

Australian Update

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Presentation Outline

- **Update on Positioning Australia Program**
- **Continuing Development of Mass Market Positioning**

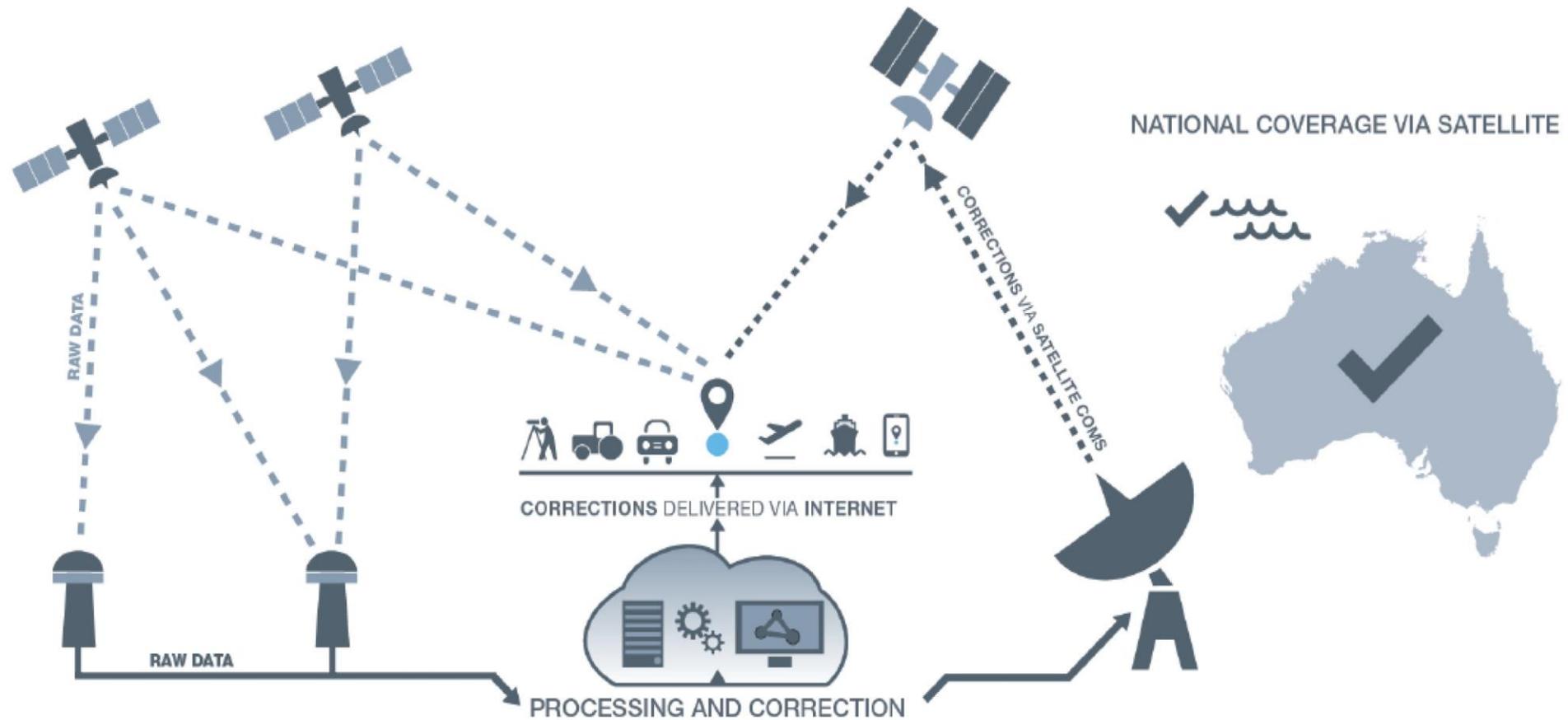




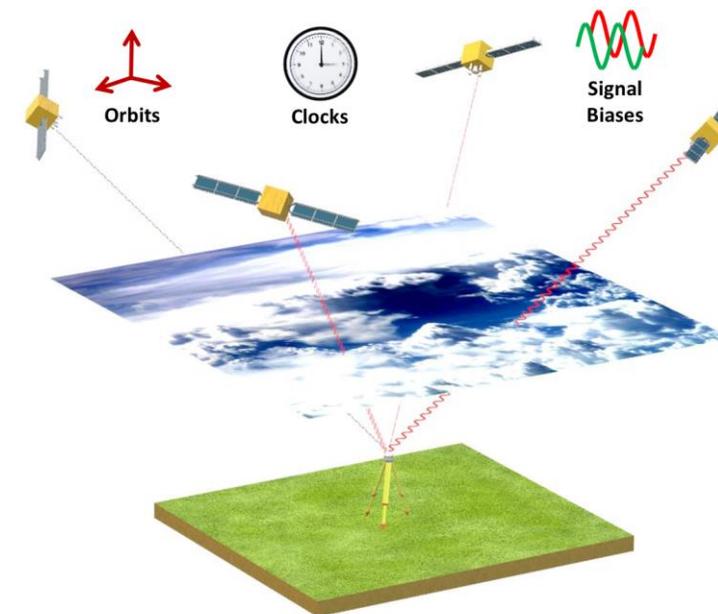
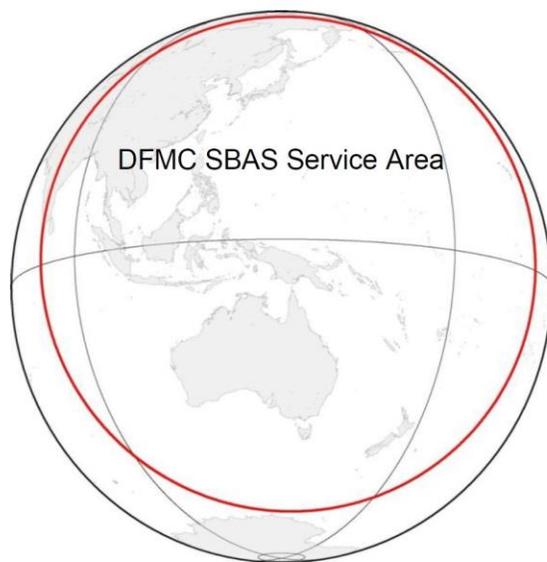
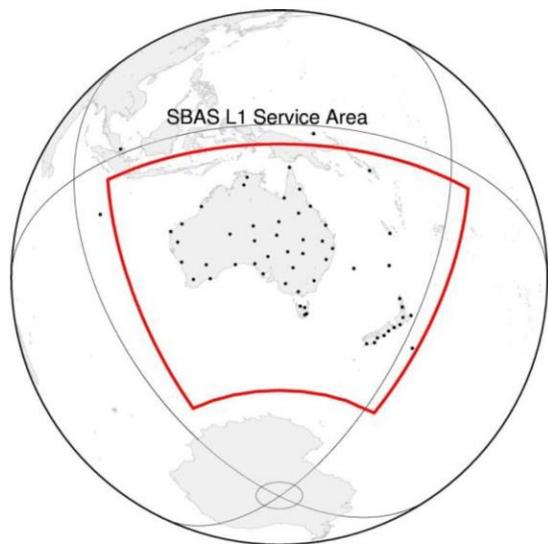
**POSITIONING
AUSTRALIA**



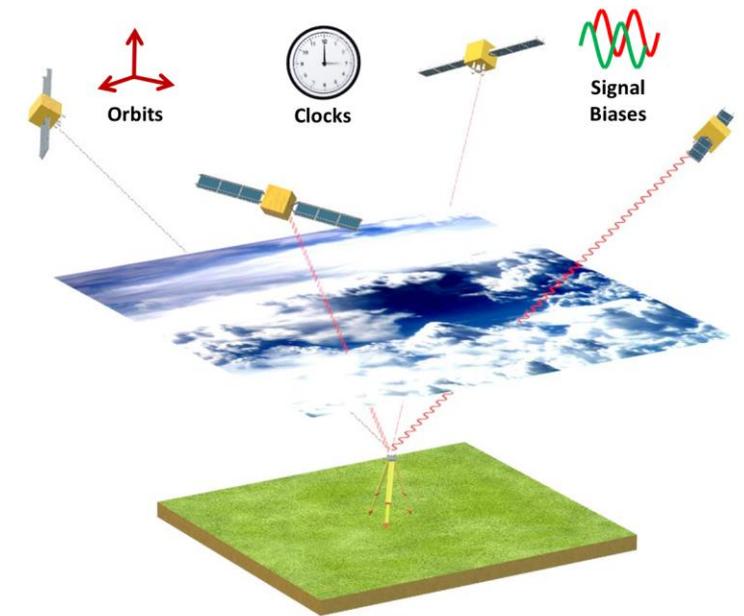
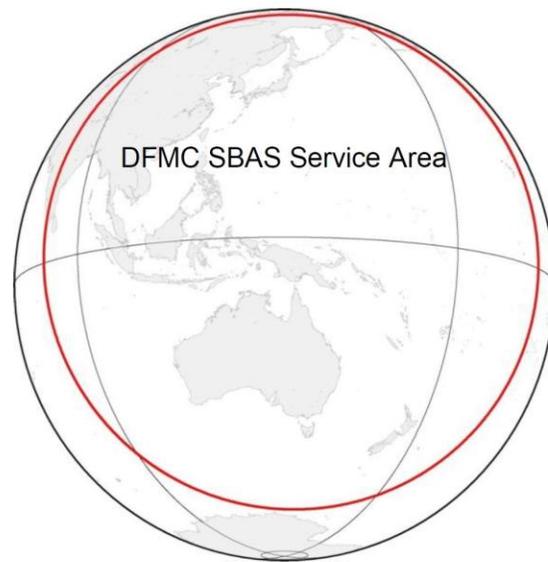
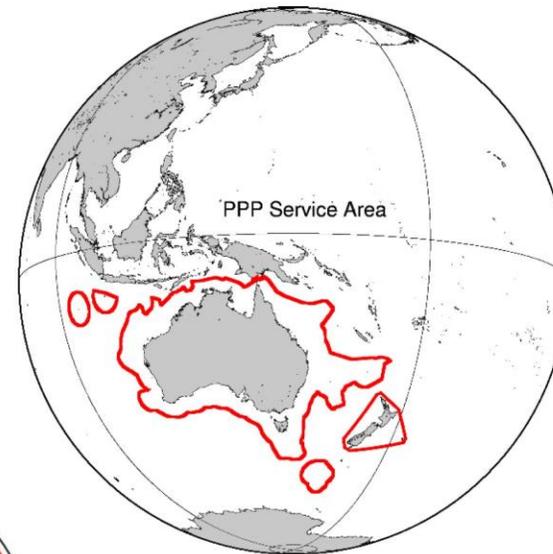
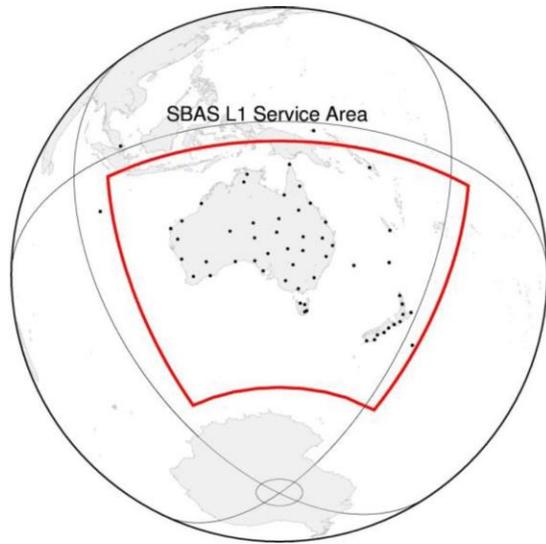
SBAS – L1 – DFMC – Precise Point Positioning



Coverage for Each Service



Coverage for Each Service



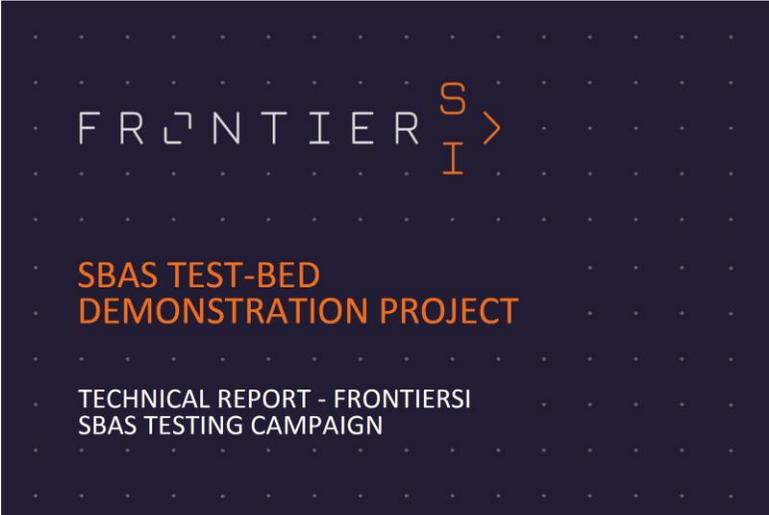
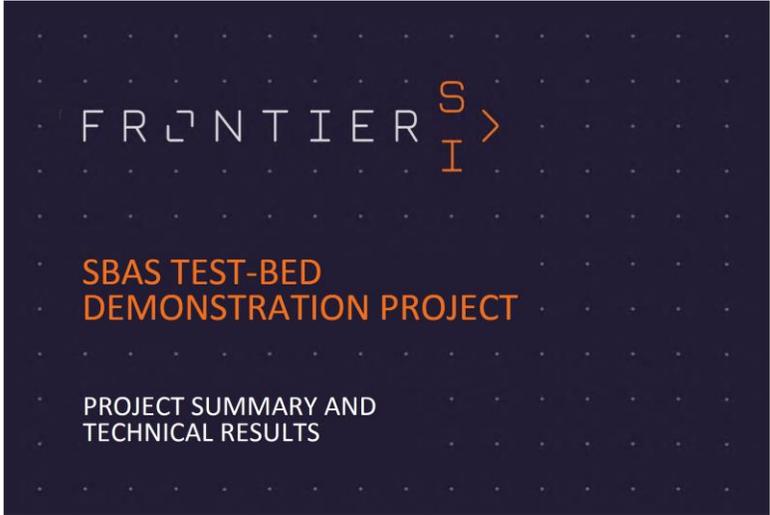
SBAS Procurement Timetable

- Request For Information currently out on AusTender (GA2019/2994)
- Market analysis complete in October 2019
- Request For Tender in January 2020
- Contract Award September 2020
- System Design, Implementation, Verification from Oct '20 to Nov '23
- Safety of Life Certification by November 2023

Source: Reynolds, Geoscience Australia, September 2019.



Australia and New Zealand



<https://frontiersi.com.au/project/satellite-based-augmentation-system-test-bed/>



Economic Benefits Analysis

- Economic benefits analysis considered
 - Health and safety
 - Operational savings: labour and other productivity
 - Environmental
 - Capital expenditure avoidance
 - New revenue
- Report based on two years of analysis of real applications, with real users, using a satellite signal in space

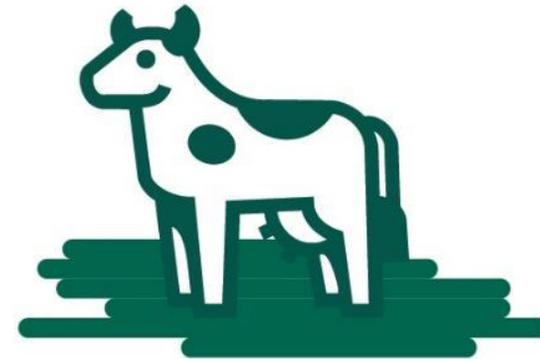
Source: Reynolds, Geoscience Australia, September 2019.



Australia and New Zealand

LIVESTOCK MONITORING: SAVE \$100 PER DAIRY COW

every year with virtual fencing
and 6 million sellable Australian
sheep valued at \$80 million



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PRECISION AGRICULTURE:

Improve the efficient spraying of nutrients, chemicals and water by 1-7%



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FORESTRY: AVOIDANCE OF 2700 HEALTH AND SAFETY INCIDENTS



Source: Dawson, October 2019



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**SAVE \$205 MILLION
THROUGH INCREASED
EFFICIENCY DURING
BLACKOUTS**



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MISPLACED FREIGHT CONTAINERS REDUCED BY 16,000



Australia and New Zealand

INCREASED VESSEL CAPACITY OF 1375 DAYS

for port operations



Australia and New Zealand

INCREASE OF 1866 SUCCESSFULLY COMPLETED

medical helicopter rescue missions
in remote locations



Australia and New Zealand

**AVOID 1700 FALLS FROM
HEIGHT SERIOUS INJURIES
AND 7 FATALITIES**

with geo-fencing



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ACCESSIBLE CITY NAVIGATION: ENABLE ASSISTIVE TECHNOLOGIES

for the visually impaired, reducing
the risks of incidents associated
with trips, falls and collisions



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PROVIDES MORE EFFICIENT OPERATION MANAGEMENT

and control of the movement of trains



Australia and New Zealand

REDUCE VEHICLE COLLISIONS ON MINE SITES

through SBAS enabled Collision Avoidance
Systems with three fatalities avoided
in open pit mines



Mass Market Positioning



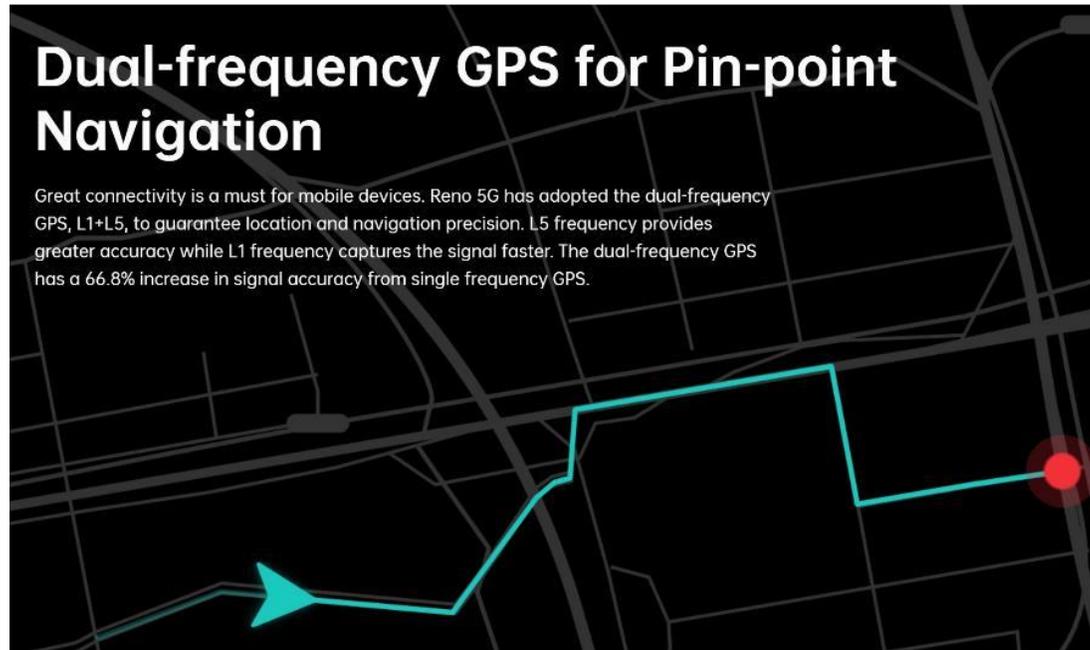
Dual Frequency GNSS Phones are now proliferating...

 **Mi 9**



Dual-frequency GPS for Pin-point Navigation

Great connectivity is a must for mobile devices. Reno 5G has adopted the dual-frequency GPS, L1+L5, to guarantee location and navigation precision. L5 frequency provides greater accuracy while L1 frequency captures the signal faster. The dual-frequency GPS has a 66.8% increase in signal accuracy from single frequency GPS.

A dark-themed navigation map with a cyan line representing a route. A red dot marks a specific location on the map, and a cyan arrow points towards it from the bottom left.

HUAWEI Mate20
CO-ENGINEERED WITH 



Proliferation of Dual Frequency GNSS Phones Continues

Smartphone Gets Dual-Frequency with BeiDou-3

The latest Lenovo smartphone, model Z6 SE, offers dual-frequency GNSS capable of tracking the latest BeiDou-3 signal using an Allystar chipset.

Allystar says this is the first time a smartphone supports the new BeiDou signal. Fitted with a Allystar HD8040 series chipset, the Lenovo Z6 youth edition provides position accuracy up to sub-meter, according to Allystar.

The HD8040 supports all civil signals on the L5 band. Besides GPS/QZS L5 and Galileo E5a, the BeiDou-3 signal B2a already has been implemented to maximize the visible satellites in L5 band.

With dual-frequency capability, the receiver tracks more than one signal from each satellite on different frequencies — GPS L1 and L5, Galileo E1 and E5a, and BeiDou B1 and B2a.

B2a will replace B2I and broadcast on medium Earth orbit (MEO) and inclined geosynchronous orbit



Images: Allystar

(IGSO) satellites. The code lengths are 10230, which have better anti-cross-correlation performance and are designed with a separated pilot component and data component to improve tracking sensitivity.

Multipath can lead to positioning inaccuracy of up to several meters, caused by signals bouncing off of higher buildings. This error can be nullified and mitigated by using two frequencies instead of one in urban areas. Under a relatively open-sky environment, measurement error caused by the ionosphere is usually



eliminated by a linear combination of dual frequencies to achieve sub-meter accuracy. 🌐

Source: GPS World Magazine July 2019



IGNSS 2020

Sydney, Australia

5 - 7 February 2020

www.ignss2020.unsw.edu.au

Thanks for your attention - matt.higgins@qld.gov.au

