

How the London bombings showed the need for tomorrow's mobile tech

July 8 2015, by Nigel Linge

One aspect of the London bombings of 7/7 that many who were there remember is that their phones went dead. Mobile phone coverage in parts of central London was almost unavailable. This was not due to damage; the emergency services had [shut down public access to the networks](#).

At times of crisis communications are essential. The emergency services need to coordinate their response while the general public want to contact loved ones and find out what's happening. The problem is that there simply isn't enough capacity for everyone to use the networks simultaneously, particularly in densely populated areas like central London.

Networks of all types are designed to cope with typical traffic demands, and so in exceptional circumstances they become massively overloaded. Operators need to prioritise access. At such times, the emergency services invoke the government's Mobile Telecommunication Privileged Access Scheme ([MTPAS](#)) procedure. This is where the police "Gold" commander – the senior officer managing a disaster or emergency event – can notify [mobile network](#) operators that they should start prioritising calls and messaging from the emergency services over others. This can be set to operate within defined geographic areas.

SIM, the key to the network

All mobile phones contain a Subscriber Identity Module, universally known as a SIM card, which stores network-specific information that authenticates and identifies subscribers on their network. Each SIM is also assigned to a privilege access class, which is a code number between 0-14. For general users this will be in the range 0-9, while emergency services responders are assigned classes 12-14.

When connected to a mobile network via a nearby base station, the details in the SIM card are transmitted over the network. During an emergency when MTPAS has been invoked, the privilege access class is checked and the network will drop attempts to connect from non-emergency class SIMs.

So while the network is certainly still up and running, it will seem unobtainable until the phone moves further from the MTPAS-controlled area where a connection can be re-established. Emergency 999 calls are unaffected. This way the mobile network cells in the area are free for use by the emergency services.

Packing TETRA

On July 7 2005, police requested O2 to invoke MTPAS (or rather its predecessor, Access Overload Control or ACCOLC) within one square kilometre of the Aldgate Tube Station for a period of four hours. Unfortunately this was only partially successful because not all emergency service personnel at the time had MTPAS-equipped mobiles, which meant their calls were blocked too. Following an [inquiry](#) after the event, that problem has been addressed.

In addition to using a mobile network, since 2005 the emergency services have had their own dedicated digital communications network called [TETRA](#) (TErrestrial Trunked RAdio). But TETRA has not been without its problems – and now the government is planning to replace it

on the grounds of cost and its limited capability for transmitting data.

Today's emergency services want to make better use of video and exploit the potential of real-time mapping applications – both of which demand a network with a greater data-handling capacity.

The future is 4G (until 5G comes along)

The natural place to find this capacity is the 4G mobile network that is now being rolled out around the world. But this will require new services to be designed and built for emergency services use. For example, the walkie-talkie style push-to-talk feature offered by TETRA for police officers, firefighters or paramedics who don't want to be scrolling through menus and contact lists – they need to be able to quickly just push and talk to colleagues.

The demand for this sort of feature has been sufficient that the next release of the international 4G network standards [now incorporate this feature](#) as part of an effort to support mission-critical and public safety use.

Of course, moving all [emergency services](#)' communications to the mobile network won't mean they start monopolising the network over the general user. Emergency service use will need to be partitioned and managed separately from that of the general public – and for those emergency situations, MTPAS will still be available to fall back on.

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