

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications)	PS Docket No. 11-153
)	
Framework for Next Generation 911 Deployment)	PS Docket No. 10-255

COMMENTS OF MICROSOFT CORPORATION

Microsoft Corporation (“Microsoft”) respectfully submits these comments in response to the Second Report and Order and Third Further Notice of Proposed Rulemaking (the “*FNPRM*”) in the captioned proceeding. The issues raised by the Commission are critical to Microsoft’s mission as a provider of online services and connected devices to a global customer base, and as a cloud-first, mobile-first enterprise. Microsoft strongly supports the FCC’s goal of protecting public safety as communication technologies continue to evolve and, for that reason, is committed to participating in the development of a next generation emergency communications network. Whether Next Generation (“NG”) 9-1-1 in the U.S., NG 112 in Europe or NG emergency communications elsewhere in the world, changing technology and evolving modes of communication demand new and innovative approaches to providing emergency services to consumers in need.

While work continues on developing and deploying long-term solutions for next generation emergency communications, the Commission should not further extend existing text-to-9-1-1 requirements on non-interconnected text services. As discussed below, there are numerous challenges, such as obtaining location information sufficiently accurate to be used in emergency response and connecting users to Public Safety Answering Points (“PSAPs”) over

non-Commercial Mobile Radio Service (“CMRS”) networks, that require longer term solutions. The efforts of non-interconnected text service providers, as well as other participants in the Internet ecosystem, instead should be focused on delivering next generation emergency communications solutions rather than on spending scarce resources to retrofit products and deliver incomplete and potentially costly and confusing solutions to consumers.

In order to deliver next generation 9-1-1 solutions, a number of significant issues must be resolved. Microsoft therefore proposes that the Commission encourage industry to voluntarily resolve the underlying location and routing challenges inherent in a communications environment resident on the global Internet before expanding emergency communications obligations more broadly. Specifically, the FCC should refrain from extending any text-to-9-1-1 obligation to non-interconnected text providers or to situations in which a user is connected to a non-CMRS network. Until the challenges described below are resolved on an industry-wide basis, the FCC should not move forward with additional obligations that could turn out to be premature and also could impair the ability of U.S. companies to operate in a global environment.

DISCUSSION

As Microsoft has commented previously in this proceeding,¹ and as the Commission also has recognized,² there are a number of challenges that must be resolved to ensure that 21st century communications capabilities can effectively connect to emergency services. The primary challenges are: (i) there must be an industry-wide solution to providing the location of

¹ Comments of Microsoft Corporation, PS Docket No. 11-153, filed April 4, 2014; Reply Comments of Microsoft Corporation, PS Docket No. 11-153, filed May 5, 2014 (“Microsoft Reply Comments”); *see also* Comments of The VON Coalition, PS Docket No. 11-153, filed April 4, 2014.

² *See, e.g.*, Second Report and Order, and Third Further Notice of Proposed Rulemaking, PS Docket No. 11-153 (“Third FNPRM”), at ¶ 81 (“[W]e recognize that enhanced location information is not yet universally attainable”).

over-the-top communications apps that are not associated with an underlying network provider; (ii) there must be a process in place for cost-effectively mapping a user's location information to the appropriate PSAP so the communication is routed to the correct PSAP; and (iii) once the appropriate routing information is confirmed, the emergency operator must have the ability to, in fact, communicate with the user in distress. All of this, moreover, must be accomplished in a manner that can be implemented on a global basis. Communications in the Internet age do not respect geographic boundaries and users can access communications apps and services from anywhere, without regard to the particular network provider over which they access the Internet. Therefore, emergency communications solutions should account for these global challenges.

I. The Commission Must Ensure that Public Access Networks Are Capable of Generating a Reliable and Usable Location for Purposes of Routing a Communication to the Appropriate PSAP.

Much of the discussion in this docket to date has centered on the need to calculate a location associated with the user in need of emergency assistance. As has been noted throughout the proceeding, there are two purposes for which location information is needed: (i) routing the communication to the appropriate PSAP, which is a particularly daunting task in the United States, given the nation's more than 6,000 PSAPs; and (ii) dispatching emergency services to the person in need – what the FCC calls in the FNRPM a “dispatchable” location.³ The FCC has a long history of unraveling the challenges of locating CMRS users for purposes of both routing and dispatch of emergency services. However, the FCC's – and the industry's – experience has been focused primarily on situations where the service subject to 9-1-1 obligations (whether voice-to-9-1-1 or text-to-9-1-1) is inextricably linked to the network over which the service is accessed. In an era of communications apps running over the top of access networks, the tie that

³ *Id.* at ¶ 82.

binds access and service has been broken. This separation creates new location challenges and the need for new approaches to resolve these challenges.

The comments appropriately have highlighted the numerous types of location information available, some device-driven, some network-derived, and some calculated by crowd-sourcing. Still other types of location information were designed for the purpose of routing emergency calls while others were designed to locate a movie theater or restaurant. All of these location capabilities have their advantages and disadvantages, which will vary from communication to communication depending on the particular locale or device from which the communication is made, and based on any number of factors (*e.g.*, indoor vs. outdoor, rural vs. urban, iOS vs. Android vs. RIM vs. Windows Phone OS). Therefore, the question is not whether location information is available, but instead what are the circumstances by which it is available, to whom it is available, whether it is sufficiently accurate to be used to route a 9-1-1 communication and/or dispatch emergency services, and what participants in the ecosystem will the Commission hold accountable for ensuring accurate location information.⁴

A type of location information that is readily available today is the location of the access point to which a device is connected. Notably, that is not a calculated or estimated location, but instead is a fixed point tied to a particular location on a physical network. In the CMRS context, this is referred to as Phase I location information, *i.e.*, the cell site or cell sector to which a device is attached. In the 21st century world of broadband connectivity, the analogous location is the access point – every device must connect to a physical network that then connects the user of that device to the global Internet. The device has no inherent need to know where it is located,

⁴ As Microsoft explained previously, a Phase II E9-1-1 approach to location accuracy testing and verification is not feasible in the over-the-top environment, given the global nature of app providers upon whom the Commission may be attempting to impose such obligations. Comments of Microsoft, PS Docket No. 11-153, filed April 4, 2014, at 14-15.

and the service or app riding on the device has no inherent need to know where its user is located. Only the access network knows the location of the device and, by association, the location of the user of a particular app or service. Therefore, Microsoft recommends that the FCC focus its and the industry's efforts initially on ensuring that public access networks make available to *devices, apps and services* the physical location information necessary to appropriately route a communication to the appropriate PSAP. Just as in the CMRS era, the location of the access point – whether a cell site or sector for a CMRS or mobile broadband communication or a hotspot's access point where a communication originates on WiFi – is sufficient for routing a communication to the appropriate local PSAP.

II. Cost-Effective Mapping Services Must Be Able to Associate the User's Location with the Appropriate PSAP.

Ascertaining a “location” that is sufficiently accurate to route a communication to the appropriate PSAP is only the first step in resolving the challenges associated with expanding emergency services capabilities to non-traditional voice services. With respect to non-CMRS location information, far more complicated – and expensive – is the need for a service that maps every possible user location in the U.S. to the appropriate PSAP. Moreover, unless and until the U.S. manages to exponentially reduce the number of PSAPs to which emergency communications must be routed, this challenge will remain far more complex and expensive than it needs to be.

Today, U.S. wireless carriers have mapped every cell site/cell sector to a particular PSAP. Before the FCC extends 9-1-1 obligations beyond the existing CMRS 9-1-1 capabilities, similar mapping services must be established to ensure that location information associated with non-CMRS access points can be mapped to particular PSAPs. In the CMRS context, while still quite complex, the establishment and maintenance of these services was relatively

straightforward since the network access points (*i.e.*, the cell sites) and the customers dialing 9-1-1 (*i.e.*, the CMRS customer) were the responsibility of the same entity: the CMRS provider. In an “over the top” app world, the separation of the network from the “service,” coupled with the fact that the service is very often free or low cost, significantly increases the challenges. There are uncertainties regarding who can and should fund the development, operation and maintenance of the necessary routing services.⁵ Questions also arise regarding the particular information that the routing services would use to determine the correct PSAP, as well as which entities would be required to participate in supporting the routing services and which entities, domestic and foreign, would have the right to access the services. Given the significant cost of the mapping services, it is unclear the extent to which those costs can be minimized by reducing the number of PSAPs to which emergency communications must be routed.⁶ Moreover, it is unclear which entities will be expected to bear the costs of building, operating and maintaining these services. It is only upon resolving this mapping and routing challenge that providing “dispatchable” location information, *i.e.*, location information that is accurate enough to dispatch fire, police, or medical emergency responders, will be of use to the emergency call-taker. Therefore, the Commission should focus the industry on developing a global, cost-effective,

⁵ See, e.g., National Emergency Number Association, Requirements for a National Forest Guide (Aug. 14, 2014), at Sections 2.9 and 2.10, available at http://c.yimcdn.com/sites/www.nena.org/resource/resmgr/Standards/NENA-INF-009.1-2014_Forest_G.pdf.

⁶ The Commission recently recognized that changes may be needed to reduce the costs and complexity of the nation’s current PSAP structure. On October 10, 2014, the FCC announced the creation of the Task Force on Optimal Public Safety Answering Point Architecture to study and make recommendations on appropriate PSAP structure and architecture, including changes that may be necessary to, among other things, “promote greater efficiency of operations” and “cost containment.” See Public Notice, DA 14-1481, FCC Seeks Nominations by November 7, 2014 for Membership for New Task Force on Optimal Public Safety Answering Point Architecture (rel. Oct. 10, 2014).

industry-wide mechanism for mapping and routing emergency communications beyond traditional CMRS networks.⁷

III. Any Text-to-9-1-1 Solution Must Ensure Two-Way Communication Between the User and the Emergency Call Taker.

Once the location and routing challenges are resolved in a reasonable, preferably global manner (or at least in a manner that can be extended globally), it is crucial that the 9-1-1 operator has the ability to communicate with the user who has contacted 9-1-1. In this regard, the Commission's proposal to extend text-to-9-1-1 to closed applications faces significant challenges. *First*, closed applications are just that: closed. These applications use proprietary protocols designed to communicate only with users of the same application. Therefore, both users must be using the same application, or at least the same protocol with the same protocol options. (For instance, a Skype user cannot send a message to a WhatsApp user, and vice versa.) If the PSAP is not using the same communications application as the user – and there are reasons, described below, why PSAPs should not, in fact, be using communications apps that operate over the Internet – the user will have no way to talk or text with the 9-1-1 operator.

Simply arming PSAPs with every potential communications app is not the solution. That would be an unfair burden to expect the public safety community to keep pace with the plethora of over-the-top communications apps available to consumers today. Given the low barriers to entry and the fact that apps are developed and placed on the Internet from every corner of the globe, new “hot” communications apps emerge seemingly every week (and often disappear just as quickly). PSAPs should not be expected to find a way to systematically review and add new

⁷ For example, ETSI, the European Telecommunications Standards Institute, is currently considering solutions to the location and routing challenges inherent in emergency communications throughout the European Union. See, e.g., ETSI, *ETSI ES 203 178, Functional architecture to support European requirements on emergency caller location determination and transport*, V1 draft, April 2014, available at http://www.etsi.org/deliver/etsi_es/203100_203199/203178/01.00.00_50/es_203178v010000m.pdf.

communications apps on a frequent basis in hopes of keeping up with consumers' communications whims and demands. Moreover, any attempt to mandate interoperability among over-the-top communications apps to ensure backwards-compatible interconnection with 20th century emergency service deployments, even assuming the Commission had adequate authority to mandate that outcome, would likely require a complete rewrite or significant enhancement of those apps just to deal with the emergency calling scenario. On top of these changes, the app developers would likely incur costs associated with purchasing gateways to interoperate with differing types of technologies, as well as for interconnecting with a vendor sitting between the app provider's customer and the PSAP. Imposing such significant costs on apps, as well as mandating fundamental changes to the software code and the manner in which they operate, is not feasible in an over-the-top communications marketplace where services are free and often provided by companies well outside the scope of the FCC's reach – practically, if not legally.

Second, even if PSAPs could stay up-to-date with all of the over-the-top communications apps that Americans use, as well as all of the apps used by global travelers who happen to be visiting the U.S. and relying on their particular over-the-top communications app,⁸ there remain significant cybersecurity risks if PSAPs openly connect to the Internet. Given the significance of the 9-1-1 emergency network to our public safety and our homeland security, the cybersecurity threat to a PSAP openly connected to the Internet would be significant. Given that PSAPs may be viewed as “critical infrastructure” in cyberspace and thus would need to ensure adequate cybersecurity practices, each PSAP likely should adhere to established best practices and

⁸ In the Third FNPRM, the FCC raised questions about international roamers. See Third FNPRM at ¶ 116. The challenges inherent in routing a text to 9-1-1 in the international roaming context are exacerbated for over-the-top applications because not only are they in no way affiliated with the underlying network provider (even on a temporary basis while roaming), but they also are designed to be used from any location on the globe. The nature of the Internet and the low cost of communications apps encourages international usage, thus increasing the likelihood that an over-the-top app user may be “roaming” internationally at any time.

standards for cybersecurity, *e.g.*, the National Institute of Standards and Technology (“NIST”) Cybersecurity Framework. Moreover, the Commission would need to work with NIST, and potentially the Committee on National Security Systems, to identify any additional cyber-related risks unique to PSAPs, so that adequate security controls could be developed and resiliency maintained across these critical infrastructures. Among other things, PSAPs would need to maintain new equipment and ensure software is patched and current in order to minimize the risk of threat or exploit from, for example, malware or denial of service attacks. A critical component of minimizing the risks of openly connecting PSAPs to the Internet would be an initial risk-assessment, including a roadmap for migration of PSAPs to the Internet. Therefore, the FCC should carefully consider the cybersecurity risks of PSAPs engaging with users of closed over-the-top apps before moving ahead with additional 9-1-1 obligations.

Finally, non-interconnected texting apps that enable only one-way texts to 9-1-1 do not enable communication between the PSAP and the consumer in need of emergency services. As Microsoft has explained previously in this proceeding, texting applications that *cannot* both send and receive texts to *and* from phone numbers run the risk over time of creating consumer confusion caused by the one-way communication, in which the user would be able to text 9-1-1 but the PSAP would not be able to text the user back.⁹ Unlike voice communications where a real-time discussion is possible, a text message is an asynchronous communication. If a PSAP cannot respond to the text it receives or initiate a text to the person in need of assistance, the PSAP will have no way of engaging in an essential dialogue with the person in need of help. Therefore, the Commission should maintain its current definition of covered texting apps and thereby ensure the consumers have an opportunity to engage in a dialogue with the PSAP when they are in need of assistance.

⁹ Microsoft Reply Comments at 8-10.

CONCLUSION

For the reasons stated in these Comments, Microsoft applauds the Commission's efforts to bring the nation's emergency calling network into the 21st century but encourages the Commission to take a holistic approach that considers the larger issues inherent in requiring all commonly used communication applications to be able to reach the local emergency calling network, irrespective of that network being NG9-1-1 or legacy-based. There are a number of industry-wide technical challenges and significant coordination issues that should be resolved before further expansion of text-to-9-1-1 obligations.

Respectfully submitted,

MICROSOFT CORPORATION

Paula Boyd
Director, Government and Regulatory Affairs
901 K Street, NW, 11th Floor
Washington, D.C. 20037
(202) 263-5946
paula.boyd@microsoft.com

Laura Holloway Carter
Assistant General Counsel,
Telecommunications and Internet
Governance
One Microsoft Way
Redmond, WA 98052
425-538-4471
lacarter@microsoft.com

October 15, 2014