VICTORIA POLICE

Public Safety Mobile Broadband

Productivity Commission Issues Paper April 2015

Victoria Police welcomes the Australian Government's study into the best way to secure a Public Safety Mobile Broadband (PSMB) capability to meet the long term needs of Australia's Public Safety Agencies (PSA's).

Operational communications capabilities are critical in supporting field-based police and emergency services personnel to undertake their duties in a safe, efficient and effective manner to contribute to a safer Australia.

Victoria Police is a long-term, major partner in the Victorian government's multi-agency or "Sector" approach to police and emergency services operational communications systems. The 2014 Victorian Long Term Communications Plan outlines the next steps in the Sector's transition to a future operational communications environment, which includes a public safety mobile broadband platform.

Since 2011, Victoria Police has supported, through various state and national forums', the PSMB initiative and allocation of 20 MHtz dedicated spectrum nationally, to ensure technical and operational interoperability and guaranteed delivery.

These forums' include the Council of Australian Governments (COAG), the Standing Council for Police and Emergency management (SCPEM), Law Enforcement Security Radio Spectrum Committee (LESRSC), National Communications Committee for Radio Communications, and the Victoria State Department of Premier and Cabinet (DPC).

Public Safety Agencies (PSA's) have welcomed the Federal Government's commitment to 10Mhtz but additional spectrum, which was acknowledged as a requirement, is considered to be too costly for PSA's to secure on a national coordinated basis. The Federal Government's commitment to 10Mhtz should be revisited against the growing capacity demand.

However, spectrum alone will not achieve the PSMB capability vision as infrastructure supporting networks and compatible end user equipment are required within a national governance structure across all federal and state agencies with industry service providers.

The *Victoria Police Blue Paper* provides a vision for Victoria Police to 2025 and acknowledges that Victoria Police will need to become a more connected, intelligence-led and evidence-based organisation:

> "Police officers on the front line should be equipped with a mobile device that receives information and tasks in real-time, so that they can focus on preventative activities, such as patrolling crime 'hotspots', and respond to incidents as and when they occur.
>
> "The traditional police service delivery model needs to shift from one based on an historical geographic footprint, to one that is more mobile technologically-advanced and more responsive to change demand."
>
> "The technology system would integrate voice and video feeds from mobile and fixed sensor platforms, advanced analytics and advice from partner Agencies"

The provision of a secure, assured interoperable operational communications capability, such as proposed in a national PSMB service, is an essential and critical dependency for Victoria Police to realise this vision and deliver the service expectations of the community in the future for Victoria and nationally.

The public order and safety landscape has changed since 2011/2012 with significant borderless activities effecting national interest, Public Safety Bodies (PSB's) and in particular national PSB's and the way they work with State bodies.

The definition of a 'Public Safety Body' involves more than the various State-centric Public Safety Agencies (PSA's) as described in the issues paper and should include other agencies such as ASIO and ICAC, as these are defined by ACMA as Public Safety Bodies'.

Our concern is that without a national governance structure , the opportunity to truly operate nationally, and deliver such broadband capabilities, within and across 'borders', in an unfettered secure and resilient manner, will be lost.

Attachment A provides the Victoria Police input to each of the questions posed in the April 2015 Issues Paper. It is acknowledged that it is relatively early in the shaping and development of a national capability, however Victoria Police would appreciate the opportunity to further continue to participate in the 'first principles analysis' to achieve the most cost –effective way of delivering this capability by 2020.

Lucinda Nolan
Deputy Commissioner

25 May 2015

Attachment A:

Victoria Police response to the consolidated list of questions

1. *What is the merit (or otherwise) of the proposed approach to undertaking first principles analysis in this study?*

Victoria Police supports adopting a principles-based approach when undertaking analysis of a complex environment. The Public Order and Safety environment has changed since 2012/2013 and requires a more nationally focused approach which is beyond the 'active response' traditional focus of emergency services. This focus would include intelligence /risk mitigation, prevention, relief/recovery and resilience activities across the Public Safety Bodies (PSBs) as defined by ACMA[1]

> ***'Public Safety Body'*** means:
>
> (a) the Australian Federal Police or the police force of a State or Territory;
>
> (b) any Commonwealth, State or Territory body that is not covered by paragraph (a) and that performs functions relating to the investigation or prevention of terrorism, serious crime or corruption;
>
> (c) any Commonwealth, State, Territory or other body that provides an ambulance, fire-fighting, search or rescue service; or
>
> (d) the Defence Force.

2. *What domestic or international developments, reports or experiences in PSMB (or related matters) are relevant to consider in this study?*

- Victorian Government ICT Strategy
- Victorian Department of Justice Report, PSMB Implementation Workshop, May 2012
- Victoria, Australia: Mobile Data Network Service, 2005-2015
- Victoria Police Blue Paper
- New Zealand: NZ Police deployment of mobile devices
- "Socioeconomic Value of Mission Critical Mobile Applications for Public Safety in the EU: 2x10MHz in 700MHz in 10 European Countries", Dr Alexander Grous, Centre for Economic Performance, London School of Economics and Political Science, December 2013
- Various White Papers from Industry on the subject, eg. Telstra, Accenture, Ericsson(Motorola)

3. *What are the implications (if any) of the Australian Government's review of the spectrum policy and management framework, and ACMA's ongoing work on spectrum allocation matters, for the delivery of PSMB in Australia?*

Victoria Police supports the continuation of this work in consultation with the relevant PSAs.

[1] Radio Communications (Public Safety and Emergency Response) Class Licence 2013 Determination,13 May 2013

Victoria Police's concern is that without Federal leadership and a National Governance Structure the opportunity to truly operate nationally, and deliver such broadband capabilities within and across 'borders' in an unfettered secure and resilient manner, will be lost.

4. *Are there any other PSAs that should be considered within scope in this study? To what extent are communications between PSAs and the community relevant to this study?*

Advice from the Productivity Commission is that the definition of PSAs is not restricted in scope and can include those defined under PSBs by ACMA in Question 1.

Victoria Police works closely with a number of National and Victorian Agencies which may not be universally regarded as PSAs, but are PSBs, for example:

- Australian Crime Commission (ACC)
- Independent Broad-based Anti-corruption Commission (IBAC)

These PSBs perform an important public order, safety and law enforcement roles and require secure, assured, operational communications systems with Agencies such as Victoria police. For this reason these Agencies should be included as PSMB users within the scope of this study.

Therefore all Public Safety Bodies under the ACMA definition should be inclusive within this study.

Communications between PSAs and the community have traditionally not utilised the PSAs' operational communications voice and data channels, therefore this interface with community communication channels should considered within the scope of PSMB study.

5. *How do the organisational and institutional arrangements for PSAs vary between the Australian jurisdictions? What implications (if any) does this have for the way in which PSAs procure, operate and use communications services?*

Victorian PSAs are generally grouped into an Emergency Services "Sector" and large operational communications projects are managed via a multi-agency approach. In the Victorian model, the central agency has the contract with the service provider, not the customer agencies.

Additionally, the development of technology capability at Sector level is managed under the newly created Emergency Management Victoria and Emergency Management Minister, in alignment with the Victorian Government ICT Strategy.

There are advantages in agency collaboration for larger scale projects, with better agency interoperability and procurement economies of scale. The resultant disadvantages relate to reduced organisational agility and the rapid delivery of specific agency requirements.

6. *What is an appropriate definition of 'mission critical' communication systems and capability for the purposes of this study? What metrics should be used to assess whether capability is being delivered to adequate levels during mission critical circumstances? What evidence is there that existing capabilities are satisfactory or unsatisfactory?*

'Mission critical' has many different definitions, and Victoria Police consider their all informed radio systems an example of a 'mission critical' systems. The Victorian Auditor-General's report on *Emergency Response ICT Systems* stated that:

> "The Emergency Services Telecommunications Authority (ESTA) depends on several 'mission critical' information and communications technology systems. These include ESTA's Computer Aided Dispatch (CAD) system and several dedicated voice and data networks for communications with emergency vehicles. These 'mission critical' systems need to be highly reliable with established backup systems."

Well-designed ICT systems with associated metrics provide the parameters for assessment of performance against operational requirements. A range of performance measures are currently monitored within the Victorian Mobile Data Network (MDN) Service, Metropolitan Mobile Radio (MMR) Service, and Emergency Alerting Service (EAS). One approach would be to examine all these current measures and then add to them as appropriate, eg. How many transmissions were attempted but could not be established because of lack of coverage, network congestion, etc.

There is already a good evidence base from the above Victorian multi-agency operational communications services, and further enquiries may be directed to the Emergency Services Telecommunications Authority (ESTA) and Emergency Management Victoria (EMV)

7. *What applications do PSAs currently use on their LMR networks that are provided for mission critical purposes? Does this differ by jurisdiction?*

The following LMR (Land Mobile Radio) networks (as distinct from fixed IT Land networks) are utilised by Victoria Police, with the examples of 'critical' functionality (ie. 'applications').

Metropolitan Mobile Radio (MMR)

- Secure all informed voice communications (Digital & encrypted)
- Duress indicator
- Alias designation for identification of user

StateNet Mobile Radio (SMR)

- Voice communications –all informed (Analogue & unencrypted)

Mobile Data Network (MDN)

- Computer Aided Dispatch
- Law Enforcement Database enquiries
- Terminal Messaging
- Intranet browser
- Field data capture / forms
- Automatic Vehicle Location

Victoria Police is not able to summarise other State systems. The market requests from other States would indicate the variance between jurisdictions.

8. *How often are PSA narrowband networks (such as LMR networks) renewed or upgraded, and to what extent are different jurisdictions at different points in this process? What are the costs involved in maintaining these networks?*

As Victoria Police operates within a Victorian multi-agency Sector, it is more appropriate that this question be answered by the government agencies responsible for the planning and management of the Sector's operational communications networks, ie. Emergency Services Telecommunications Authority (ESTA) and Emergency Management Victoria (EMV).

Over last 15 years LMR renewal or major continuity upgrades have been undertaken and typically occur every 6-plus years. Distinction needs to be made between renewal to meet changing requirements (which is continual and periodic) against continuity (same functionality/performance). The Victoria Police SMR network has been upgraded technically over 20-plus years but has essentially remained with the same end user functionality (and from a security viewpoint is acknowledged as no longer being fit-for-purpose, ie. operationally obsolete). The Victorian Government has recently committed funds for a SMR replacement.

9. *How do the different types of events that PSAs deal with affect their demand for communications capabilities? Can you provide examples or evidence to illustrate this?*

Victoria Police is a large organisation which undertakes a wide and diverse range of activities as part of its policing service delivery. Some of these activities which rely upon assured, secure operational communications are detailed below:

a) Day-day reactive policing, eg. attending an incident scene in response to 000 and other calls for service from the public.
b) Rapidly escalating situation, eg. deployment of additional resources to contain and manage an unfolding incident which may put the community at risk.
c) Planned operation, eg. the targeted deployment of police resources to address a known problem area and drive a desired outcome, such as a criminal arrest, reduced road trauma over a holiday period, a safe and secure public event, etc.
d) Proactive patrols, eg. vehicle or foot-based police patrols provide a highly visible police presence, which is an important factor in the general public's perception of community.
e) Discretionary policing, eg. police members on patrol in the field have the ability and authority to generate their own work, which is relatively unique amongst the various PSAs.
f) Investigations, eg. trained field investigators gathering evidence and building a case for prosecution of an offence.
g) Community policing, eg. regular liaison with a wide range of community groups and the general public.
h) Covert duties, eg. surveillance of investigation targets.
i) Covert operations, eg. undertaken by police specialist units, often in conjunction with other law enforcement agencies, against serious criminal targets such as organised crime gangs and terrorism suspects.

10. *How, and to what extent, are PSAs using mobile broadband capability provided over commercial networks, and related products and applications, to support their operational activities? Are there any lessons or insights from these experiences, including the benefits that are being realised?*

Commercial networks

a) Victoria Police has been utilising Optus 2G/3G commercial mobile broadband services in its 700 Mobile Data Terminals since 2010. The Optus service was designed to supplement the Motorola HPD private network in the defined greater metropolitan coverage area, and also to provide the single network service in the regional and rural areas of Victoria. During 2015/2016 all Mobile Data Terminals will be upgraded to replace Optus and operate over the Telstra 3G/4G commercial service.

b) Telstra 3G/4G commercial mobile broadband is also widely utilised across Victoria Police issued smartphones, tablets and laptop PCs to provide connectivity to the Victoria Police operating environment. This allows mobile access to a range of applications including Intranet, email, incident management software, contact lists, operations orders and reference material, which are valuable when supporting both planned and unplanned police operations, particularly when located in different Operations Centres.

The benefits

Whilst the commercial mobile broadband networks currently may not guarantee the State contracted service levels of a dedicated private network service, they generally have been found by Victoria Police to be highly beneficial in supporting police operational communications. There have been some instances where the coverage and capacity of the commercial networks have not met with police users' expectations, however overall the capability provided by these networks has greatly enhanced police service delivery in Victoria.

11. *How do other large organisations (such as government and corporate organisations with certain requirements which may be similar to those of PSAs) currently use mobile broadband services provided on commercial networks.*

The detail of this is unknown to Victoria Police except anecdotally.

12. *What lessons or insights can be taken from the previous trials of Telstra's LANES model, including during the G20 summit in November 2014?*

Victoria Police is observing the Telstra LANES developments with interest. It is understood that the lessons learned from G20 and the Queensland experience are being examined by the Productivity Commission study directly.

The scalability of this type of technical model to guarantee a dedicated, national high availability broadband network is not yet known. Also unknown is how such a technical model can best be utilised for PSA interoperability, nationally. The technology network is only one component of providing information interoperability.

13. *Can commercial network solutions that involve dedicated spectrum for PSAs (and prioritised capacity in other spectrum bands during emergency incidents) allow for interoperability between networks operated by other mobile carriers and/or for end user to roam across multiple networks? Are there any technical, institutional or commercial barriers that would prevent this outcome?*

This will depend upon the solution architecture design and Victoria Police has previously been involved in some trials which proved the concept, eg. a multi-carrier solution utilising LMR voice, 3G voice and data, and satellite voice. Any barriers would more than likely be commercial rather than technical.

14. *What applications could PSAs use if they had access to PSMB capability? How could this be expected to vary across PSAs?*

The application requirements will differ amongst the PSAs to some extent because of the different missions of each PSA, however there will also be common applications which could be delivered by a PSMB capability. Examples of some future applications envisaged by Victoria Police include:

- Automatic Resource Location, to both persons and vehicles
- Computer Aided Dispatch functionality
- Database enquiries and content-rich responses to assist in-field decision making
- Field reporting, ie. capture of relevant information in the field and instant notification
- Detailed in-field activity capture, populating business intelligence systems
- In-field facial recognition for identity verification
- Video streaming to and from the field
- Advanced analytics and advice from partner agencies
- Systems that would integrate audio, video and telemetric date from mobile and fixed sensor platforms
- Access to building plans
- Access to advanced tactical mapping, eg. multi-layers, street-view, etc.
- Access to social media feeds and public-generated information providing real-time alerts, requests for assistance, situational awareness information and evidence
- Machine-to-machine communications, eg. various sensors on persons, vehicles, buildings etc.
- Voice Over LTE

15. *To what extent could these applications replace or supplement the capability and systems currently used by PSAs on their narrowband networks?*

These applications across a PSMB, with interoperability, would be a 'Force Multiplier' but also reduce the radio traffic that now competes with critical radio communications (eg, police officer location information).

Victoria Police requires both voice and data in the field, with all-informed voice communications remaining the police officer's "lifeline" when dealing with critical situations.

In order to manage the potential operational risks prior to a potential full transition, in the short-medium term (eg. 2015 - 2025) Victoria Police would seek to supplement its dedicated voice radio services with a mobile broadband capability. Mobile broadband could deliver a range of value-added functionality to enhance police service delivery which has been set out in the Victoria Police Blue

Paper[2]. For example, the majority of the work of police officers processing people who are charged offences in the field would occur automatically/electronically from evidence gathered in the field, through a single mobile device and transmitted to the various authorities at the same time who require notification.

The Victorian Auditor-General's report on *Emergency Response ICT Systems*[3] commented on a Victoria Police analysis of the impact of Protective Service Officer (PSO) voice radio usage on other police users, and noted that the use of smart devices and applications for PSOs for routine enquiries should be investigated. The report stated that:

> "These recommendations should be implemented by VicPol."

The report also noted that:

> "Approximately 30 per cent of police primary response vehicles in metropolitan areas and some rural primary response vehicles are equipped with mobile data terminals or ruggedized laptops which can request and receive CAD event information directly, including LEAP checks. This significantly reduces the ESTA dispatcher workload, and in addition, provides ESTA with accurate vehicle location information."

16. How important are communications between PSAs and the community during emergency incidents?

Communications between Victoria Police and the community is essential, during all phases of the emergency management services model including the 'response phase' to both day-to-day events and emergency incidents, including major national emergencies.

Victoria Police regularly provides information to the community via a range of channels, such as:

- traditional media (newspapers, television, AM/FM/digital radio);
- website (http://www.vicpolicenews.com.au); and
- social media (YouTube, Instagram, Twitter and Facebook)

Information is always sought from the community via:

- 000 emergency calls
- Crime Stoppers calls or web-reporting
- Direct contact with local police station
- Contact via other channels, eg. National Security Hotline

During particular unfolding situations, Victoria Police may also monitor social media applications.

It is important to note that the above 'community communications' are very different from, and not the responsibility of, the front-line police officer utilising police operational communications systems

[2] Victoria Police Blue Paper: A Vision for Victoria Police in 2025, May 2014
[3] Victorian Auditor General's Report "Emergency Response ICT Systems", October 2014, pg. 26

17. What PSMB capability characteristics should be considered in this study?

Scoping the PSMB capability should firstly consider the PSAs' Business Requirements, at a collegiate level, nationally and locally.

Victoria Police also suggests consideration of the following characteristics/principles:

- National Governance and Management of a managed PSMB service.
- Additional Australian Government guaranteed PSMB spectrum (beyond the current2 x 5 MHz) to a recommended ***minimum*** of 20 MHz
- Additional PSMB spectrum sourced from Industry on an 'On demand' basis
- A dedicated critical PPDR "partition".
- Additional dedicated partitions and/or available on demand.
- A rapid deployment supplementary capability to provide additional coverage and capacity as needed.
- Linkages and integration with the National Broadband Network and other operational communications networks as appropriate.
- An adequate provision for growth based on how the "primary" PSA users will grow their utilisation of PSMB capability.
- Provision for growth of the PSMB user base, eg. additional "secondary" customer agencies.
- A highly self- healing resilient network design and disaster resilience capability
- A highly secure end-to-end information environment.
- A defined dynamic capacity allocation protocol.
- Customer agency tools to provide real-time visibility of PSMB utilisation and support tactical decision making.
- Acknowledgement that PSMB will be utilised 24/7 for a diverse range of day-to-day policing and law enforcement functions across Victoria and beyond, and not just reserved for major incidents or operations.
- The provision for categorising different types of mobile broadband data traffic, so that in the event of network stress some categories of lower priority data traffic can be restricted whilst designated higher priority "mission critical" traffic can continue to operate unaffected. A criticality continuum should be developed and agreed.

18. How should 'national interoperability' be interpreted in this study? Does it include interoperability between networks, devices and applications used by PSA in different jurisdictions? Does it extend to integrating communications services between different local PSAs (for example, police, fire, ambulance and other responders)?

Effective interoperability is not only technical capability in isolation and needs to include governance, training, and standard operating procedures (refer to Victorian Department of Justice Report, PSMB Implementation Workshop, May 2012).

National interoperability should be interpreted from user perspective across all phases of Emergency Management and Public Order and Safety service models.

National interoperability can start with a range of spectrum which is made available for utilisation by any authorised PSA user with an approved terminal device across Australia (and potentially Australasia). Standardisation of terminal equipment and devices is another fundamental consideration, which allows for greater economies of scale when undertaking procurement. Providing commonality of

PSA applications across different agencies and across jurisdictions has some potential, however the operational information environment is quite complex and would requires review on a case by case basis.

The Victorian PSAs already integrate operational communications services and share information in an interoperable manner according to defined protocols but do not have available the ubiquitous interoperable capability opportunities envisaged in a National PSMB Network(s) and integrated systems.

19. *Does delivering a PSMB capability raise any new opportunities for achieving national interoperability?*

There is a real potential for establishing a true national public safety interoperability framework.

Victoria Police's concern is that without a National Governance Structure the opportunity will be lost to truly operate nationally in a joined up manner, and deliver such broadband capabilities within and across 'borders' in an unfettered secure and resilient manner.

20. *Would the benefits, costs and risks of achieving national interoperability vary under different deployment options? If so, how?*

There are a number of potential PSMB service delivery models, and each of those models could contain a range of variations with subsequent impacts on benefits, costs and risks. Victoria Police is currently not in a position to document the benefits, costs and risks of each option across Agencies, but will participate in any examination of this issue.

21. *What progress has been made in putting in place arrangements to better coordinate emergency communications within and across PSAs and jurisdictions?*

Victoria already has well-established emergency communications procedures and protocols which work across all relevant Agencies. For example, Emergency Management Victoria (EMV) has been created to better coordinate emergency management communications within Victoria.

Their vision and mission is that Emergency Management Victoria supports a Sector-wide approach to achieve joined up outcomes that are community-focused.

It is only by agencies, departments, industry, business, and all levels of government and community working together will result in a sustainable and efficient emergency management system that reduces the likelihood, effect and consequences of emergencies. Leadership, governance and systems such as the PSMB would provide the enablers for an enhanced national capability.

22. *What level of network coverage do the existing networks used by PSAs (for narrowband voice and low-speed data capability) currently provide? How does this vary across jurisdictions?*

Each of the Victorian Sector's multi-agency operational communications services is contracted to provide a specified level of network coverage. Further details can be provided by the government agencies responsible for the planning and management of the Sector's operational communications

networks, ie. Emergency Services Telecommunications Authority (ESTA), and Emergency Management Victoria (EMV).

23. *What level of mobile broadband network coverage do PSAs require across metropolitan and regional Australia? Does this vary for different PSAs?*

The ultimate requirement is for systems availability everywhere at all times, however this is pragmatically limited by cost/technical constraints. Coverage is seen to grow organically as well through consumer demand and changes in the focus by infrastructure developers to deliver communication when developing new infrastructure, eg. in buildings, transport systems, agriculture, mining, tunnels and major roads and electric power lines.

On-request, fast response mobile broadband supplementation for critical incidents is also seen as a way of moving toward meeting this ultimate requirement.

Victoria Police has specific operational communications network coverage requirements, which relates to the wide variety of environments in which Victoria Police needs to operate. Further detailed information can be provided upon request.

24. *What is the most appropriate measure of network coverage for use in this study?*

Commercial coverage measurements are typically based upon an average coverage models which may not always meet an individual user's perception or expectations at a specific location. For critical services 'Coverage' is event/incident location and user based and must be known, to remove risks and assure availability of end to end services where mobile broadband is one essential component. Victoria Police and the Victorian Emergency Management Sector has typically utilised different network coverage measures to ensure the specified Business Requirements are being met. Specific requirements can include, but are not limited to tunnels, public places, transport routes, remote tourist destinations, government buildings, inshore and offshore waterways etc. The network coverage requirements are typically specified in the Business Requirements, predictive modelling is undertaken to inform the appropriate network design, and the actual network coverage is physically tested and verified.

25. *What options are there for extending the mobile coverage of commercial networks?*

An extension of the commercial networks mobile coverage to areas wherever police are required to operate, ie. virtually anywhere and everywhere in Victoria, would no doubt be of benefit. It is acknowledged however that this is an ideal, and there must be a commercial imperative for network operators to build extended coverage.

Transportable cells to provide supplementary mobile network coverage and capacity have successfully been used by Victoria Police, for radio communications, in conjunction with the commercial carriers for many years. A continuation of this type of service to support both planned and unplanned events, at the mobile broadband network level is essential. A rapid deployment capability, delivered and supported by either the commercial network providers or the PSAs will become increasingly important into the future.

26. *Would the benefits, costs and risks associated with achieving an acceptable level of network coverage for PSAs vary under different deployment options? If so, how? And with what operational consequences?*

This information is not known to the level requested.

Victoria Police has specific operational communications network coverage requirements, which relates to the wide variety of environments in which Victoria Police needs to operate.

27. *How could voice services — traditionally carried on narrowband networks — be integrated into a mobile broadband network capability? What challenges and risks need to be accounted for? Are the challenges at the local level (due to legacy factors) greater than those at the national level?*

This is a technical question that is more adequately answered by industry engagement and researching their technology roadmaps.

Emergency Management Victoria's *Long Term Communications Plan* (LTCP) has researched this issue and envisages this will not occur until the 2020- 2025 timeframe, even though some VOIP services may be used and are availability as COTS commercially now.

Mission Critical Voice Radio is contemplated to co-exist with broadband LTE through to 2025.The key risks for Victoria Police relate to maintaining the performance, reliability and security of its operational voice communications services.

A full transition from the currently used narrowband voice networks to a single convergent mobile broadband platform(s) is a major undertaking and is likely to take Victoria Police and the Victorian Sector a decade to fully implement. Challenges for Victoria Police include:

- Defining a clear Victorian Sector-wide and National strategic approach;
- Victorian Sector funded commitment to this strategic approach;
- Alignment of existing operational communications service contracts to permit a transition to a new service model;
- Appropriate assurances, including rigorous testing, to ensure Victoria Police's current and future business requirements can be met;
- Ensuring the necessary level of Victoria Police involvement in the planning and implementation processes;
- New, fit-for-purpose, terminal equipment, applications, and interfaces;
- A national level transition plan.

28. *What challenges or opportunities arise (from a technical, institutional and/or commercial perspective) from such integration, and would the benefits, costs and risks vary under different options for PSMB? If so, how?*

An Industry development Roadmap could provide an indication of the technical timelines for enabling such opportunities to occur such as described in the Victoria Police Blue Paper.

It is envisaged that such an integration and transition will be technically, commercially and organisationally complex, but will also reveal various opportunities for enhanced police service delivery.

It is too early to provide any real detail regarding challenges, opportunities, benefits, costs and risks, however Victoria Police will continue to analyse as the different PSMB delivery options become clearer.

29. *The Commission understands that there is currently work underway to develop voice applications for 4G/LTE networks for use in mission critical circumstances. When are these applications likely to become available?*

Emergency Management Victoria and the *Long Term Communications Plan* envisages some general timelines for such applications.

30. *What factors are important in ensuring the integrity and security of communications for PSAs? To what extent does this differ for different types of PSAs?*

The end-to-end information security requirements will differ amongst the PSAs because of the different missions of each PSA. For example, the CFA does not require its voice communications to be encrypted because it encourages its volunteers and interested community members to access its communications via scanners and web pages (Official CFA voice radio streaming of its Dispatch channels: http://www.broadcastify.com/listen/official).

Victoria Police is committed to meeting the information security requirements for law enforcement data as defined by the Commissioner for Privacy and Data Standards as well as applicable Department of Defence Standards and government privacy legislation standards.

Victoria Police deploys a wide range of operational units in the field and each operation unit requires reliable, secure communications. End-to-end information security is essential for Victoria Police because of the sensitivity of the data carried across its communications channels. End-to-end data encryption from terminal device to target system is necessary, with no opportunity for data interception in between.

Victoria Police also utilises covert units, whose activities and location are to be kept hidden from unauthorised personnel. A carrier or network operator will generally be able to locate a device(s) with a relatively high degree of accuracy via network triangulation. Victoria Police will require that that the location of some, if not all, its operational units are not made visible to network operator personnel.

31. *Would the costs and risks associated with ensuring the integrity and security of communications differ depending on how a PSMB capability is delivered? If so, how?*

There are a number of potential PSMB service delivery models, and each of those models could contain a range of variations. Victoria Police is currently not in a position to examine the costs and risks of each option, but the starting point for any analysis must be with Victoria Police's Business Requirements.

32. *What methods or metrics could be used to define and/or measure the level of security provided over a network that delivers mobile broadband capability?*

Victoria Police would specify its PSMB information security requirements as part of its Business Requirements (refer to the response to Question 30). Further information will not be included in this response, however the ongoing verification that these requirements are being met could be delivered using a combination of reports and regular information security inspections and audits.

33. *What additional security needs do PSAs have compared to other sectors with high security requirements for their communications?*

All Victoria Police information which flows through its police operational communication systems is treated as "Law Enforcement Data" and attracts an associated information security classification. The sensitivity of police information must be ranked higher than other sectors because of the very real potential to cause personal harm to the community. For example, the interception of police communications can allow:

1. unscrupulous persons the opportunity to invade citizens' privacy by gathering details of crimes, victims, suspects, offenders, witnesses, etc., and
2. criminals the opportunity to:
   - evade police and avoid arrest, and continue to commit crimes; or
   - plan to attack police officers with the intention to maim or kill.

Victoria Police therefore requires very strong end-to-end information security measures across its operational communications systems.

34. *How should PSA demand for mobile broadband capability be estimated in this study, including their expected demand requirements into the future?*

The starting point must be with each PSA's Business Requirements for operational communications, with a suitable overhead initially included for short-term growth, supplemented by a dynamic expansion capability.

It will be difficult to predict future demand requirements with a high degree of precision in this fast-moving environment. The PSMB service delivery model would ideally include an ongoing monitoring and review process to regularly assess emerging requirements and the optimal way to meet them.

The general public uptake of mobile broadband services worldwide provides an indicator of the type and scale of growth which could reasonably be expected.

35. *What methods or metrics could be used to define and/or measure the level of service capacity provided to PSAs?*

There are a wide range of service level metrics in industry that defines 'capacity' which could be adopted for a PSMB and some basic measures are included below:

- Performance, eg. data traffic speed compared to the benchmarks;
- Availability, eg. end-to-end system "uptime" compared to the requirement;
- Capacity, eg. actual system utilisation compared to a predicted System Utilisation Model

However, capacity is only one 'capability' that must be present for effective broadband services. Obviously coverage is another but 'latency' is one which is not given enough focus.

Victoria Police would welcome participating in future PSMB analysis and modelling exercises.

36. *What level of capacity will PSAs need for a PSMB capability, and how will this differ between business as usual activities and large scale emergency incidents?*

This is difficult to specify at this stage, however Victoria Police would welcome participating in future PSMB analysis and modelling exercises.

Generally business-as-usual activities are relatively static and measurable with incremental growth, whereas 'large scale emergency incidents' will tend to utilise all available capacity at different times throughout the response and recovery phases. Overseas and recent examples should be researched to provide some prediction models to estimate such demands.

As an indicator, Victoria Police employs approximately 15,000 sworn police officers and this number will grow over time. There are approximately 2700 police vehicles currently. It is envisaged that in the future all police officers will be issued with various devices to allow them to undertake their duties in a more efficient and effective manner. These devices will invariably be supplemented by a range of discrete but connected wearable technologies and fixed and mobile sensors. Depending upon the evolving solutions architectures it is possible that all of these elements will utilise a PSMB capability, thereby impacting on the capacity requirements.

37. *How might the demand for PSMB capability differ between types of PSAs? How could competing demands amongst PSAs be managed? Should particular uses be prioritised?*

Each PSA will have differing PSMB demands, so it is essential that modelling of the different PSA's traffic be undertaken in order to dimension the PSMB capability.

It is suggested that something like a ***PSMB Dynamic Capacity Allocation Protocol*** would need to be developed in conjunction with the customer PSAs and the PSMB Managing Body and PSMB Service Provider(s). This Dynamic Capacity Allocation Protocol would provide a model to assess the severity and potential network impact of escalating incidents, and guide the decisions to reconfigure the PSMB service as necessary to support the PSAs.

In order to make informed tactical decisions, customer PSAs will require real-time visibility of the status of the PSMB network(s) through the provision of a range of monitoring and reporting tools.

38. *How would the benefits, costs and risks of ensuring sufficient capacity vary under different deployment options?*

This is difficult to specify as this is a significant piece of work, however Victoria Police would welcome participating in future PSMB analysis and modelling exercises.

Our expectation is that this Study would provide an insight into this question

39. *What level of resilience do PSA narrowband networks usually provide and how does this differ from commercial mobile broadband networks?*

Generally, 99.999% end-to end-availability is a requirement for PSA mission critical systems and is comparable to business critical system resilience requirements.

Because of the dynamic and evolving nature of network design this question is best answered by the commercial network providers and operators.

40. *What methods or metrics could be used to define and/or measure the level of resilience provided by the networks used to deliver PSMB?*

End-to-end Availability and Performance are the general measures used to monitor systems against requirements.

Network resilience is ideally designed at the outset, but can also be added and strengthened as the network grows and evolves over time. The ultimate measure of resilience relates to service performance and availability to end users individually and in groups, ie. does the service continue to be provided to the required standards under any and all circumstances?

System resilience can be assessed via undertaking scenario analysis and examining for potential points of system failure. This is often best done in collaboration with customers to scope various operational scenarios.

41. *What priority should be given to the capacity to stand up a replacement service within a specified timeframe in the event of a physical or network based disruption?*

A simple answer and underlying principle would be that any replacement service must be established as a high priority to ensure PSA service continuity. A more pragmatic answer would be that "it depends", based upon the circumstances, eg. whether alternative operational communications services are immediately available to users or whether the disruption is due to a technical failure or malicious attack, the extent of the disruption and the number of people potentially affected, etc.

Victoria Police currently favours a layered redundancy approach, ie. in the event of a disruption to the primary operational communications service, there is the continuity capability to:

a) immediately utilise a secondary operational communications channel or service; and in parallel
b) initiate a rapid deployment capability to establish a repaired or replacement primary operational communications service;
c) Restore the primary service or activate a Disaster Recovery service.

42. *Are there any barriers (for example, institutional, informational and/or technological) to, or challenges associated with, delivering a resilient PSMB capability? How might this differ between different deployment options?*

Victoria Police's view of complex operational information and communications technology is that they are comprised of a "system of systems" and consequently multiple vendors or service providers play a part in the delivery of an end-to-end service. Service resilience involves having detailed understanding

of potential failure points across each system in the chain and establishing either a technical safeguard or, if not feasible, a highly efficient process for fault identification and service restoration.

There have been numerous instances where a service failure has been experienced but the service restoration processes have been unduly delayed because of the lack of end-to-end service governance and diagnostic capability to identify exactly where the failure occurred and what vendors or service providers have responsibilities for rectification. In such 'system of system' more than one provider is normally involved.

Technical resilience for any PSMB must be therefore supported by the appropriate level of governance, services management, commercial and contractual response to suit the PSMB deployment model.

43. *How could future developments in technology, or growth in demand for mobile broadband services and capacity, affect the sustainability of PSMB capability under different deployment options?*

It is anticipated that over the next decade Victoria Police's demand for a PSMB capability deployed across the organisation will grow significantly, most likely exponentially.

In line with Victoria Police's Key Principles for Operational Communications, it is envisaged that PSMB capability will be utilised to support:

- every frontline police officer equipped with a voice radio/device for the shift
- every frontline police officer personally issued with a portable data device
- a proportion of police vehicles equipped with a range of technology platforms, eg. mobile data terminals, Automatic Number Plate Recognition, In Car Video, wireless communications hub;
- every police vehicle fitted with a telemetry device to support Automatic Vehicle Location and other vehicle-based data;
- a range of fixed and mobile cameras, including vehicle based and drone-based;
- a range of fixed and mobile sensors and devices.
- Support applications
- Command, Control and Coordination requirements
- A 'Common Operating Picture (COP) and single view of Situational Awareness (SA) for all involved Agencies

A "Public Safety Internet of Things" may also drive significant growth, with an as-yet underdetermined amount of machine-to-machine data traffic expected to arise.

44. *How will the convergence of voice and data services affect the sustainability of PSMB capability under different deployment options?*

The assumption that converged voice and data services will meet the requirements for Victoria Police operational communications is still yet to be properly investigated and validated, and this is expected to still be some years away.

Critical Operational Voice Communications service requirements will need to continue to be in the order of 99.999%, and in a converged environment then data services would need to meet the same requirements, if feasible.

45. *What challenges are involved with delivering a mobile broadband capability to PSAs by 2020? Do these differ under alternative deployment options?*

The challenges involved in meeting a 2020 delivery target in Victoria primarily relate to the transition from the existing multi-agency operational communications technology platforms and service agreements.

Alternative PSMB deployment options will obviously impact on the potential delivery timeframes.

A primary consideration will be what is included in the service offering by the potential PSMB Provider(s), and how this eases the transition for the customer PSAs.

46. *What potential obstacles exist to a mobile broadband network being fully compatible with a range of end-user devices? Does this depend on the network deployment option?*

Victoria Police currently deploys mainly "public safety grade" equipment, which is "shared issue", ie. the equipment is utilised by the police members during the course of the shift then is used by a new crew for the following shift. Public safety grade equipment is designed to be rugged and withstand the rigours of in-field use over a number of years by multiple users. It is designed to higher specifications and therefore commands a price premium.

"Personal issue" equipment is provided for the exclusive use of that police member. Experience across a range of jurisdictions has indicated that when equipment is personally issued to members they tend to have a much stronger sense of ownership and consequently take better care of the equipment.

If the network(s) chosen operate in a custom spectrum band then the availability of end user equipment, notably wireless modems, to operate within this band is potentially limited. Specialist providers will need to supply the equipment, and without the benefits of consumer-driven economies of scale this equipment will consequently be more expensive to initially purchase.

The potential downside of commonly available consumer-grade devices being available to operate on the network means that a layer of information security is removed. For example, a standard smartphone or wireless broadband model will not necessarily operate in a dedicated public safety 800 MHz spectrum band. If general public devices operate in the same spectrum band as public safety devices then additional information security mechanisms must become an area of focus.

The ability for end-user devices to access more than one wireless network is attractive to Victoria Police in that it provides layered redundancy, ie. if the primary network becomes unavailable then connectivity is still available via a secondary network. Victoria Police has adopted this approach in its Mobile Data Network Service by using a private Motorola data network in conjunction with a public broadband data network.

47. *How does the method of ensuring interoperability impact on the cost of the system to PSAs?*

"Interoperability" has many sub components that must first be defined: technical, operational individual to individual, group to group, all informed etc. At its simplest level it relates to the sharing of information amongst the users or groups of users who require it, both within and external to a PSA.

The PSAs' Business Requirements should specify the interoperability requirement. Once these are known, ideally across all the PSAs, then the cost implications can start to be determined.

48. *What detailed options should be evaluated in this study? What underlying assumptions and key parameters would be associated with each option?*

The Productivity Commission Issues paper outline two 'bookend' options and hybrid options worthy of evaluation. Victoria Police would welcome the opportunity to contribute to future scoping and refinement of such options.

49. *What (if any) assumptions or parameters should be 'common' across all options?*

- A National Governance and Management Body be established to take leadership, governance and management of the PSMB service(s) in collaboration with PSA's (Inclusive of PSB's, relevant Partners and the community)).
- Sufficient PSMB spectrum must be assigned and dedicated to service the predicted PSA usage, with an allowance for significant but managed future growth.
- The PSMB service(s) must include a dynamic allocation capacity/capability that can rapidly expand or contract on demand to meet the dynamics of a rapidly changing PSA environment.

50. *What are the sources of costs relevant to this study?*

The starting point must be with each PSA's Business Requirements for operational communications through to 2025.

51. *In what ways could delivering a PSMB capability affect non PSA users? How would these effects differ across deployment options? What methods could be used to estimate these effects?*

No comment from Victoria Police at this stage.

52. *Is it appropriate to consider option values as part of the cost benefit analysis in this study? If so, how? What information or data is relevant?*

No comment from Victoria Police at this stage.

53. *Are the network cost elements identified in box 4 relevant for this study? What specific cost items would fall within these categories? What other network costs should be considered? What is the nature and materiality of these (and other relevant) costs under alternative PSMB options?*

No comment from Victoria Police at this stage.

54. *What method(s) should be used to estimate the network costs of different deployment options for delivering PSMB? What studies should inform the Commission's thinking in this area?*

The starting point must be with each PSA's Business Requirements for operational communications.

55. *What network cost components are interdependent with other costs, or other parameters (such as assumptions about the amount of spectrum allocated)? What is the nature of these interdependencies?*

No comment from Victoria Police at this stage.

56. *What data sources could be used to estimate expected PSMB traffic requirements, and the network infrastructure elements required to deliver PSMB capability under different deployment options?*

The starting point must be with each PSA's Business Requirements for operational communications.

The MDN Service established a Message Volume Model which modelled the expected traffic for the customer agencies, ie. Victoria Police, and Ambulance Victoria. The MDN Service provider, Motorola Solutions, continuously monitors the actual traffic levels and regularly reports on actual vs predicted.

Other police jurisdictions across Australasia have utilised commercial mobile broadband providers either totally or as part of a hybrid solution. Information must therefore exist with the agencies and/or providers as to the current and expected traffic requirements.

Telstra's support of the 2014, G20 conference in Brisbane would have provided them with invaluable insight at to the network demands for a large scale planned operation.

57. *What data sources could be used to estimate the cost of the infrastructure, equipment and operation in delivering PSMB capability under different deployment options?*

The starting point must be with each PSA's Business Requirements for operational communications.

58. *What is the appropriate approach (or approaches) to model the opportunity costs of spectrum under different deployment options? What issues does 'spectrum sharing' raise for estimating these opportunity costs, and how might they be addressed?*

No comment from Victoria Police at this stage.

59. *What data sources could be used to estimate the opportunity costs of spectrum under different deployment options for PSMB?*

The following report may give some insight as to a suitable methodology:

Socioeconomic Value of Mission Critical Mobile Applications for Public Safety in the EU: 2x10MHz in 700MHz in 10 European Countries

December 2013
Dr Alexander Grous
Centre for Economic Performance

London School of Economics and Political Science

60. What is the appropriate discount rate, or range of discount rates, to use in this study?

No comment from Victoria Police.

61. How far into the future should costs and benefits be measured?

Costs and benefits should be estimated, monitored and controlled over the life/type of the system subject to such systems remaining 'operationally fit for purpose', which continues to require expenditure to ensure such systems do not become 'operationally obsolete ' caused by not keeping pace with the changing operational requirements over the systems life cycle.

Victoria Police undertook benefits reporting for the Mobile Data Network Service until the end of the first 5 year contract period, ie. 2006-2010.

Costs and benefits are also generally assessed independently assessed, eg. via an Auditor General's office.

62. What are the sources of benefits relevant to this study?

Delivering an operational communications capability for Victoria Police must provide a range of organisational benefits, which must subsequently result in tangible benefits to the Victorian community via a better policing service, for example reduced road trauma.

63. How can the potential benefits of PSMB capability (in terms of PSA outcomes) be estimated? Is scenario analysis useful? How should scenarios be constructed to reflect an appropriate range of situations faced by PSAs?

Victoria Police has had the successful experience of deploying a mobile data capability, albeit not across the whole organisation, over the past decade. Victoria Police is observing with interest the experiences of other policing jurisdictions across Australasia and around the world, and is watching the development of the PSMB models in the USA and UK.

Scenario analysis is a useful technique to illustrate a possible future environment, and Victoria Police would welcome the opportunity to contribute to this type of PSMB modelling.

64. Can you identify any trials or pilot programs of PSMB capability? Are there any insights to draw from these experiences about potential benefits (or costs)?

Victoria Police has been successfully utilising a multi-agency Mobile Data Network Service since 2005, and although this primarily provides a public safety mobile ***narrow***band capability there is a raft of experience which may be used to inform a future PSMB capability. Victoria's Emergency Services Telecommunications Authority (ESTA) and Emergency Management Victoria (EMV) will be able to provide specific insights.

65. *Can you identify evidence or examples that illustrate the effects of PSMB capability on PSA outcomes?*

Victoria Police undertook benefits reporting for the Mobile Data Network Service until the end of the first 5 year contract period, ie. 2006-2010. Note that it took approximately 12-18 months for reliable information to become available to support this benefits reporting.

66. *What method(s) should be used to value the effects of PSMB capability on PSA outcomes?*

There are a range of quantitative and qualitative methods which could potentially be utilised, and these will vary between PSAs due to the different organisational missions and how PSMB is deployed within the organisation. A comprehensive benefits reporting framework for a National PSMB is a complex exercise and ideally requires a defined project to scope and implement.

67. *Is there research that considers how the costs of responding to natural disasters, crime or other events could be affected if PSAs had access to mobile broadband?*

No comment from Victoria Police at this stage.