

Submission to the Australian Government's Productivity Commission Study on Public Safety Mobile Broadband

By RF Technology Pty. Ltd.

Summary

This submission describes a new technology for public safety mobile communications, under development by Sydney-based RF Technology and its partner CSIRO, Australia's national science and technology agency. The new technology delivers public safety mobile broadband (PSMB) using existing *narrowband* public safety spectrum via *incremental upgrades* of existing narrowband public safety mobile communications equipment. The RF Technology-CSIRO approach will allow a smooth, software-activated transition to future additional broadband spectrum to deliver even higher data rates. First deployments of this technology will begin in the second half of 2016. This approach is expected to be the most efficient, effective and economical way of delivering PSMB to public safety agencies (PSAs) in terms of cost, features and spectrum use. RF Technology would welcome the opportunity to participate in the Productivity Commission's PSMB technical workshops. RF Technology requests that the Productivity Commission include this approach in its final report to the Australian Government, and that it considers recommending that this approach be mandated for all Australian PSAs.

PSMB challenges

The Productivity Commission's PSMB issues paper considers the following approaches to PSMB in Australia:

- Deployment of a dedicated PSMB network
- An approach that is fully reliant on commercial public networks
- A combination of the two

There are challenges associated with all these approaches. Deployment of a (new) dedicated PSMB network has the advantage that the network will never be congested by public-network traffic, so it is possible to guarantee a minimum level of service. A dedicated PSMB network also allows the deployment of public-safety-specific technology, to meet the unique requirements of public safety communications. The challenges associated with this approach are, firstly, that no broadband technology yet exists that meets public safety requirements for reliability, availability, and security, and delivers PSA-specific features in the challenging geographical and ad-hoc environments in which PSAs operate. Standards to define the performance of such a technology do not yet exist either. Broadband technologies designed for public telecommunications networks rely on flooding the coverage area with transmitted power – a workable approach in public networks with very many users, but an approach resulting in low performance and/or inefficient use of spectrum and transmit power in sparse public safety networks. Secondly, deployment of any new network has a very high capital cost, to deploy a complete new infrastructure, and a very high operational cost, to transition from the existing network to the new one.

A PSMB approach that is fully reliant on commercial public networks has significant technical challenges in meeting the stringent public safety reliability, availability & security requirements in a shared network, especially when public safety traffic is a small fraction of the total network traffic. These challenges are increased because in emergencies, the public network is under additional stress.

As for a combination of the two, any approach that involves a new, dedicated PSMB network will involve the high capital and operational cost mentioned above.

A new approach

Sydney-based RF Technology has been a world leader in narrowband mobile data communications for public safety for over 30 years. RF Technology's existing products comply with the P25 global standard for public safety communications, and are deployed in Australia and worldwide (in the Americas via RF Technology's US subsidiary, IPMobilenet). In early 2014, RF Technology began a partnership with CSIRO, Australia's national science and technology agency, to develop the next generation of public safety mobile communications. RF Technology's new products, based on CSIRO's NGARA technologies, will:

- Deliver video-capable mobile broadband: a dedicated data rate of at least 0.7 Mbit/s per user per direction in the worst case (user travelling at 150 km/h in a severe multipath environment, e.g. an "urban canyon"), initially for up to 4 users per cell, later increasing to 30 users with the same dedicated data rate
- Using existing narrowband public safety spectrum (eight 12.5-kHz channels or four 25-kHz channels, contiguous or non-contiguous) Via low-cost, in-service, step-by-step upgrades of existing narrowband P25 public safety communications equipment
- With software-activated transition to new spectrum
- And the capability to later use new broadband spectrum, when it becomes available, to deliver multi-Mbit/s dedicated data rates per user per direction, again with incremental upgrades
- Deliver voice and data/video in a single radio
- Using patented technology developed by CSIRO which is at least 6 times more spectrally efficient than the LTE technology used for mobile broadband in public networks
- First customer field trials 2Q 2016. Prototype field tests are in progress now.

Benefits of this approach

This new approach will enable a smooth transition from today's dedicated, narrowband public safety networks to dedicated public safety networks that deliver high-performance broadband; and it will deliver video-capable public safety broadband using existing narrowband spectrum as soon as 2016. Critically, the new approach will enable PSAs to start using broadband soon, with small additional investment and familiar equipment.

RF Technology is working to have this technology form the basis for PSMB standards via the P25 standards organisation.

Next steps

The approach described here is expected to be the most efficient, effective and economical way of delivering PSMB to public safety agencies (PSAs). RF Technology would welcome the opportunity to participate in the Productivity Commission's PSMB technical workshops. RF Technology requests that the Productivity Commission include this approach in its final report to the Australian Government, and that it considers recommending that this approach be mandated for all Australian PSAs.