Australian Government

Public Safety Mobile Broadband
Strategic Review

Public Safety Mobile Broadband Strategic Review – Final Report

Rebooting the PSMB

October 2022

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Reviewer's Introduction

'Rebooting the PSMB' is the report's subtitle, and was a phrase commonly used by stakeholders I met with during the course of the Review. It expressed both their desire to see a fresh approach taken to deliver the PSMB program coupled with their frustrations with its progress to date.

The stakeholders also shared their unwavering views that the modernisation of Australia's critical communications capability through a PSMB was vital to ensuring their public safety agencies can meet the growing expectations of the community.

We all benefit daily through our use of diverse and innovative applications carried over mobile networks, as do our public safety personnel. However, providing them with a mission critical broadband capability will spark the development of more innovative, effective, efficient and safer work practices. Furthermore, the implementation of a truly national capability has the potential to drive greater collaboration between the hundreds of agencies it will serve.

Establishing a PSMB is a complex undertaking, and while I have heard from stakeholders of the challenges, and there will be many, involved in implementing a PSMB, I am recommending that the most critical step is to change how a national PSMB capability should be delivered. It is clear that PSMB is not an 'if', but a 'when', and not a 'what' but a 'how'.

My report opens with a review of the program's history, the merits of a PSMB and a survey of the international stage. I found, pleasingly, the strong support for a PSMB, despite the as-mentioned frustrations with progress, and that developing a PSMB using the established mobile networks is a global theme.

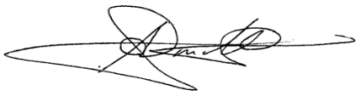
I then outline the issues and history of spectrum, and its shadow over the program, and the current thinking as to the optimum PSMB solution for this market. There is insufficient information available to cost this solution but a scan of historic and international references highlights that a PSMB is a substantial investment and one that has not been adequately considered to date.

Having considered the trajectory of the current program and its approach, I propose a 'reboot' is necessary. The first critical step must be to create a new vehicle to drive the program to the best outcome possible, with the right scale, backing, capability and authority. In parallel, the Commonwealth must prepare itself for a PSMB implementation by studying its market and regulatory impacts to ensure PSMB is being delivered within the optimal national communications framework.

I have attempted to outline these actions in a form that is clear and actionable, and with considered target dates. I trust that this Review forms a valuable step in the delivery of a national PSMB capability.

I would like to thank the stakeholders for sharing their feedback openly with the Review team, and for the support of the Secretariat through this review and in the drafting of this report.

Regards



Andrew Smith

Independent Reviewer

October 2022

Executive Summary

The Review has found there is strong agreement and alignment from stakeholders that expediting delivery of a PSMB is in the best interests of public safety agencies and ultimately the Australian public. However, there is little prospect of this occurring under the current means of implementation. The current approach lacks the structure, resources, funding, alignment and governance required to deliver a program with the scale and complexity of a PSMB solution.

To move forward, a new operating model is required. A new and dedicated entity must be created and charged with the accountability to deliver, operate and manage a PSMB. The Commonwealth must lead this action but success will require the support and alignment of the Commonwealth, States and Territories on its objectives and operating parameters, including funding. Additionally, the Commonwealth must assess and consider the impacts of a PSMB implementation to ensure it can balance the desire for a PSMB and its community benefits with the health of the mobile market on which it is based.

Without a PSMB solution, Australia's critical communications capability will not advance. Existing land mobile radio services offer a mature, trusted voice capability but have limited interoperability and cannot be evolved to deliver broadband data services. Public safety agencies therefore rely on the commercial mobile networks for their broadband data services. As these networks are designed for commercial purposes, they cannot meet the high operational standards public safety personnel demand in times of need. They also do not support the features unique to public safety operations.

A PSMB will modernise Australia's critical communications capabilities by providing mission critical mobile broadband services. It will enhance the operational effectiveness of Australia's public safety agencies and their personnel to enable them to meet the growing expectations of the community, saving lives and property and improving user safety. The case for deploying a national PSMB capability remains strongly supported across jurisdictions and public safety agencies. Importantly all remain aligned on the previously drafted key objectives for the PSMB program. Internationally, a number of other countries are planning, implementing or operating PSMB solutions, with their motivations largely consistent with Australia's. Global standards bodies have also recognised the proliferation of PSMB programs and have committed resources to developing supporting standards.

The 2018 COAG agreement to establish a PSMB was intended to initiate a plan of action to deliver a PSMB capability. However, it did not. Following this agreement, the program lost momentum due to the loss of key resources and the absence of a committed resourcing plan and compelling program targets, which is an important lesson when considering the future of the program.

Overshadowing the program has been the debate and contention between the Commonwealth and States and Territories over the provision of dedicated low band spectrum for use in the PSMB solution. It is not for this Review to opine on the history of this long running issue, but by observation it has undermined progress toward a PSMB solution.

Today, the PSMB program workload is carried on by a small number of dedicated officials, dispersed across the jurisdictions, who undertake this work in conjunction with their primary responsibilities.

The program has, however, aligned on a preferred PSMB solution following market engagements, consideration of international approaches, and findings from the Proof of Concept laboratory testing. The preferred PSMB solution would use a dedicated PSMB core connected to all three mobile networks (Telstra, Optus and TPG Telecom), sharing their spectrum. The use of all three networks in the solution creates a coverage footprint greater than any one network. Where overlapping coverage exists the failure of one service enables a user to fall back to another, improving availability levels. It also creates greater commercial

contestability when negotiating access terms with the operators. The dedicated core can also support connectivity to other complementary networks, such as satellite systems or Wi-Fi networks, and permit interconnection to land mobile radio networks. A dedicated core also preserves contestability and flexibility as well as more easily satisfying the specific security requirements of PSMB networks. This preferred solution has a number of parallels with other international approaches.

The necessity for the PSMB solution to share the mobile network operators' spectrum is a consequence of the current spectrum landscape. A solution with (low band) spectrum dedicated for PSMB users has long been favoured as it allows the separation of PSMB and commercial user traffic, which is critical in times of congestion. It could also have been used as commercial leverage in negotiation with the mobile operators. The 850 MHz expansion band auction in late 2021 led to Band 26, which was highly coveted for use in a PSMB solution, being purchased by Telstra. Band 27, which is reserved for PSMB, is not considered feasible due to its limited ecosystem and narrow bandwidth.

Shared spectrum solutions are widely used in international PSMB deployments, supported by the use of standardised features which enable the prioritisation of public safety traffic over commercial traffic, in some instances supported by regulation.

Connecting a PSMB core to the mobile networks and implementing prioritisation is just one part of a PSMB solution. The mobile networks require significant upgrades and enhancements to form part of a mission critical solution. Expansions of a mobile operators' coverage, improved resilience through network hardening, support for public safety features, capacity uplifts, new security considerations and operational changes are all required to deliver a PSMB capability. The technology is available today to deliver these PSMB capabilities over 4G networks, with evolution to 5G following.

The preferred network model has never been costed and to do so requires an agreed detailed design and a comprehensive market engagement to seek, receive and analyse industry feedback. Nonetheless, it is clear that it is a substantial enterprise and will constitute a significant investment as observed in the limited examples that have been reported publicly.

Thus, any program or process that aspires to deliver a PSMB solution must be prepared to expertly evaluate complex technical and commercial responses, assess benefits versus costs, risks and their mitigations, and appraise deployment and operational proposals before finalising the agreed solution and its cost. The Review's analysis of international programs highlighted the substantial resources required to design, negotiate and implement a PSMB solution.

This substantial scale of work required is in stark contrast to the current program's limited and distributed resources. Furthermore, there is no integrated project plan and no consideration of costs, and an absence of funding models and budget allowances. The current governance approach is unwieldly, and it is not clear how it could resolve complex issues or make major decisions. Moreover, the open-ended 'opt-in' principle precipitates a lack of commitment from States and Territories to an aligned plan of action.

The Review considers there is little prospect for the successful delivery of a program of the scale and complexity of a PSMB under the current model and that a fresh approach is needed. It also notes that as a consequence of national program delays and uncertain outlook, NSW are funding a program under their own management to deliver a State-based PSMB solution.

The Review proposes a new operating model to deliver a national PSMB capability expeditiously. A new, dedicated, enduring entity should be created and charged with the establishment and ongoing management of a PSMB capability. This body must have the scale, backing, capability, and authority to meet the challenge of implementing a PSMB capability. Its operations function must be populated with skill-based resources responsible for all aspects of the program's delivery and its operations. It would be overseen by a governance

board, comprising industry experts with experience in governing programs of such scale and complexity. This board will be accountable to a responsible Minister(s), the exact model to be agreed between the Commonwealth and States and Territories. An advisory board, comprising public safety agency representatives and other experts would work in conjunction with the governance board to ensure it remains closely connected to the user base it is ultimately delivering a service for.

The Review also proposes that the creation of the new entity must be underpinned by agreement between the Commonwealth and all States and Territories on its principles, objectives and operating parameters. This is to be codified in an Inter-Governmental Agreement. This serves dual purposes: Firstly, it compels the Commonwealth and States and Territories to come together to reach agreement on how the vision for Australia's PSMB can be reached. This is a critical initial step and governments should harness the national support for the program and renewed program momentum to be a catalyst for consensus building. Secondly, having established the direction and operating parameters, it enables the entity to focus on delivering its mission.

The Review highlights that the desire for a PSMB changes the nature of critical communications in Australia. Historically, these networks were the remit of States and Territories, and were dedicated to public safety agency use. In contrast, a PSMB will share the commercial mobile networks and will operate nationally, managed by a national entity.

This brings into focus the role of the Commonwealth, which has oversight of the national telecommunications market and how it must prepare for the introduction of a PSMB.

The Commonwealth must consider the role regulation and legislation could play to ensuring the effective operation, and fair and sustainable pricing, of a PSMB implementation. This is a contentious issue, with mobile operators favouring commercially agreed outcomes and public safety agencies believing critical communications must be underpinned by regulation.

The Commonwealth must also consider the impact of a PSMB implementation on the competitive balance of the mobile market. A PSMB solution may vary the operating model of one or more mobile operators by changing its coverage, resilience, performance or market perception. Depending on the extent of customer impact (perceived or actual) and how funding is sourced, the balance of the market could be impacted. The Commonwealth will need to continue to evaluate and ensure the desire for a PSMB is balanced against any adverse impacts to the mobile markets, on which the wider population rely for mobile services.

Existing government programs and industry are already dealing with the complex problems of coverage and resilience which demand a high degree of funding. A PSMB solution should work with and through these programs where it would be beneficial for public safety users of a PSMB.

The upshot of the PSMB program's direction is that the Commonwealth will have more direct input into the deployment of public safety communications. Correspondingly, States and Territories will need to drive alignment on the needs and priorities of users to maximise the value delivered through a national solution. Australia's mobile networks must also transform, becoming an integral piece of Australia's public safety communications network, which is itself a global theme. A successful, sustainable PSMB capability will rely on strong and committed partnerships with the mobile operators.

To move ahead requires leadership, and this must come from the Commonwealth. Initially, it needs to commit the resources and sponsor a dedicated team to drive the negotiation of the Inter-Governmental Agreement, and to implement the new entity. This includes engaging with NSW to leverage their knowledge and resources to determine how they can be used to the national program's advantage, and to gain an understanding into foundational costs. The Commonwealth should also demonstrate their commitment through their capacity to provide seed funding for the foundational elements of the network.

While placing the onus of leadership on the Commonwealth, the delivery of a successful PSMB program is just as dependent on the active involvement and timely financial commitment of the States and Territories, who represent the bulk of the agencies who stand to benefit from the program.

All governments need to acknowledge that a fresh start is required for the PSMB program, but one that has learned from the issues of the last decade. Strong commitment and alignment between the governments will ensure a national program can deliver the benefits available through a PSMB. International approaches demonstrate that delivering a PSMB capability is challenging, but achievable. A successful implementation will elevate the capabilities of our public safety agencies that we depend on to protect our lives and our properties.

Principal Findings

The following are the Review's set of principal findings that drive the recommendations for the Report. More detail and information surrounding the principal findings, as well as other relevant matters are contained in the body of the Report.

- The case for deploying a national PSMB capability remains strongly supported across jurisdictions and public safety agencies. PSMB is expected to improve operational capabilities to save lives and property and improve personnel safety

- Without a PSMB capability public safety communications in Australia will not advance. A PSMB is essential to the strategic capability and provision of public safety communications into the future

- A PSMB solution can be delivered without dedicated spectrum, and shared spectrum solutions are being used in many international PSMB implementations; however dedicated spectrum has some benefits, and opportunities to access dedicated spectrum should continue to be evaluated

- The preferred PSMB solution would use a dedicated core connected to all three of the MNOs. This solution uses available technology, and is aligned with the approaches of many other countries; however there has been no agreement with the MNOs on which the preferred solution is fundamentally based

- The preferred solution for the PSMB capability has been presented, but the selection of the most efficient and effective network solution will be an outcome of the engagement and agreement with the MNOs

- There has been little consideration given to the complexity, costs, plans and resources required to implement and operate a national PSMB. International approaches highlight the significant cost and operational scale involved in implementing a PSMB capability

- The current governance, program management, resource levels and the distributed function approach is not suited to deliver a program of the scale and complexity of a national PSMB capability. There is limited prospect for a successful delivery of a PSMB capability under the current approach

- The PSMB program must be 'rebooted' if a PSMB capability is to be delivered in Australia. A dedicated national approach to implementation is needed to effectively deliver a PSMB, with the Commonwealth taking an active leadership role working with the States and Territories

- Implementing a national PSMB solution transforms the delivery of public safety communications and therefore the roles for the Commonwealth and States and Territories as well as the MNOs

- A new operating model is needed to deliver a national PSMB capability. The Review is proposing a new operating model comprising a National PSMB Entity, a revised and streamlined governance model, and underpinned by an Inter-Governmental Agreement (IGA) that articulates its objectives and operating parameters. The IGA provides and establishes equity between the Commonwealth and States and Territories in the development of a PSMB

- The nature of the PSMB solution, its consequences and delivery challenges necessitate a national approach, and so demands a greater role for the Commonwealth working in conjunction with States and Territories in the provision of a PSMB capability

- There are a number of issues that will need to be considered by the Commonwealth to secure the success of the National PSMB Entity and a PSMB capability for Australia. These include consideration as to whether regulation and legislation will play a role to ensure the effective operation, and fair and sustainable pricing, of a PSMB solution

- Alignment on implementation timing, effort and funding is undermined by the existing 'opt-in' principle, which does not compel participant jurisdictions towards an aligned plan of action

- The Commonwealth will need to take the leadership role and build confidence in its commitment to the PSMB program. The Commonwealth must present a viable way forward to States and Territories but will also have to rely on their subject matter knowledge and expertise

Courtesy of South Australian Government

Recommendations

Following are the final recommendations of the Review. The sequence of the recommendations aligns with the body of the Report and are not to be read as the order of a recommendation's importance. All recommendations, including the Review's implementation guidance, are provided at Appendix A.

Recommendation 1

The Commonwealth strengthen and enhance its commitment to the development of this critical communications capability. A PSMB will modernise Australia's emergency service communications capability, improve the operational effectiveness of its public safety personnel and their safety, and enable them to meet the rising needs and expectations of the Australian public. Numerous Royal Commissions have also called for its delivery.

Recommendation 2

The Commonwealth, by Q2 2023, establish close relationships with the PSMB programs in other countries so the Australian program can benefit and learn from the insights gained internationally.

Priority should be given to engaging with the PSMB programs in the United Kingdom, United States, Finland and New Zealand. These jurisdictions offer early mover insights with the most relevance to the Australian program.

Recommendation 3

The set of National Objectives be expanded by Q2 2023 to include criteria for Transparency and Affordability, where:

- **Transparency** defines the need for PSAs to have visibility of the planned and operational status of an MNO's network to enable effective planning and operational management (which is critical when a PSMB solution is hosted on commercial networks); and
- **Affordability** stipulates that any investments in a PSMB capability represent value for money, and that service costs remain affordable for PSAs.

Recommendation 4

The Commonwealth formally engage with NSW Telco Authority (NSWTA) by Q1 2023 to seek their support in developing an initial view of network solution costs, to be used to determine the potential funding demands for the program, particularly seed funding.

Recommendation 5

The Commonwealth establish a new, dedicated, enduring National PSMB Entity (NPE) by Q3 2023 to deploy, operate and maintain a national PSMB capability in accordance with the National Objectives.

The entity should comprise:

- An **operations function**, which is responsible for all aspects of program execution, and is resourced by appropriately skilled staff covering the functional disciplines, and sized in accordance with the demands of the program; and overseen by:
- A **governance board**, which is responsible for program outcomes and oversight, populated by skilled resources experienced in governing a program of the scale and complexity of a PSMB; and supported by:
- **An advisory board**, which is populated by PSA representatives and other experts who can provide valuable guidance to the governance board; with
- **Government oversight** of the governance board and entity through either a Commonwealth lead Minister(s), or a Ministerial Council.

Recommendation 6

The Commonwealth engage with States and Territories to develop a PSMB Inter-Governmental Agreement (IGA), which will define the operating parameters of the new National PSMB Entity.

The IGA should aim to agree the following (non-exhaustive) terms:

- Scope of the role of the NPE, and any exclusions
- Key outcomes to be delivered by the NPE and relevant milestones
- The governance structure of the entity, including:
    - Terms and composition of the governance and advisory boards
    - Governmental oversight model and accountability
- Governance obligations and reporting requirements
- Funding principles and funding requirements, including any seed capital to initiate the venture and ongoing funding arrangements
- Scope and term of the agreement and variation management
- Any relevant directions to the entity.

The engagement and agreement should be completed by Q2 2023.

Recommendation 7

The Commonwealth formally engage with the NSW Government prior to the establishment of the National PSMB Entity to agree how its existing capability and plans should be considered in the establishment of a National PSMB Entity.

This engagement should seek to leverage the expertise that NSW have gained through their planned development of a State-based PSMB solution and management of the proof of concept as part of the national PSMB program.

Leveraging this progress provides an opportunity to 'jump start' the national PSMB program by saving time and costs and reducing replication of work.

Recommendation 8

The Commonwealth formally consider the extent to which regulatory and legislative measures are required to support an effective PSMB implementation whilst maintaining a healthy and competitive mobile market. This is to be completed by Q4 2023 with consideration given to:

a) the nature of the preferred PSMB solution and its reliance on the MNOs' networks
b) how mission critical capabilities are proposed to be deployed and maintained on MNOs' networks
c) how fair and sustainable pricing for the provision of PSMB services across MNOs can be ensured
d) how decisions around the implementation of a PSMB capability may impact the competitive balance of the mobile market.

Recommendation 9

The Commonwealth consider:

a) how any outcomes and recommendations from the Australian Competition and Consumer Commission's Regional Mobile Infrastructure Inquiry may be relevant to the PSMB program
b) how existing Government funded mobile coverage and resilience programs can be leveraged to enable the PSMB program to meet its objectives in a timelier and cost-effective manner.

Recommendation 10

The Commonwealth, in conjunction with the States and Territories, renegotiate the open ended 'opt-in' principle that was previously endorsed by COAG to secure a more definitive commitment to each State and Territories' participation in the national PSMB program, with the proposal that:

- States, Territories and Commonwealth agencies must 'opt-in' no later than three years from launch of the PSMB capability
- the outcomes of this agreement to be incorporated into the IGA.

Recommendation 11

The Commonwealth establish an appropriately resourced, dedicated team led at an appropriate level of authority and with the appropriate level of sponsorship, which is tasked with delivering recommendations 4, 5, 6, 7 and 10. The dedicated team should be established as soon as practical but no later than the end of 2022.

Recommendation 12

The Commonwealth demonstrate its support for a national PSMB by providing substantial funding towards the foundation elements of a PSMB solution, such as a national PSMB core and National PSMB Entity.

About the Review

This Review is intended to inform options that will be presented to the Commonwealth to allow decisions to be taken as to the most efficient and effective approach for implementing a PSMB capability for Public Safety Agencies (PSAs), including the appropriate roles for the Commonwealth and States and Territories to progress the PSMB program.

The delivery of a PSMB capability is not a new issue, with previous work and reports on PSMB dating back to 2009. Rather than revisit this work, the Review has used the 2018 Council of Australian Governments (COAG) agreement on the PSMB Strategic Roadmap as the reference point for commencing this review.

The Review considered feedback from State and Territory representatives, Commonwealth agencies, MNOs, telecommunications industry equipment vendors and providers, and industry representatives in preparing this report. Feedback was gathered through discussions, workshops and written submissions.

The Review's initial findings and draft recommendations were circulated in an Interim Report in July, which gave the opportunity to test them with stakeholders. Since then, the Review's focus has been on consolidating feedback and ensuring the final set of recommendations tabled in this report are clear and actionable, and with considered target dates.

The Review heard from States and Territories as to the preferred network model to be used in a PSMB solution and this is described in Part 3 of this report. There are other potential models and variant solutions which have not been captured in this Review, however this does not mean they are not viable. Rather, the focus of the Review has been on assessing the impact and potential outcomes of implementing the preferred solution.

A full list of stakeholder groups engaged and offered the opportunity to provide formal feedback to the Review is tabled in Appendix C.

The role that applications, operating over a PSMB solution, will play in providing services for PSAs has not been considered in the Review and is considered an area of development that will flow from the delivery of a PSMB solution.

Terms of Reference

Under the Review's Terms of Reference, it is to provide advice, findings and recommendations on current program progress, future PSMB capabilities architecture and technology options, spectrum options and network supply and delivery options. It should consider the opportunities to leverage emerging 5G capability, opportunities to utilise commercial mobile networks, and other technologies such as proposed Defence sovereign satellite communications capability (JP9102), and the NBN Co Sky Muster Satellites.

It should also consider any policy and regulatory settings required to establish and maintain a PSMB capability and any lessons learnt from international and domestic experiences in implementing PSMB capabilities. A summary of the Review's Terms of Reference is included in Appendix B.

Part 1 – Background

- There is strong and aligned support for an Australian PSMB capability across all jurisdictions and public safety agencies. A PSMB will modernise Australia's emergency service communications capabilities by providing mission critical mobile broadband solutions, thus supporting new use cases which will ultimately enhance PSA operational effectiveness and keep Australians safe.
- A PSMB is an essential strategic capability for public safety communications into the future.
- Land mobile radio is a mature, trusted voice services capability, and will remain so for the foreseeable future. However, the ongoing lack of interoperability remains a limitation.
- PSAs currently lack confidence in the data services offered by commercial 4G/5G networks to provide a mission critical service to support PSA operations.
- Many other countries are planning, implementing or operating a PSMB capability.
- Implementation in most countries is driven by a single body, in contrast to Australia's current federated approach to the PSMB program.
- Following the COAG agreement, the PSMB program lost momentum due to the loss of key resources and personnel and the absence of a committed resourcing plan and compelling program targets.
- The current distributed organisational model is unsuited to deliver a program of the scale and complexity of a PSMB.

Public safety mobile broadband

Australian fire, police, ambulance, and other emergency services (collectively referred to as 'public safety agencies' or PSAs) have identified a growing need for data capabilities to take advantage of novel digital technologies. These digital technologies enhance a wide range of operational functions and will be essential to the provision of public safety communications into the future. However, the mobile broadband capabilities that support them need to be reliable in adverse situations, and interoperate between different agencies and jurisdictions.

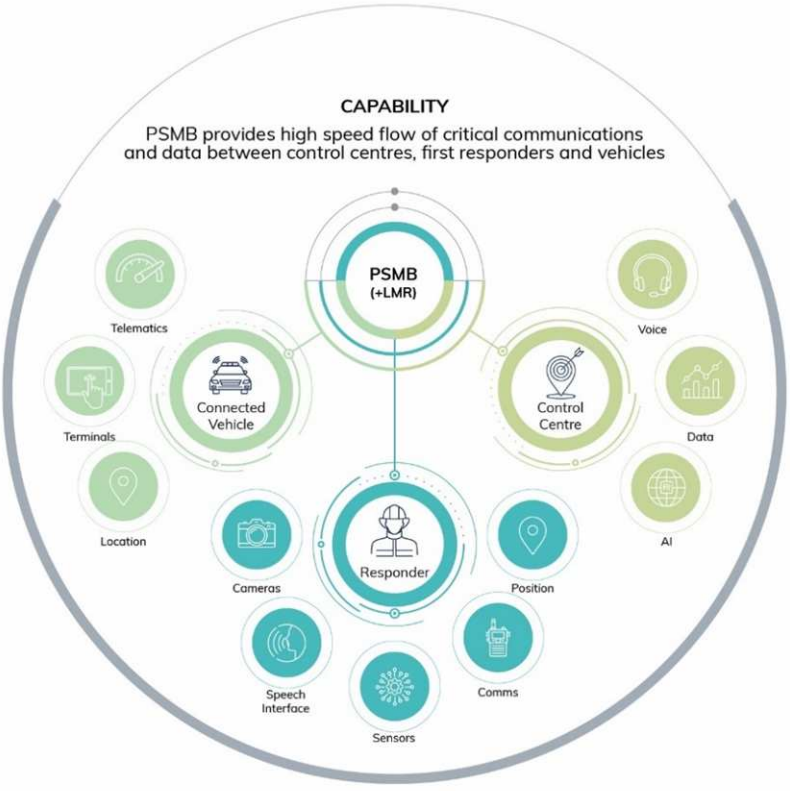
> *"Emergency services are becoming increasingly dependent upon these services… Data capabilities have evolved into a mandatory requirement for first responders to manage and enhance operational effectiveness and officer safety."* **WA Department of the Premier and Cabinet submission**

A PSMB will provide mobile broadband services to PSAs in a manner that meets 'mission critical' standards. 'Mission critical' mobile broadband services are those that are delivered by a network that offers quality of service, priority, and pre-emption; very high availability; wide and deep coverage; and a high degree of security. A PSMB capability would predominantly benefit PSAs based in States and Territories, which have primary jurisdiction for delivering emergency services to the community. A number of Commonwealth-based agencies, such as the Australian Federal Police and the Australian Border Force, will also harness the benefits of PSMB capability.

> *"A PSMB capability serves as a unified platform that helps ensure interoperability among various public safety institutions and delivers real-time accessibility and enhanced communication capabilities."* **Samsung submission**

As demonstrated in Figure 1, PSMB will present a host of opportunities for PSAs to incorporate new services and applications into their emergency response to improve their situational awareness and operational effectiveness. This will ultimately help PSAs save lives and property, and ensure personnel safety. The improvement of commercial mobile broadband networks in line with PSA requirements may also improve the quality of services experienced by the ordinary commercial mobile network operator (MNO) customers. However, this may also have consequences on Australia's MNO market, which this report will address later.

Figure 1: Capabilities and benefits offered by a PSMB solution



BENEFITS More efficient operations

PREPARED	Enhanced situation awareness through on-site and pre-site data sources
FASTER	Reduced response times through automatic provision of information
EFFICIENT	Digital capture, sharing, recording, analytics
SAFER	Location, hazard monitoring, biometrics

Jurisdictions and PSAs continue to advocate that PSMB is vital to enable the use of data-based mission critical services to access modern emergency management technologies and techniques both now and into the future. Furthermore, all States and Territories exhibit a strong degree of alignment on the continued relevance and applicability of the National Objectives, as defined in the 2018 COAG Roadmap, that describe

the target state for a PSMB as well as the High-Level Requirements. Without a PSMB, PSAs believe they will fail to meet public expectations to continuously improve their operational efficacy through the incorporation and exploitation of new communications technologies. In summary, without a PSMB, public safety communications in Australia will not advance.

A PSMB capability for Australia

Limitations of existing public safety communications

PSAs currently use a combination of dedicated jurisdiction and agency-owned mission critical land mobile radio (LMR) networks and commercially-supplied broadband services to meet their communications needs. The P25 LMR networks deliver reliable, resilient voice services but do not offer data services beyond low-bandwidth features such as text messaging.

LMR networks are not widely interoperable despite many years of work. The potential for interoperability issues to compromise emergency response was known as early as 2008. The 2009 Victorian Bushfires Royal Commission found that communications systems were hindered by a lack of interoperability between PSAs, where for example, Victorian metropolitan and regional police used incompatible radio systems. Existing interoperability solutions are inefficient and resource intensive – for example, cross-border bushfire responses currently require officers to take a second radio that is compatible with the LMR network of the other jurisdiction's fire service. While jurisdictions will still need to pursue interworking between their LMR networks to achieve full national interoperability, a national PSMB will be a step change in capability to resolve interoperability challenges not only between jurisdictions, but also between PSMB and LMR services. This will relieve the current cross-border operational challenges.

PSAs are increasingly using consumer-grade mobile broadband networks supplied by Telstra, Optus and TPG Telecom (collectively, Australian MNOs) to support the use of applications, deliver video streaming and file transfer services. The Review notes that the MNOs have provided, where possible, significant efforts to maintain services in response to emergency and disaster situations to address public safety needs. These services offer data bandwidth well exceeding that offered by LMR, but do not offer the same level of resilience. This is because the MNOs operate in a competitive commercial market and their networks are designed to a 'commercial standard'. These networks have never been designed to specifically support PSA operational targets, despite their increased use by PSAs.

Site power outages and damage to optic fibres, equipment, and power transmission lines all impact PSAs' ability to deal with emergency situations. For example, during the 2022 NSW floods the absence of phone and mobile data services caused by network outages impeded the disaster response and prevented emergency services from sending, and the public from receiving emergency warnings and evacuation orders. Experiences with network failures have been corroborated by other disaster response inquiries, most notably the Royal Commission into Natural Disaster Arrangements, which recommended the expeditious delivery of a PSMB capability. The Royal Commission noted that although PSMB would not solve all communications issues faced by PSAs, it would be "a significant advancement that would enhance network and data access in the field".

> *"Australian, state and territory governments should expedite the delivery of a Public Safety Mobile Broadband capability."* **Royal Commission into Natural Disaster Arrangements, Recommendation 6.4**

PSAs acknowledge they lack the confidence in the data services offered by commercial 4G/5G networks. These shortcomings pertain to insufficient coverage and availability and a lack of prioritisation, which are brought about by the networks' commercial-grade nature. The introduction of PSMB will necessitate changes to the commercial-grade mobile networks by raising them to a 'mission critical' standard and giving PSAs the confidence to rely on those services when communications are vital. However, there is limited commercial incentive for the MNOs to do this.

Telecommunications outages during the 2022 NSW floods

The Inquiry following the significant floods experienced by north-eastern NSW in February and March of 2022 found that essential telecommunications services suffered prolonged outages as a result of the flood events, with most disruptions and outages largely caused by losses of mains power. These outages had significant impacts on both PSAs and the community at large. These disruptions included:

- 802 commercial network sites impacted by flooding (most outages restored within 2 weeks)
- 18 communities deprived of telecommunications access for up to 13 days.

In Lismore, people faced difficulties accessing the SES hotline, with long queues and call drop-outs. In Ballina, PSA personnel had to drive between evacuation centres because they could not communicate between them. Personnel in Ballina could only communicate with walkie-talkies.

The NSW 2022 Flood Inquiry found that, "similar to the 2019-20 bushfires", the loss of telecommunications services was the greatest cause of stress to communities and recommended improving network resilience and the facilitation of cross-carrier roaming in emergency-affected regions.

In contrast, although the NSW Public Safety Network (PSN) experienced isolated outages due to power failures, it otherwise maintained an availability of approximately ninety-nine percent. Cells-on-wheels and generators were deployed to Lismore and Grafton. PSN sites are equipped with 15 hours of battery backup at most sites, with some equipped with solar power for primary and backup power. Such a degree of resilience and availability offered by mobile broadband is an outcome envisaged by the implementation of a PSMB capability.

Recommendation 1

The Commonwealth strengthen and enhance its commitment to the development of this critical communications capability. A PSMB will modernise Australia's emergency service communications capability, improve the operational effectiveness of its public safety personnel and their safety, and enable them to meet the rising needs and expectations of the Australian public. Numerous Royal Commissions have also called for its delivery.

PSMB progress internationally

> *"A myriad of dedicated, hybrid commercial-private and MVNO-based public safety LTE and 5G-ready networks are operational or in the process of being rolled out throughout the globe."* **NEC submission**

Since the late 2000s, many other countries are planning, implementing or operating a PSMB capability with the drivers for a PSMB having many similarities to those in Australia. In addition, the challenges faced by other countries in the course of implementing a PSMB capability reflect many of those in Australia's planned implementation. The Review's examination of international PSMB efforts has highlighted aligned motivations and approaches to key issues from which valuable lessons can be derived and included into the Australian PSMB implementation. Furthermore, the development of PSMB capabilities internationally is supported by the work of key standards-setting bodies and peak associations that drive the development of the capabilities that PSAs require.

Key international bodies supporting PSMB

3GPP

The 3rd Generation Partnership Project (3GPP) creates global specifications for telecommunications technologies. 3GPP packages standardise features into periodical 'Releases' which allows vendors to integrate those features into their products. Demonstrating its support for standardised enhanced public safety solutions, 3GPP established the working group 'SA6' to develop specifications for use by PSAs over mobile networks.

TCCA

The Critical Communications Association (TCCA) promotes the development of open standardised critical communications solutions. The TCCA manages the Critical Communications Broadband Group (among other working groups) which drives the development and adoption of mobile broadband standards for users in mission critical environments. The TCCA also collaborates with 3GPP.

Many countries have decided that a PSMB deployment will improve the operational effectiveness of their PSAs and acknowledged the advantage of introducing a nationally-unified PSMB, as opposed to existing patchworks of stratified communications systems.

As shown in Table 1, internationally there are different drivers to establish a PSMB that vary from responses to significant disasters or a need for better access to mission critical communications and broadband data services, to the potential for substantial cost savings. In addition, implementation in most countries is driven by a single body, whether that be a national Government entity, or a Government department or ministry. These national Government entities either already operated Government and emergency radio communications, or were purpose-built for PSMB. These entities generally operate under a national governance framework, and are populated with skill-based resources.

Table 1: Overview of the means of, and drivers for, PSMB implementation in other countries

Country	Drivers of PSMB implementation	Means of PSMB implementation
 **USA**	The 9/11 Commission Report recommended the establishment of a national public safety communications network, following findings of significant communications failures during 9/11.	Led by FirstNet Authority, which is a statutory body within the US Department of Commerce charged with establishing, operating and maintaining a PSMB capability.
 **UK**	PSMB will deliver a mission critical broadband capability and will replace an aging, expensive LMR network.	Led by the Emergency Services Mobile Communications Programme (ESMCP), a program within the UK Home Office.
 **Germany**	Meeting the demand for mission critical data services, and aims to offer data networks alongside existing emergency voice services.	Led by the German Federal Agency for Public Safety Digital Radio (BDBOS), founded in 2007 and originally tasked with establishing and operating an LMR network for public safety purposes.
 **South Korea**	The 2014 Sewol ferry disaster highlighted an urgent need for a national PSMB to facilitate inter-PSA communications and information-sharing.	Led by the South Korean Ministry of the Interior and Safety, and supported by a broad stakeholder forum including Government, MNOs, industry suppliers, companies, and public safety users.
 **Finland**	Finland's PSMB will complement its existing TETRA network by delivering mission critical data communications.	Led by Erillisverkot, a state-owned company charged with implementing national public safety communications.
 **New Zealand**	New Zealand is updating their aging PSA networks with a PSMB capability paired with a new digital LMR network.	Led by Next Generation Critical Communications (NGCC), a new Government organisation responsible for implementing PSMB.
 **France**	The French PSMB program will replace its aging TETRA networks and meet PSAs' demand for broadband services, prior to the 2024 Paris Olympic Games.	Led by the French Ministry of the Interior.
 **Belgium**	Originally launched a MVNO to respond to growth in data applications needed by Belgian PSAs.	All Belgian national radio communications including PSMB are operated by ASTRID, a Government entity with legally defined objectives.

In most overseas cases PSMB is, or will be, delivered through a partnership with one or more national MNOs. The partnering MNO networks will need to be upgraded to meet the coverage and resilience required in a PSMB solution. Examples of dedicated networks are limited, due to their high cost and prerequisite requirement of dedicated spectrum. Most PSMB models share the spectrum of the partnering MNO, although some solutions incorporate spectrum dedicated for PSMB. Table 2 highlights the different models used

internationally to access commercial networks, the use of dedicated or shared spectrum in the solution, the nature of the core, and the current status of the respective PSMB program.

> *"Unless a government has abundant access to spectrum and funds, an MNO will play a pivotal role in the provision of any PSMB network."* **Ericsson submission**

Table 2: Overview of PSMB solutions in other countries

Country	Model	Spectrum	LMR interoperability	Dedicated core	Status
 **USA**	MOCN solution, using AT&T as its partner	Shared	Yes	Yes	Operational
 **UK**	MOCN solution, using EE as its partner	Shared	Yes, until LMR is decommissioned	Split core	2024 forecast
 **Germany**	Initially roaming, evolving to dedicated	Shared and dedicated	Yes	Not initially; 2023/24	In planning
 **South Korea**	Dedicated network	Shared and dedicated	Yes	Yes	Initial launch 2022, full launch by 2025
 **Finland**	MOCN solution using Elisa as its partner	Shared	Yes	Yes	In progress 2025 launch
 **New Zealand**	Roaming across two MNOs	Shared	Yes	No	In planning
 **France**	MVNO roaming between primary and secondary MNOs	Shared and dedicated	Yes, until LMR is decommissioned	Unclear	Transition expected to occur between 2023-2025
 **Belgium**	MVNO roaming between three MNOs, evolving to MOCN or dedicated	Shared (currently)	Unclear	No, evolving to dedicated	MVNO currently operational

Australia's PSMB implementation can benefit from engaging with and deriving insights from PSMB efforts internationally, particularly Finland, the United Kingdom and the US, as they are most progressed and have similarities with Australia's intended approach. These three programs partner with a single MNO and share their spectrum. In the US and Finland, national legislation mandates prioritisation for PSAs, and in Finland roaming is also legislated should the primary MNO be unavailable. The UK's approach is also driven by a strong commercial drive to retire its existing LMR network, whereas most other countries intend to introduce a PSMB to complement their existing LMR networks for the foreseeable future, with retirement of these networks a future consideration.

New Zealand has proposed a roaming solution for its PSMB, which may offer Australia valuable lessons regarding the aggregation of network coverage and resilience. The US model may also provide some insights into operational models more relevant to Australia's situation, as it also has to manage from a national perspective across a large number of State jurisdictions and agencies, each with differing geographies and needs.

In summary, many other countries are wrestling with the challenging problem that is implementing a PSMB capability, including the associated scale, costs and timing. Different approaches are being taken across the world; accordingly, there is no 'one size fits all' approach, however the use of commercial MNO networks is a common element. Furthermore, most countries plan to operate existing LMR networks alongside PSMB for the foreseeable future, with interoperability bridging the gap between the networks.

Recommendation 2

The Commonwealth, by Q2 2023, establish close relationships with the PSMB programs in other countries so the Australian program can benefit and learn from the insights gained internationally.

Priority should be given to engaging with the PSMB programs in the United Kingdom, United States, Finland and New Zealand. These jurisdictions offer early mover insights with the most relevance to the Australian program.

Implementation Guidance

- *The Commonwealth should leverage as soon as practical the relationships that NSW Telco Authority (NSWTA) has already established with other countries' PSMB programs.*
- *The Commonwealth should also consider engaging with The Critical Communications Association to enable access to the wider international PSMB community.*

The history of PSMB in Australia

The prospect of a PSMB capability for Australia is not a novel concept with work on it dating back to 2009. Progress has been hindered due to the inability to reconcile positions on spectrum allocations, spectrum pricing, build solutions, funding sources and the obligations of the Commonwealth and States and Territories. The history of the PSMB spectrum debate, as well as the current status of PSMB spectrum, is further discussed in Part 2.

In 2015 the Productivity Commission undertook to study the most effective approach to PSMB delivery (the PC Report). The PC Report, released in January 2016, was a pivotal piece of work that undertook a 'first

principles' analysis of the most efficient, effective and economical way of delivering PSMB by 2020. The PC Report considered the relative costs, benefits and risks of a range of options for delivering a PSMB capability, including deploying a dedicated network, relying on commercial networks, or a hybrid combination. The PC Report concluded that a commercial approach represented the most efficient, effective and economical way of delivering a PSMB capability.

In 2017 the PSMB Functional Working Group, working under the direction of the PSMB Senior Officials Committee (SOC), the governing body for the program, developed a set of National Objectives for an Australian PSMB capability. Based on the objectives, and in conjunction with expert industry advice from Bell Labs, the Functional Working Group drafted a set of High-Level Requirements (HLRs) that prescribe the desired target state in more detail. In 2017, the New South Wales Telco Authority (NSWTA) issued a Request for Information (RFI) to seek market input on the optimum PSMB solution for Australia.

The RFI's evaluation recommendation

A MVNO model which included multi-carrier roaming received broad industry support, and was considered the preferred model. This model would be used in urban and regional areas, benefiting from the overlapping coverage and redundancy of multiple MNO networks. It would be complemented by a network sharing model to address areas that require an expansion of existing coverage. This model was the most compliant with the National Objectives and HLRs, and provided flexibility and greater market competition. Respondents favouring this model also advocated for dedicated spectrum and a dedicated core in the solution.

Two other models were less favoured, but considered premature to rule out at the time. These were:

- A full-service model, where one MNO hosts the PSMB service:
    - This also had a high level of compliance with the National Objectives and HLRs. While there are benefits in having a single entity accountable for the service levels and lower integration risk, there is a higher risk of market capture;
- A dedicated PSMB network model:
    - This also had a high level of compliance with the National Objectives and HLRs. However, this model was not the preferred approach of the majority of stakeholders. It raised concerns around delivery timings and the high levels of funding required. This model was also reliant on having dedicated spectrum.

The reviewing panel acknowledged there are challenges with each of the models, ranging from mobile market structure, technology maturity, and the need for and availability of dedicated spectrum. It also proposed that a Proof of Concept (PoC) trial be conducted to validate key assumptions in the preferred model. The findings of the RFI were tabled with the SOC in February 2018.

The current governance arrangements have existed since December 2018, when the Council of Australian Governments (COAG) agreed to the PSMB Strategic Roadmap which intended to present the pathway to implementing a PSMB capability in Australia. The current organisational model charged with delivering a PSMB is a distributed approach, with the National Program Management Office (NPMO) orchestrating workstreams assigned to States and Territories. In this governance framework, the National Emergency Management Ministers (NEMM) provides the ministerial level of governance, although it cannot be guaranteed to represent all major client groups at all times. Law enforcement agencies are often not represented by the NEMM. Like those preceding it, this distributed approach has yet to result in delivery of a PSMB.

The 2018 COAG PSMB Strategic Roadmap

The COAG Roadmap established that PSMB would be developed and operated via a federated model. The federated model incorporated an open-ended 'opt-in' approach, with service projected to begin from FY22. The roadmap provided a broad pathway to implementation, including a Proof of Concept, an evolved governance model, deployment of a national core and connection to a commercial RAN, with further enhancements to follow from launch.

In 2019, the PSMB NPMO was established within the NSWTA to progress delivery against the COAG Roadmap. In 2020, responsibility for the NPMO was transferred to Emergency Management Australia, now National Emergency Management Australia (NEMA) within the Department of Home Affairs, but this did not reinvigorate momentum within the project. Furthermore, the SOC has met infrequently since the COAG agreement. However, the commencement of the Review has seen the SOC now regularly convene with a refreshed impetus for the broader PSMB program.

Stakeholders concur that following the COAG agreement, the PSMB program lost momentum due in part to the loss of key resources and personnel and the absence of a committed resourcing plan and compelling program targets. Importantly, jurisdictions have nonetheless indicated a strong desire to expedite the delivery of a PSMB capability, and most are still active in the PSMB program.

NSWTA Proof of Concept (PoC) trial

The national PoC trial was the first key phase of the COAG Roadmap and was due for completion in FY20. The establishment of the PoC took longer and was more complex than originally envisaged. Funding was sought from all jurisdictions but ultimately only contributed by NSW, Victoria, South Australia, Western Australia and the Commonwealth. The NSWTA undertook national leadership of the PoC.

A contract between the NSWTA and Nokia to undertake the trial was executed in March 2021 following two years of negotiations and the finalisation of funding commitments.

The PoC was established to test capabilities such as prioritisation and pre-emption capabilities, seamless inter-carrier roaming, mission critical services, broadcast capabilities, LMR interoperability, deployable solutions, and security. Trial results will inform the design and development of a national PSMB delivery model.

Laboratory testing has now finished and testing is currently occurring in a commercial environment with the PoC scheduled to be completed in December 2022. The Review understands that testing has shown positive results and that the capability is viable. NSWTA has indicated it may extend arrangements for additional testing to account for aspects of PSMB outside the original scope of the PoC.

On 1 July NSWTA launched a request for information to invite potential and interested suppliers to workshops to seek further market input to inform NSW and the National PSMB program.

Current Australian PSMB status

As previously mentioned, PSAs increasingly require mobile broadband to harness the potential of digital technologies to improve operational effectiveness and keep Australians safe. Existing LMR networks will continue to be used to provide reliable voice services. However, LMR lacks data capabilities and has limited interoperability. Commercial mobile broadband networks are therefore being used to deliver public safety services, despite not being designed to do so.

There has been some progress in establishing a PSMB capability, particularly in light of the 2018 COAG agreement, such as the establishment of a set of National Objectives and the RFI. However, the Review has found significant difficulties in establishing a PSMB with the current approach, principally due to the past machinations between the Commonwealth and the States and Territories. In particular, the debate over access to dedicated spectrum has overshadowed progressing other aspects of the PSMB program.

States and Territories view the Commonwealth as providing unsupportive policy decisions around spectrum allocations and dormant program management. The Commonwealth views the States and Territories as overly focussed on spectrum and its pricing, and unaligned as to their engagement and commitment as there is no specified date by which jurisdictions must decide whether to 'opt-in' to the program.

The PSMB program is currently being progressed by a series of workstreams that have been delegated across multiple jurisdictions, though in most the resources and staffing allocated to this work appears limited. Primarily, a relative handful of dedicated public officials across all jurisdictions undertake work on PSMB in conjunction with their primary responsibilities. These workstreams are considering a range of technical, commercial and regulatory challenges facing the PSMB program, with some studied in detail, others less so. However, it is not clear how this work can ultimately be integrated to deliver a national PSMB capability. This is exacerbated by the lack of an integrated project plan. While there has been extensive, and well considered, analysis of potential solutions and variants, there is no clarity surrounding how decisions will ultimately be made once engagements with MNOs are undertaken.

The current governance approach through the SOC is unwieldly in size to govern such a complex program. There is a lack of clarity around principles for program decision making, such as consensus or majority, how disproportional State and Territory sizes influence voting rights, and how decision rights are granted ahead of a jurisdiction opting in.

The Review has also noted an absence of funding models and budget allowances corresponding with a lack of consideration for the costs associated with a program as complex as PSMB.

Given this, the Review considers that there is little prospect for the successful delivery of a PSMB capability under the current approach.

The Review does note that NSW have a taken an alternative approach and is actively driving arrangements to meet the mission critical data requirements for their end users. While they continue to participate in the national program, in response to the lack of progress in delivering a national solution, it has built up a team focussed on delivering a PSMB solution for the State. NSW's resource base builds off those working on the PoC, and includes dedicated resources considering the commercial, regulatory, technical, product and customer management requirements of a State-based PSMB solution.

Part 2 – Spectrum

- The discussion around a PSMB capability in Australia has been dominated by the ostensible need for dedicated low-band spectrum and the differing positions of the Commonwealth and States and Territories.
- PSMB can be delivered without dedicated low-band spectrum, but dedicated spectrum brings distinct operational benefits that will require ongoing consideration. Dedicated spectrum could also have provided commercial leverage for negotiation with the MNOs.
- Band 27 is the only unallocated low-band spectrum with potential for use in a PSMB solution. However, due to its limited ecosystem and narrow bandwidth it is impractical, leaving shared spectrum approaches as the only practical solution.
- Shared spectrum solutions are used in many international PSMB implementations using standards-based features to prioritise PSA users.
- Use of the 4.9 GHz band is limited as its ecosystem has not developed as fast as expected. Some users assert that the current licensing arrangements hamper wider adoption in Australia.
- Given the viability of accessing spectrum through commercial arrangements with the MNOs, this should become the focus of implementing a PSMB.

Dedicated spectrum for PSMB

The inclusion of dedicated spectrum in a PSMB solution has been a key part of discussions and thinking regarding PSMB solutions. Ideally, the dedicated spectrum would be low-band spectrum (i.e. sub-1 GHz) due to its coverage, and will be of adequate bandwidth and supported by a developed ecosystem of network equipment and devices.

The primary technical rationale for dedicated spectrum is that should PSMB be hosted by an MNO, then PSMB traffic could be carried on the dedicated spectrum, separately from the MNO's commercial traffic. This would address the real and perceived risk of public safety users being unable to access the network in times of need due to congestion caused by the MNO's commercial users.

However, the use of standardised features that allow prioritisation of PSA users over commercial users in times of congestion creates the opportunity for shared spectrum networks to be used in PSMB solutions. This has the additional benefit of enabling access to all of an MNO's spectrum assets, rather than being limited to a single dedicated band. This approach is becoming widely used in international PSMB deployments, as shown in Table 2.

Dedicated spectrum has also been desired as a commercial lever, due to its value to MNOs and its potential to be used as a value trade to secure favourable terms for PSMB service supply. This is best highlighted in the US PSMB model, where FirstNet was allocated 2 x 10 MHz of 700 MHz spectrum, a band highly valued by MNOs around the world. FirstNet leveraged this spectrum asset in a public-private partnership with AT&T, where in return for conditional use of the spectrum by its customers, AT&T would invest in significant network coverage expansion and hardening.

There still remains some benefits of dedicated spectrum in a PSMB solution, such as:

- Supporting the deployment of a dedicated PSMB network when required, such as:
    - coverage extension beyond the MNOs' networks; or
    - at peak events (e.g. New Year's Eve, large sporting gatherings), where capacity dedicated to PSMB users could be added to augment the capacity of MNOs' networks.
- Supporting the rapid roll out of 'deployables' using dedicated spectrum, saving the time required to integrate the deployables into the shared spectrum of an MNO.

While the debate over spectrum has focussed on the provision of unallocated bands for PSMB use, Australia's spectrum licensing regulations permit third party use and commercial trading of spectrum or other access arrangements. MNOs could, under commercial agreement, sell or provide access to some of their spectrum holdings so that it can be dedicated to PSMB users. This would be subject to the parties considering this option and assessing the pricing, costs, technical complexity, benefits and risks in reaching an agreement against the option of sharing spectrum with prioritised access. Technology developments in the 5G roadmap (highlighted in Part 3) may make this option more attractive and practical in the future.

Spectrum history

The development of a PSMB capability in Australia has been dominated by contention between the Commonwealth and States and Territories over spectrum, specifically low-band spectrum (< 1 GHz). The conflicting issues have been the choice of spectrum band, the bandwidth, whether spectrum for PSMB use should be allocated at zero or low cost, the strong policy drivers for pricing spectrum at market value, and the source of funding for the buildout of a PSMB network.

In 2012, the Commonwealth announced the allocation of spectrum for a nationally interoperable PSMB capability, being 10 MHz of spectrum in the 800 MHz band as a 2 x 5 MHz paired assignment (5 MHz downlink, 5 MHz uplink), with the exact frequencies to be considered later. This allocation also stipulated conditions relating to spectrum pricing, interoperability, and build and funding obligations. 50 MHz of spectrum from the 4.9 GHz band was also assigned exclusively for PSA usage under a class licensing arrangement.

A 2013 Parliamentary Committee made recommendations to the Commonwealth to allocate spectrum in the 700 MHz band by preference, or the 800 MHz band as an alternative, and direct monies arising from the spectrum auction to fund the capability. These recommendations were not supported by the Commonwealth.

In April 2018, the States and Territories submitted to the Commonwealth a proposal for dedicated spectrum to support a PSMB capability. The proposal sought an allocation of spectrum in the 850 MHz expansion band (Band 26) for PSMB, and that the Commonwealth apply provisions in the *Radiocommunications Act 1992* to allocate the spectrum at no or low cost, given that the allocation was for a public or community service such as a PSMB. The proposal sought 2 x 10 MHz of spectrum, but would have accepted 2 x 5 MHz over none at all. The allocation of spectrum in the 850 MHz expansion band was preferred noting concerns over a lack of industry support for other spectrum bands (namely, Band 27).

In 2018, the Commonwealth responded by offering 2 x 5 MHz spectrum in Band 27 (809 – 814 MHz and 854 – 859 MHz), with specific terms for the States and Territories. This offer was revised later in 2018, with the Commonwealth applying a fifty percent discount on the spectrum's assessed market value, dropping its price to $233 million over 15 years. The licence commencement would be deferred until 2023, at which point licence payment instalments would begin. Responses from States and Territories acknowledged the offer but stated their concerns regarding the amount of spectrum, the unsuitability of Band 27 and the cost.

Further debate ensued when the Commonwealth tabled its plans to auction the 850 MHz expansion band, including Band 26. A number of States restated to the Commonwealth their strong view that the Band 27 allocation and offer was not suitable for PSMB due to its small bandwidth and limited ecosystem. They asserted that instead the Band 26 allocation should be set aside for PSMB use and not be auctioned as planned.

In response, the Commonwealth emphasised that the auction should not be delayed and noted the significant legal, reputational and revenue risks that could come from delaying the auction. The Commonwealth's response was consistent with broader considerations of ensuring the most efficient and effective use of spectrum to maximise the public benefit. The Commonwealth also noted that the 850 MHz expansion band is critical spectrum, especially for the rollout of 5G and regional communications coverage.

The Commonwealth progressed with the auction, in which the MNOs participated. In contrast, the States and Territories chose to continue to advocate for the allocation of Band 26 spectrum, as opposed to undertaking alternative arrangements such as investigating the viability of participating in the auction. The Band 26 spectrum was subsequently secured by Telstra through the competitive price-based allocation. The Band 27 allocation and its offer terms remains in place, but has as yet to be taken up. There may be scope to revisit the offer in light of the outcome of the auction.

Spectrum status

Low-band spectrum

Band 27 currently remains as the only low-band spectrum with potential for use in a PSMB solution. The Review has found that the outlook for the applicability of dedicated Band 27 spectrum is poor. It is likely to remain this way for some time, as its current device and infrastructure ecosystem is very limited globally. Any implementation of Band 27 in a PSMB solution would necessitate the acquisition of low-volume, specialised technology that would be significantly more expensive than 'off-the-shelf' counterparts compatible with other bands. Australian MNOs have also advised that deploying Band 27 network equipment would require significant changes to their existing site designs at high cost.

> *"PSMB must be affordable for jurisdictions … therefore extensive consideration must be given to supply off-the-shelf devices … rather than spectrum and procurement determining solutions that will result in costly and inhibitive devices."* **Queensland Police Service submission**

The absence of a Band 27 ecosystem is further compounded by the lack of commercial drive to develop that ecosystem, as highlighted by discussions with industry. To date, Band 27 has only been identified for potential use within Australia, Myanmar and Latin America. Given this, there is likely insufficient demand to drive the changes within the Band 27 ecosystem required for such equipment to be sufficiently available and affordable for use in an Australian PSMB capability.

4.9 GHz band

To date, use of the 4.9 GHz band has been limited. Some jurisdictions were not aware of its existence at all, or were unsure of the extent of its use within their borders. This spectrum is identified internationally for public protection and disaster relief applications. Although this improves the probability of the development of a 4.9 GHz device ecosystem, in reality, discussions with industry have indicated that this ecosystem is not as

highly developed as initially expected. As with Band 27, a well-developed 4.9 GHz ecosystem is needed to provide the economies of scale for PSAs to efficiently access devices and equipment.

> *"NSWTA supports changes to current licence conditions to enable future 5G PSMB deployments that may otherwise be limited, such as the six-month maximum deployment at a fixed site."*
> **NSWTA submission**

State and Territory stakeholders have informed the Review that some of the class licence's restrictions on the band's usage reduce its appeal to PSAs. Under the current class licence structure, spectrum can only be reserved for six months in any given area, there is no protection from interference, and the spectrum within the band can only be used contiguously. Some jurisdictions have advocated for changes to the 4.9 GHz band's class licence conditions to make them less restrictive, thus making the band more attractive. The ACMA has highlighted this is for future consideration by recently moving the 4.9 GHz band to the monitoring stage of their spectrum planning process.

Other bands

The Review acknowledges the potential application of other spectrum bands to a PSMB solution in the future. However, those spectrum bands are currently allocated for other uses and will remain unavailable for the foreseeable future. Some stakeholders have indicated that the measures outlined in the former Government's Media Reform Green Paper may provide a potential source of low-band spectrum. However, considerations regarding these measures are still in their infancy and take into account broader and more comprehensive matters beyond spectrum use. Accordingly, further consideration of this spectrum for PSMB is not viable in the short to medium term. Another potential source of dedicated low-band spectrum is the 400 MHz band, which could be freed when LMR networks are ultimately phased out. However, the Review has heard that LMR will interoperate alongside PMSB for the foreseeable future.

Moving forward

Implementing a PSMB capability using shared MNO spectrum is now the only practical solution. However, the States and Territories are concerned that by not holding a valuable spectrum asset, commercial leverage when negotiating to secure suitable MNO services is limited. They consider that the Commonwealth must recognise the consequences of the contention surrounding spectrum and be prepared to use its unique position to ensure that any PSMB solution is fairly and sustainably priced.

Additionally, the Review's consideration of PSMB developments in other countries, such as US, UK and Finland, has shown that PSMB can be implemented without dedicated low-band spectrum and on a shared basis with commercial MNOs under commercial agreements. Australian MNOs already provide a technologically mature service, and have significant allocations of spectrum across multiple bands which can provide access and capacity greater than that offered by mere dedicated low-band spectrum.

The Review concludes that the spectrum landscape has moved on from historic perspectives. The viability of accessing spectrum through commercial arrangements with the MNOs should become the focus of a PSMB implementation.

Part 3 – PSMB Solutions

- There is a strong degree of alignment across all jurisdictions on the relevance and applicability of the National Objectives. This alignment on the fundamental direction of the PSMB program provides it with a strong foundation. It is critical not to 'lower the bar' that a PSMB must meet.
- The effective implementation of mission critical feature sets on mobile networks is vital to ensuring that prioritisation targets can be met in times of need.
- 4G LTE has proven to be capable of supporting mission critical broadband technology. It is expected that any initial PSMB solution will be developed on a 4G base, and then evolve to offer 5G capabilities as well.
- The preferred PSMB network solution would see a PSMB capability delivered over all three MNOs, acting in the aggregate, with each network configured to provide mission critical public safety feature sets, improved coverage and resilience, operational transparency and connected to a dedicated PSMB core.
- Mobile networks have been designed and built to provide commercial-grade services to their users. For commercial networks to meet the requirements of PSAs, there would need to be significant upgrades and enhancements made to all three networks.

Objectives and requirements of a PSMB solution

As noted earlier in the Report, the initial objectives and requirements of a PSMB solution were drafted in 2017 and agreed to in 2018. The National Objectives stipulate the desired attributes of a PSMB solution and are set out in Table 3.

Table 3: National Objectives for a PSMB capability

Category	Objective
Governmental Cooperation	Australian Governments will work co-operatively to develop a federated PSMB capability in Australia, that takes account of individual jurisdictional circumstances.
Services	Australia's PSMB capability will support the provision of both mission critical and non-mission critical multimedia services.
Coverage	Australia's PSMB capability will provide, as far as is feasible, coverage that is fit-for-purpose for PSAs.
Priority	Australia's PSMB capability will be able to: o prioritise between different PSA users; and o where the use case requires this, provides priority access to PSAs when service resources are shared with non-PSA users.
Capacity	Australia's PSMB capability will be scalable to accommodate public safety needs.
Availability	Australia's PSMB capability will, as far as is feasible, be available at all times.
Security	Australia's PSMB capability will have appropriate protective security measures to prevent unauthorised access of information and interference.
Interoperability	Australia's PSMB capability will provide nationwide interoperable public safety communications, including communications within and between jurisdictions.

Category	Objective
Devices	Australia's PSMB capability will be accessible on any fit-for-purpose device across multiple operating systems.
Integration	Australia's PSMB capability will complement and, where appropriate, be integrated with jurisdictional LMR capabilities.
Standards	Australia's PSMB capability will be based on open standards, with any proprietary features of the capability reverting to a standardised version once available.

The Review sought feedback from all jurisdictions and agencies as to whether the National Objectives still retained their relevance and applicability today, given the evolution in public safety practices and technology. The Review heard that:

- There is a strong degree of alignment across all jurisdictions on the relevance and applicability of the National Objectives as originally drafted, and noted that this alignment on the fundamental direction of a PSMB program provides a strong (and under-appreciated) foundation for the program that should be leveraged.
- Through engagement with its PSAs, NSW proposed that the potential outcomes of the program could be strengthened by stipulating additional objectives (and their associated HLRs) addressing **Transparency**, which defines the need for PSAs to have visibility of the planned and operational status of the MNOs to enable effective planning and operational management; and **Affordability,** to ensure that investments in a PSMB capability represent value for money, and that service costs remain affordable for PSAs.
- Most States and Territories have not recently reviewed the HLRs (which are a much more comprehensive set of requirements, totalling 111 requirements across 10 categories), and they considered it would be good practice to review the HLRs in light of the passage of time and advances in technology. However, NSW, which has recently reviewed the requirements, considers they remain generally applicable.
- Jurisdictions acknowledged that the National Objectives are a target state and will not be met at launch, but that it was critical not to 'lower the bar'. There also needs to be an understanding across jurisdictions as to what could be delivered as a minimum capability at launch, although NSW is the only jurisdiction that has formed a view as to what this would be.

Recommendation 3

The set of National Objectives be expanded by Q2 2023 to include criteria for Transparency and Affordability, where:

- **Transparency** defines the need for PSAs to have visibility of the planned and operational status of an MNO's network to enable effective planning and operational management (which is critical when a PSMB solution is hosted on commercial networks); and
- **Affordability** stipulates that any investments in a PSMB capability represent value for money, and that service costs remain affordable for PSAs.

Implementation Guidance

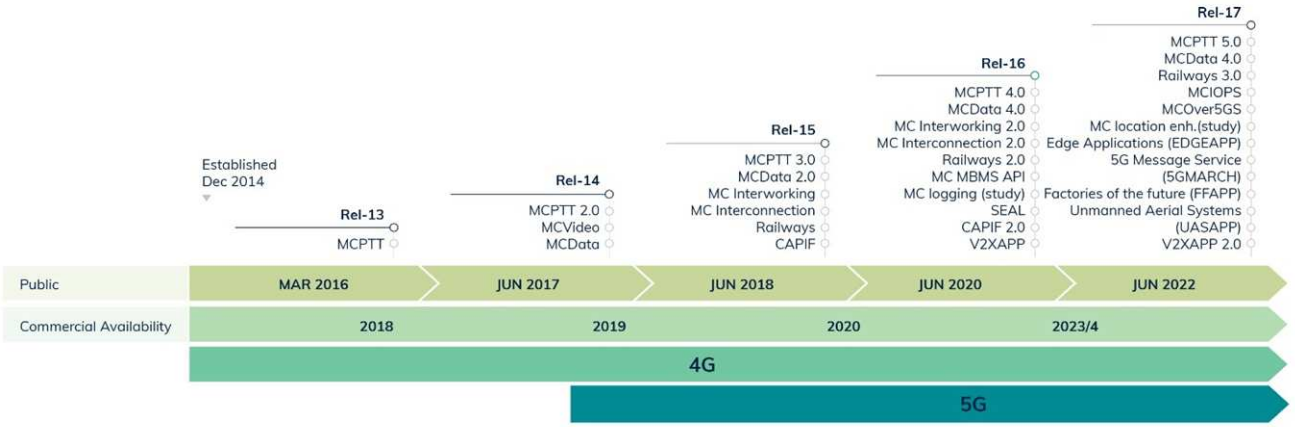
- *For each of the PSMB National Objectives there is a set of High-Level Requirements (HLRs) which describes in detail the target state required.*
- *The Commonwealth should work with States and Territories, industry and any experts as required, to define the detailed HLRs required to support these new objectives.*

Technology roadmap

Standards

As set out earlier in the Report, there are industry standards associated with public safety mobile networks. In 2014 the 3GPP established a specific working group, known as SA6, to develop specifications focussed on the needs of PSAs for use on mobile networks, in recognition of the world-wide trend to utilise mobile networks to provide PSMB capabilities.

Figure 2: Roadmap of feature developments for mission critical applications



Based on 3GPP documentation

Figure 2 highlights that there is substantial time between specification release and commercial availability. An operator choosing to implement these features would procure them once available and test them, ahead of a wide scale deployment. It is not uncommon that it can take around three to five years between release and deployment.

3GPP Release 13, made public in 2016, was the first to include public safety capabilities, with each subsequent release adding new capabilities or enhancing those already in place. The initial releases developed capabilities for use on the 4G LTE technology platform, and focussed on those known as 'MCx', which referred to mission critical capabilities for voice, data and video for use by public safety users.

Summary of key mission critical features

Mission Critical Push-to-Talk (MCPTT), supporting:

- Voice calling between a pair or a group of users
- Merge multiple groups or users in real-time for more effective incident handling.

Mission Critical Data (MCData), supporting:

- Delivers messaging, file distribution, and data streaming functionalities
- Command message sharing, picture and videos sharing of incident-relevant data to improve situational awareness.

Mission Critical Video (MCVideo), supporting:

- Group and private video calls and live streaming of video to improve situational awareness and event handling
- 'Pull/push' Video - enables dispatchers and first responders to remotely retrieve and share videos from peer devices.

Importantly, these public safety features are used in conjunction with prioritisation features that are separately defined within the 3GPP standards. These features are known as QPP (Quality of Service, Priority, Pre-emption). They are critical to enabling the prioritisation of network access and capacity for higher order public safety users over lower order public safety users and/or commercial users in times of congestion on shared spectrum. The effective implementation of these features on mobile networks hosting a PSMB capability will ensure that the mission critical prioritisation targets can be met in times of need.

The QPP features applies prioritisation through the following mechanisms:

- Quality of Service: ensures a sufficient quality for mission critical services, even if it means poorer service for consumers
- Priority: ensures prioritised access for mission critical services when there is congestion in the network
- Pre-emption: allows higher priority users to displace another user off a service that is already in progress.

In addition to the MCx feature sets, the 3GPP standards have also prescribed the functional requirements to support other features for public safety users, such interworking with LMR networks, multi-broadcast capabilities and direct mode operation (enabling users to communicate between themselves in locations where no network exists or the network has failed) to name a few.

4G roadmap and evolution to 5G

> *"The evolution of [Public Protection and Disaster Relief] users from nationwide dedicated narrowband communication networks … to broadband is relying on standardised mobile broadband technologies (i.e. 4G LTE or 5G). These broadband technologies were originally developed for commercial use and continue to evolve to support mission-critical broadband requirements."* **TCCA, Spectrum Position for World Radio Conference 2023**

4G LTE has proven to be capable of supporting mission critical broadband technology. New use cases are now supported, focused on the use of mission critical video and data, as well as voice, delivering clear user

benefits. 4G LTE is widely available today across early-adopting countries, with many other countries in the planning phase, and will continue to be deployed for the foreseeable future.

Whilst 4G LTE offered a step change in terms of capabilities for critical communication operators and users compared to previous technologies, 5G will deliver evolutionary, rather than revolutionary, enhancements for public safety users. For PSAs, 5G will have the potential to provide greater situational awareness through the use of advanced video recognition capability, artificial intelligence analysis of data collection and new user applications. It delivers these through two broad technology pathways:

- enhancing use cases initially enabled by 4G LTE and scaling them up to support a higher density of users in any given area; and
- lower system latency (faster responsiveness).

As shown in Figure 2, the 3GPP roadmap specifies new public safety capabilities through to Release 17, due to the widespread use of 4G LTE networks around the world. Specifications applying to 5G networks have been released since Release 15 in 2018, and will continue to evolve as 5G deployments increase.

Some of the 5G features that PSMB networks may access in the future:

- Porting of all MCx services to 5G
- 5G Multicast & Broadcast Services, which will enable more efficient and effective group-based communications (voice, data and video), enabling higher density of users – critical in incident response environments
- 5G Device-to-Device Communications, for use in environments with limited or non-existent network coverage, also relaying capability to extend range of signal
- Network Slicing, which can 'slice' a single physical network into many virtual 'private' networks with different service characteristics; which could be assigned to public safety users of a shared network
- Enhanced Network Security, additional mechanisms to protect the integrity, confidentiality and availability of the network services and user data
- Advanced Congestion Management: Improvements to support differentiation of mission critical users and services during times of peak congestion
- 5G Non-Terrestrial Networks, which supports expanding coverage solutions to places with no terrestrial coverage using satellites, high-altitude platforms and unmanned aerial systems.

While 5G is being deployed by Australian MNOs and has the potential to provide public safety users with an even richer set of use cases, the existing 4G LTE networks have the widest coverage and can deliver the key requirements of the PSMB capability today. Given this, 4G LTE networks can form the basis of initial PSMB deployments and there is no reason to delay a PSMB implementation to align with 5G deployments.

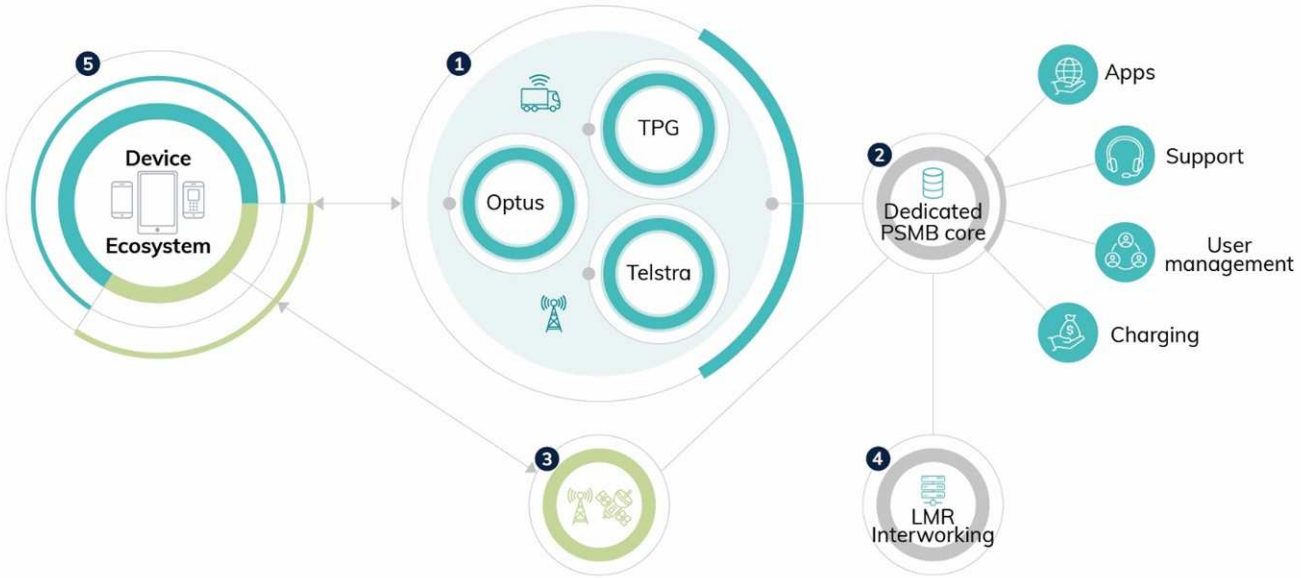
Preferred solution

The preferred PSMB network solution (see Figure 3) would see a PSMB capability delivered over all three MNOs, acting in the aggregate, with each network configured to provide mission critical public safety feature sets, improved coverage and resilience, and operational visibility and connected to a dedicated PSMB core. This configuration could be augmented with other network solutions such as satellites in a 'network of networks' model.

As shown in Figure 3, the preferred solution architecture is based on:

1. Partnership with **all three MNOs**, whose networks must be **upgraded and enhanced** to provide the mission critical capabilities required in a PSMB solution, in line with the requirements stipulated in the objectives and HLRs.
2. A dedicated PSMB core.
3. Connectivity to complementary networks, such as satellites, dedicated networks or Wi-Fi.
4. Gateway connecting PSMB and LMR networks to support interworking.
5. Ecosystem of devices, designed to support PSMB.

Figure 3: Preferred solution architecture



PSMB architecture

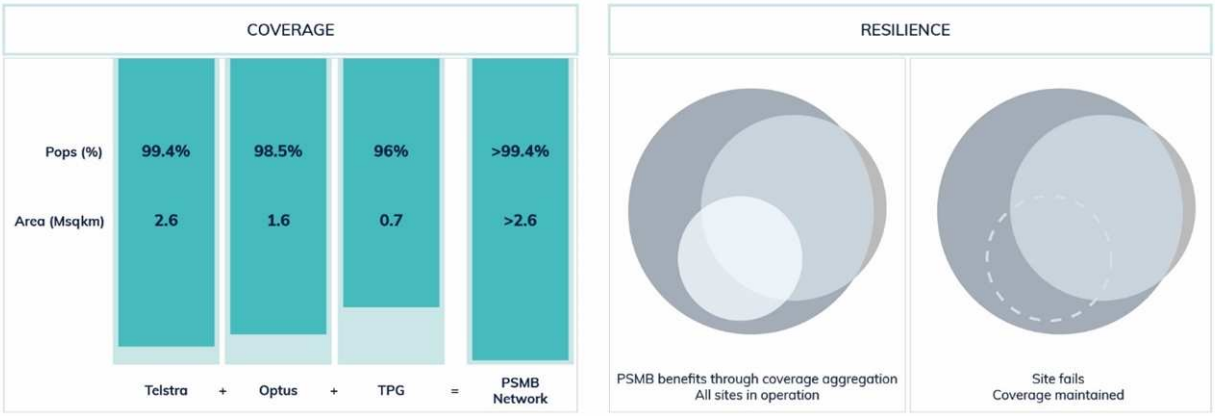
Partnering with all MNOs

The coverage profile of the Australian MNOs can be characterised as having reasonably equivalent coverage of Australia's population centres, with only 3.4 percent difference between Telstra and TPG Telecom's national population coverage. However, within these populated areas there are still gaps in coverage, often within buildings, carparks, and the fringes of metro areas. In less dense and regional and remote areas, the difference in coverage between the MNOs is more marked, with the small difference in population coverage translating to a large difference in geographic coverage. For example, Telstra has approximately one million square kilometres more geographic coverage than its closest competitor, Optus.

By using all three MNOs in a PSMB solution, a greater initial coverage footprint can be offered than could be obtained by using only one MNO in the solution. Similarly, the resilience (or availability) of the PSMB solution is enhanced through the use of all MNOs. Where overlapping coverage exists, the failure of one service enables the user to fall back to another MNO. Figure 4 provides an illustrative overview of these matters.

> *"The PSMB, like the existing Public Safety Networks, must be highly available and reliable. Commercial MNO networks are not designed as hardened networks; however, if the PSMB had access to multiple MNO [networks] in an area, this would be a way of providing a level of resilience."* **BAI submission**

Figure 4: Coverage and resilience



Using all MNOs in the solution also creates greater commercial contestability, with PSMB usage spread across all three networks. This enables greater service pricing competition, and avoids single supplier lock-in. However, it is important to note that access to these networks is subject to agreement, be it commercially or otherwise obtained. The Review notes the potential sharing arrangement currently proposed by Telstra and TPG Telecom, and the impact this may have on the coverage and capacity in regional areas. As the proposal is still under consideration by the Australian Competition and Consumer Commission (ACCC), the Review is not able to provide any commentary on this matter.

MNO enhancements required to deliver PSMB capabilities

Mobile networks have been designed and built to provide commercial grade services to its users. The specific service levels offered are an outcome of decisions made by the each of the MNOs considering their market strategies and financial objectives. With the exception of regulation that defines how the Triple Zero service is carried by their networks, there are no specific requirements placed on their operations directly linked to public safety services.

The target architecture outlined in Figure 3 requires the MNOs to be upgraded and enhanced to meet the HLRs required of a PSMB capability. The areas that require enhancement and upgrading to provide a mission critical capability are listed in Table 4 below, and are consistent with the categories outlined in the National Objectives.

Table 4: MNO uplift requirements for a PSMB capability

Capability	Requirement to deliver a PSMB capability
Prioritisation of public safety users	A PSMB solution will require the partnering MNOs to implement the QPP features which allow the prioritisation of users in times of congestion, which may also result in adverse customer impacts for commercial users. The QPP features must be

Capability	Requirement to deliver a PSMB capability
	configured in an aligned manner to ensure end user experience is consistent across MNOs, and kept current with any evolution in underlying standards.
Public safety features	The MNOs must deploy the required suite of public safety features prescribed by the HLRs. As highlighted in the 3GPP roadmap, these capabilities may commence with the MCx set of features, later evolving in line with the requirements set in the National Objectives/HLRs. Importantly, the implementation of these features must be over all partner MNOs, and configured to provide an equivalent user experience.
Capacity for public safety users	Partner MNOs will have to plan for the additional capacity demands placed on their network by the PSMB users. This will need to address predicted traffic loads as well as the management of crisis situations which give rise to high demand levels. This capacity planning goes hand-in-hand with ensuring the delivery of the required broadband data speeds and implementation of prioritisation features and their trigger conditions.
Temporary coverage solutions	PSMB users will require additional coverage to be available at short notice, to deal with planned events or crisis situations. There are a range of available coverage augmentation solutions, such as Cells on Wheels and satellite solutions. As technology advances, more extensive use of drones and other such vehicles could provide temporary services. The nature of these solutions and their ability to work in high density and low density environments must be considered in any set of augmented coverage solutions. Additionally, backhaul arrangements (terrestrial vs satellite), predicted frequency of use and cost, and which entity should own and deploy these solutions, need to be taken into account in any solution design. The mobile standards catering for PSAs also support 'direct mode' working, whereby users can communicate between themselves without the presence of a network. The potential for this solution must also be considered in an overall coverage augmentation strategy.
Expanded breadth and depth of coverage	While the use of all three MNOs provides a large initial coverage footprint, the coverage objectives stipulated by the HLRs seek even greater coverage, in regards to both the improved depth and expansion of coverage. Improving and expanding coverage ultimately requires the building of network infrastructure. This is already well understood to be economically challenging in Australia, especially in regional areas. Ultimately the extent of, and prioritisation of additional coverage and the funding model used will need to be determined based on detailed analysis of the options. In addition, any expansion of service coverage must be based on the expansion of some or all of the partner mobile networks if there is no dedicated spectrum to support a complementary network.
Higher levels of network availability	While the use of all three MNOs provides the benefit of redundancy, the National Objectives stipulated that PSAs seek a significantly higher level of availability than the MNOs target. This is reflected, for example, in base station battery back-up design in existing LMR networks of 20-30 hours compared to 4-8 hours for a commercial mobile network.

Capability	Requirement to deliver a PSMB capability
	While infrastructure-based solutions are one means of improving site reliability, consideration must also be given to how improved operational responsiveness that minimises site down-time can improve availability. The use of deployables to address service outages should also be considered as an alternative to network hardening investments.
PSMB level security	Levels of security sought by public safety networks are usually materially higher than those offered by commercial MNO networks and designed for accordingly. PSMB security needs to be considered as an end-to-end solution, covering not only security technology solutions but operational and data management practices as well.
Adherence to standards	It is important that any PSMB solution is aligned to global standards, and that this requirement is aligned with the direction of the MNOs. Adherence to global standards delivers benefits in terms of lower cost equipment, ease of integration of network elements, higher confidence in interworking success and wider selection of solution vendors. The preferred PSMB solution relies on the 3GPP roadmap for public safety related features and should continue to support and drive this position.

Dedicated PSMB core

> *"One of the essential building blocks in a PSMB solution architecture that is critical to satisfying all these requirements is a PSA dedicated core network."* **Nokia submission**

A dedicated core network is integral to the solution. It can be purpose-built for the PSMB solution, with its design meeting the redundancy and geographical requirements of a PSMB capability and independent of MNO core architectures.

The dedicated core also offers the following benefits:

- It supports the connectivity to multiple MNOs, preserving contestability and flexibility
- It provides flexibility as to the model of connectivity selected to connect to the MNOs – roaming, MOCN or MORAN
- Separates the core management of public safety users from commercial networks that are used by consumers and businesses
- Can be designed to satisfy the specific operational security requirements of a PSMB solution
- Does not tie a dedicated core vendor selection to decisions made by MNOs
- Enables connectivity to complementary networks, such as networks operating with dedicated spectrum or satellite solutions.

Network sharing models

Multi-Operator Core Network (MOCN)

MOCN involves the sharing of the radio access network infrastructure, including the equipment, site and means of power delivery, by two or more independent core networks. The spectrum is pooled and shared between core networks.

Multi Operator Radio Access Network (MORAN)

MORAN involves the sharing of the radio access network infrastructure, including the equipment, site and means of power delivery, by two or more independent core networks. Each core network uses its own spectrum.

Roaming

Roaming involves a user of one network (its 'primary' network) being permitted to operate on another network when outside the coverage of its primary network.

Support for complementary networks

The PSMB solution primarily offers coverage and broadband services by way of three MNO networks. However, the Australian geography presents challenges in economically providing coverage to low density areas. Any PSMB solution should not constrain itself to being solely based on the MNO networks, but should be open to integrating other complementary network solutions into its overall solution architecture. That is to undertake a 'network of networks' approach. This approach is already in use today with LMR terrestrial networks being complemented by satellite networks in low density areas, or temporarily in times of crisis. The following are some of the potential complementary solutions that could be integrated into a PSMB solution.

Defence JP9102 satellite systems

This system will comprise of a number of geostationary satellites covering the Australian landmass. While it is still under development and tendering, it would be prudent to consider how it could be integrated as a complementary PSMB solution, and to understand the timing, technical considerations and alignment against the PSMB objectives.

Low earth orbit (LEO) satellites

LEO satellite technology is promising and could realise a significant change in the delivery of a PSMB, especially in regional, rural and remote areas. Given this, they potentially could play a larger role, not only for PSMB, but for telecommunications in general.

Wi-Fi networks

Wi-Fi networks can provide localised communications solutions that can be used on a permanent or temporary basis, and linked through the dedicated core to harmonise communications across the broader PSMB network.

LMR gateway

The LMR gateway function will connect the PSMB network to each of the State and Territory-based LMR networks. This will enable interoperability between the LMR and PSMB networks, allowing for the harmonisation of communications across both networks. This will integrate operational communications

across users who are operating on the different networks and also address interworking across different jurisdictions and agencies.

Devices

The device ecosystem for PSMB includes standard and hardened smartphones, handhelds, vehicle-mounted and carry-on field devices, and wearable devices. Such devices may be compatible with only PSMB, while others may support dual PSMB and LMR capabilities.

To ensure seamless interoperability with the PSMB network solution, clear standards and device testing and approval regimes are required. This will also need to extend to the volunteer base of public safety users who utilise their own mobile phones.

Solution benefits

The benefits of this solution are that it utilises the existing 4G and evolving 5G broadband capabilities of the MNOs and their extensive reach, existing capacity and multiple spectrum bands over which they operate. Using commercial networks allows for quicker deployment and lower costs than dedicated network solutions. Additionally, the multi-MNO approach with a dedicated PSMB core provides greater commercial contestability, reducing the commercial and technical reliance on any one MNO. Importantly, it provides a national solution, which in time can resolve cross-jurisdictional and inter-service interoperability shortcomings. The deployment of an LMR interworking function allows integrated communications across the PSMB and LMR networks, and enables these networks to complement each other in the field.

> *"Leveraging existing assets to avoid network duplication and allowing efficient spectrum use will be the most effective way to develop a sustainable PSMB capability. Building and operating a PSMB capability is complex and costly… Leveraging an existing public carrier network would not only facilitate a more timely and cost effective introduction of the capability but will also offer coverage advantages."* **Telstra submission**

The preferred model is aligned to many international approaches seeking to derive similar PSMB outcomes. There are strong parallels with the use of a dedicated PSMB core, partnering with existing MNOs, and connectivity with existing LMR networks which are expected to remain in joint operation with a PSMB for the foreseeable future.

Complexity of solution

The simplicity of the high-level architecture portrayed in Figure 3 belies the underlying technical and commercial challenges that must be resolved in order to deliver a successful and enduring PSMB capability. Moreover, as previously highlighted, the scale and complexity of the work involved in establishing a PSMB is illustrated by the scale of some international PSMB entities which are accountable for delivering the PSMB solution for their nation, and the time taken for them to move from project conception to service delivery.

The creation of a PSMB must address challenges such as:

- the three MNOs, while delivering similar mobile services, can use different vendors, deploy different technical architectures, utilise different supplier commercial models, and have different underlying business strategies, which creates differences between the networks which must be reconciled

- the technology roadmap will always continue to develop and evolve, creating change
- commercial agreements, such as public-private partnerships, required to support a PSMB solution will likely be complex and long in tenure
- the PSMB user agency base is diverse, each with its different challenges, use cases and usage environments
- the wide range of solution decisions that will require expert analysis of market responses, cost and benefits, risk and deployment and operational strategies.

Ultimately, all elements of the solution, both technically and commercially, must be aligned to create a seamless PSMB ecosystem that can deliver to public safety users the capabilities they seek, and so to create confidence in the PSMB as a viable communications solution upon which they, and the public, can rely.

Part 4 – Reflecting the Costs

- There will be substantial costs involved in the delivery of a nationwide PSMB capability that meets the needs of PSAs. The extent of these costs is currently unclear and there will need to be buy in from the States, Territories and Commonwealth.
- There are a number of areas that will drive costs, including technical elements associated with the network architecture, MNO enhancements and additional costs and on-charges for end users, that all need to be factored into an evaluation of the cost of developing a PSMB capability.
- International counterparts are investing heavily to develop and implement PSMB capabilities. There is also limited information surrounding comprehensive costings on PSMB in these countries.
- Significant work needs to be done to fully consider the requirements and costs associated with delivering a PSMB.

This Report has shown that there are a number of technical elements associated with the network architecture that need to be considered in establishing a PSMB capability, such as developing and building a dedicated core network. There also are MNO enhancements required to deliver PSMB capabilities, which all have associated costs, and costs in expanding and/or enhancing networks. Additionally, there are costs and on-charges for end users to access services and devices.

While a preferred network model has been put forward it has not been costed. To properly cost a PSMB solution requires a clear view of the specific target outcomes required over all areas stipulated in the HLRs, and a comprehensive market engagement to seek, receive and analyse industry feedback.

However, the lack of any (even indicative) view of PSMB program costs, and any agreement as to how costs could be allocated across the Commonwealth, States and Territories, is a risk to the program as no progress can be made without budgets being established and funding being granted.

The Review has not attempted to provide an estimate of the overall cost of a PSMB. Nonetheless, this part presents some examples that reflect the scale of the potential costs associated with the delivery of a PSMB capability.

Costing examples

Productivity Commission report

The 2016 Productivity Commission (PC) Report considered four models – a dedicated network, two hybrid models (incorporating both dedicated and commercial components), and a commercial option. The PC concluded that a dedicated network was estimated to cost $6.2 billion over 20 years, and a commercial option was estimated at $2.2 billion. These costs represented the base case of each option as a range of variants were also costed. It should be noted that the PC estimated economic (or resource) costs, not costs to Government, and that these costs used a seven percent annual discount rate, so their gross costs would be higher.

The PC Report found that the commercial option was the most cost-effective model and is most relevant in considering the costs associated with a PSMB in 2022. It is important to note that the PC Report pre-dates the National Objectives and the HLRs. Accordingly, the parameters used to size the network in the PC Report do not match the target state stipulated in the HLRs and the models costed are not fully aligned with the current preferred solution.

UK Emergency Services Network

The UK Emergency Services Network (ESN) represents an 'end to end' commercially operated solution, partnering with UK telco EE, relying on spectrum, radio access network and core access. As part of the contract, EE agreed to provide access to its mobile network, which would replace the voice capabilities of the existing Airwave LMR network. The UK Home Office estimated that this would save £200m per year, while providing broadband-related opportunities and benefits.

In 2019 the National Audit Office reported on the progress of the ESN since the 2015 business case. The report broke down its estimate into categories which provide a good indication of the types of services for which expenses will be incurred and their cost relative to each other. For the purposes of this Review, the specific UK-related costs, such as the extension of the Airwave service, were removed. Taking this into account, the ESN is projected to cost £5.9 billion over a period of 22 years (2015-2037), with a further £0.7 billion allocated for contingency. Table 5 provides a breakdown of these figures.

The ESN relies on access to the EE network, at a cost of £1.7 billion. Under the contract, EE is required to increase its coverage at an estimated cost of £696 million over 22 years.

Motorola was also contracted to provide support application features including push-to-talk and large group calls. Motorola will also provide systems for billing and reporting, accrediting devices and control rooms, a virtual network, and security (hardening) features. The estimated cost of these user services is £1.1 billion.

The ESN is being progressed by the Emergency Services Mobile Communications Programme within the Home Office. Functions such as program delivery, administration, user engagement, coverage, and recruitment are outsourced to third party delivery partners. At times the program has employed up to 400 staff; currently there are over 120 people working on the program. The estimated costs for delivery partners are £162 million and £286 million for project management and integration.

Table 5: UK itemised costs for ESN (2015-37)

Item	Cost forecast (£m)
Mobile communication service	1,672
User services	1,192
Delivery partner	162
Project management	286
Coverage	696
Other	117
Devices	1,070
Usage (phone calls and data)	470
Transition from previous service	156
Control rooms	62
Net cost	**5,883**
Contingency	714

Several companies were contracted to provide handheld, vehicle and aircraft devices. These devices are estimated to cost £1 billion. Additionally, usage fees are expected to cost £470 million. In 2016, the National Audit Office estimated a fully operational ESN would cost £800 per device per year, which would save £500 compared to the current pricing model for devices under the Airwave LMR services.

US FirstNet Authority

The First Responder Network Authority (FirstNet Authority) awarded AT&T a 25-year contract to build, operate and maintain a PSMB network in the US. The agreement saw AT&T agree to spend roughly US$40 billion on the network over the 25 years in exchange for approximately US$6.5 billion, along with exclusive access to 20 MHz of 700 MHz Band 14 spectrum (valued at the time at approximately US$8 billion). As part of implementing a PSMB, AT&T would expand its network coverage, deploy Band 14 infrastructure and harden its network, alongside its ordinary network investment. The US Government's negotiating position was improved by the ability to offer dedicated low-band spectrum.

AT&T is required to pay US$18 billion of the above-mentioned US$40 billion back to the FirstNet Authority over the 25-year contract as a sustainability payment. AT&T anticipates FirstNet's operating expenses will cost US$3 billion, with the remaining US$15 billion reinvested into the network.

As highlighted through the above examples, the Review has found that international counterparts are investing heavily to develop and implement PSMB capabilities. However, similarly to Australia, there is limited information surrounding comprehensive costings on PSMB. Taking this into account, the Review has considered costs associated with PSMB capabilities and networks within the UK and US, noting there are material differences in size, population, and market conditions.

Dedicated PSMB core

Discussions with industry undertaken by the Review and the results of the PoC trial have highlighted that the technical solution to deliver a PSMB capability through a geo-redundant dedicated core is available now.

A multi-carrier approach with a geo-redundant dedicated core, to address capacity and redundancy concerns, is estimated to cost between $200-$300 million over approximately seven years, with the initial build and establishment costs comprising around one third of the total cost of the core within the first two years. While there are upfront costs, some beneficial savings include the potential to expand with increased end users over time, and the ability to activate 5G capability when needed after the initial build. This estimate is indicative of the capabilities offered, and the final cost would be dependent on the network features sought in the solution.

This only represents the core costs, and does not include any costs of services from the MNOs, capital expenditure costs such as network coverage expansion and 'hardening' for resiliency, or end users costs such as devices and application development. However, establishing a core is one of the foundational steps in developing a PSMB capability and so represents one of the earlier stages of investment required.

Appreciation of the cost for PSMB

In place of a definitive figure, it is sufficient to say that the costs of delivering a PSMB capability that meets the needs of PSAs and operates nationwide will be substantial. As outlined, significant work needs to be done to fully consider the requirements and costs associated with delivering a PSMB capability. Moreover, the costs need to be considered in light of the wide variety of potential service users.

There is currently little awareness as to what developing and implementing a PSMB will cost and how it may be funded. In looking to further progress a PSMB, there will be a requirement to fully investigate the costs associated with a PSMB and, importantly, this will need to be done nationally. In comparison to other public safety communications programs and projects, it could be said that the approach to PSMB to date has been frugal.

The Review recommends that the Commonwealth engages with the NSWTA to seek its assistance in developing an initial view of the costs of a national PSMB solution. NSWTA have recently closed an RFI which has sought solution and pricing responses from industry for their State-based PSMB implementation.

The Commonwealth could share this information with States and Territories as a starting point for discussions about the development of a national capability and contribution model. All jurisdictions must appreciate that the cost of a PSMB will be substantial and that they will have to make budget allocations to support their participation. Moreover, the focus should not be on delivering a capability for the lowest amount; rather, there must be recognition that this is a significant undertaking that must be financed properly to deliver a mission critical service for PSAs.

Recommendation 4

The Commonwealth formally engage with NSW Telco Authority (NSWTA) by Q1 2023 to seek their support in developing an initial view of network solution costs, to be used to determine the potential funding demands for the program, particularly seed funding.

Implementation Guidance

- *Getting endorsement to progress a national PSMB solution through the new entity will require a view of the initial funding levels required. The Commonwealth does not have the capacity to go to the market to source costs and this activity takes time and requires significant solution knowledge.*
- *NSWTA have just closed a Request for Information which, along with their other commercial analysis, should be used as the basis for an initial costing.*

Part 5 – A Reboot for PSMB

- The PSMB program must be rebooted if a PSMB capability is to be delivered in Australia. The current distributed model has not delivered results or secured the necessary funding or resourcing for a project of the scale and complexity of PSMB.
- A dedicated national approach to implementation is needed to effectively deliver PSMB, with the Commonwealth taking an active leadership role working with the States and Territories.

The Review has found that there is strong agreement and alignment from stakeholders that expediting delivery of a PSMB is in the best interests of PSAs and ultimately the Australian public. However, there is little prospect of this occurring under the current means of implementation. The current federated approach, which has dispersed different aspects of the PSMB program between the jurisdictions, has resulted in relatively little progress. In addition, there is also a lack of funding and resources for PSMB from the jurisdictions.

Moving forward, it is imperative that the Commonwealth takes a clear leadership role to enact the step change evidently required to deliver a PSMB. Change in the approach to PSMB implementation and governance is needed to generate momentum to deliver a PSMB capability.

Importantly, a shift from the current federated approach is required. The creation of a new, dedicated single entity, charged with the establishment and ongoing management of a PSMB network, is needed to implement a PSMB capability. The governance of such a body will also need to be structured to account for the revised implementation model. For this entity to succeed, there will need to be strong alignment between the Commonwealth and the States and Territories in terms of entity direction and governance, funding arrangements, and participation in the program. There will also need to be a common view regarding the network solution that will most effectively and efficiently deliver PSMB in Australia, and an understanding that its implementation will be a significant financial undertaking. Additionally, dedicated and appropriately skilled resources are needed to address the delivery of a highly complex national telecommunications project.

The Commonwealth's critical role in the PSMB program is further demonstrated by the implementation of a PSMB intersecting with multiple areas that fall solely within the Commonwealth's remit. Given that the PSMB network solution will be delivered through one or more MNOs, PSMB implementation is a Commonwealth issue rather than merely a State and Territory issue. Any potential application of regulations or legislation to underpin the delivery of PSMB capabilities will be the responsibility of the Commonwealth. Moreover, the Commonwealth will need to balance the impact of PSMB implementation with the ongoing health and competitiveness of the Australian MNO market.

The implementation of a PSMB triggers changes in the landscape of emergency communications in Australia. The demand for a cohesive national approach means the Commonwealth will have more direct input into the deployment of public safety communications. Correspondingly, States and Territories will need to drive alignment on the needs and priorities of users to maximise the value delivered through a national solution. The upshot of Australia's PSMB program direction is that our mobile networks must transform, becoming an integral piece of Australia's public safety communications network, which is itself a global theme. A successful, sustainable PSMB capability will rely on strong and committed partnerships with the mobile operators.

Part 6 – Single Organisation: National PSMB Entity

- Change in the approach to PSMB implementation and governance is needed to achieve the delivery of a PSMB capability. The Commonwealth needs to take a clear leadership role to deliver PSMB.
- A new operating model is needed to deliver a national PSMB capability expeditiously. The Review is proposing a new operating model comprising a National PSMB Entity (NPE), a revised and streamlined governance model, and an Inter-Governmental Agreement (IGA) that articulates its objectives and operating parameters.
- The Commonwealth should take a leadership role in establishing the NPE, which will be an enduring, dedicated national body to deploy, operate and maintain a national PSMB capability.
- A governance framework will be needed for the new entity comprising of a newly created, streamlined Governance Board and a separate Advisory Board. Considering its complexity and financial scale, the PSMB program will require a governance approach that is distinct from its operational functions.
- Ministerial oversight will be needed in the preparation of the IGA in addition to ongoing oversight of the NPE. The final design of ministerial oversight is subject to the outcome of the IGA negotiation.
- All jurisdictions will need to agree to establish the terms, objectives and principles of the PSMB entity through an IGA. While the Commonwealth should take a leading role in delivering a PSMB capability, the success of this venture relies on the States' and Territories' active participation and support.

There are functional limits to the effectiveness of the current implementation and governance models which are currently charged with the delivery of Australia's PSMB program. Issues concerning decision-making and representation will need to be addressed in any governance model. There is widespread stakeholder feedback that a change in approach is necessary and that there is a strong rationale for a dedicated national body to drive the delivery of the PSMB program.

National PSMB Entity

The Review proposes the **establishment of the National PSMB Entity (NPE), a new, dedicated, enduring, national entity which is accountable to deploy, operate and maintain Australia's PSMB capability.** It would have a new, streamlined governance function with its structure, objectives and operating parameters to be defined by agreement between the Commonwealth and States and Territories. The Commonwealth should take a leadership role in establishing the NPE working in conjunction with the States and Territories.

> *"… the following are most relevant to consider in the development of a PSMB solution for the Australian environment: Create an entity that represents the communication needs of PSMB agencies and charge it with creating and evolving the PSMB network."* **Nokia submission**

The creation of a NPE recognises the complexity associated with delivering a national PSMB, which has previously been absent. The establishment of a new, enduring, dedicated NPE will create cohesion and focus for the PSMB program and can create program momentum but most importantly will consolidate accountability in one entity. The NPE will be accountable to deploy, operate and maintain a national PSMB capability in accordance with the agreed National Objectives. Prescribing the entity as enduring is consistent with the long-term nature of the program and removes uncertainty as to whether it may be a 'build and launch' only venture. An enduring entity is more likely to attract and retain the skilled resources required,

who see a role in a PSMB entity as a positive career path with a strong public benefit. This approach is consistent with the deployment of PSMB internationally.

The Review has considered the wide range of functional activities that need to be addressed in delivering and operating a NPE, and also recognises that these functional activities cannot operate in isolation but need to work together to build a solution for launch and into the future.

Functions to be undertaken by a NPE

The Review considers that a NPE will need to undertake the following (non-exhaustive) list of functions:

- Determine the optimum solution design and direction for a national PSMB capability considering the National Objectives and HLRs
- Establish a committed program of delivery, and drive, track and report against its progress
- Enter into commercial contracts, such as private-public partnerships, with MNOs and other industry partners for the supply of equipment and services
- Establish and manage venture supply, pricing, financing and billing regimes
- Drive and manage engagements with the Commonwealth, States and Territories on regulatory and spectrum matters
- Drive and manage service delivery to all Commonwealth, State and Territory PSMB user groups (over 100 agencies across Australia)
- Work with MNOs on roadmap and capability planning, event planning and incident management
- Manage deployable resources in conjunction with MNOs and PSAs
- Manage network performance and operational engagement with MNOs and PSAs
- Continue to evolve the PSMB capability to meet the growing needs of users and to take advantage of evolutions in technology.

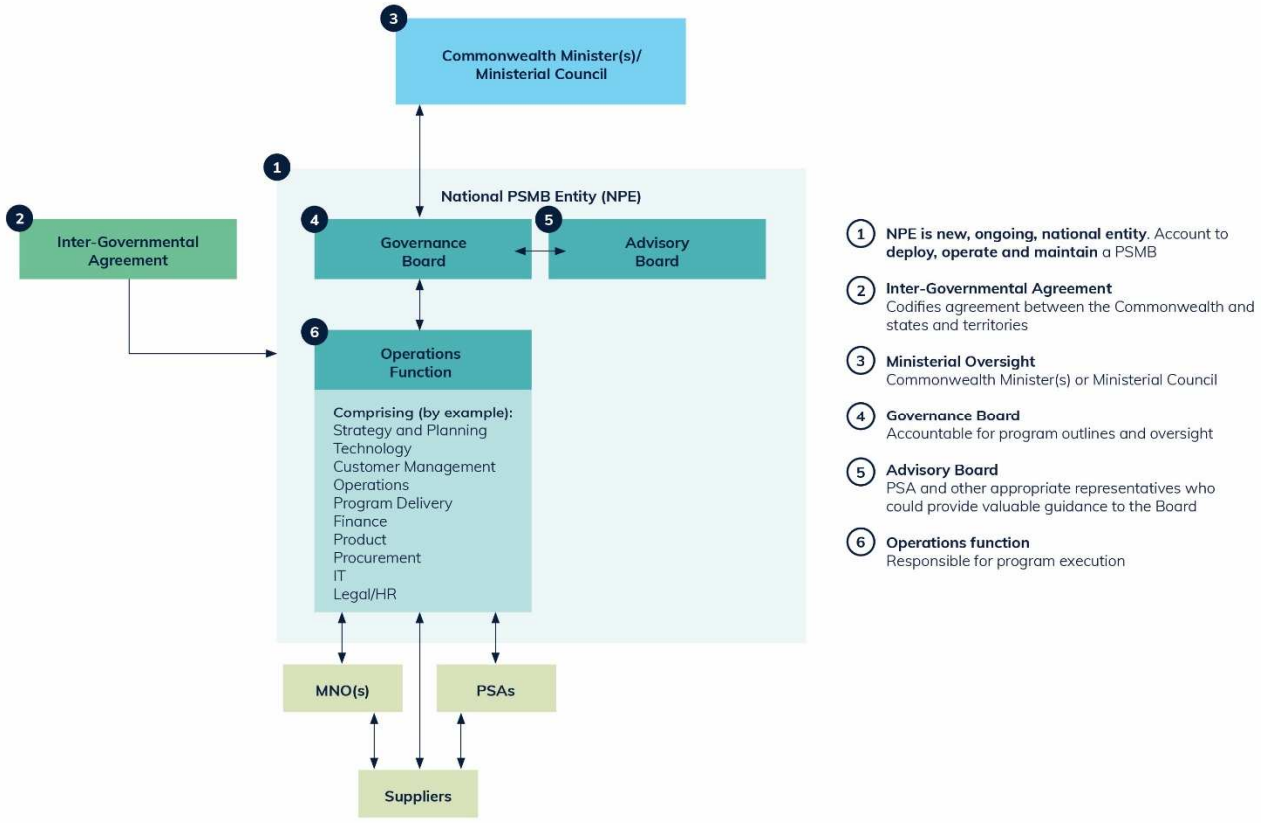
As shown, the NPE has a significant level of complexity associated with its wide range of functional activities. Given this, in developing the proposed organisational model set out in the Report, the principles of good organisational design and governance were taken into account. This included recognising:

- The technical, commercial and operational complexities inherent to a PSMB program and the diverse skill sets required to manage them
- The need to establish complex agreements with multiple MNOs and other parties
- The scale of investment associated with a PSMB program
- The diversity of the PSMB user base, its mission critical function, and need to ensure the PSMB meets the needs of its users
- The Australian federation that gives rise to a high number of diverse agencies across State, Territory and Commonwealth jurisdictions that will be serviced by a PSMB
- The National Objectives for a PSMB are already agreed.

The Review also examined domestic examples where national Government entities deliver services in a federated model, to better understand national organisational models. The Australian Digital Health Agency (the ADH Agency) has a number of parallels with the PSMB program, and these findings contributed to the proposed model.

The Review has studied international models to deliver a PSMB capability. As outlined previously in Table 1, international PSMB approaches have a single accountable entity responsible for their PSMB program, often the entity originally accountable for their LMR services. The Review examined through study and discussion the organisational and governance models used by the USA, Finland, UK, Germany and New Zealand and incorporated these learnings into the proposed model. Further details of the international and domestic models are provided in Appendix E. The proposed organisational model is shown in Figure 5 below.

Figure 5: Organisational model



The Review considered the Commonwealth Governance Structures Policy (CGSP), which supports choosing and maintaining the right governance structure to undertake a Government activity on how best to implement the new entity. Reflecting the principles set out in the CGSP, the NPE is likely to be established as a corporate Commonwealth entity, similar to that of the ADH Agency. However, the Review acknowledges that a decision on creating the NPE is for Government and accordingly, Government is best placed to advise on the most relevant fit-for-purpose governance structure for new Government activities.

Recommendation 5

The Commonwealth establish a new, dedicated, enduring National PSMB Entity (NPE) by Q3 2023 to deploy, operate and maintain a national PSMB capability in accordance with the National Objectives.

The entity should comprise:

- An **operations function**, which is responsible for all aspects of program execution, and is resourced by appropriately skilled staff covering the functional disciplines, and sized in accordance with the demands of the program; and overseen by:
- A **governance board**, which is responsible for program outcomes and oversight, populated by skilled resources experienced in governing a program of the scale and complexity of a PSMB; and supported by:
- **An advisory board**, which is populated by PSA representatives and other experts who can provide valuable guidance to the governance board; with
- **Government oversight** of the governance board and entity through either a Commonwealth lead Minister(s), or a Ministerial Council.

Implementation Guidance

- *The details of the entity's scope, targets, governance to be established through agreement between the Commonwealth, States and Territories and codified in the Inter-Governmental Agreement (See Recommendation 6).*
- *The structure of the entity is based on the principles that the Commonwealth, States and Territories have agreed to the key operating parameters and targets for the entity through the IGA.*
- *A governance board with both expert and stakeholder representation is not recommended.*
- *The advisory board is able to provide stakeholder and user feedback. Additionally, stakeholder representation may be available through Ministerial oversight via a Ministerial Council.*
- *The legal nature of the entity is not prescribed as this is a matter for Government, but noting it has many attributes of a corporate Commonwealth entity.*

Inter-Governmental Agreement

The successful establishment and ongoing operation of the NPE must be underpinned by an agreement between the Commonwealth and all States and Territories on its principles, objectives and operating parameters, and codified in an Inter-Governmental Agreement (IGA). Creating an IGA serves two purposes. Firstly, it compels the Commonwealth and States and Territories to come together to reach agreement on how the vision for Australia's PSMB can be reached, a critical initial step. The Review has heard from all jurisdictions that there is strong demand for a PSMB, together with alignment on the National Objectives. Harnessing these points and the renewed program momentum, the action to establish an IGA is a catalyst for consensus building and agreement. Secondly, once the IGA is established, it sets a clear direction and the operating parameters for the NPE enabling it to focus on delivering on its objectives.

Ultimately the scope of the IGA is a matter for the negotiating parties, however the Review considers that the IGA should aim to agree, as a minimum, on the following matters:

- The structure of the NPE
- Scope of the role of the NPE, and any exclusions
- Key outcomes to be delivered by the NPE and relevant milestones
- The governance structure of the entity, including:
    - Terms and composition of the governance and advisory boards
    - Governmental oversight model and accountability
- Governance obligations and reporting requirements
- Funding principles and funding requirements, including any seed capital to initiate the venture
- Specific obligations on the Commonwealth or States and Territories, such as expectations of participation to be considered in the revised 'opt-in' proposal
- Scope and term of the agreement and variation management
- Any relevant directions to the entity.

It is not expected that the IGA will resolve all issues of program implementation or funding but initially will be the foundational agreement that is appropriately directive which can initiate the activities required to drive a national PSMB program to implementation and beyond. The IGA must strive to balance operational flexibility for the NPE, while maintaining appropriate oversight and user group feedback. Fundamentally, it is the bedrock of a successful NPE and PSMB delivery and establishes equity between the Commonwealth and States and Territories.

Establishing the IGA

The Review proposes that the IGA be negotiated between representatives of the Commonwealth and each State and Territory, with:

- States and Territories each having one representative who represents the needs of their agencies
- Commonwealth end user agencies to be represented by NEMA
- Negotiations to be held at a first secretary / first minister level
- The Commonwealth to take the lead in establishing the framework and timetable for the negotiations; and
- The Commonwealth to determine any approval mechanisms that may be required, such as National Cabinet or other.

To make sure that there are sound principles applied in the negotiation process, the Commonwealth, in conjunction with the States and Territories, should draft a preamble agreement to be used as a starting point for the negotiations. This could be based on the findings and recommendations arising from this Review, and other relevant information sourced from the current work program.

Recommendation 6

The Commonwealth engage with States and Territories to develop a PSMB Inter-Governmental Agreement (IGA), which will define the operating parameters of the new National PSMB Entity.

The IGA should aim to agree the following (non-exhaustive) terms:

- Scope of the role of the NPE, and any exclusions
- Key outcomes to be delivered by the NPE and relevant milestones
- The governance structure of the entity, including:
    - Terms and composition of the governance and advisory boards
    - Governmental oversight model and accountability
- Governance obligations and reporting requirements
- Funding principles and funding requirements, including any seed capital to initiate the venture and ongoing funding arrangements
- Scope and term of the agreement and variation management
- Any relevant directions to the entity.

The engagement and agreement should be completed by Q2 2023.

Implementation Guidance

- *The approach may require endorsement by National Cabinet, with an agreed IGA returning to national Cabinet for endorsement.*
- *A preamble agreement should be drafted as a starting point for the negotiation.*
- *The IGA must be negotiated between representatives of the Commonwealth and each State and Territory. The proposed approach is:*
    - *States and Territories each have one representative who represents the needs of each State's agencies,*
    - *Commonwealth end user agencies to be represented by NEMA,*
    - *Negotiations are held at a first secretary / first minister level.*

Governance functions

The NPE should have a **governance board** which is accountable for program outcomes, oversight, strategic planning and decision-making. It directs and monitors the performance of the operations function and is itself accountable to ministerial oversight.

The term and composition of the governance board would be agreed in the IGA. The Review proposes that the board be streamlined and be populated with directors with the appropriate industry experience and skill set to guide and oversight a program of the scale, cost and complexity of the PSMB enterprise. The Review does not recommend that representatives of agencies or jurisdictions sit on this governance board. Instead, the Review recommends agencies and jurisdictions rely on the agreed direction of the entity having been set with their endorsement through the IGA, and their ability to be represented on the advisory board or at ministerial level. The board's focus must be on ensuring National Objectives for a PSMB capability are met, rather than a narrow focus on achieving the individual aims of each stakeholder agency.

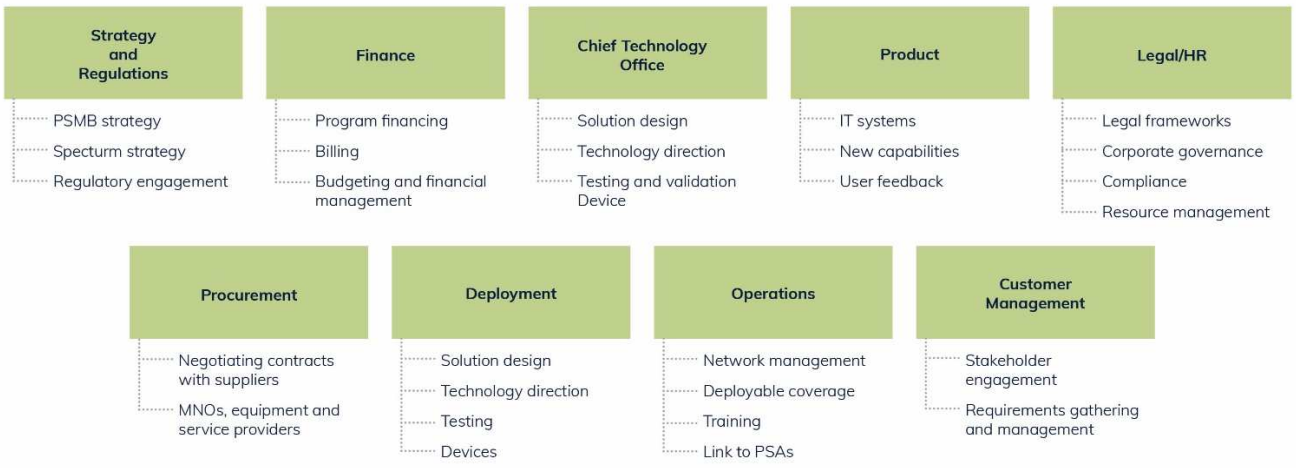
The NPE should have an **advisory board** which can be made up of PSA representatives and other entities who could provide valuable guidance to the program, with terms and tenure also to be agreed in the IGA. The value of the advisory board is that it enables the end users and experts to have governance level interactions with and between the governance board. This helps ensure that the governance board remains closely connected with the user base that it is ultimately delivering a service for. It also ensures that advisory board representatives act as a conduit with those they represent, ensuring a more managed flow of information.

Ministerial oversight is ultimately required of the NPE, and this is where final accountability for the program lies. The Review proposes two models, where accountability is held by a Commonwealth Minister(s), or alternatively a Ministerial Council comprising all State and Territory Ministers and relevant Commonwealth Ministers. The Review has noted both models in use across Government agencies. The former model presents a clearer singular accountability, however it could be criticised for lacking representation by the States and Territories who comprise the bulk of the user base. An approach seen in the ADH Agency model was that although a single minister was accountable, any board direction from that minister had to be agreed by States and Territories. Ultimately the Governmental accountability model chosen will need to be captured in the IGA.

Operations function

The operations function is responsible for program execution under the governance board's direction. It should be populated by appropriately skilled individuals working together under a management structure. It should be sized, structured, and resourced at the level required to ensure outcomes can be delivered in the timeframes required. The scope of the work to be undertaken by the operations function, or any exclusions, its targets and objectives can be defined in the IGA, along with any other specific directions. Figure 6 provides an illustration of the potential structure of an operations function, modelled on typical telecommunications entities.

Figure 6: Organisation design functions and activities



Expediting the creation of a National PSMB Entity

One of the challenges in moving to a new operating model is the time it can take to ramp up operations, with recruitment of key personnel often defining the rate of progress. It is important to move quickly to create a plan to stand up the entity and to commence recruitment of a critical core of people around which the entity can grow.

Once on board, these key resources can develop plans and budgets that scope out additional resourcing needs. Not only are these practical measures critical, but their progress sends an important signal to the user base around the commitment to deliver a PSMB capability.

As previously noted, the NSW Government under the NSWTA have been planning to implement a State-based PSMB program. They currently have dedicated resources skilled in technology and engineering, regulation, product management, commercial analysis, customer management, program management and finance.

Prior to standing up a NPE, the Commonwealth should engage with NSW to consider how best to leverage the opportunity to access the resources and intellectual property of the NSW program, with their consent.

A constructive dialogue on this issue could help 'jump-start' a national program. Conversely, progressing without dialogue or agreement has the potential to lead to role competition, skills leakage, loss of momentum and ill will between agencies.

Furthermore, the Commonwealth should seek to gather and consolidate the work and critical thinking that has been done by all jurisdictions so that this can also be used in building the foundations of a PSMB entity and reducing replication of previous work.

Recommendation 7

The Commonwealth formally engage with the NSW Government prior to the establishment of the National PSMB Entity to agree how its existing capability and plans should be considered in the establishment of a National PSMB Entity.

This engagement should seek to leverage the expertise that NSW have gained through their planned development of a State-based PSMB solution and management of the proof of concept as part of the national PSMB program.

Leveraging this progress provides an opportunity to 'jump start' the national PSMB program by saving time and costs and reducing replication of work.

Implementation Guidance

- *NSW, through NSWTA, have an existing State-based program with dedicated resources focussed on PSMB planning, commercial analysis, regulation, customer management, engineering and contract management.*
- *Developing a national NPE function in parallel, without this prior engagement, has the potential to lead to role competition, skills leakage and dilution, loss of momentum and ill-will between agencies.*

Part 7 – Securing the Success of the NPE

- There are a number of issues that will need to be addressed to secure the success of the NPE and a PSMB capability for Australia.
- Achieving all the requirements of a PSMB solution will be largely subject to the outcomes of market engagement with MNOs which will encompass a commercial agreement.
- Impacts of PSMB on MNOs may alter the competitive balance between MNOs, and must be considered by the Commonwealth in a PSMB implementation.
- Regulation to facilitate PSMB should be considered by the Commonwealth taking into account the impact on the market and the desire for the delivery of PSMB services, including considering mechanisms to ensure fair and sustainable pricing arrangements for the lifespan of a PSMB capability.
- Existing Government programs and industry are already dealing with the complex problems of coverage and resilience. A PSMB solution should work with and through these programs where it would be beneficial for public safety users of PSMB.
- Funding the NPE is critical to its success, accordingly there is a need to establish a viable funding model.
- The current 2018 COAG 'opt-in' principle is a barrier to the success of the NPE and needs to be reconsidered for the future success of the program.

The successful implementation of the NPE will require effort from all jurisdictions in conjunction with the NPE to ensure its success. There is a strong role for the Commonwealth in all of these matters and a differing role for States and Territories. Particular areas the Review has identified are the engagement with the MNO market, designing regulation, coverage and resiliency enhancement, funding and redesigning the 'opt-in' principle.

MNO engagement

The primary role of the NPE will be to develop and implement a PSMB solution. The preferred PSMB solution relies on establishing partnerships with all three Australian MNOs (Telstra, Optus and TPG Telecom) to support the delivery of mission critical services. To successfully achieve this, the entity will need to engage with all MNOs and consider their responses to the PSMB proposition.

The NPE will have to assess and compare the MNO's responses against its requirements. As previously stated, the nature of a PSMB solution is technically complex and detailed. Accordingly, it will require expert analysis and interpretation of the information provided by MNOs. This assessment will have to determine how compliant and aligned the MNO responses are to the requirements, and what gaps and risks exist. It is foreseeable that some critical PSMB capabilities may not be offered or supported by MNOs, in part or in full, or in the timeframes required. There is also potential that the capabilities offered by the MNOs may not be aligned, putting at risk the ability to deliver a homogeneous service to users. Ultimately, the NPE will have to determine the optimum solution having considered the merits of all responses.

Commercial MNO market

The Australian mobile market has typically been characterised by strong competition between the three MNOs, Telstra, Optus and TPG Telecom. For example, all three carriers have launched 5G services and continue to invest in new capabilities.

The competitiveness of mobile networks is the responsibility of the Commonwealth, including regulation of the telecommunications sector. The use of MNOs in a PSMB solution has the potential to alter the competitive balance of the mobile market. For example, a PSMB implementation could impact the network and operating model of an MNO by:

- Prioritising its capacity to PSMB users over commercial customers
- Increasing its coverage
- Increasing its network resilience
- Changing its operational processes
- Enabling marketing of its network's superiority.

The competitive effect of these changes is sensitive to their scale, the perceived and actual customer impact, and nature of their funding. Accordingly, this impact must be considered in a PSMB implementation. While the NPE would be charged with implementing the PSMB program, the Commonwealth has responsibility for the regulatory settings. The Commonwealth will need to consider how the MNO's participation in the PSMB solution could affect the competitive balance of the market, and how it may need to balance the demand for a PSMB with the need to maintain a healthy, competitive mobile market.

The MNOs and PSMB

Telstra, Optus and TPG Telecom have had different exposure to the PSMB program and public safety communications in Australia in general. While all three MNOs have engaged in the previous RFI issued to the market, only Optus and TPG Telecom are engaged in the PoC. However, Telstra have a deeper history in public safety communications, as a service provider for LMR services in some States. Telstra also offers a potential commercial service for premium access through the provision of their mobile network-based LANES product.

The NPE will be a 'service taker' from the MNOs, seeking the Mission Critical broadband services from the MNOs for a fee. While engaging all MNOs provides a degree of commercial contestability, there are some limits to how effective this may be due to the nature of the Australian market and existing usage preferences. Telstra's network provides the largest footprint, followed by Optus and then TPG Telecom, and feedback from PSAs is that their existing commercial broadband contract usage falls in the same order. Therefore, it may be challenging to fully leverage the competitive advantages in having all three MNOs engaged in the solution and the Commonwealth may be best placed to address this concern. This potentially places the NPE in a weak negotiating position with the MNOs and may make it difficult to achieve the required solution outcomes, including affordable and sustainable pricing.

In international PSMB approaches there are a mix of commercial engagement models in use. In some cases, a MNO is selected as the PSMB solution partner as a result of a commercial market tender (UK, Finland), other cases propose using multiple MNOs in the solution through a commercial engagement. There are examples where spectrum has been allocated to the PSMB entity and used as commercial leverage with a MNO partner (such as FirstNet in the USA).

The prospect of being a provider of a national public safety service would represent a material change to a MNO's business model, which to date has focused on the delivery of commercial services to consumers and businesses. A request to partner in a national PSMB solution will require a wide-ranging consideration of the impacts and obligations across an MNO's business. MNOs will need to consider both the direct PSMB related impacts, as well as the flow-on impacts to their wider commercial business. They will also need to consider how their engagement as a PSMB solution provider can impact (positively or negatively) their customer proposition, either perceived or actual. Given this, the Commonwealth will need to ensure that the development of the PSMB would not have a negative impact on the development and competitiveness of the mobile market in Australia.

In response to a request to partner in a national PSMB solution, an MNO will need to evaluate how and to what degree it can deliver against the HLRs to be set by the NPE. It will need to quantify the costs, resources, delivery timeframes, risks and other material impacts, and then consolidate this information into a proposition that the NPE will use in its evaluation.

Given their different business strategies, operating models and vendors, it would be reasonable to expect a degree of variation in responses from the MNOs. The complexity that this may create in developing an integrated solution has to be weighed against the benefits the multi-MNO model provides, and would be one of the key considerations of the NPE.

Ultimately, it will be a role for the NPE to determine the optimum solution for a PSMB. Part 3 of this document outlined the current view of the preferred solution, but as outlined above, it will be subject to considering the responses from the MNOs. Other possible solutions may consider engaging with fewer MNOs, or only one, or commencing operations with one MNO partner and then evolving to connect to others. Other models may be considered to expedite service launch, such as initially sharing a MNO's core before evolving to use a dedicated PSMB core. These are the decisions ahead for the NPE.

Regulation and legislation

The use of regulations to facilitate PSMB in Australia

The Review's stakeholder engagement has identified a potential role for regulation to support the implementation of a PSMB capability. The Review notes that there are conflicting views regarding the use of regulation broadly held by States and Territories, and MNOs. MNOs have strongly argued that commercially negotiated public-private partnerships achieve better outcomes than the use of regulation. Conversely, PSAs believe PSMB specific regulations will be required to deliver the outcomes required by a PSMB solution. The latter view is based on the risk that MNOs will not offer the services required in the solution or will offer them at unreasonable prices or terms; and secondly, that committed operational performance levels, particularly in times of operational stress, are less likely to be honoured under the risk of commercial penalty than if they were underpinned by regulation.

The Review notes that PSMB is not currently considered by the regulatory framework for the telecommunications market. With the exception of Triple Zero and some emergency case provisions, MNOs are not subject to specific public safety-related regulations. Noting that the passing of such legislation can take a significant amount of time, there nonetheless currently exists a range of regulatory levers that the Commonwealth could co-opt to support the future deployment of a PSMB capability. These levers primarily lie within the *Telecommunications Act 1992* (Telco Act) and the *Radiocommunications Act 1992* (Radcomms Act). Some examples of these levers include:

- Under the Telco Act, the Commonwealth Communications Minister may, by legislative instrument, specify conditions that binds a single MNO or all MNOs, including conditions that require compliance with a designated disaster plan that addresses the means of coping with disaster.
- Under the Radcomms Act, the Australian Communications and Media Authority (ACMA) may impose conditions on new or renewed spectrum licences as it sees fit. ACMA may also impose conditions on existing apparatus licences without the licence holder's agreement.

There are also other regulatory levers available in these two Acts, along with those contained in the *Competition and Consumer Act 2010* and the *Australian Communications and Media Authority Act 2005*. A more detailed overview on available levers and the Acts that contain them can be found at Appendix C.

The Commonwealth also has the power, should it see fit, to encapsulate all relevant requirements relating to the PSMB program, such as the creation of the NPE, the delivery and operations of a PSMB, its interaction with the MNOs, and any other areas of relevance into a single Act. It needs to be noted that this approach would likely have significant timing implications for the program.

The Review recognises the Commonwealth has discretion to set parameters and drive outcomes through regulatory means to establish a PSMB capability across commercial networks. Following its stakeholder engagement, the Review has identified key areas for regulatory consideration by the Commonwealth as set out below. For clarity, no specific changes to existing regulations are proposed by this Review, but the Review does recommend that the Commonwealth commence its own studies into the following areas so that it is appropriately informed and can communicate any findings in a timely manner, as these could materially impact market engagement and solution decisions.

Network operational requirements

As previously highlighted, the preferred PSMB solution will access the three MNOs and share their spectrum. The availability of standards-based features (QPP) permits access prioritisation either between PSAs, or PSAs over commercial traffic in times of congestion. This is a critical requirement of the PSMB solution, as its effective implementation underpins the delivery of a mission critical service. These features must be configured in an aligned manner across networks to ensure end user experience is homogeneous across MNOs, and must be kept current and evolve with standards. PSAs opine that such a critical capability should be underpinned by regulation and the Commonwealth should consider this in its study, which will have to address any consequential effects on Triple Zero traffic handling on mobile networks.

> *"In a multi-MNO deployment, it is essential that all MNO's treat priority and pre-emption levels consistently… For a PSMB capability, it is essential that priority and pre-emption levels be handled in a consistent manner network-wide, independent of MNO."* **Nokia submission**

In an MNO-hosted PSMB solution, States and Territories strongly argue they need accurate, real time information as to MNO's network performance so that their PSAs can effectively manage resources and events. Although MNOs assert that they provide operational information in times of emergency, States and Territories do not believe it is of the standard required. MNOs have also highlighted security concerns arising from the provision of such information. This is also an area where a consistent approach across all operators is required and any study should consider the merits of regulation imparting transparency obligations on MNOs to address these issues.

> *"Real-time network transparency is vital to ESOs globally and is a key part of a number of nations' solutions."* **NSWTA submission**

Ensuring fair and sustainable PSMB subscription pricing

There may also be a need to consider existing and novel mechanisms to ensure that pricing arrangements are fair and sustainable over the lifespan of a PSMB capability. Given the unique nature of PSMB services and the fact that the MNO supplier market is limited and of varied disposition, the resulting potential for vendor lock-in poses a long-term risk to the pricing of PSMB services. As previously mentioned, there are concerns that a

NPE has limited commercial leverage in establishing competitive PSMB service pricing and that the relative market positions of the MNOs may lead to unbalanced outcomes. Regulations may be used to align commercial negotiations with set service pricing principles, such as 'no loss – no gain'. Furthermore, the role that the ACCC could play to test PSMB pricing competitiveness can also be evaluated in conjunction, or as an alternative, to regulation.

> *"Without the regulatory support, the ability of the PSMB to negotiate with MNOs for a reasonable cost for the higher level of requirements may be impacted."* **Queensland Police Service submission**

Impacts of PSMB implementation on the MNO market

MNO's participation in the PSMB solution may have an impact on the competitive balance of the broader MNO market, the extent to which will be driven by the chosen solution and its terms. MNOs will expect to be compensated for costs incurred in delivering a PSMB capability, however they will benefit from service revenues, and there may be other flow-on impacts that both positively and negatively impact their businesses. These outcomes can arise whether new regulations are applied to the PSMB market or not. While focussing on the delivery of PSMB over these networks, their critical role in delivering high quality and competitive mobile services to the wider population cannot be lost. Accordingly, the Commonwealth should, on an ongoing basis, continue to evaluate the impact of the PSMB implementation on the mobile market to ensure it remains healthy and competitive.

> *"If a carrier benefited from additional Government funded network hardening, this may put it at a commercial advantage. At the same time, it's acknowledged that the extent of requirements around pre-emption and priority could negatively impact a carrier."* **DITRDCA submission**

Consideration of related inquiries

The Review also notes that the ACCC is undertaking the Regional Mobile Infrastructure Inquiry (RMII). The RMII, among other things, is investigating the feasibility of providing mobile roaming during natural disasters or other emergencies. The ACCC is scheduled to deliver its findings by 30 June 2023. The Commonwealth should also take into account any pertinent findings made by the ACCC inquiry.

Recommendation 8

The Commonwealth formally consider the extent to which regulatory and legislative measures are required to support an effective PSMB implementation whilst maintaining a healthy and competitive mobile market. This is to be completed by Q4 2023 with consideration given to:

a) the nature of the preferred PSMB solution and its reliance on the MNOs' networks
b) how mission critical capabilities are proposed to be deployed and maintained on MNOs' networks
c) how fair and sustainable pricing for the provision of PSMB services across MNOs can be ensured
d) how decisions around the implementation of a PSMB capability may impact the competitive balance of the mobile market.

Implementation Guidance

- *Timing of this action must consider that the outcome of this work can impact commercial agreements.*

International PSMB regulations

The Review has also surveyed the approach to regulation taken by other countries to facilitate the delivery of a PSMB capability. Some countries have passed laws permitting the involvement of MNOs in public safety communications. Others have implemented laws mandating carrier roaming, or the prioritisation of PSA traffic over shared spectrum. In a similar vein, some countries have amended their laws to allow the implementation of QPP due to strong existing net neutrality laws. Other PSMB-related legislation pertains to the creation and distribution of PSMB entities and workstreams, and the allocation of dedicated spectrum.

Coverage and resilience enhancements

One of the key benefits in pursuing a commercial PSMB solution is the prospect of leveraging the capabilities of an existing MNO network, thus negating the need for funding the construction of a standalone network. As part of the commercial arrangements, it would be expected that MNOs continue to improve their networks by expanding coverage, or improving network availability by hardening infrastructure. Where an upgrade is specifically required for PSMB purposes, it would be reasonable for Governments (Commonwealth, State and Territory) to contribute funding. Where the upgrade would have occurred anyway because it was deemed commercially advantageous, MNOs should make their own funding arrangements.

However, there are increasingly commercial challenges associated with MNO coverage expansion, especially in areas considered not economically viable. While such issues are often attributed to regional and remote areas, they can also arise in urban areas with low coverage. The lack of commercial viability can be attributable to a number of factors, such as an insufficient number of potential MNO customers, or in areas where difficult terrain hampers construction, such as in national parks. This means that MNOs cannot justify investments in infrastructure without some form of subsidy.

> *"…new coverage deployments to expand our footprint are typically funded via commercial arrangement with the parties requesting the coverage."* **Telstra submission**

The expansion of MNO network geographic coverage to the extent required by a PSMB capability will necessitate the construction of infrastructure in areas where it is commercially unviable to do so. Given this, there is a need to develop arrangements between the NPE and the MNO partners, commercial or otherwise, to provide coverage. In addition, given the divestment of tower assets by the MNOs there is also a need to consider the role of the tower operators in the development of new coverage through infrastructure investment.

Furthermore, the Review has been told of the need for improved resilience in commercial telecommunications infrastructure to meet the operational requirements of public safety users, especially in responding to natural disasters like the 2022 floods. The Review has previously noted that issues and shortfalls associated with the reliability, resilience and redundancy of Australian MNO networks have been well documented. The 2021 Regional Telecommunications Review found the MNO networks lack the resiliency required to withstand the pressure asserted on them by natural disasters such as bushfires and extreme weather events.

> *"In instances of natural disasters and emergencies, connectivity is significantly impacted by power and network outages. This reduces access to recovery and support."* **2021 Regional Telecommunications Review, key finding 6**

Accordingly, the NPE and MNOs will need to negotiate upgrades to deliver mission critical resilience and hardening. As previously outlined, the MNOs' networks were designed to deliver commercial services. Given this, the NPE and MNOs will need to negotiate upgrades to deliver mission critical resilience and hardening. There also will be a need for financial co-contributions from the Commonwealth and States and Territories to upgrade these networks where required.

Existing Government programs

Governments and MNOs (as well as tower operators) are well aware of the issues and shortfalls associated with the reliability, resilience and redundancy of current networks and are undertaking work to address these challenges. It is important to note that investments to improve the PSMB capability will intersect with other mobile and connectivity expansion programs across both the Commonwealth and States and Territories. These include, but are not limited to:

- Mobile Black Spot Program (Commonwealth)
- Regional Connectivity Program (Commonwealth)
- Mobile Coverage Expansion and Gig State (NSW Government)
- Digital Farms Grants Program (Western Australian Government) and
- Connecting Victoria Program (Victorian Government).

In addition, the PSMB program must align its efforts with any network resilience programs such as the Strengthening Telecommunications Against Natural Disasters (STAND) package and the Mobile Network Hardening Program.

These programs mentioned above provide broader benefits than just for a PSMB. It will not be necessary or appropriate for the NPE to lead these programs. However, coverage expansion and resiliency will need to be considered in light of these programs. The NPE should consider how best to leverage the programs for mutual benefit, which could include the NPE providing additional investment through a program or directly to the MNO for the purposes of PSMB capability. This would apply to all jurisdictions' programs, not solely the Commonwealth's.

Recommendation 9

The Commonwealth consider:

a) how any outcomes and recommendations from the Australian Competition and Consumer Commission's Regional Mobile Infrastructure Inquiry may be relevant to the PSMB program
b) how existing Government funded mobile coverage and resilience programs can be leveraged to enable the PSMB program to meet its objectives in a timelier and cost-effective manner.

Funding for the NPE

General observations are made as to which level of Government should likely be responsible for the funding of certain capabilities or services. States and Territories have long provided funding for public safety communications and would be expected to significantly contribute to the costs of a PSMB capability. However, the nature of the PSMB solution calls for a greater funding role for the Commonwealth. Moreover, there are effectively three Government sources of funding, and all three should contribute to the PSMB program - the Commonwealth, States and Territories, and PSAs. Other sources of funding for the program can come through MNOs and other industry parties (such as tower companies), where they see benefits for their businesses.

While no proposed funding models have been shared with the Review, the intent of this section is to outline the potential funding flows for the program in order to illustrate the variety of commercial engagements a PSMB entity will need to manage; such as:

- Sourcing services from all the MNOs for a fee, and aggregating these and passing onto the user agencies as a consolidated fee
- Attributing costs of the NPE and the functions it delivers to Governments or passed through in a usage fee
- Investments in coverage and resilience which will often require large amounts of capital. There will need to be an effort taken to leverage existing programs to fund these enhancements. MNOs and tower companies may also participate in these investments
- There will be other infrastructure costs where the NPE or PSA will directly engage the supplier market, such as the purchasing of deployables
- Device funding is typically the remit of user agencies, although scale contracts could be established by the NPE
- LMR intergration costs with national elements funded centrally and State-side costs funded by States
- User migration and on-boarding costs which can be the remit of user agencies
- The PSMB solution calls for a substantial investment in a national core which described in Part 3 and cost estimated in Part 4. This element would be owned by the NPE and will need to be funded by the Commonwealth and States and Territories. However, noting the 'opt-in' principles and the core's foundational nature, it would be appropriate if the Commonwealth contributed significant initial funding toward this solution. It is a matter for all jurisdictions to determine if this represents seed capital, or a financing model, or an element of both.

Ultimately determining the funding approach for the PSMB program is a matter to be agreed between Governments. Effort should be made to ensure the funding decisions that enable the program to ramp-up are agreed early on, preferably during the IGA negotiations, with others falling to the NPE to determine through its governance approach.

Addressing 'opt-in'

A core component of Australia's current national federated PSMB approach, as prescribed by the 2018 COAG Roadmap, is the ability for States and Territories to 'opt-in' and decide to participate in the PSMB program at a time of their choosing. The Review notes that States and Territories continue to broadly support the underlying rationale of the 'opt-in' model due to benefits they derive from the flexibility it offers. This flexibility allows States and Territories to effectively plan for PSMB funding, manage impacts of PSMB funding on future LMR investment, and introduce PSMB services to their PSAs according to a convenient timeframe.

However, the Review has found that the current 'opt-in' model hampers and increases the complexity of PSMB implementation. It creates a number of unintended consequences that restrict program momentum and certainty.

A 'chicken and egg' situation currently exists where the flexibility around States' and Territories' timing and participation in the PSMB program offered by the 'opt-in' model also creates a significant degree of uncertainty as to when the program will receive their commitment, resources and funding required for it to be successful. The resulting lack of commitment deprives the program of the capital funding required for initial costs and common investments, the satisfaction of which would incentivise jurisdictions to 'opt-in'. This lack of certainty then undermines the program, which lacks a galvanising program launch date for which there are no adverse consequences if missed.

The lack of certainty caused by the 'opt-in' model also compromises an effective, cost-efficient solution from MNOs and industry. There is no clear signal to the market to procure, design or build products for an Australian PSMB capability. Furthermore, States and Territories recognise that bundling aggregated usage can drive competitive pricing from MNOs. However, the absence of guaranteed user volumes means it could not be used as leverage during negotiations.

The Review proposes that the 'opt-in' principle should be reconsidered. As part of the IGA process, the Commonwealth needs to engage with the States and Territories to reconsider the terms of the 'opt-in' principle to secure a more definitive commitment to the implementation of a PSMB capability. A principle of a 'backstop' date for participation of no more than three years from launch is proposed. This time window, in addition to the time taken to get to launch, is considered adequate to enable jurisdictions to plan the transition, and align budgets and contracts.

Recommendation 10

The Commonwealth, in conjunction with the States and Territories, renegotiate the open ended 'opt-in' principle that was previously endorsed by COAG to secure a more definitive commitment to each State and Territories' participation in the national PSMB program, with the proposal that:

- States, Territories and Commonwealth agencies must 'opt-in' no later than three years from launch of the PSMB capability
- the outcomes of this agreement to be incorporated into the IGA.

Implementation Guidance

- *No later than a three-year backstop date from launch provides jurisdictions with time to plan for budgetary and operational consequences of opting in.*
- *It enables better commercial terms through higher guaranteed demand levels.*

Part 8 – Leading the Change

- In order to break away from the issues that have hampered past PSMB efforts, the Commonwealth will have to take the leadership role and build confidence in a national PSMB solution.
- The Commonwealth must present a viable way forward to States and Territories and will also have to rely on their subject matter knowledge and expertise.
- The Commonwealth's leadership needs to be demonstrated by the allocation of resources and staff to initially form a dedicated team.
- The Commonwealth should set timeframes to achieve milestones regarding the negotiation of the IGA, the implementation of the NPE, the launch of the initial service and migration of all jurisdictions onto the network.
- Acknowledging the existing PSMB management's dedication, the NPE, once established, should be responsible for the delivery of PSMB.

The way forward

The Review has positioned that a fresh start is needed for PSMB. The key component necessary to deliver this is a dedicated, enduring National PSMB Entity able to address a project as complex as PSMB. While there are many issues to be resolved and decisions to be made as to the PSMB solution, the Review has taken the view that the most critical step, to be taken first, is to create an entity with the capacity to solve these issues, get a PSMB capability off the ground, and then guide that capability as it evolves.

The NPE's operations are to be guided by the IGA. The negotiation of the IGA is deliberately intended to act as a catalyst for action and consensus building to enable the NPE to commence operations with a clear set of operating parameters and targets.

The delivery of these outcomes requires leadership, and this leadership must come from the Commonwealth. Since the idea of PSMB was floated in 2009, the Commonwealth has supported the concept of a PSMB but its actions and decisions have not always lived up to this support. More recently there has been increased optimism from those involved due to the Commonwealth's recent engagement and involvement with the project, such as initiating this Review. For the PSMB to work, the Commonwealth must show the States and Territories it is committed to this program.

While placing the onus of leadership on the Commonwealth, the delivery of a successful PSMB program is just as dependent on the active involvement and timely financial commitment of the States and Territories, who represent the bulk of the PSAs who stand to benefit from the program. They are also a significant source of knowledge through their work on the program to date, and this must be harnessed and not discarded. It is also important to remember that there are numerous Commonwealth agencies that will also be beneficiaries of PSMB.

Put simply, all Governments need to acknowledge that a fresh start is required, but one that has learned from the issues of the last decade. Strong commitment and alignment between the jurisdictions will ensure a national program can deliver the benefits available through PSMB. Successful implementation will provide increased capabilities to PSAs whose obligation is to protect the lives and property of all Australians with increased efficiency and effectiveness.

Next steps

Role of a dedicated team

The Review has made a number of recommendations to the Commonwealth that are described in terms of the outcomes desired to deliver a successful PSMB program. While the Review acknowledges that this is a decision for the Commonwealth on how best to respond to this Report's recommendations, in this section we propose an actionable plan and schedule that should be adopted to drive the outcomes required.

The Review recommends the establishment of a **dedicated team** under Commonwealth leadership to drive the actions required to, ultimately, deliver a PSMB capability. The dedicated team should be:

- appropriately resourced and funded (if required);
- led at an appropriate level of authority;
- with appropriate level of sponsorship; and
- distinct from any existing PSMB programs.

This dedicated team is responsible for driving the delivery of the recommendations until such time the NPE is in place, backed by a nationally endorsed IGA, and becomes the accountable entity for future PSMB progress.

Recommendation 11

The Commonwealth establish an appropriately resourced, dedicated team led at an appropriate level of authority and with the appropriate level of sponsorship, which is tasked with delivering recommendations 4, 5, 6, 7 and 10. The dedicated team should be established as soon as practical but no later than the end of 2022.

Implementation Guidance

- *To be effective, the dedicated team's leadership must have the authority to engage Commonwealth and State and Territory entities at the level required and the sponsorship to escalate if required.*
- *This dedicated team should be distinct from the current NPMO activities.*

Inter-Governmental Agreement

As outlined, the IGA creates equity between the Commonwealth and States and Territories. It is the agreement that underpins the establishment of the NPE and the formalising of its objectives and operating parameters and must be agreed by all Commonwealth, States and Territory Governments.

The Review proposes that these negotiations take place at the first secretary or ministerial level. Given the national significance and amount of funding potentially required, the terms of the project must be negotiated at a sufficiently senior level, with one representative from each State, Territory and the Commonwealth. Acknowledging the many different agencies that will need to be involved in PSMB, there will be a need for each jurisdiction to represent end users views to their respective IGA negotiating representative. It is proposed that NEMA would represent those Commonwealth agencies that will use PSMB. This approach would facilitate productive discussions and require all jurisdictions to come to the table having already considered the positions of their various agencies.

A preamble agreement should be created ahead of the commencement of negotiations to be used as a starting point, laying down the framework of issues to be agreed. Its preparation should be driven by the dedicated team but based on input from stakeholders and other considerations as to the appropriate form of an IGA.

The dedicated team should draw up the timeframe for negotiations in conjunction with stakeholder feedback. Importantly, this process should be streamlined, and aim to prevent protracted negotiations. To expedite the delivery of a PSMB capability, the IGA should be finalised as soon as possible and the Review contends this should be completed by Q2 2023.

The dedicated team will be responsible for working with Government to facilitate any approvals or endorsements required to either commence or approve the IGA, and any related requirements such as requests for funds or the creation of a NPE.

Once agreement has been reached on the IGA, the dedicated team will then be responsible for establishing the National PSMB Entity which will then take on responsibility for the delivery of a PSMB solution. Recruiting experienced personnel into the entity will be one of the initial challenges and should focus on recruiting a core of operations and governance personnel, which can then be expanded whilst commencing operations. The entity should aim to launch the initial service by Q4 2024.

In parallel with these activities, the dedicated team must engage with NSWTA on the topics of organisational harmonisation and cost estimation. The dedicated team should also seek to gather all other relevant knowledge from other jurisdictions to complement this information where appropriate.

Timeframes

The Review proposes a goal to have an operational, national capability with all jurisdictions on board within three years from the launch of the capability. Setting an ambitious timeline is designed to highlight the urgent need for PSMB and build a vision that all stakeholders can get behind. An example of the need for urgency is the recommendation to do away with the 'opt-in' model as previously outlined. A proposed timeline for the delivery of PSMB is as shown in Table 6, highlighting the accountabilities of the dedicated team and the NPE.

Table 6: Proposed timeframes

Action	Dedicated Team Accountability	NPE Accountability	Proposed timeframe
Engagement with NSWTA - **NPE resourcing** - **Initial funding requirements**	✓		Q1 2023
Negotiate IGA - **Agree scope** - **Draft preamble** - **Agree representatives** - **Finalise IGA**	✓		Q2 2023
Implement National PSMB Entity	✓	✓	Q3 2023
Launch initial service		✓	Q4 2024
All jurisdictions using PSMB		✓	'Opt-in' within 3 years from capability launch (approx. Q4 2027)

Initial contributions

As this Review has argued, the Commonwealth must lead on PSMB, and this encompasses a level of financial leadership. While there is still a strong need for significant initial contributions by States and Territories, the Commonwealth is still required to take the financial leadership role to show the Commonwealth's conviction for a PSMB and instil confidence in a NPE to deliver the capability.

There is no currently agreed position from the States and Territories on funding, and how each jurisdiction contributes will have to be a matter for negotiation. States and Territories will also need to make ongoing contributions.

A key role the Commonwealth can take is to address the timing gap between the need to establish the initial foundational elements of the national solution, such as the dedicated PSMB core, the connectivity to MNOs and the NPE itself, and the various jurisdictions opting-in to the program. Commonwealth should consider providing substantial seed funding towards the foundation elements of a PSMB solution. Final contribution to these costs across jurisdictions can be negotiated in the IGA. Such a funding commitment by the Commonwealth would also be a demonstration of its support for the program.

The Review's recommendations are intended to focus the Commonwealth, State and Territory Governments to fully consider how to fund a national PSMB, and the need to take a committed approach to funding in recognition of the costs associated. Developing an equitable funding approach will further support the strong agreement and alignment in the benefits of a PSMB for public safety within Australia.

Recommendation 12

The Commonwealth demonstrate its support for a national PSMB by providing substantial funding towards the foundation elements of a PSMB solution, such as a national PSMB core and National PSMB Entity.

Implementation Guidance

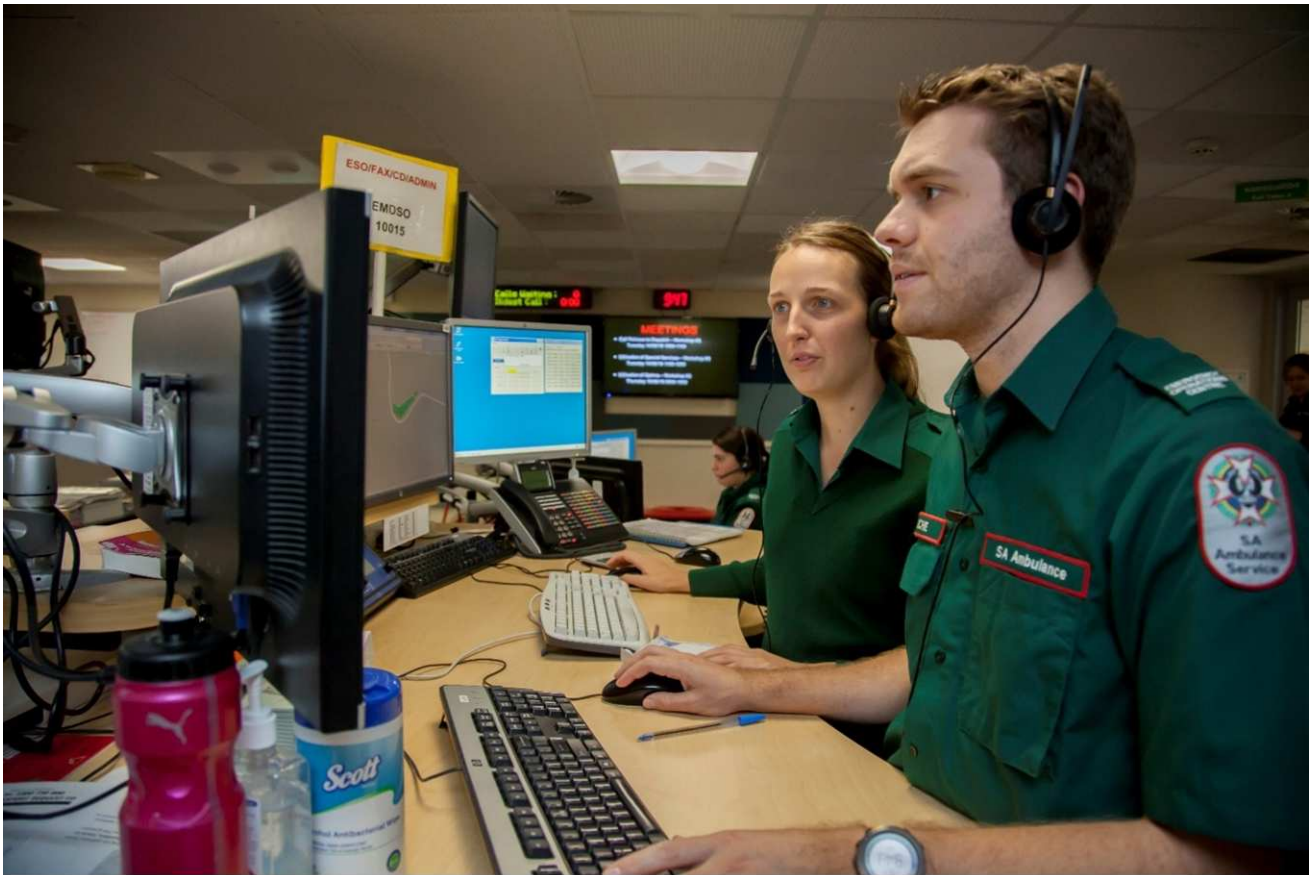
- *Scale of funding required and identification of the foundation solution elements can be developed in conjunction with NSWTA (see Recommendation 4).*
- *For clarity, this recommendation does not seek to commit the Commonwealth to fund all foundational costs, but recognises that national solution elements will require funding ahead of all jurisdictions opting in.*
- *Commonwealth and States and Territories to agree funding contribution models or cost recovery models and to be included within the IGA.*

Current PSMB management

The dedicated work of the current PSMB management, including the guidance under the SOC and coordination by the NPMO, has contributed to a greater technical understanding of PSMB and highlighted the critical need for PSMB. The long-standing commitment of SOC members, often additional to their ongoing roles within organisations, has laid the foundation for a PSMB capability in the future. Moreover, the contribution of the SOC has significantly benefited the Review.

As put forward by the Review, there is a need to refresh the current arrangements and take significant steps to deliver a PSMB capability. This includes establishing new governance and operational arrangements.

There is still a need for governance of the program until such time as the new NPE is established. Additionally, there is an opportunity to maintain the reinvigorated focus for the NPMO and progress the existing work surrounding PSMB. There is, however, also a need to make sure that the SOC and NPMO are operating complementarily to the establishment of new arrangements. This will preserve continuity and the opportunity to continue developing goodwill and cohesion across the PSMB cohort. Once the NPE is established, it will be responsible for the delivery of a PSMB capability.



Courtesy of South Australian Government

Appendix A – Recommendations and Implementation Guidance

Recommendation 1

The Commonwealth strengthen and enhance its commitment to the development of this critical communications capability. A PSMB will modernise Australia's emergency service communications capability, improve the operational effectiveness of its public safety personnel and their safety, and enable them to meet the rising needs and expectations of the Australian public. Numerous Royal Commissions have also called for its delivery.

Recommendation 2

The Commonwealth, by Q2 2023, establish close relationships with the PSMB programs in other countries so the Australian program can benefit and learn from the insights gained internationally.

Priority should be given to engaging with the PSMB programs in the United Kingdom, United States, Finland and New Zealand. These jurisdictions offer early mover insights with the most relevance to the Australian program.

Implementation Guidance

- *The Commonwealth should leverage as soon as practical the relationships that NSW Telco Authority (NSWTA) has already established with other countries' PSMB programs.*
- *The Commonwealth should also consider engaging with The Critical Communications Association to enable access to the wider international PSMB community.*

Recommendation 3

The set of National Objectives be expanded by Q2 2023 to include criteria for Transparency and Affordability, where:

- **Transparency** defines the need for PSAs to have visibility of the planned and operational status of an MNO's network to enable effective planning and operational management (which is critical when a PSMB solution is hosted on commercial networks); and
- **Affordability** stipulates that any investments in a PSMB capability represent value for money, and that service costs remain affordable for PSAs.

Implementation Guidance

- *For each of the PSMB National Objectives there is a set of High-Level Requirements (HLRs) which describes in detail the target state required.*
- *The Commonwealth should work with States and Territories, industry and any experts as required, to define the detailed HLRs required to support these new objectives.*

Recommendation 4

The Commonwealth formally engage with NSW Telco Authority (NSWTA) by Q1 2023 to seek their support in developing an initial view of network solution costs, to be used to determine the potential funding demands for the program, particularly seed funding.

Implementation Guidance

- *Getting endorsement to progress a national PSMB solution through the new entity will require a view of the initial funding levels required. The Commonwealth does not have the capacity to go to the market to source costs and this activity takes time and requires significant solution knowledge.*
- *NSWTA have just closed a Request for Information which, along with their other commercial analysis, should be used as the basis for an initial costing.*

Recommendation 5

The Commonwealth establish a new, dedicated, enduring National PSMB Entity (NPE) by Q3 2023 to deploy, operate and maintain a national PSMB capability in accordance with the National Objectives.

The entity should comprise:

- An **operations function**, which is responsible for all aspects of program execution, and is resourced by appropriately skilled staff covering the functional disciplines, and sized in accordance with the demands of the program; and overseen by:
- A **governance board**, which is responsible for program outcomes and oversight, populated by skilled resources experienced in governing a program of the scale and complexity of a PSMB; and supported by:
- **An advisory board**, which is populated by PSA representatives and other experts who can provide valuable guidance to the governance board; with
- **Government oversight** of the governance board and entity through either a Commonwealth lead Minister(s), or a Ministerial Council.

Implementation Guidance

- *The details of the entity's scope, targets, governance to be established through agreement between the Commonwealth, States and Territories and codified in the Inter-Governmental Agreement (See Recommendation 6).*
- *The structure of the entity is based on the principles that the Commonwealth, States and Territories have agreed to the key operating parameters and targets for the entity through the IGA.*
- *A governance board with both expert and stakeholder representation is not recommended.*
- *The advisory board is able to provide stakeholder and user feedback. Additionally, stakeholder representation may be available through Ministerial oversight via a Ministerial Council.*
- *The legal nature of the entity is not prescribed as this is a matter for Government, but noting it has many attributes of a corporate Commonwealth entity.*

Recommendation 6

The Commonwealth engage with States and Territories to develop a PSMB Inter-Governmental Agreement (IGA), which will define the operating parameters of the new National PSMB Entity.

The IGA should aim to agree the following (non-exhaustive) terms:

- Scope of the role of the NPE, and any exclusions
- Key outcomes to be delivered by the NPE and relevant milestones
- The governance structure of the entity, including:
    - Terms and composition of the governance and advisory boards
    - Governmental oversight model and accountability
- Governance obligations and reporting requirements
- Funding principles and funding requirements, including any seed capital to initiate the venture and ongoing funding arrangements
- Scope and term of the agreement and variation management
- Any relevant directions to the entity.

The engagement and agreement should be completed by Q2 2023.

Implementation Guidance

- *The approach may require endorsement by National Cabinet, with an agreed IGA returning to national Cabinet for endorsement.*
- *A preamble agreement should be drafted as a starting point for the negotiation.*
- *The IGA must be negotiated between representatives of the Commonwealth and each State and Territory. The proposed approach is:*
    - *States and Territories each have one representative who represents the needs of each State's agencies,*
    - *Commonwealth end user agencies to be represented by NEMA,*
    - *Negotiations are held at a first secretary / first minister level.*

Recommendation 7

The Commonwealth formally engage with the NSW Government prior to the establishment of the National PSMB Entity to agree how its existing capability and plans should be considered in the establishment of a National PSMB Entity.

This engagement should seek to leverage the expertise that NSW have gained through their planned development of a State-based PSMB solution and management of the proof of concept as part of the national PSMB program.

Leveraging this progress provides an opportunity to 'jump start' the national PSMB program by saving time and costs and reducing replication of work.

Implementation Guidance

- *NSW, through NSWTA, have an existing State-based program with dedicated resources focussed on PSMB planning, commercial analysis, regulation, customer management, engineering and contract management.*
- *Developing a national NPE function in parallel, without this prior engagement, has the potential to lead to role competition, skills leakage and dilution, loss of momentum and ill-will between agencies.*

Recommendation 8

The Commonwealth formally consider the extent to which regulatory and legislative measures are required to support an effective PSMB implementation whilst maintaining a healthy and competitive mobile market. This is to be completed by Q4 2023 with consideration given to:

a) the nature of the preferred PSMB solution and its reliance on the MNOs' networks
b) how mission critical capabilities are proposed to be deployed and maintained on MNOs' networks
c) how fair and sustainable pricing for the provision of PSMB services across MNOs can be ensured
d) how decisions around the implementation of a PSMB capability may impact the competitive balance of the mobile market.

Implementation Guidance

- *Timing of this action must consider that the outcome of this work can impact commercial agreements.*

Recommendation 9

The Commonwealth consider:

a) how any outcomes and recommendations from the Australian Competition and Consumer Commission's Regional Mobile Infrastructure Inquiry may be relevant to the PSMB program
b) how existing Government funded mobile coverage and resilience programs can be leveraged to enable the PSMB program to meet its objectives in a timelier and cost-effective manner.

Recommendation 10

The Commonwealth, in conjunction with the States and Territories, renegotiate the open ended 'opt-in' principle that was previously endorsed by COAG to secure a more definitive commitment to each State and Territories' participation in the national PSMB program, with the proposal that:

- States, Territories and Commonwealth agencies must 'opt-in' no later than three years from launch of the PSMB capability
- the outcomes of this agreement to be incorporated into the IGA.

Implementation Guidance

- *No later than a three-year backstop date from launch provides jurisdictions with time to plan for budgetary and operational consequences of opting in.*
- *It enables better commercial terms through higher guaranteed demand levels.*

Recommendation 11

The Commonwealth establish an appropriately resourced, dedicated team led at an appropriate level of authority and with the appropriate level of sponsorship, which is tasked with delivering recommendations 4, 5, 6, 7 and 10. The dedicated team should be established as soon as practical but no later than the end of 2022.

Implementation Guidance

- *To be effective, the dedicated team's leadership must have the authority to engage Commonwealth and State and Territory entities at the level required and the sponsorship to escalate if required.*
- *This dedicated team should be distinct from the current NPMO activities.*

Recommendation 12

The Commonwealth demonstrate its support for a national PSMB by providing substantial funding towards the foundation elements of a PSMB solution, such as a national PSMB core and National PSMB Entity.

Implementation Guidance

- *Scale of funding required and identification of the foundation solution elements can be developed in conjunction with NSWTA (see Recommendation 4).*
- *For clarity, this recommendation does not seek to commit the Commonwealth to fund all foundational costs, but recognises that national solution elements will require funding ahead of all jurisdictions opting in.*
- *Commonwealth and States and Territories to agree funding contribution models or cost recovery models and to be included within the IGA.*

Appendix B – Terms of Reference of the Review

Context

In December 2018 the Council of Australian Governments agreed a roadmap for the development of a national Public Safety Mobile Broadband (PSMB) capability. The objective was to deliver a mission-critical system to create a mobile broadband platform which would allow public safety agencies from all jurisdictions to integrate their communications capabilities.

The roadmap envisioned a capability which did not rely primarily on commercial networks as these were determined not to meet mission critical standards at the time. With technological advancements including the rollout of the 4G and 5G networks, it is appropriate to test the extent to which this paradigm has changed.

The PSMB program is being led on behalf of all jurisdictions by the Australian Government, through Emergency Management Australia. The NSW Government, through the NSW Telco Authority, is leading a Proof-of-Concept (PoC) trial which is expected to conclude in August 2022.

The risks to implementation of the PSMB program, such as delays, technical challenges and the concerns of the States and Territories over spectrum allocation, suggests that the current strategy may not be the most effective means of delivering a key component of a modern national emergency management communications capability.

The Australian Government recognises that this is the appropriate time to check whether Australia remains on the appropriate capability and technological path toward a unified national emergency management communications architecture. Accordingly, the Australian Government is commissioning an independent review into options for the delivery of a national public safety mobile broadband capability.

This review is intended to inform options that will be presented to the Government to allow a decision to be taken on the most efficient and effective approach for implementing a PSMB capability for public safety agencies, including the appropriate roles for the Commonwealth and States and Territories to progress the PSMB program. The Australian Government will invite States and Territories to participate in the review.

Terms of Reference

The review will prepare a draft report, which will inform an update to Government in mid-2022 on the progress of the review with the final report to be presented to Government in October 2022. The final report will inform the Commonwealth Government's approach to the PSMB program. States and Territories will be engaged on the findings of the review before the end of 2022.

Objectives

The review will provide advice, findings and recommendations on:

- the capability that PSMB should deliver into the future, including the need for it to be reliable, nationally interoperable and operating in metropolitan and regional areas;
- progress and achievements of the PSMB program to date;
- policy and regulatory settings required to establish and maintain a PSMB capability;
- capacity and willingness of the telecommunications providers to support a PSMB capability;

- the potential for PSMB to leverage the 5G roll out to deliver advanced capabilities;
- other emerging communications capabilities that could be incorporated into a national emergency services communications architecture;
- options for the architecture required to support the PSMB capability, encompassing technology, network topology and spectrum; and
- the preferred network supply model for delivering the desired PSMB capability.

Considerations

The review should consider:

- existing strategies for delivering a PSMB capability including the 2018 PSMB Roadmap, the established PSMB Objectives and High-Level-Requirements, RAN / MVNO model and achievements of the PSMB Workstreams;
- previous documentation prepared on the issue including the Productivity Commission Report;
- the need for dedicated spectrum as part of a modern PSMB capability in a mature 5G network including how the existing spectrum set aside could be used;
- the utility of spectrum identified for public safety applications including 400 MHz, 4.9 GHz and Band 27 spectrum to support a PSMB capability, including the availability of compatible end-user-devices;
- Government policy and regulatory settings that could be leveraged to deliver a PSMB capability;
- other technologies that could contribute to the delivery of a national emergency management communications capability, including satellite technology options, such as the proposed Defence sovereign satellite communications capability, Joint Project 9102, and the NBN Co Sky Muster Satellites;
- required interoperability across jurisdictions, carrier networks and user devices;
- the relative costs, benefits and risks of delivering a PSMB capability using either commercially available systems, private network or a hybrid of commercial and private;
- indicative capital and sustainment costs of PSMB if built as a standalone network, or if delivered under other models such as an overlay to an existing network;
- the capability and capacity of telecommunications networks;
- lessons learnt from international and domestic experiences in implementing PSMB capabilities; and
- any other factors the reviewer considers relevant to providing advice and options for the expedited delivery of the PSMB program.

Appendix C – Stakeholders Engaged Throughout the Review

Table 7: The stakeholder entities engaged with by the Review.

Stakeholder Category	Unit
States and Territories (includes representatives from central agencies and agencies with accountabilities for emergency service business units – not individually named)	New South Wales (through NSW Telco Authority) Victoria (through Emergency Management Victoria) Queensland South Australia Western Australia Tasmania Australian Capital Territory Northern Territory
Commonwealth Agencies (as policy agencies)	Department of Infrastructure, Transport, Regional Development, Communications and the Arts National Emergency Management Australia Department of Defence Department of Finance Productivity Commission Department of the Prime Minister and Cabinet Australian Competition and Consumer Commission Australian Communications and Media Authority
Commonwealth Agencies (as service users)	Australian Border Force Australian Federal Police Attorney-General's Department
Carriers	Telstra Optus TPG Telecom NBN Co
Industry Suppliers	Ericsson Nokia Samsung NEC Qualcomm BAI Communications Motorola

Stakeholder Category	Unit
Industry Representative Bodies	Australian Mobile Telecommunications Association Critical Communications Forum The Critical Communications Association
International PSMB Entities	Erillisverkot (Finland) First Responder Network Authority (USA) Next Generations Critical Communications (NZ) Emergency Services Mobile Communications Programme (UK) Federal Agency for Public Safety Digital Radio (BDBOS) (Germany)

Appendix D – Regulatory Levers Available for PSMB in Australia

Telecommunications Act 1997

The *Telecommunications Act 1997* (Cth) (the Telco Act), administered by the Department of Infrastructure, Transport, Regional Development, Communications and the Arts, is the Commonwealth's primary means of regulating telecommunications in Australia. The Telco Act contains several provisions that can compel MNOs to undertake certain activities in order to assist Commonwealth, State and Territory Governments when preparing for, responding to, or recovering from natural disasters. Australian MNOs are carriers under the Telco Act. However, it is important to note that these provisions (of the Telco Act) are seldom used in practice. As far as the Review is aware, to date cooperation between MNOs and PSAs during disaster response has largely been facilitated by productive, collaborative and voluntary relationships.

Carrier licences

Australian MNOs are required under the Telco Act to obtain a carrier licence from the Australian Communications and Media Authority (ACMA). The Minister can make a determination exempting network units, persons and specified uses of network units from carrier licence obligations. MNOs are bound to standard conditions attached to the carrier licence, and any conditions specified in a legislative instrument by the Commonwealth Minister with responsibility for communications. Compliance with the Telco Act is itself a carrier licence condition. Compliance with licence conditions is mandatory and enforced by ACMA. Carrier licence conditions have previously been used to impose obligations on a single carrier (for example, Telstra is required to produce the White Pages through a carrier licence condition), a class of carriers (for example, fixed line providers are required to have separate retail and wholesale units), or all carriers.

One such licence condition that can be imposed by the Minister on an MNO is a requirement for compliance with one or more designated disaster plans.[1] A designated disaster plan, prepared by the Commonwealth, a State or a Territory, is a plan that qualifies the means of addressing disasters.[2] As with other licence conditions, those requiring compliance with a designated disaster plan are binding. MNOs are not liable for any damages caused by actions done in good faith in complying with a designated disaster plan.[3] Although the power to impose such conditions has existed since 1997, to date it has not yet been exercised.

Assistance requests during disasters or other emergencies

Under the Telco Act, MNOs are required to give Commonwealth, State and Territory officers and authorities such help as reasonably necessary[4] in preparing for, responding to, and recovering from emergencies in the following circumstances:

- if a national emergency declaration, made by the Governor-General under the *National Emergency Declaration Act 2020*, is in force;
- if a state of emergency has been declared by, or with the approval of, a Minister of a State or Territory under the law of the State or Territory; or

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[1] *Telecommunications Act 1997* (Cth) s 345.
[2] Ibid s 344.
[3] Ibid s 346A.
[4] Ibid s 313(4A).

- if a declaration has been made by the Commonwealth Minister with responsibility for communications that an emergency exists under subsection 313(4D) of the Telco Act.

The type of reasonably necessary assistance is dependent on the circumstances of the disaster or emergency. It may include, but is not limited to, the deployment of temporary facilities at certain locations or the sending of emergency alerts or messages. Carriers providing such assistance are entitled to be recompensed on a 'no profit, no loss' basis.

Carriers' powers and immunities under Schedule 3

Schedule 3 of the Telco Act provides MNOs with certain powers and immunities from State and Territory legislation. Two such powers are of current relevance. Firstly, MNOs may give a notice to a landowner to enter and inspect land, and to do anything on the land that is necessary and desirable including, for example, felling and lopping trees, removing vegetation and undergrowth. This may allow MNOs to plan for, and respond to, natural hazards. Secondly, MNOs may install temporary telecommunication facilities in specified circumstances, including in an emergency, without State or Territory approvals. In most cases, notice should be given to the landowner. However, notice is not required in circumstances where activities need to be carried out without delay to protect: the integrity of a telecommunications network or facility; the health or safety of persons; the environment; property; or the maintenance of an adequate level of service.

Radiocommunications Act 1992

The *Radiocommunications Act 1992* (Cth) (the Radcomms Act) is primarily concerned with the management of radiofrequency spectrum in Australia, and sets out a licensing framework for the access and use of spectrum. It also contains provisions that may be used to support the deployment of a PSMB capability.

Allocation of licences and variation of licence conditions

ACMA has power to issue spectrum licences.[5] ACMA may also set procedures for allocating spectrum licences.[6] ACMA may impose any conditions on new or renewed spectrum licences as it sees fit.[7] The Review has been informed of the possibility of including conditions compelling MNOs to support PSMB to some degree when MNO-held spectrum licences approach their expiration and are either renewed or auctioned in the upcoming years. The conditions of a new or renewed spectrum licence need not be the same as the licence it replaces.[8] Although existing spectrum licences can be varied, the options for variations are limited and the agreement of the licence holder is required,[9] which may be difficult to acquire.

ACMA also has power to issue apparatus licences.[10] Similar to spectrum licences, ACMA may also impose any conditions on new or renewed apparatus licences as it sees fit.[11] However, ACMA may also impose additional conditions on existing apparatus licences without the licence holder's agreement.[12]

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[5] *Radiocommunications Act 1992* (Cth) s 62.
[6] Ibid s 60.
[7] Ibid s 71.
[8] Ibid s 77C(10).
[9] Ibid s 72.
[10] Ibid s 100.
[11] Ibid s 108.
[12] Ibid s 111.

Part 3.4 gives ACMA the power to issue class licences for specified devices and purposes.[13] ACMA can impose, add or remove conditions on or from class licences as it thinks fit.[14] Currently, PSAs have access to spectrum in the 4.9 GHz band through a class licence.

Ministerial policy statements

Under the Radcomms Act, the Minister may issue Ministerial policy statements (MPS) that ACMA must have regard to in exercising its spectrum management functions and powers. This allows the Minister to provide high-level policy guidance to ACMA about the Government's policies for spectrum management, including those pertaining to PSMB or other PSA communications capabilities.

Third party use of spectrum licences

Spectrum licence holders may authorise other persons to operate radiocommunications devices under their licence.[15] This may allow carriers and the NPE to negotiate and come to a commercial agreement that would provide access to spectrum for a PSMB solution. However, the Review notes that such arrangements are often regarded as unappealing by spectrum licence holders.

Declaration of emergency

If the Governor-General declares a period of emergency, the Minister may make an order enabling the use of transmitters for public safety within a specified area.[16] The Governor-General may declare a specified period to be a period of emergency, provided that the emergency involves:

- prejudice to the security or defence of Australia; or
- a serious threat to the environment; or
- risk of death of, or injury to, persons; or
- risk of substantial loss of, or substantial damage to, property.

Alongside the order, the Minister must also make guidelines for the order in the form of an instrument. The Governor-General can declare another emergency period to effectively extend the Minister's order. This power is limited in that it cannot be prepared beforehand, it must be remade for each emergency, and it requires action by the Governor-General.

Equipment rules

ACMA may make equipment rules that prescribe standards of equipment, and impose obligations or prohibitions in relation to equipment. This extends to the operation, supply, offer to supply, possession and/or importation of equipment, labelling and use of protected symbols. The Part also gives ACMA the power to impose and enforce interim or permanent bans on equipment and places requirements on suppliers in relation to the mandatory recall of equipment, and mandatory notification to ACMA in the instance of voluntary recalls of equipment.

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[13] Ibid s 132.
[14] Ibid s 134.
[15] Ibid s 68.
[16] Ibid pt 4.4.

Legislative rules

The Minister may make legislative rules on matters required or permitted by the Act, or necessary or convenient in order to carry out or give effect to the Act.[17]

Competition and Consumer Act 2010

Part XIC of the *Competition and Consumer Act 2010* (CCA) establishes a legally enforceable means for carriers to access specific wholesale services from other carriers (often their competitors).

Standard access obligations

Part XIC of the CCA establishes standard access obligations that apply to any carrier supplying an active declared service. The ACCC is able to declare a service for the purposes of part XIC by holding a public inquiry to determine whether it would be in the long-term best interests of end-users to do so. Once declared, standard access obligations apply to carriers supplying that service, unless they are exempted, and require those carriers to supply the declared service and other specified associated services.

Access Determinations

Part XIC also allows the ACCC to make an access determination in relation to a declared service. An access determination is a means for the ACCC to regulate the price and non-price terms and conditions related to access to a declared service, and to place additional obligations on the carrier supplying the service. This may relate to the capability of a facility that assists with the supply of the service.

Before making an access determination, the ACCC must undertake a public inquiry in accordance with Part 25 of the Telco Act. This must be consulted on, and follows the same process as the public inquiry process for a declared service. The ACCC must decide whether to make an access determination within six months of commencement of the inquiry. The ACCC cannot make an access determination that has certain specified effects.

Part XIC specifies several matters that the ACCC must consider prior to making an access determination, and some matters that the ACCC may choose to consider. The factors that the ACCC must consider are:

- whether the access determination will promote the long-term interests of end-users of carriage services or of services supplied by means of carriage services,
- the legitimate business interests of a carrier or CSP who supplies, or is capable of supplying, the declared service, and their investment in facilities used to supply the declared service,
- the interests of all persons who have rights to use the declared service,
- the direct costs of providing access to the declared service,
- the value to a person of extensions, or enhancement of capability, whose cost is borne by someone else,
- the operational and technical requirements necessary for the safe and reliable operation of a carriage service, a telecommunications network or a facility, and
- the economically efficient operation of a carriage service, a telecommunications network or a facility.

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[17] Ibid s 313B.

Binding rules of conduct

The ACCC may binding rules of conduct (BROCs) to specify terms and conditions of access for the supply of a specified declared service if the ACCC considers that there is an urgent need to do so.[18] Carriers must comply with BROCs. The ACCC, when making BROCs, is not required to observe any requirements of procedural fairness, conduct a public inquiry, or have regard to particular matters when not reasonably practicable to do so. BROCs can come into effect from the day they are issued.

While the BROCs arrangements allow the ACCC to quickly respond to threats to competition in the telecommunications market, there are important limitations on the process which mean that they can only act as a stop-gap measure. The ACCC must include an expiry date in the BROCs notice and they can only be in force for up to 12 months. Further, if the BROC relates to a service that is already subject to an access determination, the ACCC must commence an inquiry within 25 days of the BROC's issuance to consider varying that access determination.

Australian Communications and Media Authority Act 2005

Under the *Australian Communications and Media Authority Act 2005* (Cth), the Minister can direct ACMA in relation to its functions and powers.[19] As Australia's spectrum regulator, ACMA's functions include spectrum management in accordance with the *Radiocommunications Act 1992* (Cth).[20]

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[18] *Competition and Consumer Act 2010* (Cth) s 152BD.
[19] Ibid s 14.
[20] Ibid s 9.

Appendix E – International and Domestic Governance Examples

Table 8: International PSMB Examples

Country	Governance Approach	Considerations for Australian approach
USA / FirstNet	• Governance board consisting of 3 Federal Government reps, plus public safety and industry experience reps • Advisory board consisting of reps from wide range of PSAs • FirstNet management executive consists of CEO, CFO, CIO, CTO, Network Management marketing functions managing • Approximately 200 staff	• Governance is separate to executive function • Board is mix of Government and skills reps • Uses advisory board to link to end-users which typically sit under State and county control (similar to 'federated' model) • Executive function covers the range of skills required to establish and run a PSMB
Finland / Erillisverkot	• State-owned entity for national public safety communications • Controlled from Finnish Government Cabinet Office (their PM&C equivalent) • Small board, industry skilled rather than Government • Approximately 300 staff	• Governance is separate to executive function • Board has industry appointees overseeing management; Government control through Cabinet Office • Run as stand-alone entity with typical telco management structure • Executive function covers the range of skills required to establish and run a PSMB and LMR network • National model – no federated challenge to address
NZ / NGCC	• Board has four oversight ministers (Police [Lead], Finance, Digital, Infrastructure), 4 leaders of emergency service agencies, plus industry specialists • Implementation and delivery are outsourced	• Governance is separate to executive function • Board balances gov't, users and industry • $15m in seed funding allocated • National model – no federated challenge to address

Table 9: Australian delivery and governing body example

Entity	Governance Approach	Considerations for Australian PSMB approach
The Australian Digital Health Agency (the Agency) **Created to accelerate adoption and use of innovative digital services and technologies**	• The ADH Agency is a corporate Commonwealth entity, legally separate from the Commonwealth • The ADH Agency is governed by a skills-based board comprised of members with skills, knowledge and experience relevant to business leadership as well as the health sector. • To assist the Board in carrying out its functions, four standing advisory committees have been established	• Governance is separate to executive function • Contains an IGA between the Commonwealth and States or Territories • Has Ministerial oversight, reporting to Commonwealth, State and Territory Health Ministers through Ministerial Council • Executive function covers the range of skills required to establish and run the ADH Agency • Advisory Committees provides link to end users

An example for how this approach could serve as the basis for good corporate governance of the NPE can be found in the Australian Digital Health Agency. The ADH Agency establishes an IGA implemented through a definitive Charter, which is further strengthened a legislative rule, made under an Act.

The Charter is established under the Public Governance, Performance and Accountability (Establishing the Australian Digital Health Agency) Rule 2016 (Agency Rule) and the *Public Governance, Performance and Accountability Act 2013* (PGPA Act). The Agency Rule, and by extension the ADH Agency must comply with the framework established by the PGPA Act.

The Charter sets out the key functions of the ADH Agency Board; the roles and responsibilities of the Board and specific positions; and processes used by the advisory committees to fulfil its roles, responsibilities and functions, aimed at ensuring the effective operation of the advisory committees.

The ADH Agency has four expert advisory committees that are charged with reporting to the Board within their defined function:

- Clinical and Technical Advisory Committee;
- Jurisdictional Advisory Committee;
- Consumer Advisory Committee; and
- Privacy and Security Advisory Committee.

The advisory committees were established under the Agency Rule. The Board has final accountability over the advisory committees. The advisory committees are not responsible for the operational management of the ADH Agency. Of interest, there are additional Charters that are associated with some advisory committees.

The Board delegates certain powers and functions to the CEO, who can then sub-delegate powers or functions to specific positions within the ADH Agency. The Commonwealth Minister for Health (the Minister) is the responsible Minister for the ADH Agency. The Minister may give the Board a written statement setting out strategic guidance for the Agency.

This statement must

- be of a general nature only; and
- not relate to a particular individual; and
- not be inconsistent with the legislate arrangements for the ADH Agency, such as the PGPA Act and legislative rule.

The Minister must not give this statement unless each State and Territory Health Minister agrees to the giving of the statement. In performing its functions or exercising its powers, the Board must have regard to this statement.