

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of

Framework for Next Generation 911 Deployment

PS Docket No. 10-255

**COMMENTS OF QUALCOMM INCORPORATED**

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QUALCOMM Incorporated hereby submits these comments in response to the FCC's Next Generation 911 *Notice of Inquiry* seeking input on means of further improving the ability of public safety personnel to provide next generation emergency services to 911 callers. Qualcomm applauds the Commission's desire to better understand "how the gap between the capabilities of modern networks and devices and today's 911 system can be bridged."<sup>1</sup>

**INTRODUCTION AND SUMMARY**

Qualcomm strongly supports the development of and smooth transition to an NG911 system. Along with industry, Qualcomm is actively studying how best to technically and economically integrate next generation emergency communications tools into public safety's existing capabilities in order to ensure a smooth rollout of NG911 services. In this regard, Qualcomm and its wireless industry partners are in the midst of developing standards with organizations such as ATIS and 3GPP.<sup>2</sup>

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<sup>1</sup> See Framework for Next Generation 911 Deployment, PS Docket No. 10-255, *Notice of Inquiry*, FCC 10-209 (Dec. 23, 2010) at 1 ("*NG911 NOI*").

<sup>2</sup> ATIS is an accredited technical standards organization that develops market-driven, global standards for the communications, information, and entertainment industries. Qualcomm is one of the more than 200 ATIS member companies that are actively formulating standards in

*Continued on next page*

This standards work by industry, which is benefiting greatly from cooperation with the public safety community, offers the best means of ensuring the successful rollout of interoperable and reliable NG911 services. Indeed, since the late 1990s, Qualcomm and its wireless industry partners invested substantial resources to comply with the FCC's E911 rules, and they are making similar investments to successfully deliver NG911 services across the U.S.

In addition to the research, analysis, testing, and standards development work that Qualcomm and the wireless industry are engaged in, two other essential pieces are needed to complete the NG911 puzzle. *First*, PSAPs and their associated emergency services organizations will need a sound funding mechanism in place to support the rollout of NG911 systems and technologies, which almost certainly will include upgrades to their existing equipment, the purchase and installation of new equipment, and the training of emergency staff on how to use the equipment. The funding challenge is exacerbated by the fact that many state and local jurisdictions have substantially reduced PSAP funding, while the volume of calls that PSAPs are handling on a day-to-day basis has grown. To ensure that NG911 systems are successfully deployed, the FCC, with help from Congress and the states, should work to ensure that a fair, financially sound funding mechanism to support NG911 deployment is in place before the Commission promulgates any regulations in this space.

*Second*, the FCC, in conjunction with other federal and state agencies, needs to carry out a massive public awareness campaign, community by community, as NG911 services are rolled out so community members – particularly the elderly and disabled – are aware of and know how

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ATIS' separate committees, which include Emergency Services and IP-Based and Wireless Technologies, among others. ATIS is the North American Organizational Partner for the 3rd Generation Partnership Project ("3GPP"), a member and U.S. contributor to the International Telecommunication Union ("ITU") Radio and Telecommunications' Sectors, and a member of the Inter-American Telecommunication Commission ("CITEL").

to access NG911 services. NG911 capabilities will be deployed within communities across the U.S on a rolling basis, so timely informing the relevant populations of the availability of and means of accessing new emergency services is perhaps the most critical piece of the puzzle.

## **BACKGROUND**

### **A. Qualcomm Has Played A Pioneering Role In The Development Of Many Innovative Wireless Technologies And Emergency Communications Tools**

Qualcomm has been serving public safety needs since its founding more than 25 years ago. The company's Assisted GPS ("AGPS") location accuracy solution, which is the most accurate wireless position location technology in use today and reliably serves many public safety needs, has been implemented worldwide by more than 50 wireless carriers and dozens of OEMs. Qualcomm is continuing its R&D efforts to improve AGPS and supplement emergency communications tools to take advantage of new phone and network capabilities. Many of the tools under study go hand-in-hand with enabling a variety of "location aware" technologies, which not only support public safety applications but also health care, education, social networking, advertising, machine-to-machine, and gaming applications. For these reasons, Qualcomm is working closely with the public safety community as well as its carrier customers, equipment infrastructure manufacturers, and handset vendor partners, to improve emergency communications as expeditiously as possible.

Qualcomm is a world leader in developing innovative wireless technologies, including Code Division Multiple Access ("CDMA") -based and Orthogonal Frequency Division Multiple Access ("OFDMA") -based cellular technologies used throughout the world for voice and broadband communications and countless mobile products and services. Qualcomm's chip division, Qualcomm CDMA Technologies ("QCT"), is the world's largest provider of wireless chipset technology that is used in cell phones and consumer electronics devices. QCT's chipsets

support all major frequency bands, the full gamut of standardized, globally harmonized 3G and 4G wide area mobile broadband and cellular technologies, several AGPS location tools, Bluetooth, Wi-Fi, and many operating systems, such as Android, Windows Mobile, Symbian, and Qualcomm's own Brew Mobile Platform.

Qualcomm Government Technologies division ("QGOV") has been at the forefront of developing wireless communication solutions for public safety personnel, pioneering efforts in cellular standards, microelectronics design, mobile broadband data, encryption, and value-added end-user applications for wireless phones. QGOV adapts Qualcomm's commercial products to meet the specialized needs of federal and state emergency personnel. By leveraging the company's wireless expertise, innovative technologies, and industry reach, QGOV offers products and engineering and advisory services to meet government needs for classified and unclassified solutions in the areas of deployable mobile broadband, information sharing, interoperability, as well as tracking, locating, and situational awareness.

**B. Public Safety Personnel Rely Upon Qualcomm's gpsOne Technology, Which Is Deployed Worldwide And Integrated Into Hundreds Of Wireless Devices**

Qualcomm's gpsOne solution is the world's most widely deployed GPS-based location technology, with more than 700 million gpsOne-enabled handsets in use around the world. The technology is a particularly important tool for police and other public safety personnel. For example, the technology has allowed law enforcement personnel to locate kidnapping victims in a timely manner. More broadly, gpsOne has enabled network operators to cost-effectively meet the FCC's E-911 mandate and offer a wide range of services leveraging location data.

Qualcomm is continuing to enhance the highly versatile gpsOne platform. Mobile gaming devices, cameras, and pocketable computing devices, to name a few, are being integrated with gpsOne technology to support location-aware applications in next generation products.

*QPoint.* Qualcomm's QPoint ubiquitous location determination solution integrates gpsOne technology with location-based server software accompanied by a complementary set of location-based tools and services. QPoint is used by a number of large carriers as well as smaller wireless carriers that lack the resources to operate their own position determination system or prefer to contract with Qualcomm to do so.

*Gobi Mobile Platform.* Qualcomm's Gobi worldwide mobile platform for notebook computers integrates on a single chipset gpsOne technology and all major 3G and 4G frequency bands, e.g., CDMA2000, EV-DO Rev. A and Rev. B, HSPA+, dual-carrier HSPA+, and LTE, and is backwards compatible with the earlier HSPA and EV-DO technologies. The latest generation embedded Gobi module provides many enhancements, including increased data speeds, enhanced GPS functionality, integrated power management, and additional operating systems, such as Windows 7 and Linux.<sup>3</sup> Gobi is well suited to support public safety services with devices that require broad coverage and connectivity to multiple interfaces while public safety personnel are on the road and within facilities, homes, and businesses, for it readily enables emergency responders to select the best available connection from multiple networks and obtain the best possible cellular service at the lowest possible cost.

*inGeo.* Qualcomm's inGeo solution is an end-to-end mobile solution that supports location monitoring, tracking, and other public safety applications through leveraging "location-aware" applications. The inGeo platform includes the gpsOne solution for real-time data, location monitoring, and tracking and can support any number of public safety applications. The

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<sup>3</sup> See *Qualcomm's Expanded Gobi Connectivity Portfolio Gains Broad Industry Support Huawei, Novatel, Option, Sierra Wireless and ZTE Now Developing Gobi-compliant Offerings* (June 29, 2010) available at <http://www.qualcomm.com/news/releases/2010/06/29/qualcomms-expanded-gobi-connectivity-portfolio-gains-broad-industry-support>

inGeo module has one of the industry's smallest form factors at less than 1,000 mm<sup>2</sup> in area.

The module also includes a Bosch SMB380 3-axis accelerometer for positioning, and a 2.4 GHz ZigBee transceiver for short range connectivity. Finally, it has an extremely long battery life, which is critically important for emergency personnel who spend long hours in the field.

*FlashLinq.* Qualcomm's new FlashLinq technology allows thousands of wireless devices within a several block radius to discover one another automatically and communicate directly at broadband speeds via direct peer-to-peer ("P2P") and device-to-device ("D2D") communications.<sup>4</sup> This technology provides interesting opportunities for next generation public safety applications, for it creates a form of "Proximal Communications" using OFDMA, whereby mobile users (and devices) can discover each other up to one kilometer away, and then continuously connect, disconnect, and directly communicate with other mobile users (and devices) at broadband speeds at ranges of up to several hundred meters. FlashLinq is designed to use unpaired licensed spectrum in a new, highly efficient manner, where devices are near one another and can communicate directly *without* cellular infrastructure. Operating in a 5 MHz unpaired allocation, FlashLinq allows thousands of devices to discover and remain "aware" of one another in a continuous background fashion, effectively creating mutual awareness in what Qualcomm calls a "neighborhood area network." FlashLinq enables entirely new types of direct D2D/P2P wireless services, offloads traffic from the cellular network, and offers important benefits for first responders, who can use it to directly discover and communicate with one another and with victims during emergencies. Because FlashLinq communications are proximal (*i.e.*, relatively short range), transmission power levels are kept low, and high levels of spectrum

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<sup>4</sup> See *Qualcomm to Demonstrate New Peer-to-Peer Technology at Mobile World Congress* (Feb. 8, 2011) available at <http://www.qualcomm.com/news/releases/2011/02/08/qualcomm-demonstrate-new-peer-peer-technology-mobile-world-congress>.

reuse are achieved on par with cellular OFDMA and substantially higher than unlicensed technologies.

**C. Qualcomm Is Partnering With Emergency Service Providers And Public Safety Personnel To Enable Improved Communications Services**

*Lifecomm Mobile Personal Emergency Response Solution.* Qualcomm, Hughes Telematics, and American Medical Alert Corporation have combined forces to deliver mobile health services through Lifecomm LLC, a joint venture of all three companies. Later this year, the joint venture plans to launch in the U.S. a mobile Personal Emergency Response Service (“mPERS”) to offer seniors and their caregivers enhanced freedom of movement and peace of mind.<sup>5</sup> Whereas today’s PERS operations carry messages like “I’ve fallen and can’t get up” from users in their homes to emergency service providers, caregivers, and family members, the mPERS solution extends this capability outside users’ homes to any place they may travel.

The mPERS solution will contain a cellular modem to support wireless voice and data communications with an emergency call center, an embedded GPS module, and other sensors to enable location-based monitoring. A personalized web portal for users, their families and caregivers will provide detail about user activity and location. This mPERS platform will be a major step forward in providing fully-connected and affordable emergency services.

*Qualcomm’s Worldwide Wireless Reach Initiative Is Working With Public Safety To Reduce Crime.* Qualcomm’s Wireless Reach initiative supports quality-of-life programs in the

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<sup>5</sup> See *Qualcomm-Backed Venture Tries to Aid Seniors, Stylishly*, Wall Street Journal Blog (Jan. 5, 2011) available at <http://blogs.wsj.com/digits/2011/01/05/qualcomm-backed-venture-tries-to-aid-seniors-stylishly/>; see also *Hughes Telematics, Qualcomm and American Medical Alert Corporation Announce Joint Venture to Create Lifecomm, New company to offer mobile Personal Emergency Response products and services* (May 12, 2010) available at <http://www.qualcomm.com/news/releases/2010/05/12/hughes-telematics-qualcomm-and-american-medical-alert-corporation-announce->.

areas of public safety, education, health care, and the environment, by introducing the benefits of wireless connectivity to underserved regions. Wireless Reach has 56 active projects in various stages of development in 28 countries around the world. One Wireless Reach public safety project involves the Municipality of Santa Tecla and the National Civilian Police in El Salvador in collaboration with RTI International and the United States Agency for International Development, wherein a wireless security system using 3G technology is being used to collect and share vital crime information in real time.<sup>6</sup> This project is enabling law enforcement and government personnel to use mobile phones and web-based applications to reduce crime by reporting crime incident locations and related information.

## **DISCUSSION**

### **I. Qualcomm Is Actively Working With The Wireless Industry And Public Safety To Develop Standards For Next Generation 911 Services**

Qualcomm strongly supports the development of and smooth transition to an NG911 system. At the present time, Qualcomm is working closely with its wireless industry partners, through standards groups such as ATIS and 3GPP, to develop standards, guidelines and best practices to support NG911 services. ATIS's membership, which includes wireless and wireline operators, network and consumer equipment manufacturers, broadband providers, and public safety agencies, has been actively working together for several years on NG911 issues, particularly voice services and more recently Non Voice Emergency Services ("NOVES").

The Commission should continue to encourage these efforts, for such industry efforts in cooperation with public safety community offer the best means of ensuring the successful rollout

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<sup>6</sup> See Qualcomm Wireless Reach – Public Safety in El Salvador: Wireless Security, Helping Reduce Crime *available at* [http://www.qualcomm.com/citizenship/wireless\\_reach/projects/public\\_safety.html](http://www.qualcomm.com/citizenship/wireless_reach/projects/public_safety.html).

of interoperable and reliable NG911 services. Indeed, Qualcomm and its wireless industry partners have invested substantial resources over the past decade to comply with the FCC's E911 rules, and they are making similar investments to deliver NG911 services across the U.S.

**A. The NG911 Framework Should Be Based Upon A Core Group Of Highly Reliable, Low Latency Communications Services**

In order to ensure a successful rollout of NG911 services across the country, they should be limited to a core group of services that are highly reliable and have a very low latency to support real-time communications. In addition, NG911 emergency communications must be given priority over non-emergency messages, and they must include location-based routing to the appropriate PSAP, and be able to provide accurate location information to the PSAP.

Focusing on a core group of emergency communications services that can meet these requirements will help to ensure a successful deployment. If too many services are included in NG911, it increases the likelihood that PSAPs, network providers, and equipment suppliers will support different subsets, which will lead to fragmented deployments and interoperability issues. Also, because many communications services can be direct and nearly direct substitutes for one another, it is more efficient, from a technology deployment and economic perspective, to choose a focused, core group of services that best supports the requirements outlined above.

**B. A Real-Time Texting Solution, Not SMS, Should Be Part of NG911**

It is important that NG911 services include a highly reliable, real-time texting solution because such a service is needed to support emergency communications from members of the disabled community. Short Message Service or SMS, which is commonly referred to as "texting," is a best efforts communications service that is not sufficiently reliable for emergency communications. SMS messages may become lost or arrive in the wrong order, which is not useful and possibly dangerous in the context of emergency communications. In addition, SMS

suffers from latency issues, and the service has no ability to support location-based routing and no place to embed location information. Even if location information were embedded into a second message, SMS cannot guarantee that the location information would be received along with the initial message.<sup>7</sup> Accordingly, ATIS is actively working on including into NG911 a highly reliable, low-latency, real-time texting solution.

## **II. NG911 Success Requires Close Cooperation Among The Communications Industry, Federal, State & Local Governments, And The Public Safety Community**

To ensure the successful rollout of NG911 services, PSAPs and their regional emergency services organizations will need a fiscally-sound funding mechanism in place to support upgrades to their existing equipment, the purchase and installation of new equipment, as well as the training of emergency staff on how to use the new equipment. The funding challenge is not made any easier by the fact that many state and local jurisdictions have substantially reduced PSAP funding in recent years due to budget shortfalls, while the volume of calls that PSAPs are fielding is growing each day. The funding challenge may be further exacerbated by the greater service diversity and architectural complexity of NG911 in comparison to E911 services. The FCC, with help from Congress, should work to ensure that a fair and financially sound funding mechanism to support NG911 deployment is in place before any regulations are instituted.

The federal government, the FCC, Department of Homeland Security, and other agencies, in conjunction with state and local governments and agencies, also must engage in a massive public awareness campaign, community by community, as NG911 services are rolled out. Such

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<sup>7</sup> Despite the reliability issues with SMS, some PSAPs have implemented text-to-911 services based on SMS, while many others have recognized the limitations of SMS and have no plans to implement such a system. NG911 services should strive to curtail such fragmentation because it adds to end user confusion and will make it more difficult to develop an effective and consistent public awareness campaign.

public outreach is essential so community members, particularly the elderly and disabled, are informed of and where necessary taught how to access new (and thus unfamiliar) NG911 services. Because NG911 capabilities will be deployed across states and local communities on a rolling basis, supplying timely information of the availability of the new services is critically important to ensuring NG911 success.

## CONCLUSION

Qualcomm looks forward to continuing its intensive research and technology development efforts, standards development work with its wireless industry partners, carriers, infrastructure vendors, and handset suppliers, as well as the public safety community and the FCC, to ensure a successful rollout of NG911 services across America. As noted herein, the Commission should continue working with Congress, other federal agencies and state and local governments, to ensure that: (i) PSAPs are adequately funded to properly support NG911 equipment and services, and (ii) all members of the public know how to use these next generation emergency communications tools as they are deployed.

Respectfully submitted,

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