Before the
FEDERAL COMMUNICATIONS COMMISSION

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 BANDWIDTH.COM, INC.

I. INTRODUCTION / SUMMARY

As the leading industry innovator and provider of integrated VOIP, SMS, and 911 services, Bandwidth.com, Inc. ("Bandwidth") remains very encouraged by the Commission's continued leadership to ensure end-user emergency calling capabilities keep pace with widely adopted innovative communications services that accompany today's profound shift in underlying technologies. As Chairman Wheeler aptly puts it: "The best way to speed technology transitions is to incent network investment and innovation by preserving the enduring values that consumers and businesses have come to expect." [1] Chairman Wheeler stresses that public safety is "fundamental" among those enduring values.

The Text-to-911 Policy Statement and FNPRM[2] accurately recognize that OTT text applications are ubiquitous services with significant adoption as a primary means of communication for millions of end-users.[3] To advance the Commission's core public safety goals, service providers and the emergency services community should take it upon themselves to collaborate in seeking innovative and cost-effective solutions to address today's needs, and those of tomorrow as well.

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[1] *See* Chairman Wheeler blogpost, January 9, 2014 at http://www.fcc.gov/blog/author/Tom%20Wheeler
[2] *In the Matter of Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications; Framework for Next Generation 911 Deployment*, PS Docket No. 11-153, PS Docket No. 10-255, Policy Statement and Second Further Notice of Proposed Rulemaking, FCC 14-6 (rel. January 31, 2014) (*Second Further Notice*").
[3] *Second Further Notice* at ¶ 6.

Notably, prior text-to-911 efforts by the nation's four largest wireless carriers successfully demonstrate the fundamental feasibility of text-to-911. These efforts also highlight areas for future improvements. Experience gained thus far under the Carrier-NENA-APCO Agreement[4] provides a solid foundation for continued improvements toward the Commission's ultimate goal of ensuring that end-users of all forms of text-to-911 have effective emergency service support. It is also important to note that the Carrier-NENA-APCO Agreement will serve to further develop consumer expectations that emergency services will be available by texting "911." However, in order to advance more ubiquitous deployments, the Commission effectively highlights a number of important issues in the FNPRM to be resolved as it drives emergency calling capabilities forward. Key solutions to some of the issues highlighted include: (i) To address near-term needs, industry standards must support the implementation of pre-NG911 text-to-911, while simultaneously driving toward ubiquitous NG911 implementation; (ii) Leveraging non-discriminatory access to collective industry investments in network solutions can dramatically lower the implementation costs for interconnected OTT providers so that concerns about costs should not be a long-term impediment; and (iii) Location accuracy and pervasive location solutions that are consistent with established technical standards can include existing CMRS solutions but must also support a broad range of application-derived location solutions commonly used by today's OTT providers.

There are multiple potential solutions for interconnected-OTT providers to implement text-to-911 – any of which could theoretically be voluntarily adopted by December 31, 2014 as proposed. However, in deciding which potential solution holds the most promise for broad industry adoption, Bandwidth believes that long-term benefits must be given considerable weight. Choosing solutions that combine near term capabilities that can also be readily incorporated into a rapid implementation of nationwide

[4] *See* Letter from Terry Hall, APCO International, Barbara Jaeger, NENA, Charles W. McKee, Sprint Nextel, Robert W. Quinn, Jr., AT&T, Kathleen O'Brien Ham, T-Mobile USA, and Kathleen Grillo, Verizon, to Julius Genachowski, Chairman, Federal Communications Commission, and Commissioners McDowell, Clyburn, Rosenworcel and Pai; PS Docket 11-153, PS Docket No. 10-255, on Dec. 6, 2012. ("*Carrier-NENA-APCO Agreement*").

NG911 in the future should be paramount.[5] In fact, advancing the availability of NG911 is the primary reason that Bandwidth recommends that OTT providers determine location using any and all capabilities available to the OTT application. Where GPS is available on the underlying device, it can serve as an excellent location identifier, but there are also other commercial IP location methodologies available to the OTT apps as well. Transport of the text message can be over any data network available to the application for delivery to the Text Control Center ("TCC") using the "server method" of delivery to the PSAP. Capturing location information at the OTT end-user's device, whether via GPS, A-GPS or an alternative technology, is most consistent with NG911 now and with future deployments as well.

While conformity with NG911 is Bandwidth's primary reason for recommending this approach, there are also many other benefits to doing so. The "Application-centric Model" that includes delivery via any available IP network allows for the broadest adoption with rapid implementation, while also being the most technologically sound option. This model does not rely on CMRS technology, which is being phased out, and instead takes advantage of the new, enhanced location determination methodologies available in/on the communications devices and from external sources such as Wi-Fi triangulation and Hot Spot databases. Finally, because this approach does not depend on the 10-digit number assigned to the underlying communications device, it would also technically allow for the possible expansion of text-to-911 requirements to include non-interconnected OTT application providers in the future.

II. RECOMMENDED TECHNICAL APPROACHES

Bandwidth applauds the efforts of those who have engaged in experimentation to advance the awareness of the entire industry about challenges that must be confronted and successes that may be achieved. For example, the successful trial conducted in Greater Harris County[6] provides an instructive roadmap for success on a much broader scale. In keeping with the Commission's encouragements,[7]

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[5] *See* Reply Comments of Bandwidth.com, Inc. at 12-13 (filed March 11, 2013); Reply Comments of Bandwidth.com, Inc. at 10-11 (filed Feb. 9, 2012).

[6] Cassidian Communications and Greater Harris County 9-1-1 Emergency Network Text Messaging to 9-1-1 Trial a Success, Press Release (June 20, 2011) (http://www.cassidiancommunications.com/company/newsroom/press-releases.php?id=23&Cassidian+Communications+and+Greater+Harris+County+9-1-1+Emergency+Network+Text+Messaging+to+9-1-1+Trial+a+Success+ (last visited April 3, 2014).

[7] *Technology Transitions*, Order, Report & Order and Further Notice of Proposed Rulemaking, GN Docket No. 13-5, *et al*., FCC 14-5, at ¶¶ 190-194 (rel. Jan. 31, 2014).

Bandwidth itself plans on validating its recommendations in its own voluntary "beta offerings" or "trials" over the remainder of the year. As it moves ahead with developing its solutions, Bandwidth believes that leveraging investments made by the wireless carriers on a commercially reasonable and non-discriminatory basis will be important, but only up to a point. While existing network assets may appear to make it easier and less time consuming for interconnected OTT application providers to implement text-to-911 in the near-term, deviation from NG911 and other potential unintended consequences make CMRS-based solutions far less desirable.

A. Defaulting to Underlying CMRS Carriers' Text-to-911 Capabilities is Short Sighted

An OTT text-to-911 solution that depends upon CMRS carriers as the delivery default for end-users of CMRS-enabled devices that also utilize OTT texting services has a number of important limitations. First, it is unclear that OTT end-users that also have a CMRS service would consider their OTT application as a means to reach emergency services. Next, this approach places burdens on CMRS carriers and handset providers to create APIs for the OTT application providers. Creating and implementing this kind of an interface is not a straightforward development effort and will take considerable time and effort from multiple segments of the industry. Seamlessly handing off 911 text messages to emergency responders on large numbers of new and legacy smartphones is no easy task. Further, the CMRS-default option would be dependent upon the availability of a CMRS network[8] – which would dramatically limit availability of text-to-911 from OTT applications. The Commission should also not ignore the fact that increasingly, consumers are adopting Wi-Fi-only devices.[9] Sole reliance on a CMRS network for 911 text delivery dramatically limits the range of platforms that could potentially provide effective support to end-users that need emergency assistance. Finally, this approach takes industry off the path to NG911. This first option described in the FNPRM[10] takes maximum advantage of the current capabilities of the four largest wireless carriers but also places an additional burden on them and all other CMRS carriers while significantly limiting the range of underlying communications devices that can support text-to-911 for OTT applications.

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[8] *Second Further Notice* at ¶ 27.
[9] *See e.g.* http://gigaom.com/2012/03/20/sorry-carriers-9-out-of-10-tablets-sold-are-wi-fi/
[10] *Second Further Notice* at ¶¶ 25-29.

B. Use of 10 Digit Numbers Associated with Underlying CMRS Service for Location Determination is Flawed

The descriptions in the FNPRM of potential solutions that would derive subscriber location from the OTT end-user's underlying wireless carrier are worthy of consideration but also suffer from fatal flaws that argue against full adoption. While the "10 Digit Number Solutions" could enable OTT applications to use available data networks to deliver 911 text messages, doing so would require the presence of an underlying voice service that uses a wireless 10-digit number. This requirement/assumption would, again, dramatically reduce broad availability for OTT applications to support 911 texting. Limited availability of device types that support text-to-911 combined with the burden on handset providers and OTT providers to create APIs that would capture the underlying 10-digit number makes this architecture problematic as well. While the second "10 Digit Number Solution" set forth in the FNPRM[11] is marginally superior to the first potential "10 Digit Number Solution," it too would fail to capture the more robust capabilities available under an application-centric IP delivery solution. On the other hand, streamlining development efforts while "future-proofing" text-to-911 for NG911 networks will yield the greatest benefits at the lowest cost both now and down the road.

C. Using Available Data Networks Together With Application-derived Location Holds the Greatest Promise

Of the alternatives set forth in the FNPRM, Bandwidth believes combining reliance upon available data networks with application-derived location capture is the most robust and technically sound approach for the industry to pursue.[12] Among the key benefits to using data networks for delivery of device-based location information to emergency operators is that it will place the fewest requirements on end-users and the devices supporting OTT texting applications. Additional important benefits to this proposed solution include: (i) not requiring access to a CMRS network; (ii) not requiring a 10-digit number assigned to the underlying device; (iii) not requiring the development and use of an API to access the CMRS network or the discovery of the underlying assigned 10-digit number; and (iv) not requiring the use of the CMRS carrier's location determination equipment, which introduces delays and creates

[11] *Second Further Notice* at ¶¶ 32.
[12] *Second Further Notice* at ¶¶ 30-33.

challenges in a roaming situation. Further, any development efforts that are imposed on the OTT application providers will be in-line with developments required to support NG911 anyway, and are well within the technical capabilities of the application providers. The light lift of the development also means that deployment can be accomplished far more rapidly. Finally, and perhaps most critically, this approach makes OTT text-to-911 available on the broadest range of underlying communications devices - thereby meeting the growing demands of the marketplace.

III. LOCATION ACCURACY

Public safety has become accustomed to the location information that is typically presented by the CMRS carriers with wireless 911 calling. Because of the relatively high degree of accuracy of the location information wireless carriers present, the public safety community has high levels of confidence in the wireless carriers' location determination systems. Yet, even while public safety's familiarity and confidence with wireless carrier location determinations are important considerations, they are not, from Bandwidth's perspective, reason enough to employ OTT text-to-911 solutions that would depend upon them. Application-derived location determination is excellent and is getting better. The use of GPS, A-GPS and Wi-Fi to determine location can and does provide location accuracy needed by Public Safety. In particular, GPS may have an advantage in rural areas when a device cannot connect to three towers. While familiar, it is broadly acknowledged that the technology currently used by wireless carriers to determine the location of a mobile device has its limitations.[13] Improving location accuracy in general, but inside buildings and in rural areas in particular, is the focal point of a number of the Commission's efforts.[14] The approaches being explored to address the limitations of the current technology used for wireless 911 calls will be available to OTT applications and their underlying platforms just as GPS technology is today.

Significant investment is going into application-derived and device-derived location determinations. In addition, carrier provisioning of Location Information Servers ("LISs") in states implementing NG911 can be accessed by the device, which augments and improves the accuracy of the

[13] *Second Further Notice* at ¶ 41.

[14] *See, e.g.*, *In the Matter of Wireless E911 Location Accuracy Requirements*, Third Further Notice of Proposed Rulemaking, PS Docket No. 07-114, FCC 14-13 (rel. Feb. 21, 2014).

location determination. For these reasons, Bandwidth argues that device-derived location accuracy is adequate today and will improve over time making it a better solution for both voice 911 and text-to-911 provided by interconnected and no-interconnected OTT providers.

IV. LEVERAGING EXISTING ASSETS

As noted previously, the four major wireless carriers have begun building network infrastructure that could be used with any of the options outlined in the FNPRM. The value in leveraging deployed network assets is particularly acute under Bandwidth's recommended approach. Pursuant to Bandwidth's recommendation, existing TCCs could readily support OTT texts as well. Providers of TCC services should not object to such a proposal so long as they can also gain non-discriminatory access to other TCC services on commercially reasonable terms as well. Also, TCC network owners should be incented to leverage their investments as broadly as possible as more PSAPs request service. While the commercial agreements between the wireless carriers and TCC service providers are not publicly available, the Commission should codify the availability of these network components for additional use by new entrants to advance rapid adoption. With a clear declaration of this intent, it would be unlikely that the Commission would need to intervene in the pricing and cost recovery mechanisms that would optimize the re-use of TCCs. Without such direction at the outset however, the likelihood of Commission intervention would increase, and thereby delay text-to-911 adoption in the long term.

V. INCORPORATTING SPEECH AND HEARING IMPAIRED USERS INTO THE PLAN

Bandwidth has a strong track record of supporting TRS/VRS service providers and their end-users with their emergency calling capabilities. Thus, Bandwidth is firmly in support of the Commission's goals to enable emergency services for the disabled community as communications services evolve to the greatest degree possible. TRS/VRS providers can play an important role in advancing the adoption of text-to-911. One initial step that the Commission could adopt to advance 911 support for the speech and hearing impaired is adopting a rule that requires that 911 text messages be sent to a relay center instead of sending a bounce-back message when 911 texts are sent in jurisdictions that have not yet requested service. As more and more PSAPs sign up for the service, fewer and fewer texts will be routed to a relay center. But, for the foreseeable future, this could be a valuable service. Second,

as Bandwidth has observed in the past, there are times when the technology will fail. At these times, a relay center can be an important "backstop" ensuring that a text message is not dropped. Here again, Bandwidth believes that there is a valuable opportunity to meet near-term demands while simultaneously advancing the development of more robust capabilities within NG911 networks.

VI. CONCLUSION

Bandwidth supports the Commission's effort to implement 911 texting for interconnected OTT-text applications.[15] Bandwidth is confident that the delivery of text messages to the TCCs using the "Application-centric Model" with transport over any available IP network, along with application-derived location information, provides the most direct path to NG911, allows the broadest possible underlying device support, and leverages investments already made while limiting the burden on the wireless carriers implementing text-to-911 for their customers. This recommended technical option can also be implemented in a time frame that is in keeping with the schedule proposed by the Commission. As it has in the past, the Commission should require open, standards-based implementations and access to infrastructure on a non-discriminatory basis to drive the most robust emergency services possible as the industry rapidly evolves to an all-IP network and service environment.

Respectfully Submitted,
/s/

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[15] *Second Further Notice* at ¶ 2.