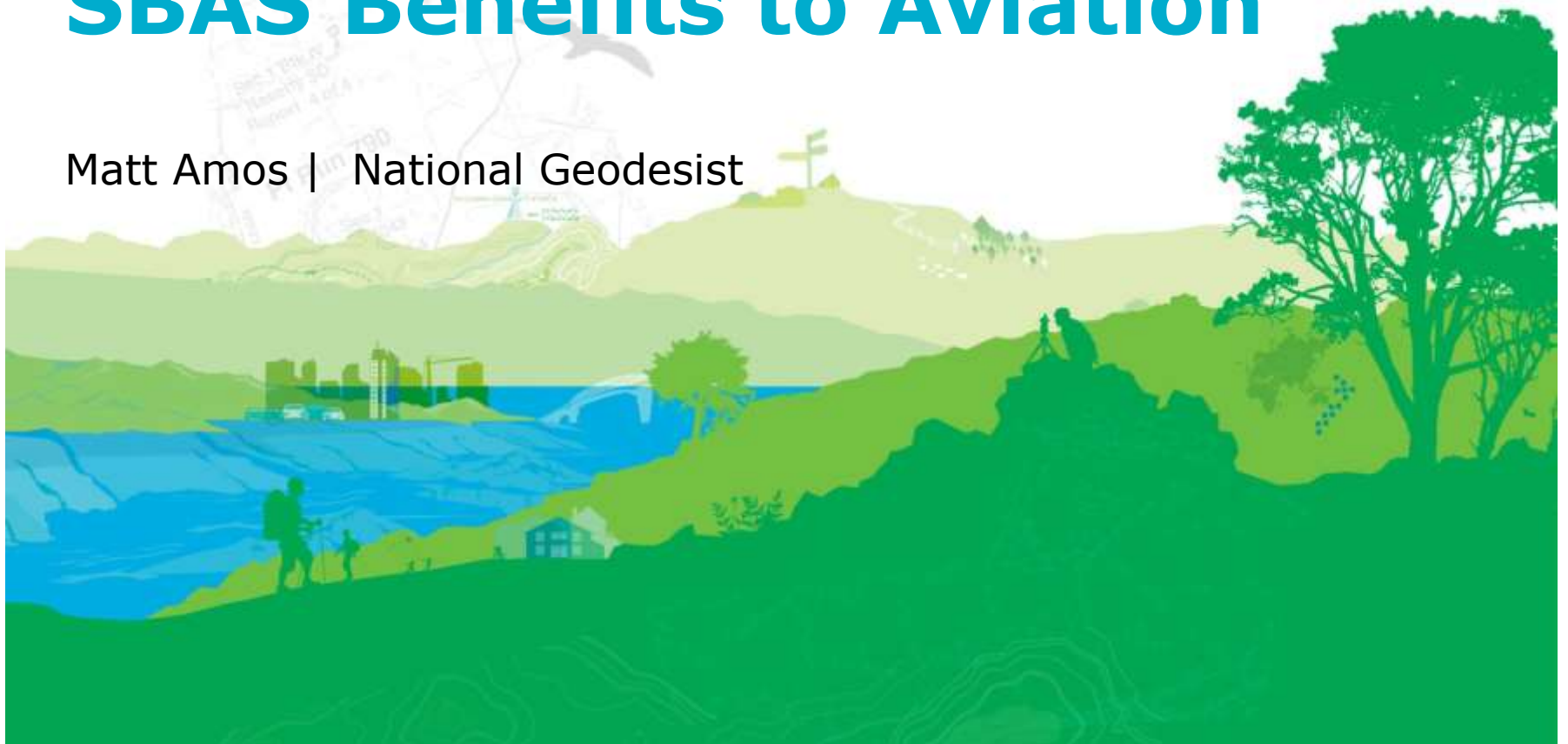


SBAS Benefits to Aviation

Matt Amos | National Geodesist





Satellite Based Augmentation Systems

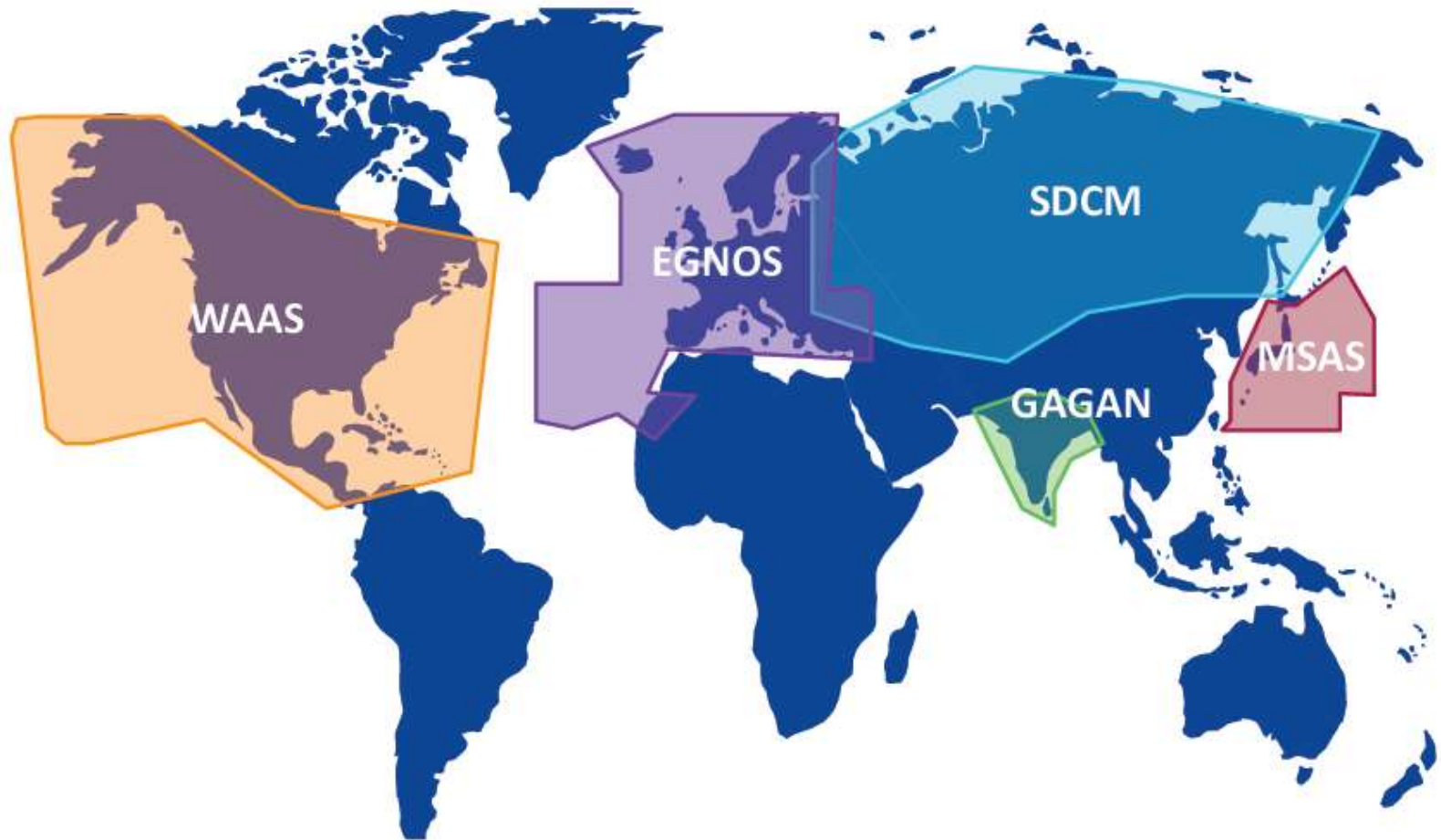


Satellite Based Augmentation Systems

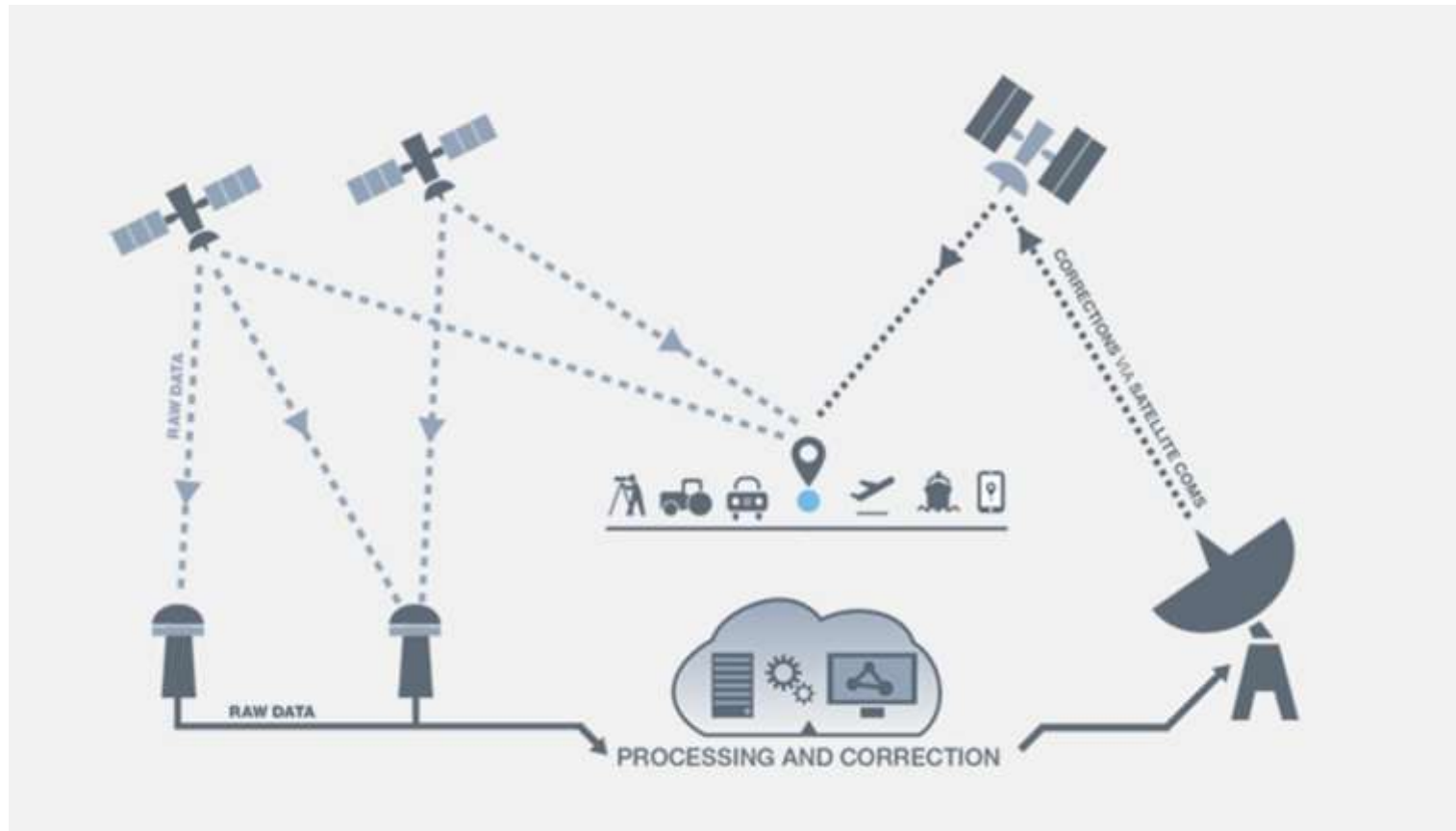


- System to improve accuracy and integrity of GNSS positions, headings and velocities
- GNSS – Global Navigation Satellite System
 - GPS
 - GLONASS
 - Galileo
 - Beidou
- Aviation certified SBAS include:
 - WAAS – Wide Area Augmentation System
 - EGNOS – European Geostationary Navigation Overlay Service

Existing SBAS



SBAS System Components



SBAS Services



- L1 GPS
 - Achieve RTCA/DO-299D MOPS
 - Well established for aviation
- DFMC (Dual Frequency Multi Constellation)
 - Includes two signals (L1 & L5) and multiple GNSS constellations
 - Improved atmosphere and multipath mitigation
 - Improved performance in challenging environments
- PPP (Precise Point Positioning)
 - More accurate than SBAS
 - Relatively long convergence times (at present)



Australasian SBAS Test Bed



Australasian Trial Objectives



1. Assess current and future technology
2. Explore current industry positioning requirements
3. Explore industry innovations

Ultimately, determine benefits of SBAS to the New Zealand and Australian economies



Australian Government

Geoscience Australia



Land Information
New Zealand

Toitū te whenua

FRONTIER S I >

NZ Government Participants



What is Being Tested



- L1 SBAS (GPS)
- DFMC SBAS (L1+L5 GPS+Galileo)
- PPP (L1+L5 GPS+Galileo)

- 28 trial projects
- 10 sectors: Agriculture, Aviation, Construction, Consumer, Maritime, Rail, Resources, Road, Spatial, Utilities
- 2 aviation projects (Airways NZ, Airservices AU)



SBAS Benefits to Aviation



SBAS Benefits



- GNSS already provides lateral guidance to support PBN standards for some phases of flight
- SBAS provides enhanced vertical positioning with GNSS
- SBAS can enable CAT I “ILS-like” approaches at airports and helipads without ILS equipment
- Doesn’t require infrastructure to be installed at each airport

Reduced Risk of CFIT



**Better access across
New Zealand**



**Safer approaches –
by eight times**

Increased Network Reliability

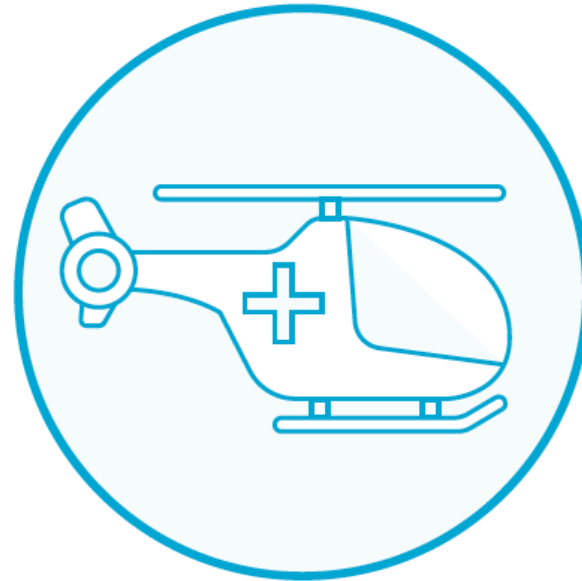


Fewer cancelled flights



Improved safety in bad weather

Increased Successfully Completed Rescue and Medical Flights



**Operating benefits for
emergency and rescue
helicopters**

Summary



- SBAS is an existing technology that benefits many sectors
- Different sectors require different SBAS services
 - L1 SBAS is essential for aviation
- Aviation benefits fall into 3 major categories
 - Reduced risk of CFIT
 - Increased network reliability
 - Improved rescue and medical flights

Questions?

