

PUBLIC SAFETY MOBILE BROADBAND STRATEGIC ROADMAP

SMARTER

STRONGER

FASTER

Executive Summary

Public safety mobile broadband is the most significant advancement in public safety communications in decades

We depend on our Public Safety Agencies (PSAs) to protect the Australian community, and they do it every day. Around the country over 550,000 women and men work selflessly to uphold and protect our Australian way of life.

Communication is critical to that work. Smart, strong and fast systems enable better decisions that save lives. Over 6.3 million Triple Zero (000) calls are made every year in Australia. Each one of those calls triggers a complex systematic response underpinned by mission- critical grade radio communications. Put simply, these communications systems have been built not to fail.

Australia is changing. We will endure more regular, extreme weather events, more sophisticated criminal activities enabled by emerging technology and a continued terrorist threat from those who seek to disrupt our values. This is happening when our population and industry centres are becoming more concentrated; supply chains are longer and more interdependent; and Australia's population is growing.

To keep Australians safe in this rapidly changing context, our emergency services need to continue to work with the best technology. This means carefully transitioning to mobile broadband- based applications and technologies for public safety purposes. These applications and technologies will improve operational efficiency and effectiveness.

This transition will be complex. To achieve it, all Australian governments have agreed to the development of a national public safety mobile broadband capability. This will deliver the 21st century communications needed to ensure our PSAs can keep doing what they do best, reliably and without interruption.

The benefits of a Public Safety Mobile Broadband (PSMB) capability will be realised by all Australians for decades to come.

This strategic roadmap outlines the plan for making it happen.

PUBLIC SAFETY COMMUNICATIONS TODAY

Australia's PSAs are characterised by their professional and dedicated personnel, and the tools and technologies that support them.

While our existing public safety communications technologies are robust and have served the community well, they are limited.

These technologies — mostly land mobile UHF radio — cannot support heavy data traffic and web-based applications. This limits access to information, situational awareness and ultimately the capacity of our emergency service agencies to respond.

Today, emergency services gather information as best they can. In most cases situational awareness relies on manual submissions with different equipment and technical standards between jurisdictions and agencies. The result is often an incomplete picture of the broader situation.

Some emergency services utilise consumer-grade commercial mobile broadband networks to transmit data. These networks currently do not meet mission critical standards, but they are used to supplement existing systems.

A consumer-grade system is not the same as a mission-critical system.

Many emerging technologies, such as state-of-the-art situational awareness applications, cannot be fully utilised by our emergency services today because the data services they rely on do not reach mission-critical standards.

THE FUTURE

Deliver a smarter, stronger and faster communications platform which:

- **Improves access to information.**
- **Provides real-time, automated situational awareness.**
- **Creates a platform for emerging technologies to be integrated into the operational practices.**

A PSMB Capability for Australia will meet 11 national objectives. It will:

1. Be delivered through national cooperation and tailored to meet each jurisdiction's needs and circumstances.
2. Support the services and applications that Australia's PSAs need to use.
3. Have coverage where Australia's PSAs need it.
4. Ensure that those communications which matter most will get through first.
5. Have the capacity to manage the volume of communications required and to expand as needed.
6. Be available when Australia's PSAs need it.
7. Be secure.
8. Enable interoperable public safety communications.
9. Be accessible on any fit-for-purpose device.
10. Complement and, where appropriate, be integrated in existing public safety communications systems.
11. Be based on open standards to ensure the technology can evolve and is more cost effective and efficient.

On the following pages, we explore the potential of PSMB through real-life scenarios.

Scenario 1

Providing our police with the information they need to make the right decisions.

A police officer stands before a house. She is responding to a potential act of domestic violence. Through a web-based application on her hand held device and an in-car terminal, she has been provided detailed intelligence that was linked seamlessly to the dispatch call. This includes whether any firearms or other weapons are registered at the address. This has all happened in the four minutes it took to drive to the incident.

When she arrives at the house the police officer updates her status for the police operations centre by pressing a button inside her vehicle, informing them that she and her partner have arrived and have left the vehicle.

Through reliable and fast web- based applications Police will have more information that will improve response outcomes. Police will be able to make better decisions and be assisted to manage potentially dangerous situations.

Scenario 2

Enhancing emergency responses across organisational and geographical boundaries

A middle aged man has collapsed at home in a regional border town with a suspected stroke.

The Triple Zero (000) call made by his wife is directed to the ambulance dispatch centre. By consent the patient's online medical records are combined with the dispatch request to the nearest available ambulance.

The dispatch centre has real-time data on the location, status and capability of all nearby ambulances. This includes those ambulances belonging to other jurisdictions to facilitate cross-border response.

Meanwhile, in the state capital, an on-call stroke specialist receives an alert on her mobile device through a web-based application. She may be required to video-conference through that web-based application with the emergency responders to this stroke case.

The ambulance arrives at the scene. The paramedics have been provided with the 000 report and his online medical records. The patient is stabilised for transportation and during the transit to the hospital the paramedics video-conference the on-call stroke specialist for further advice. The on-call stroke specialist and the receiving emergency department are provided real-time access to data on the patient's condition through sensors in the ambulance's equipment.

More lives could be saved through faster delivery of effective diagnosis and treatment. A PSMB capability will connect the people and equipment needed to make this happen.

Scenario 3

A PSMB capability will be the foundation of public safety communications over the coming decades. It will be a data-rich platform for emerging technologies that will improve how hazards and threats are managed.

It is dusk on the second day of efforts to control a major bush fire. Over 300 professional and volunteer firefighters have been deployed to battle the fire. The response includes six water bombing aircraft and dozens of vehicles.

The response is being monitored from above. A small fleet of drones maintain constant overwatch of the fire front and surrounding areas. These unmanned aircraft orbit the fire and capture high definition infrared – heat – footage. They communicate with each other to ensure they spread out to optimise surveillance of key areas. When one drone leaves to refuel, another takes its place automatically.

Deployable PSMB base stations provide these drones with a data network to stream their data to a nearby command centre. The effectiveness of aerial water drops is reviewed and detailed coordinates are provided to pilots. Personnel on the ground are working ahead of the fire front to back burn.

At operational headquarters the data collected by drones is fed into a computer model. By understanding the temperature, humidity, wind speed and direction the algorithm predicts the behaviour of the fire. The output of this model is available in the command centre to help prepare the necessary actions ahead of time.

A PSMB will facilitate the integration of information, situational awareness and evolved technologies to enhance responses.

A proposed PSMB model for Australia: At a glance

PSMB benefits will be realised through developing new capabilities and through partnership with service providers.

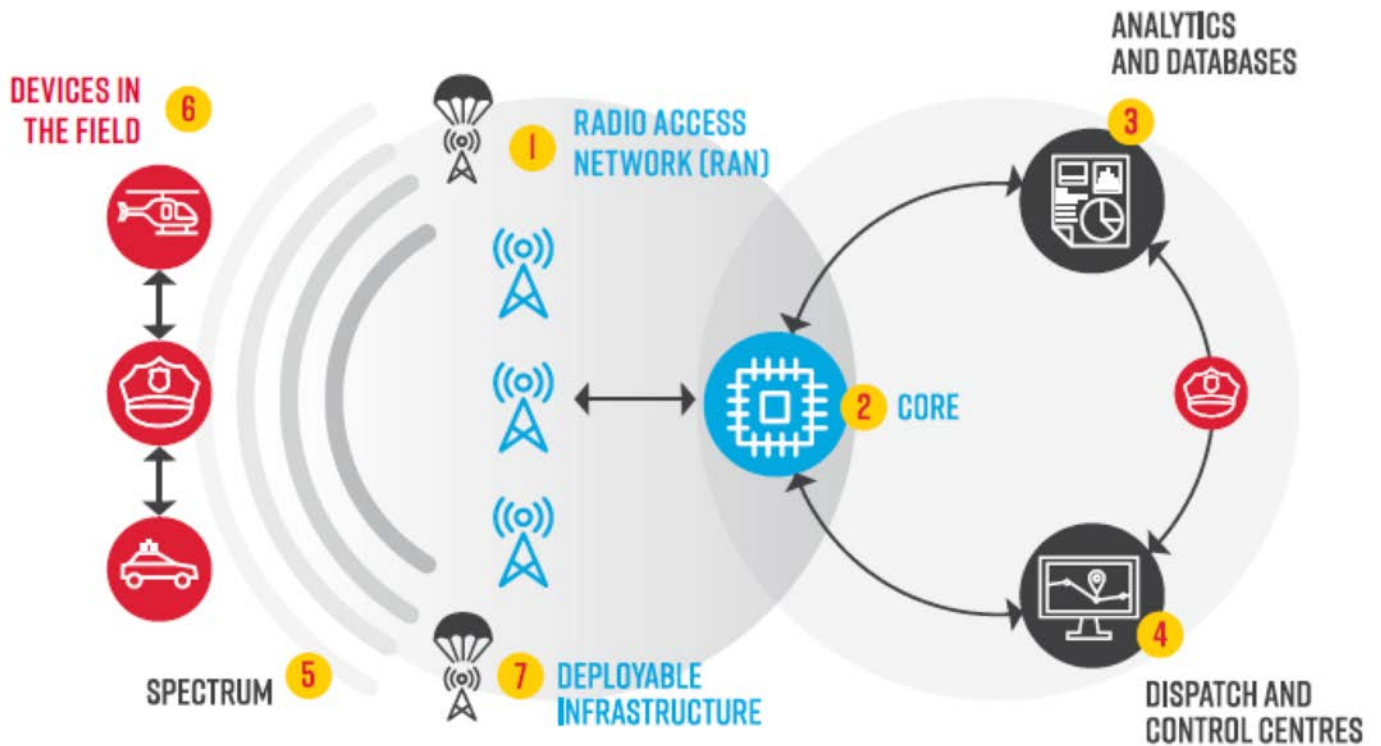


Figure 1

1. **Radio Access Network (RAN)** - The site infrastructure, including transmission towers, which provide network coverage.
2. **Core** - Infrastructure which manages the network, policies and data between users.
3. **Analytics and Databases** - Software which enables specific functionality.
4. **Dispatch and Control Centres** - Coordination and decision making equipment.
5. **Spectrum** - The medium over which data is sent and received by PSMB users.
6. **Devices in the field** - An ecosystem of mobile and vehicle mounted devices connect to the RAN.
7. **Deployable Infrastructure** - Portable radio infrastructure for expanding and improving RAN coverage.

Our global partners

Australia is well positioned to be a PSMB leader without taking the risk of being the first. These international programs give us an opportunity to examine and understand what approaches are most effective and what lessons have been learned by our global partners.

Other advanced economies either have developed or are in advanced stages of developing PSMB capabilities.

Canada - In 2017 the Canadian government committed \$3M USD for the establishment of implementation models for a dedicated public safety broadband capability. The federal government has reserved 20MHz of the 700MHz spectrum band for public safety use.

United Kingdom - The Emergency Service Network is being rolled out across the UK through a public-private partnership (PPP) which includes mobile operators and vendors, EE and Motorola. This PPP commenced in 2015. In 2017 the UK telecommunications regulator granted license variations to EE to allow access to 20MHz of spectrum for the ESN in the 1900MHz band.

South Korea - A request for proposal has been issued for rollout of a public safety LTE network – SafeNet – to commence in March 2019. Samsung has won a contract to provide infrastructure and user devices. The national government has dedicated 20MHz of the 700MHz band. A trial of SafeNet was conducted during the 2018 winter Olympics.

USA - FirstNet has been established as an independent authority to oversee a national network for public safety agencies. As of October 2018, a public-private partnership with AT&T has established 150,000 connections for 2,500 agencies. This network currently provides enhanced data and plans are in place to deliver mission critical data in the near term. 20MHz of the 700MHz band was dedicated for PSMB use by the federal government. AT&T can use FirstNet's dedicated spectrum for commercial purposes when there is excess capacity but public safety users have priority access.

France - France has begun awarding tenders for aspects of network development. 19 MHz of the 700MHz spectrum was reserved for use for public protection and disaster relief. These licenses will be taken up in July 2019.

Spectrum is an important input into the establishment of a PSMB capability. There are a number of economic models which would make adequate spectrum available for PSMB. The selection of a spectrum model is necessary to provide certainty to suppliers and governments, allowing them to create accurate investment proposals which form part of any detailed business case.

The Road Ahead

This high-level roadmap is a plan to design, implement and operate a national PSMB capability.

Australia's PSMB capability will be developed and operated as a federated model. Each jurisdiction is responsible for their own rollout and will have a stake in national governance. This national governance will be required to ensure PSMB meets the requirements of PSAs, to manage any shared assets and to oversee international engagement. The PSMB rollout is planned to be evolutionary, not a 'big-bang'. This means PSMB services will become available over-time and improve in a phased manner. This provides the flexibility for jurisdictions to opt-in to the nationwide rollout in a way that takes account of their individual circumstances.

Below are the major activities that will need to be undertaken to deliver PSMB. These activities are categorised into related streams of work. This plan will be reviewed and updated based on decisions and results and as more information comes to hand.

Assumptions for the indicative investment model:

1. National spending on emergency services communications will remain constant into the future.
2. National PSMB investment will grow as more jurisdictions begin implementation.
3. As PSMB capability evolves the need to invest in voice Land Mobile Radio (LMR) will diminish.
4. As PSMB data services become available the need for commercial data services will be reduced.
5. Some commercial data services will be used into the foreseeable future.
6. Voice Land Mobile Radio (LMR) investment will be needed into the foreseeable future.
7. PSMB service costs increase as PSAs buy newly available services and migrate from commercial data services.

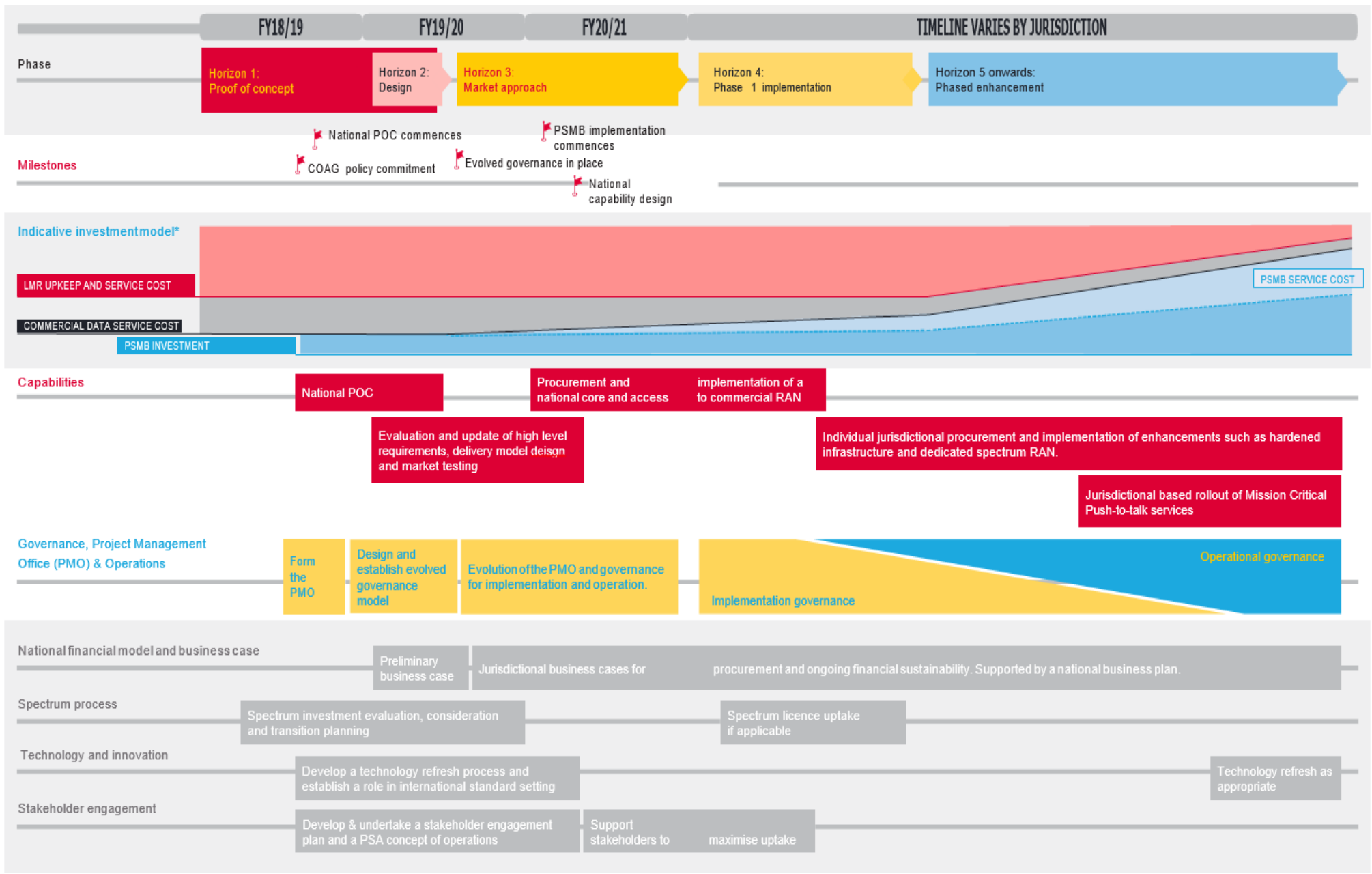


Figure 2

The document has been developed by the Australian Government Department of Home Affairs, in consultation with the States and Territories through the PSMB Functional Working Group.

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