

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

In the Matter of)	
)	
Implementing Kari's Law and Section 506 of RAY BAUM'S Act)	PS Docket No. 18-261
)	
Inquiry Concerning 911 Access, Routing, and Location in Enterprise Communications Systems)	PS Docket No. 17-239
)	

**COMMENTS OF
COMTECH TELECOMMUNICATIONS CORP.**

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Comtech Telecommunications Corp. (“Comtech”)¹ respectfully submits the following comments to the Federal Communications Commission (“FCC” or “Commission”) in response to the Commission’s Notice of Proposed Rulemaking in the above-referenced proceeding.²

I. Introduction and Summary

Comtech, a leading provider of advanced communications solutions for both commercial and government customers, together with TCS and NextGen, has significant experience with the development and implementation of technical standards necessary for ensuring effective Enhanced 911 (“E911”) and Next Generation 911 (“NG911”) services. For example, Comtech currently supports approximately half of all U.S. wireless E911 calls, and Comtech’s wireless and voice over Internet Protocol (“VoIP”) E911 solutions, together with our wireline E911 solutions, serve

¹ When referencing Comtech, we include its direct and indirect wholly-owned subsidiaries, TeleCommunication Systems, Inc. (“TCS”) and NextGen Communications, Inc. (“NextGen”), respectively.

² *Implementing Kari’s Law and Section 506 of RAY BAUM’S Act, Inquiry Concerning 911 Access, Routing, and Location in Enterprise Communications Systems*, PS Docket Nos. 18-261 and 17-239, Notice of Proposed Rulemaking, FCC 18-132 (Sept. 26, 2018) (“*NPRM*”).

over 140 million wireless and IP-enabled devices. Comtech is the nation's only non-carrier TL 9000-certified wireless and VoIP E911 Network Operations Center ("NOC"), and our E911 solutions ensure that emergency calls route to the appropriate Public Safety Answering Point ("PSAP"). Comtech also provides systems and networks to deliver 911 caller location information.

Comtech strongly supports the Commission's efforts to ensure that whenever and wherever consumers attempt to dial (or send a message to) 911, they reach an appropriate PSAP and that any dispatched first responders have sufficient information to quickly locate the 911 callers.

Dialing 911 during an emergency is now an ingrained response for most consumers, as it is emphatically taught to children from a very young age. This almost reflexive response to dial 911 during an emergency is critical to connecting those in peril to life-saving resources and helps ensure a rapid response from first responders. Unfortunately, many consumers truly do not understand that certain types of technology used to initiate voice calls (or send messages) are currently unable to reach 911 telecommunicators or provide first responders with sufficient location information to effectively find callers. As new forms of technology capable of making voice calls and sending multimedia messages (*e.g.*, text messages) become more pervasive, consumers will invariably attempt to use such new technology to dial 911 during emergencies – with potentially life-threatening consequences if the Commission does not act to ensure that sufficient caller location standards apply to all 911-capable communications services. Since all forms of regulated emergency telephone calls are required to somehow provide the caller's location, including the caller's geodetic location or civic address,³ Comtech urges the Commission to adopt rules governing the availability of location for all forms of 911 calling.

³ See, *e.g.*, 47 C.F.R. §§ 9.5(d), 20.18(d)-(g), 64.605(b)(2)(ii).

Accordingly, Comtech takes this opportunity to answer questions set forth in the *NPRM* and to describe the possible approaches the FCC might take given the current state of technology for: (1) Multi-Line Telephone Systems (“MLTS”) services, (2) fixed telephony services, (3) text-to-911 services, (4) fixed interconnected VoIP services, (5) nomadic interconnected VoIP services, and (6) all other communications services capable of placing a call to 911 that are not covered by existing 911 rules. Adoption of the proposed dispatchable location requirements will serve the public interest by improving 911 call response times, thereby saving lives and protecting property, and may also encourage the development of innovative location solutions.

II. A Dispatchable Location Can Be Determined for All 911-Capable Services

The *NPRM*, in part, seeks comment on whether to adopt dispatchable location requirements for MLTS and other 911-capable services. The statute defines “dispatchable location” as “the street address of the calling party, and additional information such as room number, floor number, or similar information necessary to adequately identify the location of the calling party.”⁴ Comtech generally supports having all 911-capable services provide dispatchable location information, and encourages the Commission to ensure reasonable use of other forms of location information, whether such information is used as a primary method of determining a caller’s location or to validate a civic address.

⁴ *NPRM* ¶ 56 (citing Section 506 of the Repack Airwaves Yielding Better Access for Users of Modern Services Act of 2018 (RAY BAUM’S Act), Pub. L. No. 115-141, 132 Stat. 348, 1095 (codified at 47 U.S.C. § 615 note)).

A. MLTS

Comtech supports the adoption of more granular location requirements for MLTS systems.⁵ While a civic address may provide sufficient information to locate a caller within the smallest enterprise buildings, any MLTS deployment that is extended vertically or horizontally will need to provide the PSAP with more detailed location information, such as the caller's suite number, building number, unit number, and floor number.

Beyond requiring the inclusion of more specific address elements as part of a registered dispatchable location, the FCC could require the use of other location information that does not meet the definition of dispatchable location.⁶ There are several ways in which other types location information could be utilized. For example, the Commission could require the inclusion of a caller's specific location that is shown as a point on a building floor map. Whereas dispatchable location information may be able to guide first responders to the entrance of a caller's building, and possibly even the floor of such building, providing the caller's location using a point on a building floor map — either on a PSAP's display or on a first responder's mobile device screen — could save time by visually indicating the caller's precise location within a specific floor. Although location technology capable of providing a point on a building floor map is already commercially available, many building operators would need to augment their existing location data by linking floor maps with their integrated Wi-Fi Access Point or Bluetooth Low Energy (“BLE”) network systems.

⁵ See *NPRM* ¶ 58.

⁶ *Id.* ¶ 65.

Comtech also supports the use of other sources of location information to validate a caller's transmitted street address. For example, calculated x/y/z position information can be used to validate dispatchable location information by comparing the distance between the measured x/y/z position and the derived dispatchable civil address position. If the measured x/y/z position and target dispatchable civic address are close enough in proximity, then this alternate location serves to corroborate the provided dispatchable location information. Since PSAPs already utilize x/y coordinates for wireless mobile calls, it is feasible for PSAPs to use callers' x/y/z coordinates for MLTS calls (as well as other types of calls), provided that necessary changes are made to the automatic location identifier ("ALI") configuration and PSAPs' call handling equipment to integrate and display such information. Until PSAPs are equipped to handle x/y/z location information, civic addresses must continue to serve as a primary source of location information for MLTS calls to 911.

The *NPRM* also asks whether to require MLTS to utilize the National Emergency Address Database ("NEAD").⁷ Although Comtech understands that it may be *possible* to extend the use of the NEAD to MLTS operators and users,⁸ many onerous changes would be required to enable such use of the NEAD, including changes to the NEAD standards, architecture, and infrastructure. In contrast to the NEAD, similar dispatchable location information may be provided by other standardized, commercially-available and distributed location database systems, include an Automatic Location Information ("ALI") database, transitional location database ("LDB"), or location information server ("LIS") functional element.

⁷ *NPRM* ¶ 65.

⁸ See Alliance for Telecommunications Industry Solutions ("ATIS"), Standard on Location Accuracy Improvements for Emergency Calls, ATIS-0700028 v1.1, (Oct. 2016).

Regardless of how dispatchable location information is provided, the FCC's proposed changes may save lives by improving upon existing location granularity to enable more accurate PSAP dispatch operations. The importance of using some level of supplemental location information to validate dispatchable location information depends on the size of the building, or the size of suites or units in a building, coupled with the amount of detail already included in the civic address. For this reason, Comtech urges the Commission to carefully draft any location requirements for MLTS such that MLTS operators have flexibility to determine whether additional location information is necessary in any particular MLTS environment.

B. Mobile Carriers

The *NPRM* also seeks comment on whether dispatchable location information and other enhanced location information can be generated and delivered with text messages sent to 911, and whether the necessary technology to convey a dispatchable location or other enhanced location information with text-to-911 already exists.⁹ As Comtech explains below, while it is feasible to deliver more granular location information with various implementations of text-to-911, there are significant challenges to achieving such an objective.

Pursuant to current FCC rules, mobile carriers and other covered text providers are only required to obtain enough location information in order to route a text-to-911 to the appropriate PSAP based on cell site sector information,¹⁰ which is not necessarily granular enough location information to appropriately dispatch first responders. Presently, location information for text

⁹ See *NPRM* ¶ 70.

¹⁰ See 47 CFR § 20.18(q).

messages sent over short message service (“SMS”) networks is obtained by commercial location platforms, which provide an estimated geodetic position based on a wireless cell site sector centroid. While such location information is fast and reliable, there is typically a high level of uncertainty in the resulting position, equating to a larger search area.

It is possible to obtain a more precise geodetic position and reduce the estimated search area size to more closely resemble the smaller search radius provided for wireless voice 911 calls by utilizing newer, more capable location technologies, such as commercial Location Based Systems (“LBS”) or DBH location technology based on handset determined Wi-Fi Access Point and/or BLE location platform and Global Navigation Satellite System (“GNSS”) position methods. Utilizing any of these newer location technologies to determine a more granular location of a device sending a text message to 911 is dependent on such systems becoming more prevalent.

It is difficult to assess an exact timeframe in which covered providers will be able to provide dispatchable location information (or other forms of location information) for text-to-911 due to significant financial hurdles and technological challenges that must first be overcome. In terms of the financial impacts, adopting new text-to-911 location capabilities across the board would be costly for both wireless carriers and PSAPs.

Some of the technological challenges that must be overcome to improve location information for text-to-911, when compared to wireless voice 911 location information, include: (1) the current configuration of mobile handsets, (2) the types of location technologies and protocols supported by mobile handsets, and (3) the availability of real-time location platforms across each individual carrier. First, mobile handsets’ current configurations present a technical challenge and must be reconfigured since handsets must be able to utilize the location platform capabilities.

Second, since mobile handsets utilized for text-to-911 currently rely on the location platform to deliver a manually-entered cell or sector position (rather than a position calculated in real-time) mobile handsets must be redesigned to include requisite GNSS hardware and protocols, which will enable handsets to convey necessary measurement data to their location platform.

Lastly, when a text-to-911 is sent, currently only commercial location platforms are used to acquire the sender's location information. The challenge here is that some existing commercial platforms are not capable of performing more precise positioning techniques. In addition, the ways in which commercial location platforms interact with mobile handsets for commercial use is very different from the way emergency location platforms interact with handsets for wireless 911 voice calls, which prioritize the 911 location determination processes within the network during an emergency session. Overcoming these operational challenges would be time consuming and costly for operators that currently do not have this capability.

Despite these challenges, Comtech urges the Commission to consider adopting enhanced location information requirements for covered text providers. Comtech views such enhanced location capability as essential to supporting text-to-911 for existing and future messaging platforms, including Rich Communications Services ("RCS") standards or 3rd Generation Partnership Project ("3GPP") MultiMedia Emergency Services ("MMES") that use the Session Initiated Protocol ("SIP") and/or Message Session Relay Protocol ("MSRP") to convey signaling and/or media. These protocols and the corresponding standards to support providing location information for such protocols have existed for some time, however, Comtech cannot anticipate the timing of their adoption, which is subject to consumer demand and wireless provider trends.

Alternatively, the Commission could consider promoting the use of DBH location information for text-to-911, which is already used in wireless voice calls to 911. In order to adopt DBH location information for SMS text-to-911, standards must be developed to extend existing interfaces for the Text Control Center (“TCC”). This may be a simple means for providing enhanced location information for text-to-911, therefore, Comtech suggests that the FCC explore this alternative approach and encourage the development of industry standards for DBH technology inclusion.

C. Interconnected VoIP Providers

The *NPRM* emphasized the importance of revisiting the E911 rules for interconnected VoIP, which only require interconnected VoIP providers to transmit the Automatic Number Identification (“ANI”) and the caller’s Registered Location with each 911 call.¹¹ Unfortunately, such manually provisioned static location information may not always be sufficient to allow first responders to quickly locate interconnected VoIP callers. Relying exclusively on a Registered Location is also inherently risky due to the possibility for human error in entering a Registered Location. As discussed below, Comtech is particularly concerned with the risk associated with relying a Registered Location for nomadic Interconnected VoIP.

1. Fixed Interconnected VoIP

Comtech agrees with the FCC that a Registered Location, in most cases, provides sufficient dispatchable location information for fixed interconnected VoIP users.¹² This is particularly true

¹¹ See *NPRM* ¶ 72, citing 47 CFR § 9.5(b)(2).

¹² *NPRM* ¶ 74.

when calls to 911 are placed from either inside of a single-family home or small building where the PSAP and first responders do not need additional room or floor level information.¹³

Relying exclusively on a Registered Location to determine a caller's location does, however, have certain inherent weaknesses due to the potential for human error. For example, a Registered Location will not be sufficient if the input address is not entered in a valid format or does not accurately represent where a caller is located due to intentional or unintentional data entry errors.

For this reason, Comtech supports adding location validation requirements to ensure that the registered civic address is validated using NG911 Location Validation Function ("LVF"), which relies on Geographic Information Systems ("GIS") street centerline and/or site structure authoritative data originated and controlled by public safety. Adopting validation requirements to ensure that the Registered Location represents an NG911 data format, as well as the potential integration with other location techniques to provide a contextual indication of where the caller is located when the 911 call is placed, will significantly help reduce unexpected routing and errant dispatching results.

2. Nomadic Interconnected VoIP

With respect to nomadic interconnected VoIP, Comtech generally does not find user-provisioned Registered Location information to be a sufficient proxy for a context validated dispatchable location. As discussed above, there are inherent problems with PSAPs relying primarily (or exclusively) on user-provided Registered Location. Such problems are necessarily exacerbated in a nomadic environment where a device may occasionally be moved between

¹³ NPRM ¶ 74.

locations or moved between locations on a daily basis (*e.g.*, if the device is a mobile phone, tablet, or laptop). As such, Comtech strongly supports the adoption of location validation requirements for nomadic interconnected VoIP, as well as the adoption of incentives to determine a nomadic interconnected VoIP caller's real-time calculated position and compared dispatchable location. Wired nomadic VoIP systems rely largely on wired location measurement or port allocation techniques. VoIP systems using wirelessly-connected devices are potential candidates for other measurement techniques, including commercial location platforms that perform real-time, dynamic positioning. Some such commercial location platforms use Wi-Fi or BLE measurement techniques in conjunction with a building floor plan map to associate a dispatchable location with a connected device (*e.g.*, VoIP handset with Wi-Fi capabilities). This results in having a building floor map that graphically indicates where the calling device is located on a floor map display. Although there are currently no industry standards that support these types of commercial location platform interfaces with nomadic VoIP devices or applications, Comtech urges the Commission to encourage the development of standards to determine and convey this type of location information to PSAPs.

D. Other 911-Capable Services

Comtech supports the FCC's proposal to establish basic 911 rules for services capable of initiating 911 calls but that are not currently covered by existing 911 rules,¹⁴ including outbound-only VoIP services that enable 911 call initiation and routing from an IP-connected device that is used for voice communications. Imposing FCC requirements on such 911-capable VoIP services also represents a necessary step toward ensuring the availability of emergency services in devices

¹⁴ See *NPRM* ¶ 82.

and commercial communications offerings that consumers are increasingly relying on in their daily lives. Enabling 911 support and basic 911 standards for such services is critical to saving lives, protecting property, and ensuring that federal regulation keeps pace with the changing communications market.

Comtech also supports expanding the use of dispatchable location requirements for other 911-capable services. In most circumstances, dispatchable location information offers first responders an opportunity to quickly locate 911-callers, thereby allowing lifesaving aid to be administered sooner.

Comtech believes that the option of alerting enterprises simultaneous to an emergency call being initiated may be helpful in specific instances, however, the processes around such capability must be carefully constructed and managed since such notifications may cause confusion or delay.¹⁵

III. Conclusion

For the forgoing reasons, it is imperative that any location requirements adopted for 911-capable services take into consideration the current state of technology and its rapid rate of change. The Commission should ensure that location requirements extend to all communications services capable of initiating 911 calls that are not covered by existing 911 regulations. With new forms of technology capable of making 911 calls becoming more ubiquitous, it is critical that the Commission's regulations are adapted for such new modes of communications in order to ensure

¹⁵ For example, early actions taken by internal personnel may not have been adequately communicated to first responders, such as moving the person requesting help to a different location.

that — regardless of the type of service being used to dial 911 — consumers can successfully request emergency services and be quickly and accurately located by first responders.

Respectfully submitted,

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