



**Agenda Item 3: Report of activities and deliverables of the INTEROP TF and Subgroups**  
**b) CNS Implementation. Progress of the Subgroups.**

**BENEFITS OF SPACE-BASED ADS-B FOR  
AIR TRAFFIC FLOW MANAGEMENT (ATFM)**

(Presented by Aireon)

**SUMMARY**

This information paper presents the significant benefits of Space-based ADS-B for air traffic flow management (ATFM).

**Reference:**

- Air Traffic Services Planning Manual Doc 9426

**1. Background**

1.1 Air traffic flow management (ATFM) is the process of ensuring that air traffic flows smoothly and safely through the airspace. ATFM aims to balance the demand for air traffic with the available airspace capacity, and it has become an increasingly important aspect of air traffic management over the years.

1.2 The history of air traffic flow management can be traced back to the early days of commercial aviation. In the 1930s, air traffic control (ATC) was primarily a safety-focused operation, and there was little concern for managing the flow of air traffic. However, as air travel became more popular and the number of flights increased, it became apparent that a more efficient system was needed to manage the growing demand for airspace.

1.3 In the 1950s and 1960s, the first attempts were made to develop an air traffic flow management system. These early systems were rudimentary, and they relied on manual coordination between air traffic controllers and airline dispatchers. In the 1970s, with the advent of computer technology, the first automated ATFM systems were developed. These systems used computer algorithms to predict airspace demand and capacity, and they provided real-time information to air traffic controllers to help them manage traffic flow.

1.4 In the 1980s and 1990s, ATFM systems became more sophisticated, and they were integrated into the larger air traffic management system. These systems were able to provide more accurate predictions of airspace demand and capacity, and they were better able to handle unexpected events such as weather disruptions or equipment failures.

1.5 In the early 2000s, ATFM systems began to take advantage of new technologies such as satellite-based navigation and communication systems. These technologies allowed for more precise and efficient routing of aircraft, which in turn reduced congestion in the airspace. At the same time,

ATFM systems began to incorporate more data sources, such as weather radar and airline flight plans, to improve their predictions of airspace demand and capacity.

1.6 Today, ATFM systems are highly automated and sophisticated. They rely on a wide range of data sources and use complex algorithms to predict airspace demand and capacity. These systems are integrated with other air traffic management systems, such as surveillance and communications, to ensure a balance between demand and capacity.

## 2. Analysis

2.1 Space-based Automatic Dependent Surveillance-Broadcast (ADS-B) refers to a system that utilizes satellites to receive and relay aircraft position information. Implementing Space-based ADS-B service offers several significant benefits to air traffic flow management (ATFM):

- Enhanced Surveillance Coverage: Space-based ADS-B extends surveillance coverage to areas where ground-based infrastructure is limited or non-existent. Remote regions, oceanic areas, and polar regions can now be effectively monitored, enabling better management of air traffic flow across the globe.
- Improved Situational Awareness: By providing real-time, accurate, and reliable aircraft position information, Space-based ADS-B enhances the situational awareness of air traffic controllers. This enables them to make informed decisions regarding route planning, traffic sequencing, and airspace utilization, leading to more efficient traffic flow management.
- Increased Safety: The availability of comprehensive surveillance data through Space-based ADS-B reduces the risk of mid-air collisions and enhances overall flight safety. Air traffic controllers can proactively detect and resolve potential conflicts, maintaining appropriate separation between aircraft and ensuring a safer airspace environment.
- Efficient Resource Allocation: Space-based ADS-B enables more precise tracking of aircraft trajectories, allowing for optimized routing and allocation of airspace and resources. By accurately predicting aircraft positions and arrival times, ATFM systems can efficiently manage air traffic demand, reduce congestion, and minimize delays.
- Seamless Integration: Space-based ADS-B can seamlessly integrate with existing ground-based surveillance systems, providing a harmonized surveillance picture for air traffic management. This integration facilitates the coordination and exchange of information between different air traffic control centers, enhancing overall efficiency and collaboration.

2.2 The implementation of Space-based ADS-B service brings significant benefits to air traffic flow management. Enhanced surveillance coverage, improved situational awareness, increased safety, efficient resource allocation, and seamless integration with existing systems all contribute to a more effective and optimized management of air traffic, resulting in safer, more efficient, and less congested skies.

2.3 AireonFLOW is a data service that provides Air Traffic Management (ATM) surveillance quality data within a designated primary Area of Responsibility Service Volume (AOR) and, typically, up-to 3000 NM beyond (the “Long-Range Area Service Volume”) to support air traffic flow management initiatives. Customers can define their Long-Range Area Service Volume to meet their unique operational objectives.

2.4 Leveraging Aireon’s streaming platform, customers such as EUROCONTROL receive a stream of Space-based ADS-B data. In their AoR, EUROCONTROL receives a data stream of all

available aircraft. In the Long-Range Area Service Volume, EUROCONTROL provides Aireon with access to their Flight Plans via the AMHS network. Aireon integrates these flight plans with AireonFLOW data and provides a tailored stream of data that identifies only those flights for which flight plans have been provided. Aircraft position updates are provided at a standard rate of sixty seconds to support forecasting a time of arrival into an airspace or an airport while keeping data flows at a manageable volume. The Figure 1 below depicts Eurocontrol’s AireonFLOW Area of Interest data stream.



Figure 1

2.5 Key components of the AireonFLOW service are highlighted in the below diagram (Figure 2).

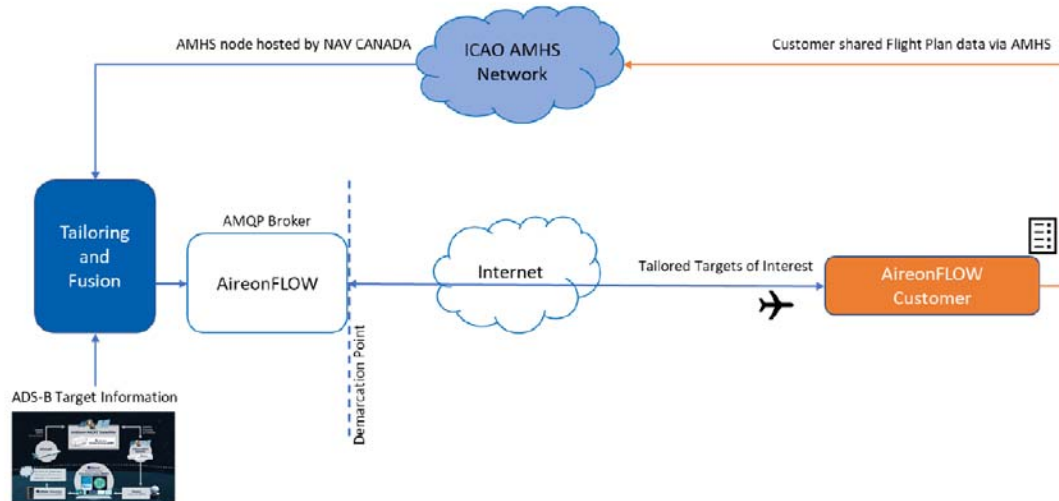


Figure 2

**3. Suggested Action**

3.1 The Meeting is invited to take note of the information provided.