



Operational Efficiency and Enhanced Safety through Satellite Connectivity

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WE GET SAFETY

- Inmarsat established 35 years ago
- Principle of reliability, dependability and availability
- Today the only provider of maritime GMDSS
- Invested \$3bn in satellite fleet since 2005



INMARSAT: AVIATION'S BEST KEPT SECRET

30 years Experience



Over 30 years experience and operating on 95% of transoceanic aircraft

Purpose-built for Aviation



Built to serve the needs of the aviation industry - built for routes, not gaps and with technology that can provide capacity where and when it is needed

Financial Muscle



FTSE 250 company with a market capitalisation of over \$3bn demonstrating the kind of financial stability required to compete in this market

Ongoing Investment



We've spent over \$2bn in the last 5 years alone, and have similar ongoing investment plans for the next 5

Future-proofed partner



We are not just a satellite company.

We are your connectivity partner.

We exist to help you make the most of the opportunities associated with inflight connectivity

Commercial in confidence

INMARSAT IS AVIATION SAFETY TODAY

Aircraft Position Reports

100 | **35**
thousand | **million**
Per day | Per year



Onboard

95
percent

Of oceanic aircraft



11,500

Planes fly with Inmarsat



Between 2001 and 2016, in oceanic regions, satcom generated a **\$3 billion benefit** for airlines*

AOC Benefits: \$1.9B



- Improved delay management and scheduling



- Improved maintenance capability



- Better fleet management



- Better flight crew management



- Reduced turnaround time



- Increased efficiency and predictability

ATC Benefits: \$1.1B



- Reduced separation standards



- User preferred route



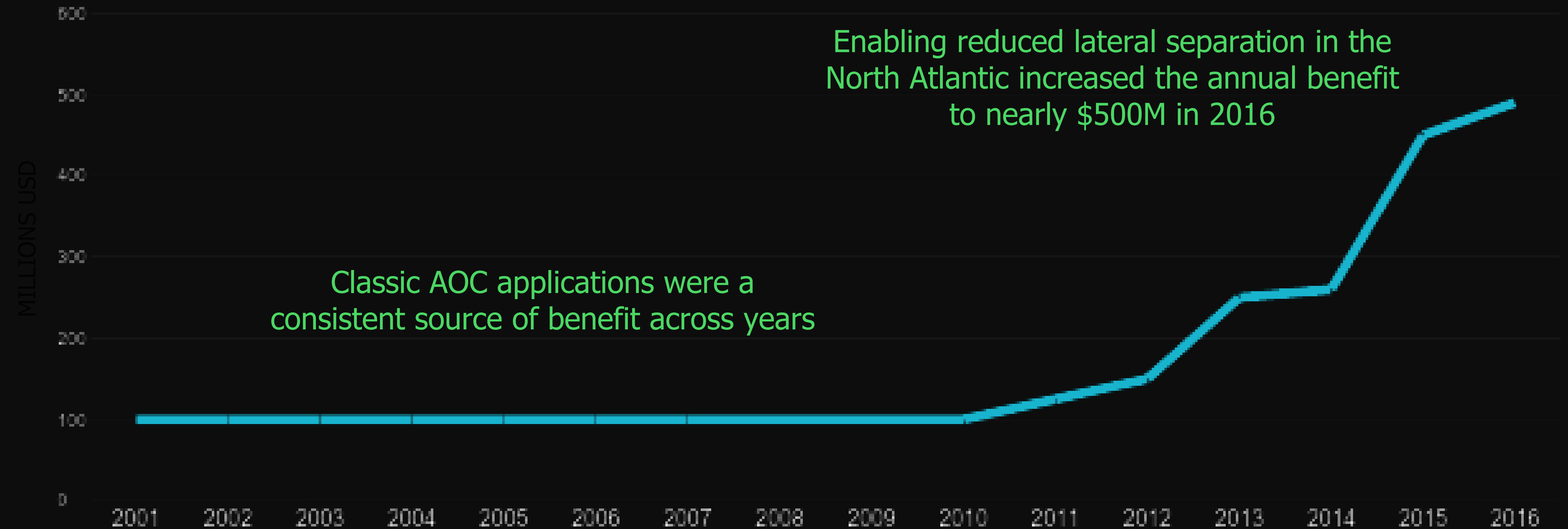
- Tailored arrivals



- Dynamic airborne reroute procedure

REDUCED SEPARATION WAS THE KEY DRIVER BEHIND BENEFIT GROWTH

Between 2013 and 2016 the benefits grew at an average annual rate of 35%



The Future: Moving from Oceanic Communications to Everyday Operations



Commercial in confidence

Resilient, Reliable Broadband Connectivity

SwiftBroadband-Safety

Up to **1.7** mbps

VDL



kbps
31

Classic Aero



kbps
10.5

VHF



kbps
2.4

HF



kbps
0.3

Secure



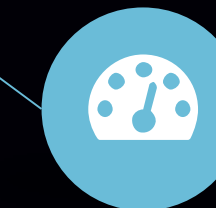
Global



Broadband for the
cockpit

HIGH SPEED, HIGH VOLUME,
SECURE NETWORK

High Speed



inmarsat
aviation



Real-time Aircraft Telemetry for Maintenance and FOQA



FLIGHT DATA PARAMETERS

INFLIGHT DATA QUERIES

REAL-TIME QUICK ACCESS RECORDER

VIDEO CHAT AND INCIDENT ASSISTANCE

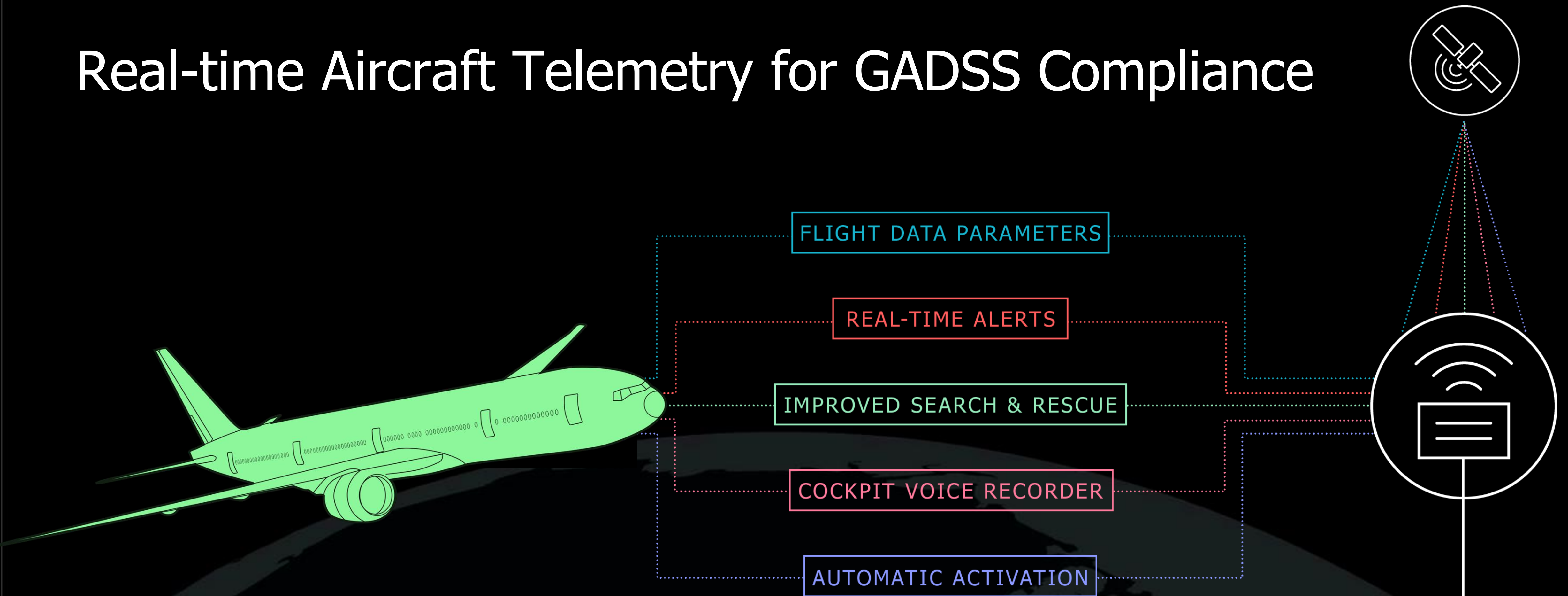
EFB INTEGRATION



Operational Benefits

- Flight data is immediately accessible to maintenance and dispatch when needed
- Flight data streams can be custom tailored and queried in real time
- To assist operators with performance optimisation, incident assistance and advanced scheduling
- To assist airframe and engine OEMs with maintenance and performance monitoring

Real-time Aircraft Telemetry for GADSS Compliance



GADSS Compliance

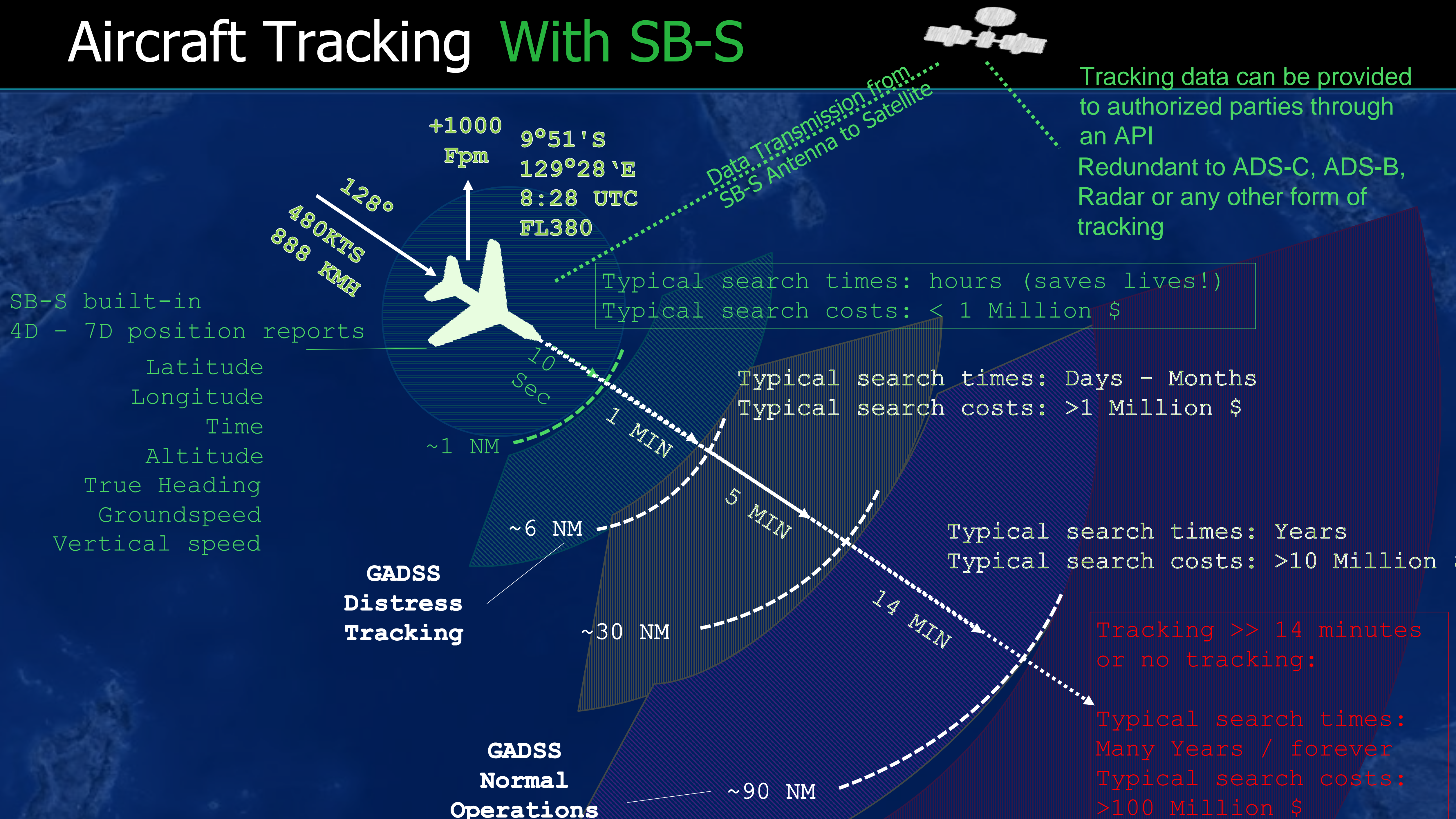
- Compliant with GADSS aircraft tracking and flight recorder data recovery. Flight data stored in a Black-box in the Cloud (BBiC) would be immediately accessible for Accident Investigators without having to wait for the recovery of the physical flight data and voice recorders.
- Integrates GADSS Global Aircraft Tracking
- Flight trials for service evaluation will begin in 2018

GADSS AUTONOMOUS DISTRESS SYSTEMS THAT HELP AIRLINES AND CREWS IN EMERGENCY SITUATIONS

EVENT TRIGGER (S):
HYDRAULIC FAIL, ENGINE OVERSPEED

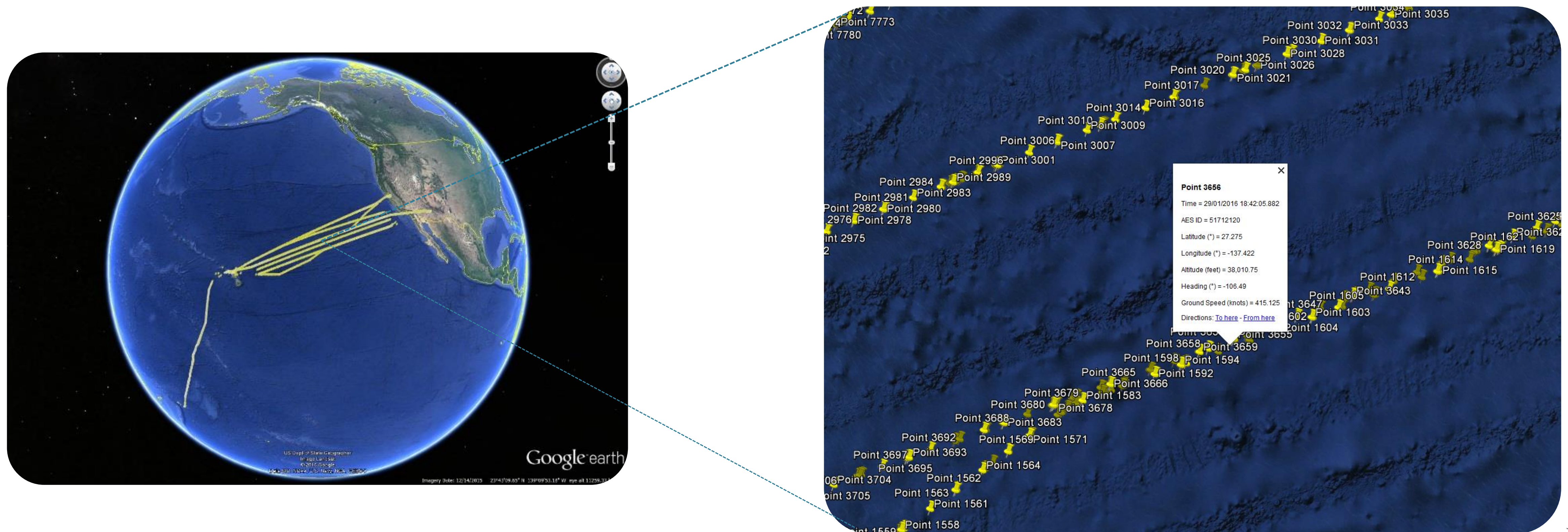


Aircraft Tracking With SB-S



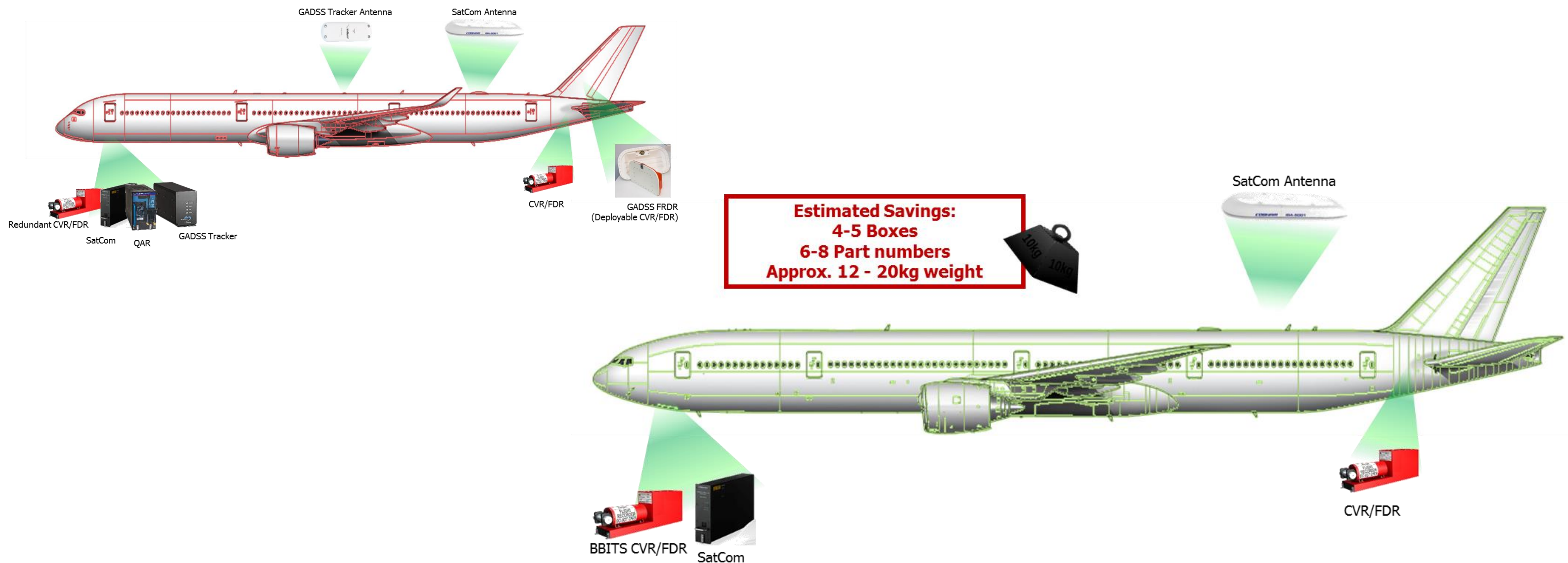
Integral position reporting in action

SB-S built in position reporting feature in action on Hawaiian Airlines



SB-S Lightens Your Load

Reduced weight and operating expenses through SB-S



SB-S in the regulatory environment

Engaging with global aviation bodies to improve safety and operations for the future

GADSS



Autonomous
distress tracking
systems aiding
search and
recovery

SESAR Europe



Enabling the SESAR
concept with
efficient data link
services

Iris Europe



Modernising and
securing European
air traffic
management

TASAR

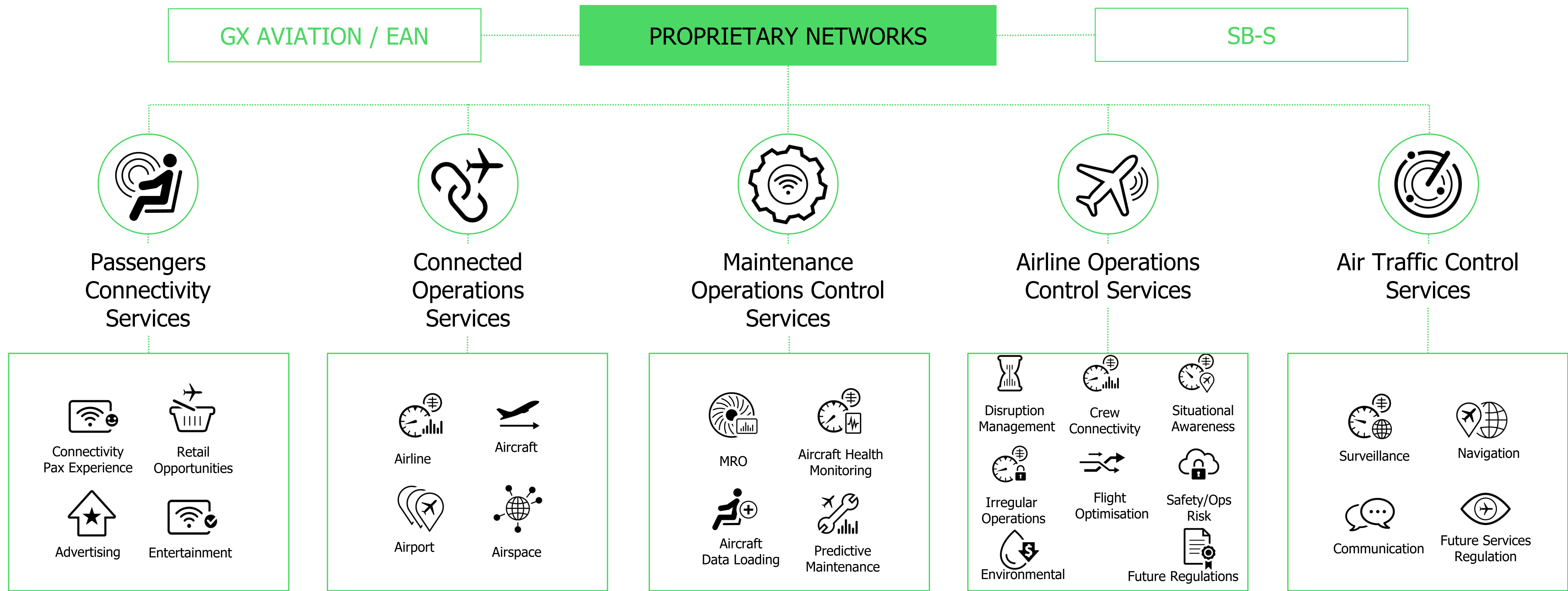


Improving
communication to
increase efficiency

SwiftBroadband-Safety Application Partner Program

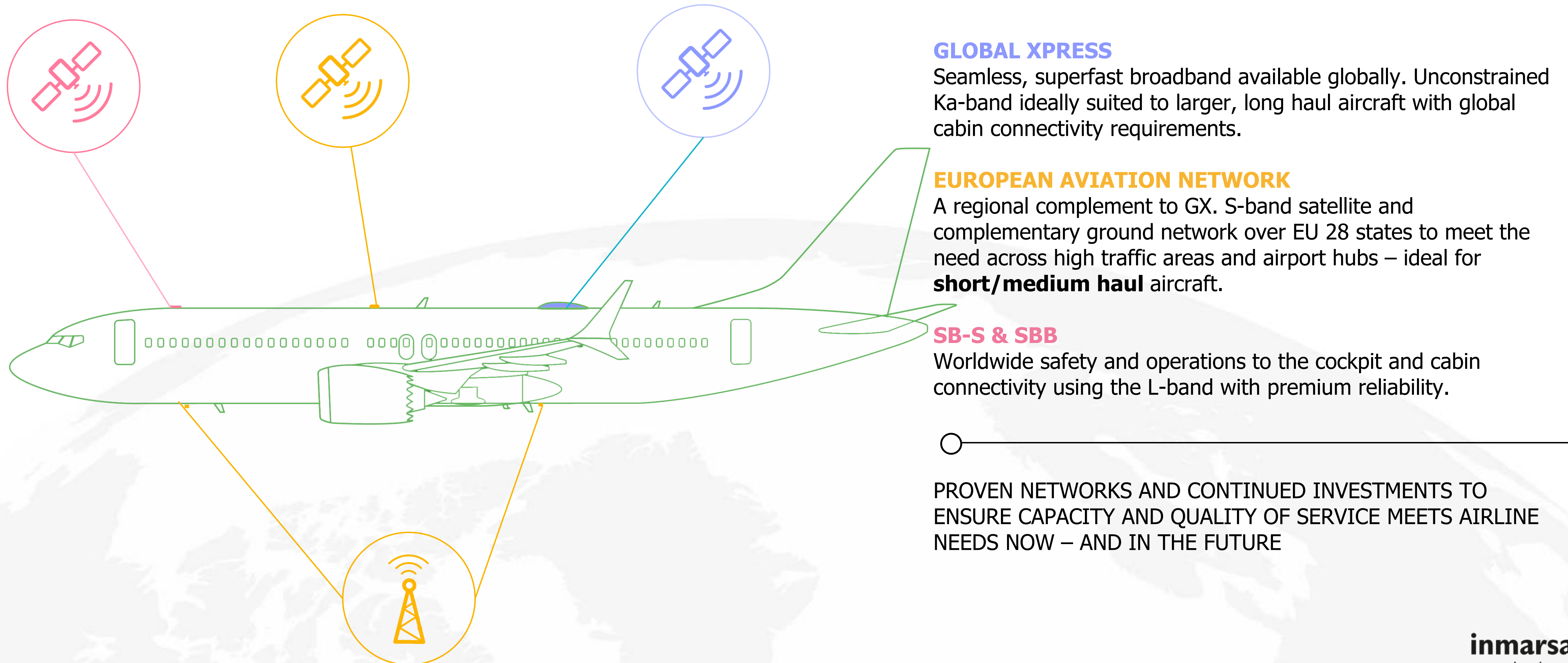


ONLY INMARSAT CAN DELIVER INTEGRATED GLOBAL CONNECTIVITY FOR YOUR ENTIRE OPERATION



INMARSAT AVIATION NETWORKS FOR THE COMPLETE CONNECTED AIRCRAFT: GLOBAL, INTEGRATED, FIT-FOR-PURPOSE

SCALABLE, BUNDLED SOLUTIONS: GLOBAL/ REGIONAL, FLIGHT DECK/CABIN, AIRCRAFT, SPEED AND QoS TO SUIT



SWIFTBROADBAND-SAFETY TAKES FLIGHT



Next**GEN**

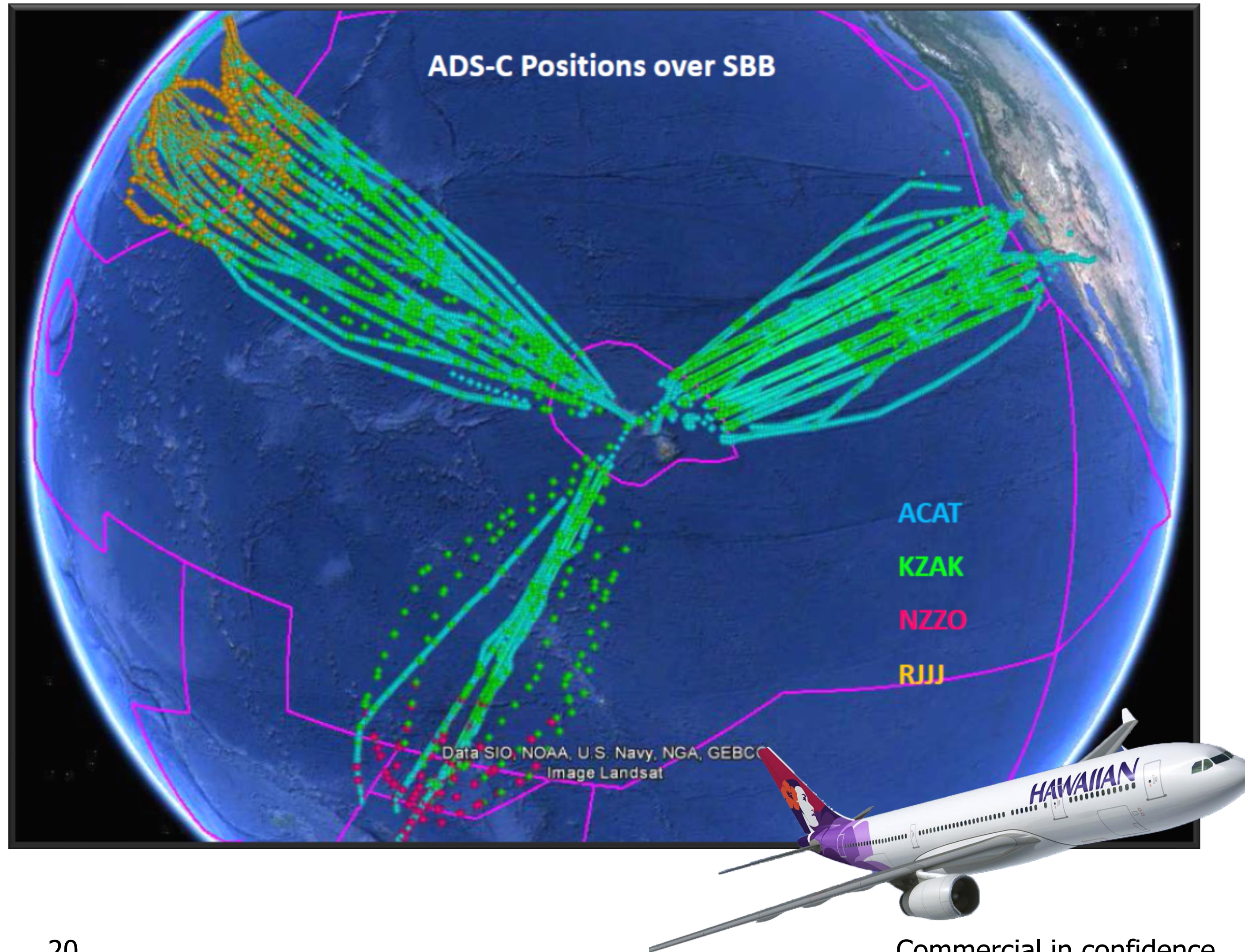
← Powering →

Commercial in confidence

SESAR
DEPLOYMENT MANAGER

inmarsat
aviation

Hawaiian Airlines : Pioneers of Broadband Cockpit Connectivity



- First commercial airline to fly with SB-S starting in June, 2015.
- The ACARS data was essential for proving the performance of the system for safety critical surveillance functions (FANS).

➡ *PARC Recommendation achieved!*

- In addition to ACARS, HAL will use the SB-S terminals to support real-time high resolution weather, wind and convective updates to the EFBs in flight
- Representative of the next generation of connected EFBs which will vastly enhance real-time situational awareness and decision support.

HAL's Experience: Overwhelmingly positive!

"The quality of voice communication has improved so much that it's like using a telephone, or your cell phone, or a very good landline."

- Captain David Valente,
Boeing 767 Fleet Captain,
Hawaiian Airlines

"And in fact, it's working better than other alternative satellite communication technologies."

- Dan Smith, Systems
Engineering Manager,
Hawaiian Airlines

"The results thus far have been very promising. And frankly as we learn more of the capabilities that will continue to evolve, I suspect we will continue to develop uses of the product that we haven't even imagined."

- Ken Rewick, Vice
President Flight
Operations, Hawaiian
Airlines



SB-S won the 2018 Jane's ATC Award



“The SwiftBroadband-Safety (SB-S) satellite communications platform for the flight deck is designed to meet the needs of the modern flight deck, combining cutting-edge satellite technology with secure IP broadband connectivity.”

(IHS Markit / Jane's)

Summary: The Next Generation SatCom is Here!

CAPABILITIES



Fuel and CO₂ savings

Flight optimization EFB apps (graphical weather)

Lighter avionics

Optimised profile descent (i4D)

Better routes reduce emissions



Increased capacity

Higher frequency position reporting

**Improved ATC communications (Voice over IP,
ACARS over IP)**



Secure, enhanced safety

Global Flight Tracking

Black box in the cloud (BBiC)

99.9% reliability

Data fortress door



Better asset utilisation

Pre-position parts for better turnaround

Reduce medical diversions (telemedicine)

Tech log, crew schedules



Increased
revenue

BRING IT  ON

Commercial in confidence



THANK YOU

Hannes Griebel
Inmarsat