Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of:

Public Safety and Homeland Security Bureau	)	
Comments Sought on NPSTC Broadband Task	)	PS Docket 06-229
Force and Public Safety Spectrum Trust Technical	)	PS Docket 06-150
Recommendations for 700 MHz Public Safety	)	
Broadband Deployments	)	

Comments of IPWireless, Inc.

Introduction

IPWireless Inc, ("IPW"), as the largest existing supplier of public safety mobile broadband systems in the USA to both large cities such as New York and smaller cities such as Gillette, is pleased to submit comments on the NPTSC Broadband Taskforce and Public Safety Spectrum Trust Technical Recommendations for 700 MHz Public Safety Broadband Deployments.
In the response below, IPW comments on the specific questions posed by the commission, and on certain aspects of the PSST ex-parte.

Comments on Specific Questions Posed by the Commission

Should we condition any waiver disposition on adherence to the standards recommended by the BBTF and the PSST?

The PSST, in its ex-parte, refers to Long Term Evolution (LTE) as the "preferred technology standard" in the context of providing the framework for nationwide interoperability, but otherwise does not specifically recommend the LTE standard.
Likewise, the NPSTC Broadband Task Force does not specifically recommend the choice of LTE, but assumes it on the basis of National Public-Safety Telecommunications Council's (NPSTC) vote to endorse Long Term Evolution (LTE) as the technology of choice.
IPWireless supports the choice of LTE as the basis for long term interoperability between public safety mobile broadband systems. However, the following points should be considered:

- LTE is not a discrete standard in its own right, but rather a release (currently release 8) in the 3GPP family of standards. It is designed to be backwards compatible with GSM

and HSPA[1]. Furthermore, an LTE network cannot be implemented without the use of earlier 3GPP releases, such as those relating to subscriber authentication.

- By definition, LTE networks will not be standards-compliant until interoperability testing ('IOT") between different equipment vendors is completed, in accordance with 3GPP and Global Certification Forum (GCF) processes.
- Most commercial operators plan to deploy LTE as an overlay to their existing 3G and 2G networks. LTE User Equipment (UE) is intended to be backward compatible to support this. Therefore, for many years to come, commercial network coverage will be provided by a combination of standards rather than LTE alone. Verizon, for example, plans to complete the LTE overlay of its 3G (cdma2000) network in 2013[2]
- While Rel 8 standards include support for voice (using VoIP) the related IP Multimedia Subsystem (IMS) profiles have not yet been agreed or implemented among the major carriers to form a standardize approach.
- There is currently no LTE (3GPP Release 8) User Equipment with FCC Equipment Authorization for the public safety broadband spectrum allocation at 700 MHz (3GPP Band 14). [3] The only FCC approved UE for this band is an IPWireless 3GPP release 7 device.
- Public safety needs proven and reliable technology for its mission-critical applications. LTE is still in the prototype / trial phase, and is not yet mature. According to AT&T's CTO, "Verizon is embracing technology that "isn't fully mature."[4]

Based on the above, it is evident that 3GPP Release 8 LTE is not sufficiently mature for deployment by Public Safety Agencies under waivers. To grant waivers for a standards release that is not widely deployed by multiple service providers resulting in commercially-mature systems for public safety, and for which compliance-tested devices, and especially devices for the public safety spectrum, are not available, would be defeating the intended goal of the waivers.

The NPSTC Broadband Task Force recommendations are made in the context of longer term interoperability. In fact, their report in section 1 points out that "the BBTF recognizes that some recommendations and applications may need follow-on work or may not be supported by the current release level of the LTE standard and this should not hold up the approval and quick build out of the regional systems".

We also note that these recommendations are expected to further evolve and change as a result of the work of the Emergency Response Interoperability Center (ERIC). Therefore it would not be appropriate for what are essentially proposals to become conditions of waivers.

---

[1] GSM Association (GSMA), see http://www.gsmworld.com/technology/lte.htm

[2] Verizon CTO Tony Melone interviewed in Network World (February 2010)

[3] FCC OET Equipment Authorization search - http://www.fcc.gov/oet/ea/fccid/

[4] AT&T Chief Technology Officer John Donovan quoted in the Wall Street Journal, March 22 2010

IPWireless therefore recommends that the waivers be granted for the use of current release standards, with a requirement to meet interoperability standards to be defined by ERIC by a defined future date. Public Safety agencies can protect their network investments by using software defined radio (SDR) base stations that can be software-upgraded to 3GPP release 8 and subsequent releases.

The earliest possible deployment of public safety mobile broadband networks will allow public safety agencies to:

- Meet immediate operational needs that are not able to be served effectively o commercial networks (such as mobile video surveillance)
- Gain experience in the deployment and operation of such networks
- And, very importantly, obtain real-world traffic / usage statistics to help in determining the ultimate capacity and amount of spectrum required for public safety mobile broadband.

Are these recommendations sufficient to ensure later compatibility with a nationwide interoperable broadband network for public safety?

The 3GPP standards are designed specifically to allow roaming and interoperability internationally, both between operators and between countries, and therefore adherence to these standards should ensure that most requirements of public safety in the US are met. The NPSTC Broadband Task Force has addressed the key aspects of roaming and interoperability, and we anticipate that ERIC will build upon this work, resulting in workable arrangements for public safety.

Does the BBTF Report provide adequate architectural details, specificity, consistency and precision to serve as the basis for conditions on waivers? If not, what modifications would serve this purpose?

These recommendations are directionally correct for long term roaming and interoperability, but should not be requirements for networks built under waivers, as many of these recommendations (such as the proposed clearing house) could take considerable time to implement, and thus defeat the purpose of waivers for early deployments.

The NPSTC Broadband Task Force recommendations are made in the context of longer term interoperability. The agreed scope by the BBTF members was to provide guidelines and framework for an interoperable nationwide network and not to repeat the earlier SOR work previously provided to the FCC. Based on this approach, the BBTF recommendations were not intended to be used as conditions for the waivers. In fact, their report in section 1 points out that “the BBTF recognizes that some recommendations and applications may need follow-on work or may not be supported by the current release level of the LTE standard and this should not hold up the approval and quick build out of the regional systems”.

We also note that these recommendations are expected to further evolve and change as a result of the work of the Emergency Response Interoperability Center (ERIC). Therefore it would not be appropriate for what are essentially proposals at this time to become conditions of waivers.

IPWireless therefore recommends that the waivers be granted for the use of current release standards, with a requirement to meet interoperability standards to be defined by ERIC by a defined future date. Public Safety agencies can protect their network investments by using software defined radio (SDR) base stations that can be software-upgraded to 3GPP release 8 and subsequent releases.

Could these recommendations provide a basis for evolution to new technological standards?

The BBTF recommendations as such do not provide a basis for evolution to new technological standards, however the adoption of the 3GPP family of standards will allow public safety to take advantage of new technologies in future 3GPP releases, such as "LTE Advanced".
This is further reason for public safety to adopt the 3GPP family of standards, rather than a particular release such as release 8.

From our experience, 3GPP standards are suitable for a wide range of operator and application requirements. ERIC and the Public Safety community should strive to use existing 3GPP standards wherever possible, as the adoption of new requirements or revisions takes a minimum of approximately 2 years under the 3GPP processes.

ERIC and other public safety representatives have the opportunity to contribute to the advancement of 3GPP standards, and to input specific public safety requirements into the standards for future releases.

Could these recommendations serve as an appropriate foundation for the work of the proposed Emergency Response Interoperability Center (ERIC)?

As the BBTF recommendations address the major requirements for roaming and interoperability, this good work is a suitable foundation for ERIC to develop its requirements

Specific aspects of the technical recommendations made by the BBTF and the PSST: Recommendation 6.2 (Operations), and particularly those functions that the PSST suggests are "Requirements at Startup."

Internet Access:
A mobile broadband network adhering to 3GPP standards is inherently capable of providing both home and visiting subscriber access to the Internet, to the extent permitted by the public safety entity's network policies and roaming arrangements
VPN Access to any Authorized Site and to Home Networks:

A mobile broadband network adhering to 3GPP standards is inherently capable carrying VPN tunnels to other networks.

Status / Information Homepage:

Provision of such a homepage is not a 3GPP network function, but can easily be implemented at the IP network and server level.

Status/Information "SMS-MMS" messaging:

The 3GPP standards for LTE (Rel 8) do not support SMS or MMS. Commercial operators will support these services through fallback to earlier release networks that LTE will be overlaid on. SMS / IMS implementations over IP on an LTE network are possible, but these would be proprietary, and would require further proprietary implementations to interoperate with other networks (such as commercial operators).

Access to Responders under Incident Command System (ICS):

The ability of a 3GPP network to support roaming and interoperability should ensure that this requirement can be met, subject to requirements to be developed by ERIC and public safety policies.

LMR Gateway Devices:

As noted earlier, 3GPP Release 8 (LTE) standards do not support voice, therefore this requirement can only be met on LTE networks using proprietary voice-over-IP implementations. Other releases in the 3GPP family do support voice.

Field-Based Server Applications:

As 3GPP mobile broadband networks can transport virtually any IP application, we do not envisage any network constraints in supporting this requirement.

Location Based Data Capability:

Location services are not supported in 3GPP Release 8 (LTE), but are in development and targeted for Release 9. Location services can however be supported by earlier 3GPP releases. Proprietary implementations over the LTE user plane using IP are possible, but can be expected to limit user device availability.

One-to-Many Communications across All Media:

3GPP Release 8 standards do not support Multimedia Broadcast and Multicast Service (MBMS) over the LTE air interface. This is planned for a later 3GPP release under the name of eMBMS. Earlier 3GPP releases do support MBMS. The 3GPP IMB standard (also known as MBSFN) supports broadcast one-to-many communication, but requires a separate 5 MHz radio channel.

LMR Voice

As noted earlier, 3GPP Release 8 (LTE) standards do not support voice, therefore this requirement can only be met on LTE networks using proprietary voice-over-IP implementations. Other releases in the 3GPP family do support voice.

PSTN Voice

As noted earlier, 3GPP Release 8 (LTE) standards do not support voice, therefore this requirement can only be met on LTE networks using proprietary voice-over-IP implementations. Other releases in the 3GPP family do support voice.

It is evident from the above that 3GPP Release 8 (LTE) is not able to support all of the services that the PSST defines as being required at startup. This is further justification for allowing

networks built initially under waivers to use other releases of the 3GPP standards that do support these services.

Specific aspects of the technical recommendations made by the BBTF and the PSST: Recommendation 6.3 (Technical), and particularly those addressed as "Minimum Applications" and "Security" features.

Minimum applications have been addressed above in our response to "Specific aspects of the technical recommendations made by the BBTF and the PSST: Recommendation 6.2 (Operations)"

> **Security:**
> The BBTF report refers to the 3GPP TS 33.401 document. The various aspects of security in Release 8 networks (e.g. user plane, control plane, ciphering and integrity protection) are complex and dealt with in a number of 3GPP documents, and a number of options exist. Public Safety should define the minimum mandatory security required.

Comments on other PSST Recommendations

I. C. Buildout Commitments and Deployment Schedules

IPWireless concurs that local / regional / rural public safety operators be allowed to build our as soon as possible. The flexibility of the current plan enables a broad range of partnerships between public and private entities to construct networks. The FCC's acknowledgment of "one size does not fit all" is clearly the right approach to achieving a nationwide interoperable network. As such, many smaller entities are prepared to partner today and build networks that become part of the nationwide framework. As 3GPP Release 8 (LTE) is unlikely to be sufficiently mature for Public safety operators to deploy within at least 12 months or more, they should be permitted to deploy networks using prior releases of 3GPP standards, provided that the base station infrastructure is software upgradeable to release 8 (and subsequent releases) for future roaming and interoperability.

I. F. Equipment and Features Test Facility

IPWireless supports the work of NIST in guiding public safety operators in configuring systems and achieving roaming and interoperability for national network compatibility. It should be noted that 3GPP interoperability testing processes will provide assurance of standards compliance and interoperability of equipment from different vendors, and any duplication of this testing may further delay Release 8 LTE availability for public safety.

I.G. Funding Requirements

We agree that public safety operators planning to deploy under waivers should provide a plan for funding, but suggest that this should not require evidence of existing funding, recognizing that some funding sources may be conditional upon the waivers.

IV. C. Access to PBSL Spectrum by Emergency Response and Federal Agencies

IPWireless supports the broadening of the definition of “first responders” to cover other government agencies and and emergency responders that are not covered by the current definition. Based on our experience with Multi Agency networks, this can increase the economies of scale and scope of public safety mobile broadband networks, and widen sources of funding, which is critical to these networks.

Respectfully submitted,

Roger Quayle,
Chief Technology Officer
IPWireless

By: /s/Joe Hanna, President
Directions

6805 Clear Springs Circle
Garland, Texas 75044