

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

In the Matter of

Wireless Emergency Alerts

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PS Docket Nos. 15-91 and 15-94

To: The Commission

COMMENTS

DIGITAL BROADCASTING TECHNOLOGIES, LLC (“DBT”), through counsel and pursuant to Section 1.415(a) of the Commission’s Rules,¹ hereby submits its comments in response to the Commission’s Public Notice seeking to refresh the Commission’s record on facilitating multimedia in Wireless Emergency Alerts (“WEA”)^{2 3}.

Background

1. Nearly 12 years ago, Congress directed the establishment of a process for the creation of a national mobile alerting system, now known as WEA, whereby participating commercial mobile service (“CMS”) providers transmit emergency alerts to their subscribers.⁴ Since then, there has been a high level of participation by CMS providers, with all four major wireless carriers participating in the system, which accounts for 98.6% of the U.S. population being served.⁵ Yet despite most areas of the country now being

¹ 47 C.F.R. § 1.415(a)

² “Public Notice,” DA 18-302, released March 28, 2018; 83 Fed. Reg. 18,257 (Apr. 26, 2018) (hereinafter the “Public Notice”).

³ DBT’s Comments are timely filed. 47 C.F.R. §§ 1.4(b)(1), (j).

⁴ *Warning, Alert and Response Network (WARN) Act, Title VI of the Security and Accountability for Every Port Act of 2006*, 120 Stat. 1884, § 602(a), codified at 47 U.S.C. § 1201, et seq., § 1202(a) (2006).

⁵ 4th quarter 2017. <https://www.statista.com/statistics/199359/market-share-of-wireless-carriers-in-the-us-by-subscriptions/> See also “FCC 20th Mobile Wireless Competition Report Quick

covered, there is continued concern about the content, presentation and geographic targeting of the WEA Messages.

2. In recent years, the Commission has expended considerable time and effort on the question of improving the content and method of delivery of WEA Messages. For example, capabilities of WEA Messages have been enhanced in 2016 by increasing the character length of messages to 360 characters. This improves the quality of information available to the public during emergencies and reduce public confusion caused by difficult-to-understand abbreviations.

3. Nevertheless, despite these enhancements, there is need for improvement in the quality of WEA Alert messaging, particularly with respect to multimedia, which can not only improve the content of the information provided, but also assist in further identifying the actual nature and location of emergency situations (such as by providing maps in alerts).

4. The Public Notice requesting that the record be supplemented specifically asked that commenters refresh the record with any new information regarding the technical feasibility for requiring multimedia content in WEA messages, including the current state of multimedia testing and standards development.”⁶ DBT asserts that such technology not only already exists but is capable now of insertion into WEA Messages to provide the more robust messaging needed to assist in emergency situations.

Facts (2016),” <https://www.fcc.gov/20th-mobile-wireless-competition-report-quick-facts>

⁶ Public Notice, *supra*, at 1.

Multimedia in WEA Messages

5. Over the years, the Commission has urged the inclusion of multimedia in messages. Notably, in 2016 the Commission stressed that: “we are committed to allowing the public to realize the benefits of multimedia content in WEA”.⁷ Various Commissioners have continued to stress the importance of inserting multimedia in WEA messages. For example, in the FCC’s most recent decision on WEA messaging, Commissioner Rosenworcel highlighted the need to consider multimedia in alerts messages.⁸ The recent confusion caused by a false WEA Alert Message regarding a supposed missile attack on Hawaii has increased this push to improve messaging through inclusion of multimedia. Similarly, in the case of the recent California fires in the Santa Barbara area, residents and first responders could have benefited from multimedia such as maps that would have more clearly delineated the areas affected by evacuation orders.

6. CMS carriers and others in the telecommunications industry continue to assert that insertion of multimedia in WEA Alerts is not yet feasible. The industry’s standards organization, Alliance for Telecommunications Industry Solutions (“ATIS”) maintains that “Cell Broadcast technology is not designed for multimedia” and “numerous issues that would make the presentation of multimedia content in WEA notifications problematic if not technically infeasible.”⁹

⁷ See generally *Report and Order and Further Notice of Proposed Rulemaking in PS Docket No. 15-191*, 31 FCC Rcd 11112, 11193 (¶ 126) (2016)

⁸ *Second Report and Order and Second Order on Reconsideration in PS Docket No. 15-91*, 33 FCC Rcd ____, FCC 18-4 (released Jan. 31, 2018).

⁹ Comments of The Alliance for Telecommunications Industry Solutions in PS Docket 15-91,

7. ATIS contends that “presentation of multimedia content, such as maps, photos and hazard symbols, in WEA notifications [is] problematic if not technically infeasible[.]”¹⁰ “Given the time and resources that would be needed and the existing technical challenges surrounding the transmission of these types of multimedia content in WEA,” ATIS maintains that the requirements should not be implemented.¹¹

8. Essentially, ATIS’s objection is that data rates were too slow to make it feasible to transmit multimedia such as maps or pictures, but that even if the data rates were faster, there is currently no way to encode pictures into a text stream. Although the first proposition is debatable, the second is not correct. DBT has been employing the technology to encode multimedia in a text stream and has been doing so for some time. Thus, contrary to what has been said, WEA messaging can improve using existing technology.

9. Existing technology developed by DBT can permit immediate insertion of multimedia in WEA. In so doing, the Commission can advance not only the objective of more complete information about emergency situations that can be provided by multimedia images such as maps and pictures, but also in a sense the goal of microtargeting by improving the content to give the recipient a better idea of whether the WEA Message applies to him.

January 13, 2016, at 9.

¹⁰ *Id.*

¹¹ *Id.*, at 10.

DBT and its Multimedia Technology

10. DBT is a veteran-owned, Georgia-based technology company. DBT produces Digital Wireless control and information systems and software. Its products include proprietary transmitters, digital receivers used for remote control and communications and proprietary codec and protocols, which are what makes the combination of text, binary controls, and multimedia content possible in a single broadcast data stream.

11. C.Y. Smith is the president and founder of DBT. He also serves as Chief Engineer of DBT. A U.S. Naval Academy graduate, Mr. Smith's professional experience includes serving as the Design Agent (chief engineer) for the U.S. Navy's STANDARD Missile system (Terrier, Tarter and Aegis missiles) while working at General Dynamics. There he was responsible for the design, performance, and reliability of the Navy's premier surface-to-air supersonic missile system.

12. DBT, which was organized in 2018, uses and deploys technology that Mr. Smith has been developing for the past 17 years. For example, this technology was the basis for XYCAST technology that permitted broadcast of customized video highlights, photos, stats, play-by-play analysis, interactive games of NCAA college football at selected stadium to users via an app on a mobile phone.¹²

13. The technology that is being used by DBT is a further development of that which was first used in 2002 at American LeMans Racing Series events to control leader lights

¹² "New XYCAST Stadium Technology Delivers Rich, Interactive Game-Time Content to College Football Fans," Business Wire, Aug. 27, 2014.
<https://www.businesswire.com/news/home/20140827005168/en/New-XYCAST-Stadium-Technology-Delivers-Rich-Interactive>

on each car and send scoring information to wireless receivers for use by fans and competitors at events.¹³ In 1994, Mr. Smith founded Zytex Instruments, Ltd., a company formed to provide telemetry data systems and displays for use in the television broadcast of auto races.

14. DBT's technology can fill the gap and provide multimedia in emergency text messages and do so now. DBT has created a format for combining these elements that is compatible with broadcasts of virtually any baud rate. The company's format is used to transmit text, pictures, video, audio, and binary commands, if desired. It consists of a single data stream that is parsed by software running on the receiver. The codec DBT employs could combine the content into a single digital container file to insert multimedia into WEA Alerts.

15. The digital information being broadcast is structured such that each byte of data is contained in a message packet which has a preamble that includes address information for the intended receiver, as well as the location of the data within a larger file, if appropriate. This address information allows for data to be transmitted in any sequence necessary to accomplish the tasks of the overall network. Binary data can be intermixed with larger data files without corrupting the larger file. This address information can be in the form of a database address, table structure, or even a simple memory map. The only requirement is that each message packet being transmitted contains all address

¹³ <https://www.motorsport.com/alms/news/le-mans-24h-race-to-use-alms-leader-lights/>

information necessary for the intended receiver to interpret and execute or store the data.

16. At any particular broadcast location, the transmitter will be constantly sending out the entire structure of the data being used by receivers at that location in what is commonly referred to as a “carousel” format. Thus, even without an acknowledgement signal sent from the receiver, the screens on the host device eventually fully populate even if data is initially missing/lost.

17. The digital information being transmitted can also include digital instructions, which can be used to control devices located at the venue that could benefit from not having to be hardwired to a larger network. Because each message being transmitted contains address information specifying which receiver it is intended for, receivers can be built to turn specific devices on or off, as well as configure and/or control these devices with digital commands being embedded in the broadcast.

18. When a transmission is broadcast from the server, it will have a multi-byte packet data structure, with a preamble (or postamble) which identifies:

- a. a message ID, which identifies which alert the packet is applicable to. There can be multiple alerts running simultaneously and in close proximity.
- b. a memory map or message type identifier, which tells the data receiver how the data should be used, or where it should be stored in a pre-defined memory map. In the case of a video or picture, the message may be a single or group of pixels.
- c. and then the message data itself.

19. To compensate for the fact that the backchannel is not used for acknowledgement of every message (though some may be acknowledged), the server will preferably continuously transmit all messages for a predetermined period of time even if they have

long been received. This will allow “backfill” of message data packets that might have been missed in the first transmission but due to lack of acknowledgement, there is now way to know which data is missing. By retransmitting in this carousel format, the messages will ultimately be completely delivered.

20. Long-Term Evolution (LTE) technology for high-speed wireless communication for mobile devices and data terminals can manage fast-moving mobiles and supports multi-cast and broadcast streams. Using the broadcast feature of LTE technology would enable the broadcast of DBT’s multimedia emergency messages. The broadcast feature of LTE technology is currently deployed by the mobile industry worldwide, including in the U.S. However, it is available in the U.S. only on a limited basis. Of the major carriers, only Verizon Wireless has made any extensive deployment of LTE since Verizon launched in 2015.¹⁴ Although some handsets are LTE broadcast compatible, they are limited to use on the Verizon network. Thus, until there is more widespread deployment by U.S. wireless carriers of LTE broadcast capability, there needs to be an interim solution to provide robust, multimedia capability for WEA, especially in situations like Hurricane Maria in Puerto Rico in October 2017 involving wholesale shutdowns of mobile service.

21. Until there is widespread deployment of LTE or other broadcast technology in the U.S., DBT still can offer an immediate solution to the problem of WEA multicast messages. Because most cell phones are not currently equipped to receive multimedia broadcast messages (except for those LTE broadcast capable phones available for use on

¹⁴ “Mobile operators should embrace LTE Broadcast,” Broadband TV News, 11 Jan. 2017, <https://www.broadbandtvnews.com/2017/01/11/mobile-operators-should-embrace-lte-broadcast/>

Verizon),¹⁵ a small Bluetooth®-equipped digital receiver is used to receive the message packets and then re-transmit them to the phone using standard Bluetooth® protocols. On the phone, the messages packets are downloaded and process by a custom application which contains the codec and APIs necessary to compile the digital information packets back into text, binary commands, or multimedia content, as appropriate.

22. An emergency like Hurricane Maria, where there is a lengthy outage of wireless service, provides an example of how DBT technology could be employed immediately to provide WEA multimedia capability. The Federal Emergency Management Agency (“FEMA”) or a state emergency agency could distribute the Bluetooth®-equipped digital receiver to residents of an affected area. Multicast WEA messages could then be broadcast to provide necessary information for affected people from a special temporary transmitter. At the conclusion of the emergency, the receivers could be returned to FEMA for future use in another emergency event and redeployed in a future emergency situation.

23. If in the future LTE or another method of broadcasting the digital packets were to become available through greater deployment of LTE by carriers, then the use of a separate transmitter/receiver would not be required. Everything necessary to format and decode these message packets is contained in the software codec. However, in the interim, DBT’s proven technology can be used to substantially enhance the capability of the WEA alert system to provide multimedia emergency messaging.

¹⁵ For example, Samsung Galaxy X9, Galaxy Note 8, Galaxy S series phones, and Motorola Droid MAXX 2. See <https://www.verizonwireless.com/smartphones/> (reviewed May 28, 2018).

Conclusion

24. Despite assertions to the contrary in the telephone industry, DBT submits that there is technology available for deployment now to provide robust, multimedia capability in WEA messaging. DBT can today provide and transmit such multimedia WEA messaging with technology that it has developed. DBT looks forward to the opportunity to demonstrate to the Commission that robust multimedia emergency messaging is something that be provided now and not in the distant future.

Respectfully submitted,

DIGITAL BROADCASTING TECHNOLOGIES, LLC



By _____

Stephen Díaz Gavin

RIMON, P.C.

1717 K Street, N.W., Suite 900

Washington, D.C. 20006

(202) 871-3772

Its Counsel

Dated: May 29, 2018

APPENDIX 1 – Declaration of C.Y. Smith

Declaration of C.Y. Smith

I, C.Y. Smith, hereby declare the following:

1. I am the president and founder of Digital Broadcasting Technologies, LLC ("DBT").

I am also the Chief Engineer of DBT.

2. The foregoing comments were prepared at my direction and under my supervision.

I have authorized the filing of these Comments in FCC Docket Nos. Docket Nos. 15-91 and 15-94.



C.Y. Smith