



# BEYOND NEXTGEN: IMPLEMENTATION OF SPACE-BASED ADS-B

The Federal Aviation Administration (FAA) is modernizing the U.S. air traffic control system through its NextGen program. NextGen aims to increase efficiency and predictability within the National Airspace (NAS) while maintaining uncompromising safety standards. Automatic Dependent Surveillance-Broadcast (ADS-B) is a NextGen flagship program developed and operated by Harris Corporation. It provides enhanced GPS-based aircraft surveillance that improves air traffic safety and efficiency to airspace users.

## *However, what's next? What's beyond NextGen?*

Space-based ADS-B extends critical air traffic surveillance from the NextGen program beyond the reach of traditional ground stations in U.S. airspace; for the first time, space-based ADS-B is providing real-time coverage for the entire globe. Expanding ADS-B coverage through a space-based system will significantly increase the benefits in efficiency and safety to all stakeholders, and it requires no additional avionics beyond what is already mandated by the FAA for adoption by 2020.

## SHAPING SPACE-BASED ADS-B

The FAA manages the largest airspace in the world, with responsibility for more than 24,600,000 square miles of oceanic airspace. As such, the FAA plays an important role in the development and deployment of space-based ADS-B. The FAA was one of the first Air Navigation Service Providers (ANSPs) - and Harris one of the first systems integrators - to partner with Aireon to explore using space-based ADS-B in U.S. airspace. The FAA and Harris engaged in the development and the design of the Aireon<sup>SM</sup> system from its inception to influence critical safety and security requirements and to ensure the deployment of a robust surveillance system.

The FAA and Harris continue to collaborate with Aireon on the integration of space-based ADS-B into existing systems, test and validate performance, develop safety cases and explore business models.



Figure 1: ADS-B air traffic over North America, one of the world's busiest airspaces. The FAA manages over 24,600,000 square miles of oceanic airspace.

## BUILDING ON EXISTING TECHNOLOGY

Space-based ADS-B requires no new technology or modification to the avionics that the FAA mandated for adoption by 2020. Extending ADS-B coverage beyond the terrestrial network will result in net benefits to the business case used in the original economic analysis. The FAA will also benefit from an additional layer of surveillance with minimal changes to the existing Harris ADS-B system.

To support the test and validation of space-based ADS-B services, the FAA has integrated and processed Aireon space-based ADS-B data in test systems and the En Route Automation Modernization (ERAM) automation system at the FAA's William J. Hughes Technical Center.

The FAA and Harris are actively involved in the evaluation of Aireon surveillance data, focusing on four challenging oceanic airspace environments, specifically the key service volumes of New York Oceanic (including Bermuda), Miami Oceanic and San Juan. This testing will support the FAA's evaluation of end-to-end system performance, safety case development, and automation system integration.

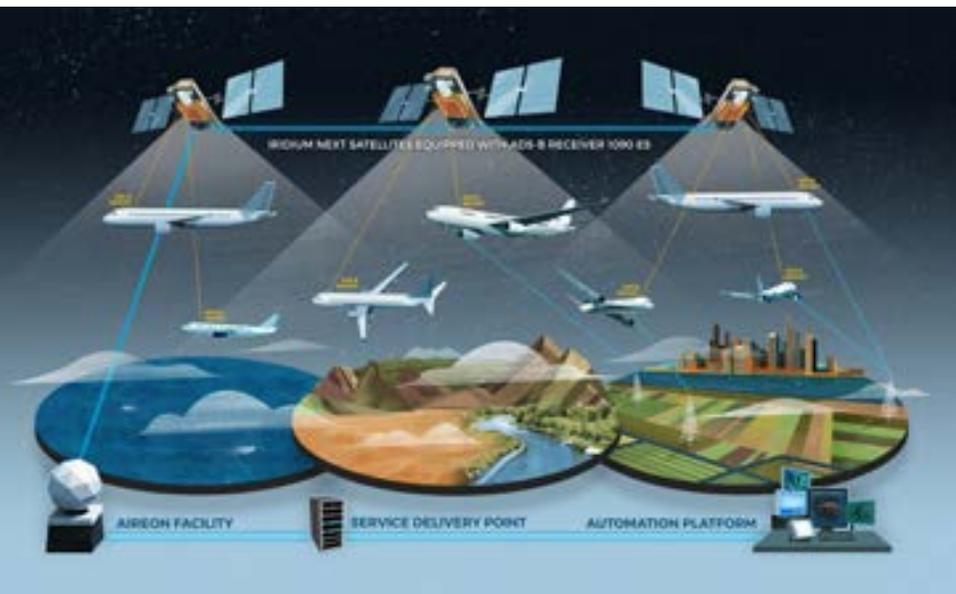


Figure 2: Space-based ADS-B from aircraft to automation platform.

*Continued collaboration between Aireon, Harris and the FAA will maximize the safety and efficiency benefits of this innovative technology.*

## DEPLOYMENT COLLABORATION

As an international leader in air traffic management, the FAA has an active role in the International Civil Aviation Organization (ICAO) North Atlantic Systems Planning Group (NAT SPG), which continuously studies, monitors and evaluates the air navigation system for changing traffic characteristics and technological advances. The FAA is working with the NAT SPG as it considers the deployment of space-based ADS-B in the North Atlantic.

Additionally, the Radio Technical Commission for Aeronautics' (RTCA) NextGen Advisory Committee's report on "Enhanced Surveillance Capabilities in FAA Controlled Oceanic Airspace: Operational Need and Added Benefits" was supportive of space-based ADS-B deployment. Written by airlines and RTCA, the report recommended that the FAA proceed with the introduction of enhanced surveillance capability in oceanic airspace to support seamless Air Traffic Control (ATC) surveillance, enhanced efficiency and predictability, and more precision than available today.

Aireon and Harris are collaborating on additional airspace service volumes to support the FAA, and over time, testing will extend to additional FAA airspace, including the Pacific Ocean, Gulf of Mexico and Alaska.

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