number of sites around the country by late 2009 and early 2010.

In February 2008, the FAA announced that the Gulf of Mexico will be the first area to be equipped with ADS-B. The agency believes the region is a good site because there is no radar coverage over the gulf. Other regions set to receive what the FAA refers to as ADS-B "critical services" are Louisville, Kentucky, Philadelphia, Pennsylvania, and Juneau, Alaska. The critical services will allow air traffic controllers to see ADS-B data fused with data from other sources, such as radar, to guide incoming and outgoing air traffic.

In November 2008, the FAA announced that 11 ground stations set to receive ADS-B data were deployed in Florida. In total, ADS-B will consist of 795 ground stations in the contiguous 48 states, Alaska, Hawaii, and the oil platforms in the Gulf of Mexico. The FAA plans to have all stations deployed and operational by 2013.

**ADS-B (U.S. FAA)**

# Funding

**U.S. FUNDING**

| | FY08 QTY | FY08 AMT | FY09 QTY | FY09 AMT | FY10 QTY | FY10 AMT | FY11- FY14 QTY | FY11- FY14 AMT |
|---|---|---|---|---|---|---|---|---|
| **Procurement (U.S. FAA)** | | | | | | | | |
| Budget Item 1A10 | | | | | | | | |
| ADS-B National Airspace Wide Implementation | - | 85.7 | - | 306.8 | - | 201.4 | - | 987.0 |

All $ are in millions.

Source: FY10 U.S. Budget Documents

# Contracts/Orders & Options

| Contractor | Award ($ millions) | Date/Description |
|---|---|---|
| ITT Corp | 207 | Aug 2007 – Contract awarded by the FAA to develop and deploy the ADS-B system. This initial contract is for three years, and covers system integration and engineering. The contract has options that could bring total contract value up to $1.86 billion. The options cover operation and maintenance of the ADS-B system. |

# Timetable

| Month | Year | Major Development |
|---|---|---|
| | 2000 | Capstone Project in Alaska declared operational |
| | 2002 | FAA establishes basic architecture of ADS-B |
| Mar | 2007 | Request for Proposals for ADS-B system |
| Aug | 2007 | ITT Corp awarded $1.86 billion contract for ADS-B |
| Oct | 2007 | Notice of Proposed Rulemaking regarding aircraft upgrades with ADS-B "Out" |
| Nov | 2008 | 11 ground stations deployed in Florida |
| Jul | 2010 | In-service decision expected on ADS-B |
| Apr | 2010 | Final rule on ADS-B "Out" mandatory installation to be published |
| | 2013 | FAA expects ADS-B to become operational |
| | 2020 | Aircraft will be required to carry ADS-B "Out" |

# Worldwide Distribution/Inventories

The **United States** FAA will upgrade the U.S. air traffic control system with ADS-B.

# Forecast Rationale

The U.S. FAA's plans to upgrade the United States' aging radar-based air traffic control system with a modern GPS-based system is wrought with controversy. The amount of money allocated for this effort is sure to attract attention over the next few years. The source of the funding is also causing debate.

However, the agency believes that the new system, once implemented, will improve safety in U.S. airspace. In addition, countries such as Australia, Canada, and many in Europe have already begun upgrading their systems, and the U.S. will not want to be left behind.

Many previous upgrades to the air traffic control system in the United States involved infrastructure changes. But this time, the FAA's upgrades include avionics, which aircraft operators will be responsible for completing, and at their expense. That means a case must be made convincing aircraft operators that paying for the equipment makes good business sense. While many believe that ADS-B "In," which allows pilots to view ADS-B information, will offer a number of benefits, it remains to be seen whether those benefits will outweigh the expense, especially regarding older aircraft. Many airline officials claim that airlines will only order the equipment on new aircraft, rather than upgrading older aircraft.

To help pay for ADS-B upgrades, the FAA originally wanted to increase the fees paid by general and business aircraft owners, forcing them to split the cost with commercial airlines. However, the business and general aviation community fought that plan. Under a new proposal, the FAA will increase taxes on non-commercial jet fuel. The funds raised from the tax increase will be used to fund part of the ADS-B infrastructure upgrades.

Airlines and other aircraft operators have expressed concern over the FAA's plan to install ADS-B equipment on aircraft. ADS-B requires transponders, called ADS-B "Out," to be installed on each aircraft to transmit aircraft location and other information to ground stations. The FAA wants ADS-B "Out" to become mandatory by 2020. But the airlines want more specific information regarding system requirements, as well as further details about ADS-B "In" – systems designed to provide pilots with the same information that ground stations receive. Many industry officials believe that the rules regarding ADS-B installation onboard aircraft were rushed. They want more input from industry in the rule-making process.

Despite these outstanding issues, the FAA will continue to upgrade the U.S. air traffic control system. Most experts believe that the current system will not be able to handle future increases in air traffic. In addition, many other countries are moving toward an ADS-B system. Australia and Canada have already begun installing the system; Sweden, Indonesia, New Zealand, and Thailand are investigating use of the system; and the European Union would like to install a similar system over European skies. In order to maintain interoperability, the United States will need to keep pace with the rest of the world.

Funding for ADS-B, which covers development, procurement, maintenance, and other operational costs, is expected to be at its highest during the 2009-2014 timeframe. By 2014, the FAA expects to have all ADS-B ground stations operational. Funding will slowly begin to decline after that point.

## Ten-Year Outlook

| ESTIMATED CALENDAR YEAR COMMINGLED FUNDING (in millions $) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Designation or Program** | | **High Confidence** | | | | **Good Confidence** | | | **Speculative** | | |
| | **Thru 2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **Total** |
| **ITT Corp** | | | | | | | | | | | | |
| **Automatic Dependent Surveillance - Broadcast (ADS-B)** <> United States <> FAA | | | | | | | | | | | | |
| | 165.65 | 306.77 | 201.35 | 230.15 | 251.11 | 258.12 | 248.64 | 202.41 | 165.00 | 123.00 | 109.00 | 2,095.55 |
| | | | | | | | | | | | | |
| **Total** | 165.65 | 306.77 | 201.35 | 230.15 | 251.11 | 258.12 | 248.64 | 202.41 | 165.00 | 123.00 | 109.00 | 2,095.55 |