

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Wireless Emergency Alerts)	PS Docket No. 15-91
)	
Amendments to Part 11 of the Commission’s Rules)	PS Docket No. 15-94
Regarding the Emergency Alert System)	
)	

REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING

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By the Commission: Chairman Wheeler and Commissioners Clyburn, Rosenworcel and Pai issuing separate statements; Commissioner O’Rielly approving in part, dissenting in part and issuing a statement.

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I. INTRODUCTION

1. In this *Report and Order and Further Notice of Proposed Rulemaking*, we take advantage of the significant technological changes and improvements experienced by the mobile wireless industry since the passage of the Warning, Alert and Response Network (WARN) Act, and deployment of Wireless Emergency Alerts (WEA) to improve the utility of WEA as a life-saving tool.¹ In the *Report and Order*, we adopt rules informed by WEA’s use during the first four years of its deployment and by stakeholder feedback to the *WEA NPRM*.² Our goal is to promote the utility of WEA for communities as a life-saving tool. Accordingly, this *Report and Order* adopts rules focused on improving WEA in three key areas.

¹ WEA was formerly known as the Commercial Mobile Alert System (CMAS). In 2013, the Public Safety and Homeland Security Bureau amended its Part 10 rules to change the name “Commercial Mobile Alert System” (CMAS) to “Wireless Emergency Alert” (WEA). See Commercial Mobile Alert System, PS Docket No. 07-287, Order, 28 FCC Rcd 1460 (PSSB 2013); The Commercial Mobile Alert System, PS Docket No. 07-287, *First Report and Order*, 23 FCC Rcd 6144 (2008) (*WEA First Report and Order*); The Commercial Mobile Alert System, PS Docket No. 07-287, *Second Report and Order and Further Notice of Proposed Rulemaking*, 23 FCC Rcd 10765 (2008) (*WEA Second Report and Order*); The Commercial Mobile Alert System, PS Docket 07-287, *Third Report and Order*, 23 FCC Rcd 12561 (2008) revised by Erratum (dated Sept. 5, 2008) (*Third Report and Order*).

² *Improving Wireless Emergency Alerts and Community-initiated Alerting*, PS Docket No. 15-91, Notice of Proposed Rulemaking, 30 FCC Rcd 13781 (2015) (*WEA NPRM*). In the *WEA NPRM*, we closed the CMAS docket, PS Docket No. 07-287, and opened a new docket, PS Docket No. 15-91, for WEA. See *id.* at n.2.

2. First, we adopt rules that will improve Alert Message content in order to help communities communicate clearly and effectively about imminent threats and local crises.³ Specifically, we improve Alert Message content with the following actions:

- We increase the maximum Alert Message length from 90 to 360 characters for 4G-LTE and future networks.
- We create a new Alert Message classification for “Public Safety Messages,” defined as “an essential public safety advisory that prescribes one or more actions likely to save lives and/or safeguard property.”
- We require Participating Commercial Mobile Service (CMS) Providers to support embedded references (*i.e.*, URLs and phone numbers) included in Alert Messages.
- We require Participating CMS Providers to support transmission of Spanish-language Alert Messages.⁴

3. Next, we adopt rules to meet alert originators’ needs for the delivery of the Alert Messages they transmit.⁵ Specifically, we take the following steps:

- We require Participating CMS Providers to log and maintain basic Alert Message attributes, and to make those logs available upon request to the Commission and FEMA, and to emergency management agencies that offer confidentiality protection at least equal to that provided by the federal Freedom of Information Act (FOIA) insofar as those logs pertain to alerts initiated by that emergency management agency.
- We require Participating CMS Providers to narrow their geographic targeting (geo-targeting) of Alert Messages to areas that best approximate alert areas specified by the alert originator.⁶

³ The term “Alert Message” is defined in the Commission’s WEA rules as “a message that is intended to provide the recipient information regarding an emergency, and that meets the requirements for transmission by a Participating Commercial Mobile Service Provider under this part.” 47 CFR § 10.10(a).

⁴ A “Participating CMS Provider” is a Commercial Mobile Service Provider that has voluntarily elected to transmit Alert Messages under Part 10 of the Commission’s rules. 47 CFR § 10.10(f). “A Commercial Mobile Service Provider (or CMS Provider) is an FCC licensee providing commercial mobile service, as defined in section 332(d)(1) of the Communications Act of 1934 (47 USC § 332(d)(1)). Section 332(d)(1) defines the term commercial mobile service as any mobile service (as defined in 47 USC 153) that is provided for profit and makes interconnected service available to the public or to such classes of eligible users as to be effectively available to a substantial portion of the public, as specified by regulation by the Commission.” 47 CFR § 10.10(d). “The term ‘Commercial Mobile Service’ (CMS) is co-extensive with the term ‘Commercial Mobile Radio Service’ (CMRS) as defined in 47 CFR § 20.3.” *See WEA NPRM*, 30 FCC Rcd at 13783, n.6; *see also* Protecting and Promoting the Open Internet, *Report and Order on Remand, Declaratory Ruling, and Order*, 30 FCC Rcd 5601, 5778-5778, paras. 388-408 (2015) (including mobile broadband Internet access service providers within the CMRS definition).

⁵ The term “alert originator” refers to a federal, state, territorial, tribal, or local entity authorized by FEMA to use the Integrated Public Alert and Warning System (IPAWS) to issue critical public alerts and warnings in emergency situations. The Federal Emergency Management Agency (FEMA) recognizes “alerting authorities,” *e.g.*, federal, state, territorial, tribal, and local authorities that have completed the necessary authentication steps to use IPAWS. *See* FEMA, *Alerting Authorities*, <https://www.fema.gov/alerting-authorities> (last visited Jun. 3, 2015). For the purposes of this proceeding the term is used as coextensive with the terms “emergency manager” and “emergency management agency” unless otherwise specified.

⁶ “Geo-targeting” alerts refers to the ability of the WEA architecture to direct an alert to a geographic area that matches that desired by the alert originator. *See* CSRIC IV, Working Group Two, *Wireless Emergency Alerts, Geo-targeting, Message Content and Character Limitation Subcommittee*, Final Report 8 (2014), https://transition.fcc.gov/pshs/advisory/csric4/CSRIC_CMAS_Geo-Target_Msg_Content_Msg_Len_Rpt_Final.pdf (last visited Jun. 9, 2015) (*CSRIC IV WEA Messaging Report*). The *CSRIC IV WEA Messaging Report* has been (continued....)

- We require WEA-capable mobile devices present Alert Messages as soon as they are received.
4. Finally, we create a framework that will allow emergency managers to test, exercise, and raise public awareness about WEA. The framework for testing, exercises and outreach that we adopt consists of three components:
- We require support for State/Local WEA Tests and encourage emergency managers to engage in proficiency training exercises using alert-origination software.
 - We require periodic testing of the public television broadcast-based backup to the C-interface.
 - We allow federal, state, local, tribal and territorial entities, as well as non-governmental organizations (NGOs) in coordination with such entities to issue Public Service Announcements (PSAs) aimed at raising public awareness about WEA.
5. In addition, we adopt a *Further Notice of Proposed Rulemaking (Further Notice)* to provide a framework for further study where necessary, and to seek comment on new issues and opportunities to improve WEA that may warrant Commission action. Specifically, and as discussed in further detail below, we propose to ensure the continued provision of effective WEA Alert Messages while leveraging advancements in technology to improve WEA's multimedia, multilingual and geo-targeting capabilities. We also seek comment on methods of improving consumer choice about WEA and increasing the transparency of the WEA system for all WEA stakeholders.

II. BACKGROUND

6. In 2008, pursuant to the Warning, Alert and Response Network (WARN) Act,⁷ the Commission adopted rules allowing CMS Providers to voluntarily deliver timely and accurate emergency alerts over subscribers' mobile devices.⁸ The WARN Act required that the Commission undertake a series of actions, including the establishment and convening of an advisory committee to recommend technical requirements for WEA.⁹ Accordingly, the Commission formed the Commercial Mobile Service Alert Advisory Committee (CMSAAC).¹⁰ The CMSAAC submitted its report to the Commission on October 12, 2007, as required by the WARN Act.¹¹ The Commission subsequently promulgated rules governing WEA, within the timeframes established by the WARN Act.¹² The WARN Act gives the

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endorsed by the Disability Advisory Committee (DAC). *See* Letter from Susan Mazrui, Co-Chair, Disability Advisory Committee (DAC), to Marlene H. Dortch, Secretary, FCC, PS Docket No. 15-91 (filed Jun. 25, 2015).

⁷ On October 13, 2006, the President signed the Security and Accountability for Every Port (SAFE Port) Act into law. Title VI of the SAFE Port Act, also known as the WARN Act, establishes a process for the creation of a national mobile alerting system, now known as WEA, whereby Participating CMS Providers transmit emergency alerts to their subscribers. *See* Warning, Alert and Response Network (WARN) Act, Title VI of the Security and Accountability For Every Port Act of 2006, 120 Stat. 1884, *codified at* 47 USC § 1200, *et seq.* (2006) (WARN Act).

⁸ *See* 47 CFR § 10; *see also supra* note 1 (listing the rulemakings in which the Commission adopted these rules).

⁹ WARN Act §§ 603(a), (d), 47 USC § 1203(a), (d).

¹⁰ *See* Notice of Appointment of Members to the Commercial Mobile Service Alert Advisory Committee, Agenda for December 12, 2006 Meeting, *Public Notice*, 21 FCC Rcd 14175 (PSHSB 2006).

¹¹ *See* Federal Communications Commission Commercial Mobile Service Alert Advisory Committee (CMSAAC), PMG-0035 Commercial Mobile Alert Service Architecture and Requirements, at 66 (2007) (*CMSAAC Report*).

¹² WARN Act § 602(a), 47 USC § 1202(a) (requiring the Commission to promulgate technical standards for WEA within 180 days of receipt of the CMSAAC's recommendations); *id.* at § 602(c), 47 USC § 1202(c) (requiring the Commission to promulgate requirements for noncommercial educational broadcast stations or public broadcast stations to enable the distribution of geographically targeted messages within 90 days of the publication of its technical standards); *id.* at § 602(b), 47 USC § 1202(b) (requiring the Commission to promulgate election procedures for CMS Providers within 120 days of the publication of its technical standards); *id.* at § 602(f), 47 USC § 1202(f) (requiring the Commission to require by regulation technical testing for commercial mobile service

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Commission authority to adopt “relevant technical standards, protocols, procedures and other technical requirements based on the recommendations of such Advisory Committee necessary to enable commercial mobile service alerting capability for commercial mobile service providers that voluntarily elect to transmit emergency alerts.”¹³ The WARN Act also gives the Commission authority to adopt procedures whereby CMS Providers could specify their intent to the Commission to participate in WEA.¹⁴ Many CMS Providers, including the four nationwide wireless carriers, elected to participate in WEA, at least in part.¹⁵ Since it was deployed in April 2012,¹⁶ WEA has been used to issue over 21,000 emergency alerts, including severe weather warnings, evacuate and shelter-in place alerts, and America’s Missing: Broadcast Emergency Response (AMBER) Alerts.¹⁷

7. The WEA system is a tool for authorized federal, state and local government entities to geographically target Presidential, Imminent Threat, and AMBER Alerts to the WEA-capable mobile devices of Participating CMS Providers’ subscribers.¹⁸ As depicted in *Figure 1* below, a WEA Alert Message is sent by an authorized federal, state or local government entity using the Common Alerting Protocol (CAP) to the Federal Emergency Management Agency (FEMA)-operated Alert Aggregator via a secure, Internet-based interface (the A-Interface) where it is authenticated, validated and subsequently delivered to FEMA’s Alert Gateway (the B-Interface).¹⁹ At the FEMA Alert Gateway, the Alert Message

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providers that elect to transmit emergency alerts and for the devices and equipment used by such providers for transmitting such alerts).

¹³ *Id.* at § 602(a), 47 USC § 1202(a).

¹⁴ *Id.* at § 602(b), 47 USC § 1202(b). Under the WARN Act, CMS Providers could elect to participate in whole, in part, or not at all. *Id.* at § 602(b)(1)(B), 47 USC § 1202(b)(1)(B). CMS Providers who intended to participate in WEA were required to specify their intent to the Commission in writing. *See id.* at § 602(B)(2)(A), 47 USC § 1202(B)(2)(A) (requiring that “within 30 days after the Commission issues its order under [Section 602(b)], each licensee providing commercial mobile service shall file an election with the Commission with respect to whether or not it intends to transmit emergency alerts”).

¹⁵ *See* FCC, *Master CMAS Registry*, <https://www.fcc.gov/pshs/docs/services/cmas/MasterCMASRegistry.xls> (last visited Oct. 21, 2015); PS Docket No. 08-146 (containing a record of all Participating CMS Providers’ elections to participate in WEA). *See also* Policies Regarding Mobile Spectrum Holdings and Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, WT Docket No. 12-269 and Docket No. 12-268, Report and Order, 29 FCC Rcd 6133, 6206 & n.502 (2014) *citing* Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, WT Docket No. 11-186, *Sixteenth Report*, 28 FCC Rcd 3700, 3736-37, para. 26 (observing that “there are four nationwide providers in the U.S. with networks that cover a majority of the population and land area of the country – Verizon Wireless, AT&T, Sprint, and T-Mobile –” and referring to other providers with “networks that are limited to regional and local areas” as “non-nationwide providers.”); Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial mobile Services, WT Docket No 15-125, *Eighteenth Report*, 30 FCC Rcd 14515, 14520, para. 9 (2015).

¹⁶ *See* FCC’s Public Safety and Homeland Security Bureau Sets Timetable in Motion for Commercial Mobile Service Providers To Develop a System That Will Deliver Alerts to Mobile Devices, PS Docket No. 07-287, *Public Notice*, 24 FCC Rcd 14388 (PSHSB 2009).

¹⁷ *See* CTIA, *Wireless Emergency Alerts*, <http://www.ctia.org/your-wireless-life/consumer-tips/wireless-emergency-alerts> (last visited Oct. 20, 2015). The AMBER (America’s Missing: Broadcast Emergency Response) program is a nationwide alerting program designed to help bring missing children to safety. *See* Office of Justice Programs, *AMBERAlert.gov*, <http://www.amberalert.gov/about.htm> (last visited Jul. 23, 2016).

¹⁸ *See, e.g.*, 47 CFR § 10.450 (geo-targeting); 47 CFR § 10.430 (character limit); 47 CFR § 10.400 (classification).

¹⁹ *See infra* *Figure 1* (WEA Architecture). CAP is an open, interoperable, XML-based standard that can include multimedia such as streaming audio or video. *See* OASIS CAP v1.2 (IPAWS Profile for the OASIS Common Alerting Protocol IPAWS USA). CAP messages contain standardized fields that facilitate interoperability between and among devices. *See id.*

is prepared for delivery to the Participating CMS Provider by being converted to Commercial Mobile Alert for C-Interface (CMAC) format to render it readable by WEA-capable mobile devices. The Alert Message is then disseminated across a secure Internet-based interface (the C-Interface) to the Participating CMS Provider's Alert Gateway (CMSP Gateway) for distribution to mobile customers over cell broadcast (CMSP Infrastructure).²⁰

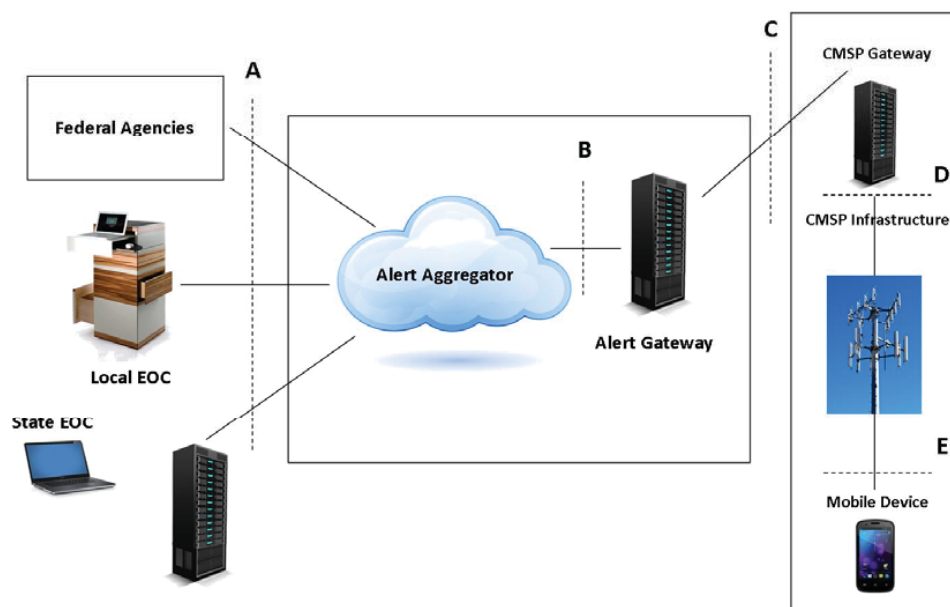


Figure 1: WEA Architecture

8. While the response to WEA from Participating CMS Providers and alert originators has been overwhelmingly positive, stakeholders continue to recommend steps that the Commission can take to require feasible improvements to WEA that can enhance its power as a life-saving tool. The Department of Homeland Security (DHS) has supported a number of research initiatives, including *WEA Mobile Penetration Strategy* that examined barriers to WEA adoption and options for improving WEA penetration, and the *START Reports* which sought to determine the optimal message contents for WEA.²¹

²⁰ From a technical standpoint, the WEA system currently deployed by FEMA and Participating CMS Providers is based on standards created by the Alliance for Telecommunications Industry Solutions (ATIS), the Telecommunications Industry Association (TIA) (jointly, ATIS/TIA), and the 3rd Generation Partnership Project (3GPP). See *CSRIC IV WEA Messaging Report* at 7. We note that nothing in the WARN Act or the Commission's rules requires WEA to be a cell-broadcast-based service.

²¹ Daniel Gonzales, Department of Homeland Security, Science and Technology, Wireless Emergency Alerts Mobile Penetration Strategy at 124 (2013) (*WEA Mobile Penetration Strategy*); Department of Homeland Security Study of Terrorism and Responses to Terrorism, Comprehensive Testing of Imminent Threat Public Messages for Mobile Devices (2014) (*START Report*); Department of Homeland Security Study of Terrorism and Responses to Terrorism, Comprehensive Testing of Imminent Threat Public Messages for Mobile Devices, at 29-30 (2015)

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Further, the Commission tasked its federal advisory committee, the Communications Security, Reliability, and Interoperability Council (CSRIC) IV, with reviewing the current WEA rules and recommending any appropriate changes.²² In 2014, CSRIC IV submitted two reports recommending rule changes and other actions to facilitate improvements to WEA.²³ The Government Accountability Office (GAO) also recommended that the FCC, in conjunction with FEMA, review and update rules governing character limitations, geo-targeting, and testing procedures.²⁴ In light of these concerns, and considering the many advancements in wireless technology since the adoption of the Commission's WEA rules in 2008, including the widespread use of smartphones and the development of 4G technologies,²⁵ in November 2015, we adopted the *WEA NPRM* to seek comment on several proposals designed to improve WEA and to facilitate more effective community-initiated alerting.²⁶ In January 2016, we sought further comment on the Nation's alerting capability in the *Alerting Paradigm NPRM*, including the extent to which WEA Alert Messages are currently available on tablets.²⁷

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(*Updated START Report*). START is a university-based research and education center, headquartered at the University of Maryland, comprised of an international network of scholars committed to the scientific study of the human consequences of terrorism in the United States and around the world. START was established in 2005 with Department of Homeland Security grant funding as a U.S. Department of Homeland Security Center of Excellence, tasked with utilizing state-of-the-art theories, methods, and data from the social and behavioral sciences to improve the understanding of the origins, dynamics, and social and psychological impacts of terrorism. See National Consortium for the Study of Terrorism and Responses to Terrorism (START), *About START*, <http://www.start.umd.edu/about/about-start> (last visited May 12, 2015).

²² See Larissa Herda, *CSRIC IV Working Group Descriptions and Leadership 2-3* (2014), <http://transition.fcc.gov/bureaus/pshs/advisory/csric4/CSRIC%20IV%20Working%20Group%20Descriptions%2010%2023%2014.pdf> (last visited Oct. 2, 2015). CSRIC is a federal advisory committee charged with providing recommendations to the FCC to ensure, among other things, the optimal security and reliability of communications systems, including telecommunications, media, and public safety systems, subject to the requirements of the Federal Advisory Committee Act (FACA). See 5 USCA § 10.

²³ See CSRIC IV, Working Group Two, *Wireless Emergency Alerts, Testing Subcommittee, Final Report*, at 7, 9 (2014), http://transition.fcc.gov/pshs/advisory/csric4/CSRIC_IV_WG-2_Testing-Rprt_061814.pdf (last visited Apr. 16, 2015) (*CSRIC IV WEA Testing Report*) (exploring various facets of the current WEA testing paradigm with the goal of developing an approach that would support an option for state and local "end-to-end" testing); *CSRIC IV WEA Messaging Report* (examining the feasibility and desirability of expanding the maximum character limit for Alert Messages; enhancing Alert Message content with multimedia; and improving WEA geo-targeting).

²⁴ See Government Accountability Office, *Emergency Alerting: Capabilities Have Improved, But Additional Guidance and Testing Are Needed*, GAO 13-375 (2013).

²⁵ Fourth generation (4G) mobile telecommunications technology standards include Long Term Evolution (LTE) and Worldwide Interoperability for Microwave Access (mobile WiMAX). See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, WT Docket 15-125, *Eighteenth Report*, 30 FCC Rcd 14515 (WTB 2015) (*2015 Competition Report*). "LTE increases the capacity and speed of wireless networks by redesigning and simplifying the network architecture to transition from the existing combination of circuit and packet switching to an all-IP architecture system." See Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket Nos. 12-332, 12-69, *Report and Order and Order of Proposed Modification*, 28 FCC Rcd 15122, 15126-27, para.7 (2013). A "smartphone" is a cellphone and handheld computer that has the functionality of a personal computer, but is compact, has a high-resolution screen, and supports voice recognition. See PCMag Encyclopedia, <http://www.pcmag.com/encyclopedia/term/51537/smartphone> (last visited May 14, 2015).

²⁶ *WEA NPRM*, 30 FCC Rcd 13781. We received 104 comments and 8 replies in response to the *WEA NPRM*.

²⁷ Amendment of Part 11 of the Commission's Rules Regarding the Emergency Alert System, Wireless Emergency Alerts, PS Docket Nos. 15-94, 15-91, *Notice of Proposed Rulemaking*, 31 FCC Rcd 594 (2016) (*Alerting Paradigm NPRM*). We received 71 comments and 7 replies to the *Alerting Paradigm NPRM*.

III. REPORT AND ORDER

A. Alert Message Content

1. Increasing Maximum Alert Message Length from 90 to 360 Characters

a. Background

9. Under Section 10.430 of the Commission's rules, WEA Alert Messages are limited to 90 characters.²⁸ In the *WEA First Report and Order*, the Commission concluded that a 90-character limit was appropriate to serve the public interest "at this initial stage" because it enabled all currently existing systems (mostly 2G and 3G networks defined herein as "legacy" networks)²⁹ to transmit Alert Messages with minimal change.³⁰ Further, the Commission reasoned that an initial 90-character limit was advisable because a person receiving a WEA Alert Message could choose to seek out additional information from other media sources should the Alert Message be insufficient.³¹ In the *WEA NPRM*, we proposed extending the character limit to 360 for those networks and devices for which it is technically feasible, while continuing to allow the delivery of 90-character messages on legacy networks and devices.³²

10. The majority of commenters support expanding the maximum character length for Alert Messages to 360 characters because it will increase the quality of information available to the public during emergencies and reduce public confusion caused by difficult-to-understand abbreviations.³³ Most commenters agree, however, that legacy networks cannot support transmission of a 360-character message.³⁴ To address this issue, FEMA recommends that in cases where the alert originator does not independently generate a 90-character maximum, free-form text message, the Integrated Public Alert and Warning System (IPAWS) will automatically generate a 90-character maximum message from the CAP parameters of the Alert Message (such as "hazard," "location" and "time") in order to provide a transmittable Alert Message to customers on legacy networks.³⁵ According to FEMA, this practice is

²⁸ 47 CFR § 10.430.

²⁹ See *Legacy Networks*, <https://www.techopedia.com/definition/25121/legacy-network> (last visited May 17, 2016).

³⁰ *WEA First Report and Order*, 23 FCC Rcd at 6174, para. 83.

³¹ See *id.*

³² *WEA NPRM*, 30 FCC Rcd at 13788, para. 9.

³³ See, e.g., AT&T Services Inc. Comments, PS Docket No. 15-91, 5 (Jan. 13, 2016) (AT&T Comments); T-Mobile USA, Inc. Comments, PS Docket No. 15-91, 3 (Jan. 13, 2016) (T-Mobile Comments); Sprint Corporation Comments, PS Docket No. 15-91, 3 (Jan. 13, 2016) (Sprint Comments); Verizon Comments, PS Docket No. 15-91, 2 (Jan. 13, 2016) (Verizon Comments); Microsoft Corporation Reply, PS Docket No. 15-91, 2 (Feb. 12, 2016) (Microsoft Reply); Association of Public-Safety Communications Officials-International, Inc. Comments, PS Docket No. 15-91, 3 (Jan. 13, 2016) (APCO Comments); Wireless RERC Comments, PS Docket No. 15-91, 6 (Jan. 13, 2016) (Wireless RERC Comments); Letter from Michael E. Gerber, Meteorologist, Office of Communications, NOAA/National Weather Service to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed May 21, 2015) (NWS May 21, 2015 *Ex Parte*); Federal Emergency Management Agency Integrated Public Alert and Warning System Program Management Office Comments, PS Docket No. 15-91, 1 (Feb. 13, 2016) (FEMA Comments); Disability Advisory Committee Comments, PS Docket No. 15-91, 1 (Jun. 17, 2016) (DAC Comments).

³⁴ See, e.g., AT&T Comments at 6-7; T-Mobile Comments at 4; Sprint Comments at 3-4; Microsoft Reply at 2.

³⁵ See Letter from Mark Lucero, Chief, IPAWS Engineering, FEMA National Continuity Programs, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 5-6 (filed Jun. 9, 2016) (FEMA Jun. 9, 2016 *Ex Parte*); accord AT&T Comments at 6-7 (stating that legacy networks could be supported by automatically parsing 90-character messages from 360-character messages, but that that operation should be completed in FEMA IPAWS). This filing amends FEMA's previous statement that "[i]n no case should the IPAWS system be responsible for this [message parsing] function." See Letter from Alfred Kenyon, IPAWS Engineering Branch, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Mar.

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consistent with the current ATIS/TIA C-interface specification for how to handle WEA Alert Messages that do not contain 90-character maximum, free-form text, and could easily be applied to 360-character maximum Alert Messages that do not contain 90-character maximum, free-form text.³⁶

b. Discussion

11. We amend Section 10.430 to expand the character limit for Alert Messages from 90 to 360 characters for 4G-LTE and future networks. A 360-character maximum Alert Message length balances emergency managers' needs to communicate more clearly with their communities with the technical limitations of CMS networks. While Hyper-Reach states that support for "1,000+" characters would be preferable because it would be consistent with the *START Report's* findings that messages longer than 1,380 characters produce "better outcomes for interpretation, personalization and milling, than did the standard 90-character WEA message,"³⁷ this approach is not supported by the weight of the record.³⁸ Beaufort County cautions, for example, that "people will stop reading" Alert Messages once they get past the second screen of text, diminishing the value of any additional characters that extend beyond that,³⁹ and moreover, longer Alert Messages may contribute to distracted driving.⁴⁰ On balance,

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17, 2016) (FEMA Mar. 17, 2016 *Ex Parte*). See also *infra* para. 14 (explaining in further detail how this approach will work). IPAWS is the Nation's federal alert and warning system, and is administered by FEMA. See Integrated Public Alert & Warning System, <https://www.fema.gov/integrated-public-alert-warning-system> (last visited Aug. 22, 2016).

³⁶ FEMA Jun. 9, 2016 *Ex Parte* at 5. Some alert origination software may also become able to automatically parse a 90-character Alert from a 360-character Alert Message. See APCO Comments at 4 ("APCO believes that the software used by public safety alert originators can break up messages as needed, so that consumer devices limited to 90-character alerts would still be able to receive longer messages as separate alerts until the full message length is transmitted."); Clark County Office of Emergency Management Comments, PS Docket No. 15-91, 1 (Jan. 13, 2016) (CCOEM Comments) (stating that messaging software providers should make such an option available); Letter from Tom Crane, Regulatory Counsel, Everbridge, to Marlene Dortch, Secretary, Federal Communication Commission, PS Docket No. 15-91, at 1 (filed May 12, 2016) (Everbridge May 12, 2016 *Ex Parte*) (stating that "[i]t makes more sense if IPAWS gateway accepts any length message and parses the message as needed" but also that "Everbridge software could parse a message into required pieces given appropriate lead time and provide the pieces in the required order within the XML document; Everbridge recommends IPAWS consider implementing a sequencing attribute so the consuming applications downstream know the order in which to concatenate the message pieces."); Letter from Brian Murray, Emergency Public Information Planner, Harris County Office of Homeland Security & Emergency Management, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 2 (filed Mar. 8, 2016) (revised by *erratum*) (Harris County OHSEM Mar. 8, 2016 *Ex Parte*); Indiana Department of Homeland Security Comments, PS Docket No. 15-91, at 3 (Dec. 14, 2015) (Indiana DHS Comments); Jefferson Parish Emergency Management Comments, PS Docket 15-91, 1 (Dec. 14, 2015) (Jefferson Parish EM Comments); New York City Emergency Management Comments, PS Docket 15-91, at 2 (Dec. 29, 2015) (NYCEM Comments); *but see* United States Geological Survey Comments, PS Docket No. 15-91, 1 (Jan. 13, 2016) (USGS Comments) (stating that this may be undesirable because it would undermine many of the expected benefits of expanded character length (*e.g.*, jargon would still be needed to express the full message in the first 90 characters)).

³⁷ Sam Asher Computing Services, Inc., dba Hyper-Reach, PS Docket No. 15-91, at 3 (Jan. 13, 2016) (Hyper-Reach Comments) (Hyper-Reach is a mass notification provider); *START Report* at 30.

³⁸ See, *e.g.*, T-Mobile Reply, PS Docket No. 15-91, 3 (Feb. 12, 2016) (T-Mobile Reply); Verizon Comments at 6-7; The Weather Company Comments, PS Docket No. 15-91, 1 (Feb. 12, 2016) (The Weather Company Comments).

³⁹ See Verizon Comments at 6-7 (stating that "much higher character limits—such as the 1,380 character message described in the NPRM or the use of multiple-part messages for legacy networks—would require new standards development as well as network and device upgrades that network vendors may be reluctant to embrace for legacy networks"); Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments, PS Docket No. 15-91, 1 (Jan. 12, 2016) (Beaufort County Comments) (reasoning that approximately 280 characters fit on a mobile device screen); see also Kansas City Emergency Management Comments, PS Docket No. 15-91, 1 (Dec. 2, 2015) (Kansas City EM Comments).

we find that a 360-character maximum for Alert Message text “is appropriate for disseminating official, targeted, immediate, and actionable information.”⁴¹ We note that establishing 360 characters as the maximum character length leaves emergency managers free to issue Alert Messages that are shorter than 360 characters in appropriate situations. We defer to emergency managers’ experience and best practices to determine the appropriate message length for their particular needs.

12. We also find that expanding the maximum character length to 360 for 4G-LTE networks is technically feasible. As we observed in the *WEA NPRM*, CSRIC IV recommended that the Commission expand the character limit for WEA Alert Messages on 4G LTE networks to a maximum of 280 characters, pending confirmation by the Alliance for Telecommunications Industry Solutions (ATIS) that such an increase would be feasible.⁴² Not only did ATIS’ feasibility study conclude that it was feasible for 4G-LTE networks to transmit 280-character WEA Alert Messages, but it found that Participating CMS Providers could transmit 360-character Alert Messages just as easily.⁴³ ATIS found that transmission of WEA Alert Messages longer than 360 characters, on the other hand, would cause additional delays in the delivery of the Alert Message and could drain battery life.⁴⁴ Commenting Participating CMS Providers and device manufacturers agree.⁴⁵ In addition to the feasible steps that compliance with this rule will require Participating CMS Providers to take, FEMA states that the increased message length will require “software modifications to CAP message authoring tools, IPAWS OPEN, [and] the ‘C’ Interface.”⁴⁶ We find that we can achieve our goal of expanding the maximum

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⁴⁰ See Wyoming Department of Transportation Comments, PS Docket No. 15-91, 2 (Jan. 13, 2016) (Wyoming DOT Comments); Beaufort County Comments at 1; *see also* Letter from Matthew Straeb, Executive Vice President, Global Security Systems, LLC, to David G. Simpson, Bureau Chief, Public Safety and Homeland Security Bureau, Federal Communications Commission, PS Docket No. 15-91, at 2 (filed Apr. 24, 2015) (Global Security Systems *Ex Parte*) (stating that “WEA service is not intended to be a reading service” and should only include pertinent “life-saving information for the Citizen.”). We urge all consumers to pull over if they receive a WEA Alert Message while driving and want to read it. *See* [Distraction.gov](http://www.distraction.gov/), <http://www.distraction.gov/> (last visited Aug. 29, 2016) (containing information and guidance on how to stay safe while driving).

⁴¹ APCO Comments at 3.

⁴² *See CSRIC IV WEA Messaging Report* at 44.

⁴³ *See* ATIS, Feasibility Study for LTE WEA Message Length 18-19 (2015) (*ATIS Feasibility Study for LTE WEA Message Length*).

⁴⁴ *Id.* at 17-18.

⁴⁵ *See* AT&T Comments at 6 (“The use of 360 characters as described in the ATIS (Alliance for Telecommunications Industry Solutions) Feasibility Study is a compromise solution that delivers a longer message to the user without adding significant delays in its delivery.”); T-Mobile Comments at 3 (“T-Mobile supports expanding the maximum permissible length of WEA messages from 90 to 360 characters of alphanumeric text for 4G LTE and future network technologies.”); Sprint Comments at 3 (“Based on the CSRIC IV recommendations, it may be appropriate to expand the maximum permissible length of WEA messages for LTE technologies.”); Verizon Comments at 2 (“Expanding alerts to a 360-character maximum for LTE-enabled networks and devices is technically feasible and in the public interest to enable alert originators to provide additional emergency information to consumers.”); Verizon Comments at 2 (“Expanding alerts to a 360-character maximum for LTE-enabled networks and devices is technically feasible and in the public interest to enable alert originators to provide additional emergency information to consumers.”); *see also, e.g.*, Microsoft Reply at 2 (“Microsoft is not opposed to the expansion of alert lengths to 360 characters for LTE-capable devices on LTE networks in accordance with standards once they are developed and to the extent all the technical and implementation issues are resolved.”).

⁴⁶ FEMA Comments at 2. CSRIC IV observes that these standards and associated supplements would include, but are not limited to, the following: (1) ATIS-0700008 (Cell Broadcast Entity (CBE) to Cell Broadcast Center (CBC) Interface Specification); (2) ATIS-0700010 (CMAS via EPS Public Warning System Specification); (3) ATIS-0700014 (Implementation Guidelines for CMAS Handling of CMAS, Supplemental Information Broadcast); (4) J-STD-100 (*ATIS/TIA Mobile Device Behavior Specification*); (5) J-STD-101 (Joint ATIS/TIA CMAS Federal Alert Gateway to CMSP Gateway Interface Specification); (6) J-STD-102 (Joint ATIS/TIA CMAS Federal Alert Gateway

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character limit for WEA Alert Messages on 4G-LTE networks without presenting WEA stakeholders with undue technical burdens.

13. We also find, however, that we should continue to allow Participating CMS Providers to transmit 90-character Alert Messages on legacy networks until those networks are retired. While many public safety commenters, including APCO and Harris County OSHEM, state that it would be feasible and desirable to support 360-character Alert Messages on legacy networks by linking together (concatenating) multiple 90-character messages,⁴⁷ we are convinced by AT&T that message concatenation would be problematic because “[m]essages are not guaranteed to be received by the device in the correct order,” which would likely cause confusion that would be exacerbated during the pendency of multiple alerts.⁴⁸ Further, according to AT&T, concatenating 90-character Alert Messages on legacy networks would have an adverse effect on mobile device battery life.⁴⁹ T-Mobile, Sprint and Microsoft agree that, unlike 4G-LTE networks, it would be infeasible to expand the character limit for legacy networks due to the technical limitations of those networks, and because of financial disincentives to continue to update networks that will soon be retired.⁵⁰ The risks that public confusion and other complications would result from Alert Message concatenation are too great for public safety messaging where the potential for panic is heightened, and the consequences of misinterpretation could be deadly.

14. Emergency managers will be free to transmit an Alert Message containing as many as 360 characters as of the rules’ implementation date.⁵¹ FEMA IPAWS will make this possible, while also

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to CMSP Gateway Interface Test Specification); (7) 3GPP TS 23.041 (3GPP Technical realization of Cell Broadcast Service (CBS)); and (8) OASIS CAP v1.2 (IPAWS Profile for the OASIS Common Alerting Protocol IPAWS USA). See *CSRIC IV WEA Messaging Report* at 50.

⁴⁷ See Letter from Jeffrey S. Cohen, Chief Counsel, Association of Public-Safety Communications Officials, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Mar. 22, 2016) (APCO Mar. 22, 2016 *Ex Parte*) (stating that “carriers should automatically concatenate and label messages appropriately” and stating further that “it may be possible that alert origination software products could perform this function”); Letter from Harris County Office of Homeland Security & Emergency Management, to Marlene Dortch, Secretary, Federal Communications Commission, at 2 (filed Mar. 7, 2016) (Harris County OSHEM Mar. 7, 2016 *Ex Parte*). (“Harris County supports the option of releasing four concatenated messages”); Indiana DHS Comments at 3 (“The ability to send multiple 90 character WEAs in the interim would be a workable solution from the alerting agency’s perspective.”); Jefferson Parish EM Comments at 1 (“If technology allows please let 90 characters phones receive multiple messages to receive the full 360 characters.”); NYCEM Comments at 2; *cf.* Letter From David Blonder, Director, Legal Counsel, Regulatory and Privacy, BlackBerry Corporation, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Mar. 21, 2016) (BlackBerry Mar. 21, 2016 *Ex Parte*) (noting that Alert Message concatenation would not contribute to alert delivery latency).

⁴⁸ See Letter from William L. Roughton, Counsel, AT&T Services Inc., to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Mar. 17, 2016) (AT&T Mar. 17, 2016 *Ex Parte*); AT&T Comments at 8; T-Mobile Reply at 4; Microsoft Reply at 2.

⁴⁹ See AT&T Mar. 17, 2016 *Ex Parte* at 1.

⁵⁰ See, e.g., AT&T Comments at 7 (“[T]hese networks cannot receive 360-character WEA messages.”); T-Mobile Comments at 4 (“90-character limit on WEA messages on 2G and 3G networks . . . should be maintained due to limitations on these networks and the rapid transition of consumers to 4G LTE.”); Sprint Comments at 5; Microsoft Reply at 2. These commenters also state that an approach based on concatenation would be infeasible. See AT&T Comments at 6-7; T-Mobile Comments at 4; Sprint Comments at 3-4; Microsoft Reply at 2.

⁵¹ See *infra* Section III.D (Compliance Timeframes). Where the alert originator provides no free-form 90-character maximum text, IPAWS’ existing capabilities will automatically generate a 90-character maximum Alert Message from the CAP fields of a 360-character free-form message. FEMA Jun. 9, 2016 *Ex Parte* at 5. We note that many emergency managers have expressed a desire to send two separate free-form messages under this rule; our approach affords emergency managers to do so where they so choose. See, e.g., Hyper-Reach Comments at 2, 3 (stating that superior message quality will result if emergency management agencies retain responsibility for message creation because emergency management agencies have the most knowledge about public safety messaging, and will better

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ensuring that all community members in the target area, including those on legacy networks, can receive an Alert Message, by automatically generating a 90-character Alert Message from the CAP fields of a 360-character message for distribution on legacy networks whenever an emergency manager transmits only a 360-character Alert Message.⁵² Once a CMS network is able to support 360-character messages, it will cease to receive the 90-character version, and begin to receive the full 360-character version instead.⁵³ CSRIC IV and FEMA attest that this co-existence of 90- and 360-character Alert Messages is technically feasible.⁵⁴ Indeed, FEMA IPAWS already treats Alert Messages that do not contain free-form text in this manner, and their approach is consistent with the methodology that the Participating CMS Provider Alert Gateway will use to process Alert Messages in multiple languages.⁵⁵ For example, if FEMA IPAWS receives an Alert Message today without free-form text, it will use the CAP parameters [hazard][location][time][guidance][source] to generate Alert Message text along the lines of “Tornado Warning in this area until 6:30 PM. Take Shelter. Check Local Media. –NWS.”⁵⁶ The CMS Provider Alert Gateway will send the longer free-form message to devices on 4G-LTE networks, and the automatically generated 90-character Alert Message to mobile devices on legacy networks.⁵⁷ This is illustrated as “Scenario 4” in *Figure 2* below.⁵⁸ This figure illustrates that, pursuant to the approach we

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suited for creating two separate and effective messages than would Participating CMS Providers or FEMA); Letter from Michael Gerber, Program Analyst, Office of Dissemination, NOAA/National Weather Service, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Mar. 9, 2016) (NWS Mar. 9, 2016 *Ex Parte*) (concluding that they would “prefer to provide both a freeform 360 and 90 character message for 4G LTE networks and legacy networks, respectively.”).

⁵² See FEMA Jun. 9, 2016 *Ex Parte* at 5.

⁵³ *Id.*; see also FEMA Mar. 17, 2016 *Ex Parte* Letter (“Under CAP parameters, there is a single identification number for each alert message. A single alert message may contain both 90 and 360 character message elements for display on WEA capable devices. Devices would process both and display a message dependent upon the device capability and the network to which the devices are connected. Each character length message may have a unique identifier that a device would identify. A device on a 4G LTE network would get both messages and display the correct message, while a legacy network would only receive a 90 character message.”).

⁵⁴ CSRIC IV supports the coexistence of different message-length standards for legacy and 4G networks. *Cf. CSRIC IV WEA Messaging Report* at 44 (“It is recommended that the industry modify existing CMAS/WEA standards to support coexistence of both the legacy 90 characters of displayable text for use on 2nd and 3rd Generation CMS Provider Infrastructure, and a message length of 280 displayable characters for 4G LTE CMS Provider Infrastructure including the addressing of backward compatibility issues.”); see also FEMA Mar. 17, 2016 *Ex Parte* Letter (“Under CAP parameters, there is a single identification number for each alert message. A single alert message may contain both 90 and 360 character message elements for display on WEA capable devices. Devices would process both and display a message dependent upon the device capability and the network to which the devices are connected. Each character length message may have a unique identifier that a device would identify. A device on a 4G LTE network would get both messages and display the correct message, while a legacy network would only receive a 90 character message.”).

⁵⁵ See FEMA Jun. 9, 2016 *Ex Parte* at 5 (stating, as well, that “[f]rom the CMSP Gateway perspective, this methodology is identical to the working proposal for Spanish language message retrieval”).

⁵⁶ Annex A of the *Joint ATIS/TIA Federal Alert Gateway to CMSP Gateway Interface Specification* (J-STD-101) contains guidelines for the generation of the alert message in English from the CAP parameters, identifies the CAP parameters to be used for the message generation, and associates CAP parameter values with the recommended phrase for the alert message. Annex A of the *ATIS Implementation Guidelines for CMAS Supplemental Information Retrieval* (ATIS-0700012) contains similar guidelines for the generation of Spanish alert messages from the CAP message. See *CSRIC IV WEA Messaging Report* at 17.

⁵⁷ This is the same approach that FEMA IPAWS currently takes to generating a 90-character Alert Message from the CAP parameters of an Alert Message that contains no free-form text.

⁵⁸ See *infra Figure 2* (Our Approach to Expanding the Character Limit).

adopt today, no matter how an alert originator transmits a WEA Alert Message, members of their community in the target area will receive a version of it.

WEA Alert Messaging Under New Character Length Rules

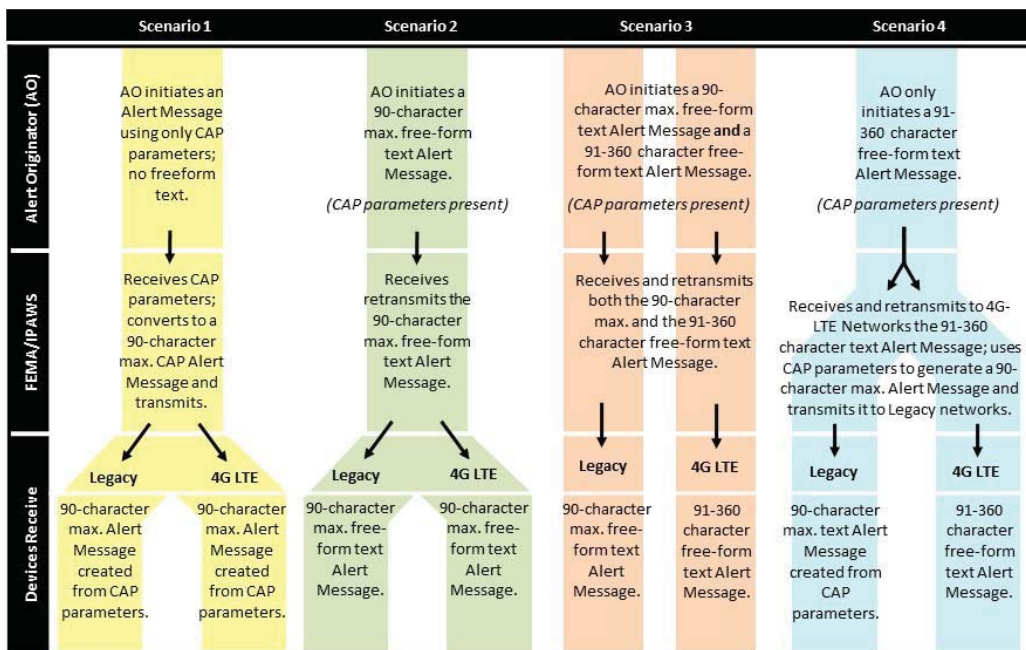


Figure 2: Our Approach to Expanding the Character Limit

15. Increasing the maximum character length for WEA Alert Messages will produce valuable public safety benefits. Emergency managers state that the current 90-character limit is insufficient to communicate clearly with the public because 90-character Alert Messages rely on difficult-to-understand jargon and abbreviations.⁵⁹ Expanding the character limit will reduce reliance on these potentially confusing terms and will allow emergency managers to provide their communities with information that is clear and effective at encouraging swift protective action.⁶⁰ The value of this benefit will be increased

⁵⁹ See Wireless RERC Comments, PS Docket 15-91, at 7 (Jan. 13, 2016) (Wireless RERC Comments); San Francisco International Airport Safety & Security Services Comments, PS Docket No. 15-91, 1 (Jan. 13, 2016) (San Francisco Int'l Airport Safety & Security Services Comments); California Governor's Office of Emergency Services Comments, PS Docket No. 15-91, 2 (Dec. 14, 2015) (California Governor's OES Comments); Eagle County, Colorado Emergency Management Comments, PS Docket No. 15-91, 1 (Jan. 12, 2016) (Eagle County EM Comments); NYCEM Comments at 3.

⁶⁰ See, e.g., Florida Department of Law Enforcement Comments, PS Docket No. 15-91, 1 (Jan. 20, 2016) (Florida Dept. of Law Enforcement Comments); Winnebago County Emergency Management Comments, PS Docket No. 15-91, 1 (Nov. 23, 2015) (Winnebago County EM Comments); Denver Office of Emergency Management and Homeland Security Comments, PS Docket 15-91, at 1 (Dec. 9, 2015) (Denver OEMHS Comments); City of Austin Homeland Security and Emergency Management Comments, PS Docket No. 15-91, 2 (Jan. 13, 2016) (Austin HSEM Comments); CCOEM Comments at 1; City of Houston Office of Public Safety and Homeland Security Comments, PS Docket No. 15-91, at 2 (Jan. 12, 2016) (Houston OPHS Comments); Jefferson Parish EM Comments at 1; International Association of Firefighters Comments, PS Docket No. 15-91, 1 (Jan. 6, 2016) (IAFC Comments); (continued....)

when taken together with several of the improvements that we adopt in this *Report and Order*. For example, according to Jefferson Parish Emergency Management, the additional characters are necessary to adequately communicate critical information, such as shelter locations, that could prevent unnecessary loss of life and property damage.⁶¹ The additional characters will also support the inclusion of embedded references in Alert Messages,⁶² help facilitate message comprehension for individuals with disabilities,⁶³ and will facilitate the translation of English-language Alert Messages into the Spanish language.⁶⁴ Further, our approach to the co-existence of 90- and 360-character Alert Messages has the additional benefit of ensuring that emergency managers will be able to simply initiate one 360-character Alert Message in instances where every second counts.⁶⁵ In sum, this action will improve the likelihood that the public will understand and properly respond to WEA Alert Messages, increasing the likelihood that WEA will save lives.

2. Establishment of a New Alert Message Classification (Public Safety Messages)

a. Background

16. Section 10.400 of the Commission's WEA rules provides for three classes of WEA: (1) Presidential Alert; (2) Imminent Threat Alert; and (3) AMBER Alert.⁶⁶ For an alert originator to issue an Alert Message using WEA, it must fall within one of these three classifications.⁶⁷ The Commission adopted these requirements in the *WEA First Report and Order* because it found that adopting additional classes of Alert Messages, such as traffic advisories, would be inconsistent with the WARN Act's direction to the Commission to enable an "emergency" alerting system, and because if the public were to

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County of San Joaquin Office of Emergency Services Comments, PS Docket No. 15-91, 1 (Dec. 23, 2015) (San Joaquin OES Comments); Ventura County Sheriff Office of Emergency Services Comments, PS Docket No. 15-91, 1 (Dec. 21, 2015) (Ventura County Sheriff EMS Comments).

⁶¹ See, e.g., Jefferson Parish EM Comments at 1; Indiana DHS Comments at 3; Pinellas County Emergency Management Comments, PS Docket 15-91, 3 (Jan. 13, 2016) (Pinellas County EM Comments). Such information would be helpful to include in "Public Safety Messages," a new Alert Message classification we adopt today. See *infra* Section III.A.2 (Establishment of a New Alert Message Classification).

⁶² City of Lexington, Division of Emergency Management Comments, PS Docket No. 15-91, 1 (Jan. 11, 2016) (Lexington Division of Emergency Management Comments); see also *infra* Section III.A.3 (Supporting Embedded References).

⁶³ See Letter from Wireless RERC, to Marlene H. Dortch, Secretary, Federal Communications Commission, Re: Open Proceedings of the Emergency Alert System and the Commercial Mobile Alert System, April 25, 2011 at 28 (indicating that 46 percent of survey participants who were deaf found the 90-character message length "too short"), <http://www.wirelessrerc.gatech.edu/sites/default/files/publications/Ex%20Parte%20WEC%20filing%20%28final%209.doc>; <http://www.wirelessrerc.gatech.edu/content/publications/emergency-communications-and-people-disabilities> (last visited June 19, 2015); DAC Comments at 1. We note that this proceeding addresses, but does not close accessibility issues that we raised in the *Alerting Paradigm NPRM*. See generally, *Alerting Paradigm NPRM*, 31 FCC Rcd 594, paras. 95-97.

⁶⁴ More characters tend to be required to communicate a concept in Spanish than in English. See *Why Spanish Uses More Words than English*, Transfluent, available at <https://www.transfluent.com/fi/2015/07/why-spanish-uses-more-words-than-english-an-analysis-of-expansion-and-contraction/> (last visited Mar. 29, 2016); see also *infra* Section III.A.4 (Supporting Spanish-language Alert Messages).

⁶⁵ NYCEM recognizes that if emergency managers were to be required to initiate both 90- and 360-character Alert Messages, as permitted by the CAP standard, the potential for message delivery delays could be particularly acute for emergency management agencies that are short-staffed. NYCEM Mar. 8, 2016 *Ex Parte* at 2; Hyper Reach Comments at 3.

⁶⁶ 47 CFR § 10.400.

⁶⁷ *Id.*

receive alerts that did not relate to *bona fide* emergencies, it would risk increasing consumer opt out.⁶⁸ In the *WEA NPRM*, we proposed to add a fourth Alert Message classification, “Emergency Government Information,” defined as an essential public safety advisory that prescribes one or more actions likely to save lives and/or safeguard property.⁶⁹ The *WEA NPRM* proposed to allow Participating CMS Providers to enable consumers to opt out of receiving this new Alert Message classification through existing settings on their devices, and sought comment on appropriate contexts for sending such Alert Messages.⁷⁰

17. AT&T and the majority of emergency managers support creating a new Alert Message classification.⁷¹ Some commenters, including FEMA, support the creation of a new Alert Message classification, but suggest modifications to our proposed approach.⁷² A cross-section of commenters, including the majority of Participating CMS Providers and some emergency managers, urge the Commission to instead clarify that the types of Alert Messages that emergency managers want to issue under a new Alert Message classification can be issued as Imminent Threat Alerts.⁷³

b. Discussion

18. We amend Section 10.400 to create a fourth classification of Alert Message, “Public Safety Message.” Whereas we proposed to name this new Alert Message classification “Emergency Government Information” in the *WEA NPRM*, we agree with FEMA that it should be named “Public Safety Message” because the title “Emergency Government Information” is “vague and could be confusing,” and because FEMA’s recommended title more accurately describes the intended message content.⁷⁴ We define a Public Safety Message as “an essential public safety advisory that prescribes one or more actions likely to save lives and/or safeguard property,” as we proposed.⁷⁵ By defining Public

⁶⁸ *WEA First Report and Order*, 23 FCC Rcd at 6155-56, para. 27.

⁶⁹ *WEA NPRM*, 30 FCC Rcd at 13792, para. 18.

⁷⁰ *Id.* at 13793-94, paras. 19, 21.

⁷¹ *See, e.g.*, AT&T Comments at 11; Hyper-Reach Comments at 3; APCO Comments at 5; AWARN Coalition Comments, PS Docket No. 15-91, 4 (Dec. 14, 2015) (AWARN Coalition Comments); Clarion County Office of Emergency Services Comments, PS Docket No. 15-91, 1 (Nov. 25, 2015) (Clarion County OES Comments); NYCEM Comments at 5; City of Peoria Emergency Communications Center Comments, PS Docket No. 15-91, 1 (Jan. 7, 2016) (Peoria ECC Comments); Ashtabula County Emergency Management Agency, PS Docket No. 15-91, 2 (Dec. 14, 2015) (Ashtabula County EMA Comments); California Governor’s OES Comments at 3; USGS Comments at 1.

⁷² *See, e.g.*, FEMA Comments at 2 (“[R]ecommending that this new Alert Message classification be called a “Public Safety Message”); NYCEM Comments at 5 (recommending that our definition of this new Alert Message classification hinge on an emergency managers’ opinion about whether it is appropriate to send an alert, and stating that it should include a stipulation that the Alert Message be “time sensitive”); Hyper-Reach Comments at 3 (stating that the Commission should clarify that “permitted messages include those designed to prevent sickness and promote public safety in general, in addition to saving lives and safeguarding property”).

⁷³ *See* Boulder Regional Emergency Telephone Services Authority Comments, PS Docket 15-91, at 15 (Jan. 13, 2016) (BRETSA Comments) (stating that “WEA should be reserved for Imminent Threat Alerts” and that “[t]here are other notification tools which can fill the need of emergency government information such as boil water alerts.”); T-Mobile Comments at 5; Sprint Comments at 6-7; Microsoft Reply at 4; Alliance for Telecommunications Industry Solutions Comments, PS Docket No. 15-91, at 9 (Jan. 13, 2016) (ATIS Comments); Cellular Telephone Industries Association, PS Docket No. 15-91, 10 (Jan. 14, 2016) (CTIA Comments); NWS Comments at 2-3; San Joaquin OES Comments at 1; NYCEM Comments at 5; BRETSA Comments at 15; Douglas County, WA Emergency Management Comments, PS Docket No. 15-91, at 1 (Jan. 11, 2016) (Douglas County EMA Comments); Beaufort County Comments at 2; CCOEM Comments at 1; San Francisco Int’l Airport Safety & Security Services Comments at 1.

⁷⁴ *See* FEMA Comments at 2.

⁷⁵ *See* *WEA NPRM*, 30 FCC Rcd at 13792-93, para. 18; *see also infra* para. 22 (explaining that while a Public Safety Message may be as essential to public safety as an Imminent Threat Alert, it would not be appropriate to issue
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Safety Messages in this way and by tailoring their use as we describe below, we strike an appropriate balance between some commenters' requests for discretion in the use of this new Alert Message classification,⁷⁶ and others' warnings that Public Safety Messages may be overused and contribute to alert fatigue if they are defined in an over-inclusive manner.⁷⁷

19. Public Safety Messages will only be eligible for issuance in connection with an Imminent Threat Alert, an AMBER Alert, or a Presidential Alert, as recommended by AT&T, CTIA and several emergency management agencies.⁷⁸ We agree with Mason County EM that "if this category were utilized as a standalone alerting classification . . . it would desensitize the public" to the urgency of response to WEA Alert Messages.⁷⁹ In this way, we do not expand the definition of an "emergency" situation in which it is appropriate to issue an Alert Message, but add a tool to emergency managers' alerting toolkit to improve their ability to communicate with the public during and after emergencies in a manner that naturally complements existing Alert Message classifications. We note that several commenters state that our new Alert Message classification should be eligible for issuance even in the absence of another Alert Message type.⁸⁰ If we were to allow Public Safety Messages to stand alone, however, it would expand the definition of an "emergency" during which the issuance of a WEA Alert Message is appropriate, contrary to our reasoning in the *WEA First Report and Order* that the existing Alert Message classifications are sufficient to communicate information about "bona fide emergencies."⁸¹ Further, we believe that a broader definition of an "emergency" would risk increasing alert fatigue and consumer opt out.

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Public Safety Messages as Imminent Threat Alerts because the required elements of "urgency," "severity" and "certainty" describe the underlying alert condition, not the supplemental instructions that Public Safety Messages are intended to provide).

⁷⁶ NYCEM Comments at 5 (stating that the Commission should adopt a broader definition of Public Safety Messages to encompass "advisories that, in the opinion of the alert originator, provide time-sensitive information about an emergency condition or situation to promote the public's situational awareness"); Jefferson Parish EM Comments at 2 (stating that a new Alert Message classification should be a "catch-all alert [for] non-previously categorized messages"); Houston OPHS Comments at 2 ("This additional category would serve as a "catch-all" for appropriate, actionable, life-saving information that may not be currently available in WEA"); Hyper-Reach Comments at 3 (requesting that we clarify that "messages designed to prevent sickness and promote public safety in general, in addition to saving lives and safeguarding property" are appropriate for issuance as Public Safety Messages).

⁷⁷ See, e.g., Indiana DHS Comments at 3; Jefferson Parish EM Comments at 2; Douglas County EMA Comments at 1; See CCOEM Comments at 1; see also APCO Comments at 5 ("APCO encourages the Commission to adopt and apply a definition that prevents expanding use of WEA too far.").

⁷⁸ See, e.g., AT&T Comments at 11 (stating that the new Alert Message classification should be directly related to a WEA alert); Mason County EM Comments at 1; accord CTIA Comments at 10 (stating that use of a new Alert Message classification should be limited to imminent threats); Matanuska-Susitna Borough Comments, PS Docket 15-91, at 1 (Dec. 2, 2015) (Matanuska-Susitna Borough Comments).

⁷⁹ Mason County EM Comments at 1.

⁸⁰ See, e.g., NYCEM Comments at 6 ("Instead, the Commission should develop guidelines that permit alert originators to use this message class if, in its opinion, a condition requires an acute level of individual awareness or action as a result of an emergency condition"); Jefferson Parish EM Comments at 2; Houston OPHS Comments at 2; CCOEM Comments at 1; Vail Public Safety Communications Center and Vail Police Department Comments, PS Docket 15-91, 1 (Dec. 15, 2015) (Vail PSCC and PD Comments); Osage County Emergency Management Agency Comments, PS Docket 15-91, 1 (Nov. 25, 2015) (Osage County EMA Comments); see also Verizon Comments at 10; CTIA Comments at 10; Indiana DHS Comments at 3.

⁸¹ *WEA First Report and Order*, 23 FCC Rcd at 6155-56, para. 27.

20. Any entity authorized to use WEA may initiate Public Safety Messages. Some commenters state that we should limit eligibility to issue Public Safety Messages to government entities.⁸² This may be because it would not make sense for non-governmental entities to issue Alert Messages under our proposed title, “Emergency Government Information.” Moreover, we agree with the majority of emergency managers treating the issue that all entities that have completed FEMA IPAWS alert originator authorization process may send Public Safety Messages.⁸³ We thus defer to FEMA, as we have done since WEA’s deployment, to determine the suitability of agencies as WEA alert originators.⁸⁴

21. Within this framework, we agree with commenters that the development of best practices around the use of Public Safety Messages will help ensure that this new Alert Message classification is used appropriately.⁸⁵ NYCEM offers a number of best practices that would help inform emergency managers’ determination of whether it is appropriate to send a Public Safety Message. These best practices include answering the following questions prior to initiating a Public Safety Message: “Is your emergency operations center activated?” “Has a competent, authorized party declared a state of emergency and/or are emergency orders being issued?” “Is there a need for broad public action or awareness of a condition that is occurring or likely to occur?” “Will the message prevent public fear or serve to preserve critical public safety functions that are (or could be) overwhelmed (e.g., inappropriate use of 911)?”⁸⁶ We encourage emergency management agencies to build upon these best practices and incorporate them into any alert origination training modules that they may develop for their staff. We expect that emergency managers will be best positioned to determine the specific situations in which it is appropriate to issue Public Safety Messages. We will monitor the use of this new Alert Message classification, and will take further action in the event it becomes evident that our adopted definition is either too narrow or too broad.

22. We do not agree with commenters that, rather than create a new Alert Message classification, we should clarify that the types of Alert Messages that would be issued as Public Safety

⁸² See, e.g., Pinellas County EM Comments at 5; Cochise County Office of Emergency Services Comments, PS Docket No. 15-91, at 1 (Dec. 7, 2015) (Cochise County OES Comments).

⁸³ See, e.g., Nebraska State Emergency Communication Committee Comments, PS Docket No. 15-91, at 1 (Dec. 17, 2015) (Nebraska SECC Comments); Douglas County EMA Comments at 1; Vail PSCC and PD Comments at 1.

⁸⁴ Under FEMA guidelines, a federal, state, local, tribal or territorial entity that applies for authority for the use of the Integrated Public Alert and Warning System (IPAWS) is designated as a Collaborative Operating Group (COG) by the IPAWS Program Management Office. A COG may have members from multiple jurisdictions with each individual member account administered through its software system. Before a public safety entity may generate WEA alert messages through IPAWS, it must undergo a four-step process administered by FEMA. First, an organization must procure IPAWS compatible software. Second, to become a COG, a Memorandum of Agreement (MOA) must be executed between the sponsoring organization and FEMA. MOAs govern system security. Third, alerting authorities that wish to send alerts to the public through IPAWS must complete an application defining the types of alerts they intend to issue and the prescribed geographic warning area. Fourth, alerting authorities must complete FEMA’s IPAWS web-based training, which includes skills to draft appropriate warning messages and best practices for effective use of CAP. Once these steps are completed, alerting permissions will be implemented in IPAWS, and the alerting entity will be able to send alerts and warnings in the geographically prescribed areas. See FEMA, *How to Sign Up for IPAWS*, <https://www.fema.gov/how-sign-ipaws> (last visited May 14, 2015). Several PSAPs have obtained alerting authority to generate WEA alert messages through IPAWS. See FEMA, *Integrated Public Alert & Warning System Authorities*, <https://www.fema.gov/integrated-public-alert-warning-system-authorities> (last visited May 8, 2015).

⁸⁵ See, e.g., Microsoft Reply at 4; APCO Comments at 5; CTIA Comments at 11; Chester County Emergency Management Agency Comments, PS Docket No. 15-91, at 1 (Dec. 18, 2015) (Chester County EMA Comments); NYCEM Comments at 6; Lexington Division of Emergency Management Comments at 2; Pinellas County EM Comments at 5; Cochise County OES Comments at 1; California Governor’s OES Comments at 3.

⁸⁶ See NYCEM Comments at 6.

Messages can be issued as Imminent Threat Alerts.⁸⁷ The term “Imminent Threat Alert” is defined in our rules as “an alert that meets a minimum value for each of three CAP elements: Urgency, Severity, and Certainty.”⁸⁸ Public Safety Messages would not fit within this definition because the “severity” and “urgency” elements of an Imminent Threat Alert describe the underlying imminently threatening emergency condition, whereas Public Safety Messages are intended to provide supplemental instructions about how to protect life or property during an AMBER Alert, Presidential Alert, or Imminent Threat Alert. We anticipate that this separate and broader applicability for Public Safety Messages will make them more versatile emergency management tools than if we were to limit such Alert Messages to the preexisting definition of an Imminent Threat Alert.

23. In addition to tailoring the scope of emergency managers’ use of Public Safety Messages, we also take steps to ensure that the public receives Public Safety Messages in an appropriate manner. Specifically, we amend Section 10.280 to specify that Participating CMS Providers shall provide for their subscribers to receive Public Safety Messages by default, and may provide their subscribers with the option to opt out of receiving Public Safety Messages if they decide that they no longer wish to receive them.⁸⁹ We agree with the majority of commenters that the public should be opted in to receiving Public Safety Messages by default because the information that they provide is essential by definition.⁹⁰ We agree with Hyper-Reach that treating Public Safety Messages in this manner ensures that a greater percentage of the public will receive the information that Public Safety Messages are intended to provide than would be possible if the public were opted out of receiving Public Safety Messages by default.⁹¹

24. Further, we allow, but do not require Participating CMS Providers to associate a unique attention signal or vibration cadence with Public Safety Messages. We agree with ATIS that requiring a new, unique attention signal and vibration cadence could create “significant technical impacts” for

⁸⁷ See BRETSA Comments at 15; T-Mobile Comments at 5; Sprint Comments at 6-7; Microsoft Reply at 4; ATIS Comments at 9; CTIA Comments at 10; NWS Comments at 2-3; San Joaquin OES Comments at 1; NYCEM Comments at 5; BRETSA Comments at 15; Douglas County EMA Comments at 1; Beaufort County Comments at 2; CCOEM Comments at 1; San Francisco Int’l Airport Safety & Security Services Comments at 1.

⁸⁸ See 47 CFR § 10.400(b) (further defining each of the elements as follows, “(1) *Urgency* - The CAP Urgency element must be either Immediate (*i.e.*, responsive action should be taken immediately) or Expected (*i.e.*, responsive action should be taken soon, within the next hour); (2) *Severity* - The CAP Severity element must be either Extreme (*i.e.*, an extraordinary threat to life or property) or Severe (*i.e.*, a significant threat to life or property); (3) *Certainty* - The CAP Certainty element must be either Observed (*i.e.*, determined to have occurred or to be ongoing) or Likely (*i.e.*, has a probability of greater than 50 percent)”).

⁸⁹ See WARN Act § 602(b)(2)(E), 47 USC § 1202(b)(2)(E) (“Any commercial mobile service licensee electing to transmit emergency alerts may offer subscribers the capability of preventing the subscriber’s device from receiving such alerts, or classes of such alerts, other than an alert issued by the President.”). In the case that currently deployed legacy devices are not able to receive software updates sufficient to provide consumers with an independent option to opt-out of receiving Public Safety Messages, Participating CMS Providers may associate consumers’ preference for receiving Public Safety Messages with their preference for receiving Imminent Threat Alerts only until those devices are retired. We reason that while Public Safety Messages may also be issued in connection with other Alert Message types, they are particularly likely to be issued in connection with Imminent Threat Alerts, as illustrated by use cases commenters have offered into the record. See, e.g., Pinellas County EM Comments at 4. All new devices and devices eligible for software updates should independently present consumers with the option to opt out of receiving Public Safety Messages pursuant to the rule we adopt today.

⁹⁰ See, e.g., Vail PSCC and PD Comments at 1; California Governor’s OES Comments at 3; CCOEM Comments at 1; Houston OPHS Comments at 2; Jefferson Parish EM Comments at 2; Cochise County OES Comments at 1; Pinellas County EM Comments at 5; Fort Riley Emergency Management Comments, PS Docket 15-91, 1 (Dec. 10, 2015) (Fort Riley EM Comments); NYCEM Comments at 7; *but see* Chester County EMA Comments at 1.

⁹¹ See Hyper-Reach Comments at 5 (stating that “current opt-in programs for emergency alerts rarely succeed in getting even 10% participation”).

currently deployed WEA-capable mobile devices.⁹² We also agree with FEMA, however, that “the option to silence alerts that do not present an immediate threat” may have value in reducing consumer opt out.⁹³ By allowing Participating CMS Providers to offer this functionality, we allow the market to determine whether or not any costs that may be implicated by these personalization options are outweighed by the benefits. Similarly, we will allow, but do not require Participating CMS Providers to provide their customers with the ability to turn off Public Safety Messages during certain hours. For example, if customers want to receive Public Safety Messages, but only during the daytime, they may be given the option to suppress the presentation of Public Safety Messages during nighttime hours.

25. APCO and many emergency management agencies support our creation of a new Alert Message classification because it “will enable public safety alert originators to take advantage of WEA when helpful, as compared to less secure and less immediate methods they may be employing presently.”⁹⁴ We agree with commenters that adding a new Alert Message classification will allow emergency managers to expand their “capabilities of informing the public . . . to keep the residents and community safe and aware of potential situations” during and after emergencies in a manner that complements existing Alert Message classifications.⁹⁵ We also agree with Peoria County EMA that a new classification of Alert Messages would allow emergency managers to include specific secondary information, like shelter locations and other helpful disaster recovery instructions in WEA for the first time.⁹⁶ Finally, we agree with commenters and CSRIC IV that it is technically feasible to support the transmission of this new Alert Message classification provided the sufficient time that we allow industry to update relevant standards.⁹⁷

3. Supporting Embedded References and Multimedia

a. Background

26. The Commission’s rules provide minimum technical requirements for text-based WEA Alert Messages.⁹⁸ The rules do not include technical requirements for WEA Alert Messages that contain multimedia. Under Section 10.440 of the Commission’s WEA rules, Participating CMS Providers are

⁹² See ATIS Comments at 9-10; T-Mobile Comments at 5.

⁹³ FEMA Comments at 2.

⁹⁴ APCO Comments at 5; *see also* Fort Riley EM Comments at 1; United States Coast Guard Comments, PS Docket No. 15-91, 10 (Jan. 13, 2016) (US Coast Guard Comments); Indiana DHS Comments at 3; Vail PSCC and PD Comments at 1; *cf.* Verizon Comments at 10 (opposing the addition of a new classification but stating that if the Commission does elect to create a new category, it be “subject to the stringent criteria the CSRIC IV recommended.”).

⁹⁵ Clarion County OEM at 1; *see also, e.g.*, AT&T Comments at 11 (stating that the new Alert Message classification should “be a standalone message generated from credentialed, authorized, and trained alert originators, but directly related to a WEA Alert”); APCO Comments at 5 (“APCO supports this new category, and the Commission’s proposed definition”); Los Angeles Emergency Management Department Comments, PS Docket No. 15-91, 1 (Jan. 13, 2016) (Los Angeles EMD Comments) (“This new class of alerts greatly expands our ability to send alerts that may not necessarily fall into the original three categories.”); Hyper-Reach Comments at 3; AWARN Coalition Comments, PS Docket No. 15-91, 4 (Dec. 14, 2015) (AWARN Coalition Comments); NYCEM Comments at 5; City of Peoria Emergency Communications Center Comments, PS Docket No. 15-91, 1 (Jan. 7, 2016) (Peoria ECC Comments); Ashtabula County Emergency Management Agency, PS Docket No. 15-91, 2 (Dec. 14, 2015) (Ashtabula County EMA Comments); California Governor’s OES Comments at 3; USGS Comments at 1; California Governor’s OES Comments at 3; Telecommunications for the Deaf and Hard of Hearing Comments, PS Docket No. 15-91, 11 (Jan. 13, 2016) (TDI Comments).

⁹⁶ Peoria ECC Comments at 1.

⁹⁷ See *CSRIC IV WEA Messaging Report* at 46-47; T-Mobile Comments at 5 (stating that updates to 3GPP standards may also be needed); Sprint Comments at 6-7; ATIS Comments at 9-10; CTIA Comments at 10.

⁹⁸ See 47 CFR §§ 10.400 – 10.470.

also prohibited from distributing non-Presidential Alert Messages that contain embedded references (*i.e.*, phone numbers or Uniform Reference Locators (URLs)).⁹⁹ In the *WEA First Report and Order*, we declined to require Participating CMS Providers to support multimedia or embedded references in Alert Messages because of the limitations of cellular broadcast technology at the time, and because a concern that permitting embedded references' inclusion in Alert Messages could exacerbate wireless network congestion.¹⁰⁰ The *WEA NPRM* proposed to allow the inclusion of embedded references in WEA Alert Messages, and sought comment on whether it would serve the public interest to adopt rules governing the provision of multimedia-enabled Alert Messages.¹⁰¹ The *WEA NPRM* also took note of the strong record demonstrating that the benefits of embedded references would be particularly pronounced if allowed in WEA AMBER Alerts.¹⁰²

27. The majority of commenters, including emergency managers, alert origination software vendors, mass notification providers and individuals, support including embedded references in all WEA messages because the availability of URLs could transform the scope of WEA from a character-limited text message service to a multimedia-enabled, comprehensive disaster response resource,¹⁰³ and because phone numbers in WEA Alert Messages could help people to take rapid action to streamline incident reporting.¹⁰⁴ Conversely, Participating CMS Providers treating this issue state that including embedded references in Alert Messages risks data network congestion,¹⁰⁵ but have offered no support for their claim.

⁹⁹ 47 CFR § 10.440. Uniform Resource Locators (URLs) are the fundamental network identification for any resource connected to the web, and are used to specify addresses on the Internet in the following format: "protocol://hostname/other information." See Indiana University, Knowledge Base, *What is a URL?*, <https://kb.iu.edu/d/adnz> (last visited May 12, 2015).

¹⁰⁰ See *WEA First Report and Order*, 23 FCC Rcd at 6161, para. 43; see also *id.* at 6175, para. 85.

¹⁰¹ *WEA NPRM*, 30 FCC Rcd at 13795, para. 25; see also *id.* at 13798, para. 30.

¹⁰² *Id.* at 13796, para. 27.

¹⁰³ See Hyper-Reach Comments at 3; APCO Comments at 6; Wireless RERC Comments at 15; NWS Comments at 1; City of Henderson, Nevada Office of Emergency Management Comments, PS Docket No. 15-91, 1 (Dec. 15, 2015) (Henderson OEM Comments); NYCEM Comments at 9; Pinellas County EM Comments at 5; Mason County Emergency Management Comments, PS Docket No. 15-91, 1 (Dec. 21, 2015) (Mason County Emergency Management Comments); Peoria ECC Comments at 1; Cochise County OES Comments at 2; Douglas County EMA Comments at 1; Eagle County EM Comments at 1; Bosque County Office of Emergency Management Comments, PS Docket No. 15-91, 1 (Jan. 12, 2016) (Bosque County OEM Comments); Jefferson Parish EM Comments at 2; Kansas City EM Comments at 1; Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness Comments, PS Docket No. 15-91, 1 (Jan. 12, 2016) (Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness Comments); NWS Comments at 3; USGS Comments at 1; FEMA Comments at 2; Harris County Office of Homeland Security & Emergency Management Reply, PS Docket No. 15-91, 3 (Feb. 16, 2016) (Harris County OHSEM Reply); California Governor's OES Comments at 3; *cf.* Everbridge May 12, 2016 *Ex Parte* at 1-2 (stating that it would be feasible to permit embedded references to be included in WEA Alert Messages); *accord* Letter from Don Hall, IPAWS Product Manager, Emergency Communications Network (ECN), to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1-2 (filed May 27, 2016) (ECN May 27, 2016 *Ex Parte*).

¹⁰⁴ Maryland Emergency Management Agency Comments, PS Docket No. 15-91, 1 (Jan. 19, 2016) (Maryland EMA Comments) ("Phone numbers and web URLs would be of a great importance as it allows the public another resource to seek assistance in times of emergencies."); Ashtabula County EMA Comments at 2 ("In this modern world, URLs and telephone numbers are a staple of everyday American life. To not allow them in WEA alerts is like giving someone an instruction manual with only half the pages."); Telecommunications for the Deaf and Hard of Hearing, Inc. Reply, PS Docket 15-91, 7 (Feb. 12, 2016) (TDI Reply).

¹⁰⁵ See T-Mobile Comments at 6; Sprint Corporation, PS Docket No. 15-91, 5 (Feb. 12, 2016) (Sprint Reply); Verizon Comments at 2, 8-9; Microsoft Reply at 3-4; ATIS Comments at 11; National Association of Broadcasters and National Public Radio Comments, PS Docket No. 15-91, 2 (Jan. 13, 2016) (NAB and NPR Comments); AWARN Coalition Comments at 5; CTIA Comments at 12.

28. Further, the *WEA NPRM* sought comment on the technical feasibility of including multimedia in Alert Messages in light of technological developments since WEA's deployment.¹⁰⁶ Participating CMS Providers and ATIS agree that technology is available to support multimedia alerting,¹⁰⁷ but also observe that significant standards efforts would be required to determine the feasibility of integrating this technology into WEA.¹⁰⁸ For example, according to recent ATIS studies, the development of a new WEA standard for transmitting binary content could enable Participating CMS Providers to transmit a thumbnail-sized photo over WEA cell broadcast using eleven WEA binary messages in less than a minute.¹⁰⁹ Because multimedia transmission is not supported by current cell broadcast standards, Participating CMS Providers urge the Commission not to adopt requirements for multimedia content in this *Order*.¹¹⁰

b. Discussion

29. We require Participating CMS Providers to support embedded references, as proposed.¹¹¹ Accordingly, Participating CMS Providers must support the transmission of embedded URLs and phone numbers in WEA Alert Messages. This rule will become effective one year from the rules' publication in the *Federal Register*. Further, thirty days from the date the rules are published in the *Federal Register*, we allow voluntary, early adoption of embedded references through an industry-established and industry-led pilot program.¹¹² With respect to multimedia, we find that the inclusion of multimedia capability in WEA Alert Messages can result in tremendous public safety benefits. At the same time, however, we recognize that additional standards development remains necessary. Accordingly, we seek comment in the *Further Notice* regarding the establishment of an appropriate regulatory framework and timeframe for incorporating multimedia capability into WEA Alert Messages. In order to facilitate the development of

¹⁰⁶ *WEA NPRM*, 30 FCC Rcd at 13798, para. 30.

¹⁰⁷ ATIS Comments at 13 ("eMBMS would permit the broadcasting of large amounts of data, including multimedia content"); see also AT&T Comments at 16 ("Full multimedia content requires new technologies like evolved Multimedia Broadcast Multicast Service"); AT&T May 5, 2015 *Ex Parte* at 2.

¹⁰⁸ See AT&T May 5, 2015 *Ex Parte* at 2 (stating that integrating eMBMS into WEA would involve "costly updates to both network infrastructure and handset technology as well as a significant amount of time"); AT&T Comments at 16 ("eMBMS standards do not currently support WEA, and a standards effort will be required to determine the feasibility of incorporating WEA capabilities into eMBMS"); ATIS Comments at 13 ("eMBMS is not widely deployed and the underlying standards are still in a state of flux as enhancements to eMBMS are being considered by the industry. Such standardization efforts, including efforts to make any necessary WEA-related modifications, would take significant time (i.e., minimally several years), as would the implementation of new/revised standards."); CTIA Comments at 13 ("Multimedia has the potential to become a reality in the future, after deployment of LTE evolved multimedia broadcast multicast service").

¹⁰⁹ *ATIS Feasibility Study for WEA Supplemental Text* at 10 ("A thumbnail photo of about 1.5"x1.5" with a resolution of 72 dots per inch (DPI) will produce an image of 120x120 pixels. If 8 bit color scale is used, then a digital image file will be about 14,400 bytes in size. If we assume a 25% compression, then the resulting image file to broadcast would be 3600 octets. If a WEA message for broadcasting binary content were to be defined, the example described above would require at least 11 WEA binary messages to broadcast a small image file at the proposed WEA maximum of 360 characters."); *ATIS Feasibility Study for LTE WEA Message Length* at 12 (stating that WEA Alert Message segments can be transmitted every 80 milliseconds to 5.12 seconds). Where transmitting 11 WEA Alert Messages, one every 80 milliseconds would result in an 880 millisecond delay (0.88 seconds) and transmitting 11 WEA Alert Messages, one every 5.12 seconds would result in a 56.32 second delay).

¹¹⁰ See T-Mobile Comments at 6; Verizon Comments at 2.

¹¹¹ See *supra* note 40 (urging the public to pull over to avoid distracted driving if they receive a WEA Alert Message and want to read it while behind the wheel). Consumers should avoid reading WEA Alert Messages while driving irrespective of whether the Alert Message contains an embedded reference.

¹¹² See *infra* Section III.D (Compliance Timeframes (requiring compliance with this rule within 30 months of its publication in the *Federal Register*); see also *infra* para. 32 (explaining this approach in further detail).

standards for multimedia in the swiftest timeframe possible, we allow voluntary, early prototyping of certain multimedia capabilities in Public Safety Messages 30 months from the effective date of the rules, as described in greater detail below.

30. Participating CMS Providers express concern that allowing embedded references in Alert Messages would risk network congestion,¹¹³ but the weight of the record supports our conclusion that this action will be more likely to reduce network loading than to increase it. The public already accesses public safety and other resources using the data network upon receipt of WEA messages that do not include embedded references.¹¹⁴ This behavior, known as “milling,” is a predictable public response to receiving an Alert Message, as members of the public will seek to confirm that the indicated emergency condition is indeed occurring, and to gather additional information not provided by the Alert Message to inform their response.¹¹⁵ Milling is considered undesirable from a public safety perspective because it increases the delay between receiving an Alert Message and taking an appropriate protective action, and from a network management perspective because it increases use of the data network.¹¹⁶ We agree with FEMA, the National Weather Service (NWS), NYCEM, Dennis Mileti, Professor Emeritus of Sociology at The University of Colorado, and the many emergency managers treating this issue that providing access to additional text and resources through URLs embedded in WEA Alert Messages could actually reduce network congestion by channeling the public’s milling behavior through a single authoritative and comprehensive resource.¹¹⁷ This finding is also supported by the 2014 and 2015 *START Reports*, which

¹¹³ See T-Mobile Comments at 6; Sprint Reply at 4-5; Verizon Comments at 2, 8-9; Microsoft Reply at 3-4; ATIS Comments at 11; NAB and NPR Comments at 2; AWARN Coalition Comments at 5; CTIA Comments at 12; see also AT&T Mar. 17, 2016 *Ex Parte* at 3 (stating that embedding phone numbers in Alert Messages could be potentially more problematic than embedding hyperlinks); but see Letter from Benjamin Moncrief, VP, Government Relations, C Spire, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Jun. 24, 2016) (C Spire Jun. 24, 2016 *Ex Parte*) (“It is unclear what impact embedded URLs in WEA messages would have on network traffic. Data traffic could increase or decrease depending upon the type of alert, the content available at the linked site, and whether the linked site encouraged or discouraged additional data consumption by an alerted user.”).

¹¹⁴ See, e.g., APCO Mar. 22, 2016 *Ex Parte* at 2; FEMA Mar. 17, 2016 *Ex Parte* Letter at 4; NYCEM Mar. 8, 2016 *Ex Parte* at 3.

¹¹⁵ “Milling” is a behavior in which “individuals interact with others to confirm information and develop a view about the risks they face at that moment and their possible responses. Milling creates a delay between the time a warning is received and the time protective action is taken.” See Computer Science and Telecommunications Board; Division of Engineering and Physical Sciences; National Research Council, Public Response to Alerts and Warnings Using Social Media: Report of a Workshop on Current Knowledge and Research Gaps, at 4 (2013), available at http://www.nap.edu/catalog.php?record_id=15853 (last visited Jun. 9, 2015); see also Letter from Dennis Mileti, Professor Emeritus, University of Colorado Boulder, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Apr. 7, 2016) (Dennis Mileti Apr. 7, 2016 *Ex Parte*) (“Recent research findings in the START report on WEA messaging include a revolutionary finding: public WEA warning messages, if properly revised, may hold the potential to reduce milling and encourage the public to more rapidly initiate self-protective actions in imminent risk events than may now be the case.”).

¹¹⁶ See Dennis Mileti Apr. 7, 2016 *Ex Parte* at 2 (“Ignoring this basic human element in providing public disaster warnings has and will continue to cost human lives.”); see also *id.* (“The key improvement needed in the nation’s WEA system is to update the system such that it reduces public milling after receipt of a warning, particularly after the first warnings received for imminent events in which public response delay can cost lives, and increase injuries and property damage.”).

¹¹⁷ See NYCEM Mar. 8, 2016 *Ex Parte* at 3; NWS Mar. 10, 2016 *Ex Parte* at 2; Dennis Mileti Apr. 7, 2016 *Ex Parte* at 2; Mason County Emergency Management Comments at 1 (stating that “the public already turns to internet based news media and/or social media to confirm the alert and learn more”); FEMA Comments at 2 (stating that inclusion of a URL in alerts “would be consistent with the long-standing historical observation that people who are warned engage in a search for additional information before taking a protective action. Thus, inclusion of a URL will contribute to a reduction of post-alert milling by the public.”); FEMA Jun. 18, 2015 *Ex Parte* at 2; Jefferson Parish

(continued....)

state that providing the public with access to enhanced information in WEA Alert Messages can help to convince people to take protective action more quickly.¹¹⁸ Upon review of these studies and expert analyses, we are persuaded that embedded references are likely to reduce network load when included in Alert Messages.

31. Finally, Participating CMS Providers who claim that embedded references will result in harmful network congestion have offered no network models, or any other form of rigorous network analysis, to support their proposition that allowing embedded references in WEA would cause or contribute to network congestion.¹¹⁹ While all network activity contributes to network congestion to some degree, the unsupported assertion of a risk of network congestion cannot be the sole basis for declining to adopt any measure that utilizes the data network, particularly a measure that has been demonstrated to have a statistically significant impact on WEA's ability to save lives.¹²⁰ In the absence of data to the contrary, and in light of the significant record outlined above, we conclude that even if support for embedded references were to result in an incremental increase in data network usage in some cases, this increase would be insufficient to affect network performance during emergencies.¹²¹ Further, we observe that many WEA-capable mobile devices are set to offload network usage to Wi-Fi where available by default, and nearly all smartphones make this option available through the settings menu.¹²² Thus, many individuals who choose to click on an embedded reference will not use the mobile data network to access them at all.

32. At the same time, however, we seek to ensure that Participating CMS Providers are able to assess the performance of their networks in real-world conditions and have an opportunity to make any necessary adjustments to accommodate embedded references. AT&T and CCA support "moving ahead with a time-limited trial on their wireless network for purposes of determining whether embedded URLs

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EM Comments at 2 ("[I]ncluding a URL would point people to a place to receive more information like maps, reducing a "milling" effect."); San Francisco Int'l Airport Safety & Security Services Comments at 1; Denver OEMHS Comments at 1; Boulder Regional Emergency Telephone Services Authority Reply, PS Docket 15-91, at 4 (Feb. 12, 2016) (BRETSA Reply). ("inclusion of an alternative telephone number, URL which could be accessed by wireline or broadband internet service as well as by mobile internet access, twitter feed information, or other alternative information source could reduce PSAP congestion, and possibly network congestion to the extent voice calls to 9-1-1, family or friends are not the most efficient use of network resources."); USGS Comments at 1; Jefferson Parish EM Comments at 2; San Francisco International Airport Safety & Security Services Comments at 1; TDI Comments at 13; *but see* T-Mobile Comments at 6; Sprint Reply at 5; Verizon Comments at 2, 8-9; Microsoft Reply at 3-4; ATIS Comments at 11; NAB and NPR Comments at 2; AWARN Coalition Comments at 5; CTIA Comments at 12.

¹¹⁸ See *START Report* at 29; see also *Updated START Report* at 31 (finding that understanding of Alert Messages was "significantly higher for individuals who viewed the optimized 280-character WEA message that also included a link to additional general information"); Hyper-Reach Comments at 3 (supporting this connection between providing the public URLs and the *START Report*'s findings about how providing the public with enhanced information in a WEA Alert Message reduces milling).

¹¹⁹ See NWS Mar. 9, 2016 *Ex Parte* at 2.

¹²⁰ See, e.g., NCMEC May 5, 2015 *Ex Parte* at 1 ("A review of the most recent 359 AMBER Alerts that have contributed to the successful recovery of an abducted child found that 89% featured either license plate information, a photo or both").

¹²¹ Harris County OSHEM Mar. 7, 2016 *Ex Parte* at 2-3.

¹²² See, e.g., Android One Help, <https://support.google.com/android-one/answer/2819524?hl=en> (last visited Mar. 30, 2016) (instructing users how to turn off mobile data and offload to Wi-Fi in order to prevent data overages); see also Pablo Valerio, *WiFi Offloading to Skyrocket*, Information Week – Network Computing, <http://www.networkcomputing.com/wireless/wifi-offloading-skyrocket/1733513641> (last visited Aug. 23, 2016) (sharing the Juniper Research finding that "[c]arriers will offload a four-fold increase in mobile data traffic to WiFi networks by 2019").

result in unmanageable congestion when included in Amber Alerts.”¹²³ We therefore allow voluntary, early adoption of embedded references through an industry-established and industry-led pilot.¹²⁴ In this regard, we allow Participating CMS Providers, if they choose, to “pressure test” the use of embedded references in Alert Messages in a sample of their network area or subscriber base, prior to full implementation. To this end, Participating CMS Providers may voluntarily coordinate with NCMEC, NWS, FEMA, and other stakeholders to accomplish a targeted, pilot deployment of embedded references in WEA in a particular geographic location, Alert Message classification, or to a particular subset of subscribers thirty days from the rule’s publication in the *Federal Register*, and prior to the effective date of our rule requiring support for embedded references.¹²⁵ We encourage all WEA alert initiators to work with Participating CMS Providers as this functionality is piloted and deployed in order to establish best practices for the inclusion of embedded references in Alert Messages, including the development of any network congestion mitigation strategies as appropriate. For example, stakeholders could voluntarily agree to constrain the amount of data that is made available through an embedded reference. We note that NCMEC already states that it intends to use a low-bandwidth (15kB or less), mobile-friendly version of their website (missingkids.com) in connection with their issuance of WEA AMBER Alerts.¹²⁶ C Spire, FEMA and NWS have suggested that limiting the bandwidth requirements of embedded references will likely mitigate the risk of network congestion by limiting the amount of data that will need to be transferred.¹²⁷ We defer to Participating CMS Providers to identify the specific terms and timeframe of any such pilot deployment on their own initiative, as well as to undertake any necessary coordination, whether they do so individually or through a third-party coordinator of their choosing.

33. CSRIC IV and FEMA agree that support for embedded references in alert origination software, IPAWS, the C-interface, and on mobile devices can be enabled through a straightforward process of updating standards and software.¹²⁸ The successful use of embedded references will also require the development of appropriate best practices. Specifically, CSRIC IV observes that some individuals, particularly those with feature phones, may not have access to the data connection necessary to access content made available by URLs.¹²⁹ We share this concern, and urge emergency managers to continue to convey the most important actionable information through the Alert Message text to ensure that all members of the public are able to receive that information, even if they are unable to access the

¹²³ Letter from Bill Roughton, Executive Director, Senior Legal Counsel, AT&T Services, Inc., to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed May 23, 2016) (AT&T May 23, 2016 *Ex Parte*); *accord* Letter from Rebecca Murphy Thompson, Executive Vice President and General Counsel, Competitive Carriers Association, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 2 (filed Jul. 18, 2016) (CCA Jul. 18, 2016 *Ex Parte*).

¹²⁴ *See infra* Appx. A (Final Rules); Section III.D (Compliance Timeframes).

¹²⁵ *See infra* Section III.D (Compliance Timeframes); *see also infra* Appx. A (Final Rules). Emergency management agencies should not expect FEMA IPAWS or Participating CMS Providers to support embedded references prior to the effective date of our rule requiring support for embedded references absent a specific agreement.

¹²⁶ *See* Letter from Preston Findlay, Counsel, Missing Children Division, National Center for Missing & Exploited Children, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1-2 (filed Mar. 2, 2016) (NCMEC Mar. 2, 2016 *Ex Parte*).

¹²⁷ *See* C Spire Jun. 24, 2016 *Ex Parte* at 1; NWS Mar. 9, 2016 *Ex Parte* at 2; FEMA Mar. 17, 2016 *Ex Parte* at 4.

¹²⁸ *See CSRIC IV WEA Messaging Report* at 36; *see also* Letter from Wade Witmer, Deputy Director, IPAWS Division, FEMA and Mark Lucero, Chief Engineer, IPAWS Division, FEMA to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 2 (filed Jun. 18, 2015) (FEMA Jun. 18, 2015 *Ex Parte*). (“The ATIS/TIA specification for the interface between IPAWS and participating wireless carrier gateways already contains the provisions for including a phone number in AMBER type messages.”).

¹²⁹ *See CSRIC IV WEA Messaging Report* at 42.

URL.¹³⁰ Commenters also express concern that inadequately prepared web servers or call centers may become overloaded as a result of mass access.¹³¹ NCMEC assures us that the AMBER Alerts website is capable of handling the expected increase in traffic, and we urge all alert originators to take appropriate steps to ensure the preparedness of their web hosting service before initiating an Alert Message that contains a URL.¹³² Further, we urge emergency managers to consider the capacity of their call centers or hotlines before embedding a phone number in an Alert Message.

34. Finally, commenters express concern that allowing embedded references in Alert Messages may provide an opportunity for a malicious actor to compromise WEA.¹³³ To the extent that Participating CMS Providers take part in this opportunity to pilot the use of embedded references in WEA Alert Messages, they should take appropriate steps, in concert with their pilot program partners, to ensure the integrity of the embedded references they transmit. We also encourage emergency management agencies to continue to work with FEMA and Participating CMS Providers to ensure the authenticity and integrity of every Alert Message they initiate. For example, NCMEC confirms that it already authenticates the content on every AMBER Alert on its website and that it will take measures to ensure the security of any URL that it might embed in a WEA AMBER Alert.¹³⁴ We note that all WEA Alert Messages are protected with a CAP digital signature that effectively prevents malicious intrusion into Alert Message content in transit.¹³⁵ We also note that industry has already begun to take steps to address any particular cybersecurity issues that may be implicated by allowing URLs to be included in WEA. Pursuant to the recommendation of CSRIC V, ATIS is completing a best practice standard to address potential threat vectors for WEA, including embedded references.¹³⁶ We also encourage Participating

¹³⁰ See Letter from Paul Margie, Counsel for Apple Inc., to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 2 (filed Mar. 22, 2016) (Apple Mar. 22, 2016 *Ex Parte*) (stating that “the Commission’s rules should ensure that alerts convey recipient-usable information in the absence of broadband Internet access.”).

¹³¹ See, e.g., ATIS Comments at 11.

¹³² NCMEC Mar. 2, 2016 *Ex Parte* at 2 (stating that the website to which the public would be directed during an AMBER Alert (www.missingkids.org/AMBER) “can accommodate even the highest volume of simultaneous visitors seeking information about a current AMBER Alert, and it is optimized for viewing on mobile devices”); see also NWS Mar. 9, 2016 *Ex Parte* at 1-2 (stating that NWS believes that it also has the ability to create a small web landing page for weather alerts with the necessary server capacity to support mass access).

¹³³ See, e.g., Sprint Reply at 5; Verizon Comments at 8-9, ATIS Comments at 12; CTIA Reply at 10-11; United States Coast Guard Comments, PS Docket No. 15-91, 11 (Jan. 13, 2016) (US Coast Guard Comments); Microsoft Reply at 3; but see FEMA May 21, 2015 *Ex Parte* at 2 (stating that a standard already exists for including a phone number in AMBER Alerts).

¹³⁴ See Letter from Preston Findlay, Counsel, National Center for Missing and Exploited Children, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1-2 (filed Jul. 27, 2016) (stating further that NCMEC ensures that each AMBER Alert is linked to a recognized AMBER Alert Plan).

¹³⁵ See OASIS, Common Alerting Protocol Version 1.2, § 3.3.4.1 (Digital Signatures); Letter from Mark Lucero, IPAWS Chief Engineer, FEMA, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91 (filed Sep. 28, 2016) (stating that the danger of spoofing or altering a URL is greatly decreased thanks to the existing security of WEA, provided in part by CAP digital signatures and carrier network security controls).

¹³⁶ See CSRIC V, Working Group 2, *WEA Security*, Final Report, at 7, 24, 30 (2016) (*CSRIC V WEA Security Report*). The “appropriate cyber security protections and protocols” for URLs added to Alert Messages will likely also be informed by the guidelines established in the CSRIC IV Cybersecurity Risk Management and Best Practices Final Report and the WEA Cybersecurity Risk Management Strategy for Alert Originators. See CSRIC IV, Working Group Four, Cybersecurity Risk Management and Best Practices Working Group, Final Report (2015), https://transition.fcc.gov/pshs/advisory/csric4/CSRIC_IV_WG4_Final_Report_031815.pdf (last visited Jun. 9, 2015) (*CSRIC IV Cybersecurity Report*); see also Software Engineering Institute, WEA Project Team, Wireless Emergency Alerts (WEA) Cybersecurity Risk Management Strategy for Alert Originators (2014), available at (continued....)

CMS Providers and alert originators to work with FEMA to develop protocols that may help to mitigate potential risks.¹³⁷

35. Commenters identify the inclusion of embedded references in Alert Messages as the most critical among all of our proposed improvements to WEA.¹³⁸ NCMEC, in particular, has found this capability to be paramount to the success of AMBER Alerts.¹³⁹ We agree that allowing emergency managers to embed URLs in Alert Messages empowers them to offer the public multimedia-capable, comprehensive emergency response resources.¹⁴⁰ Including an authoritative URL will also likely lead to swifter community response by reducing the likelihood that consumers will seek to verify information through additional sources before taking action.¹⁴¹ We also agree with commenters that allowing URLs to be included in Alert Messages will improve WEA accessibility,¹⁴² could streamline the public's use of 911 services,¹⁴³ and would provide alert originators with a method to ensure the public has access to up-to-date information.¹⁴⁴

36. In addition to embedded URLs, allowing embedded phone numbers to be included in Alert Messages will offer the public significant public safety benefits. We agree with emergency managers, disability rights advocates and individuals that support including phone numbers in Alert Messages because integrating clickable phone numbers into WEA will provide an accessible method to

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http://resources.sei.cmu.edu/asset_files/SpecialReport/2014_003_001_87729.pdf (last visited Jun. 9, 2015) (*Software Engineering Institute WEA Security Report*).

¹³⁷ This may include the development of a FEMA-hosted URL repository of authenticated and approved embedded references.

¹³⁸ NCMEC May 5, 2015 *Ex Parte* at 2; *see also* Hyper-Reach Comments at 3; NYCEM Comments at 10; Houston OPHS Comments at 3; Florida Department of Law Enforcement Comments at 1; Osage County EMA Comments at 2.

¹³⁹ *See* NCMEC May 5, 2015 *Ex Parte* at 3 (stating that “in those cases in which AMBER Alert is credited for the safe rescue of a child 89% included a picture and/or vehicle and license plate information”); *see also* Florida Dept. of Law Enforcement Comments at 1 (The child’s photo and/or abductor photo would provide the public with an accurate, visual reference, so the public will more readily and easily identify missing child(ren) and/or the abductor(s).”).

¹⁴⁰ *See supra* note 103 (listing commenters supporting our proposal to allow embedded references in WEA Alert Messages for these reasons). While the cell broadcast technology currently used to support WEA on legacy networks has inherent technical limitations (*e.g.*, difficulty supporting multimedia, messages longer than 360 characters, messages in languages other than English and Spanish), requiring support for embedded references allows alert initiators to overcome those limitations by providing them with a tool to give the public direct access to specific, purpose-built websites. *See, e.g.*, Missingkids, <http://www.missingkids.org/AMBER> (last visited Mar. 30, 2016); NOAA’s National Weather Service, Storm Prediction Center, <http://www.spc.noaa.gov/products/outlook/> (last visited Mar. 30, 2016) (containing graphical depictions of predicted severe storm activity).

¹⁴¹ *See supra* para. 30 (discussing “milling” behavior).

¹⁴² *See, e.g.*, TDI Comments at 13 (stating that “[t]he deaf and hard of hearing community will especially benefit from having convenient, direct access to URLs and even telephone numbers in the context of the written message”); Wireless RERC Comments at 18; CCOEM Comments at 2; Henderson OEM Comments at 1; Douglas County EMA Comments at 1; Harris County OHSEM Comments at 2; Kansas City EM Comments at 1; Houston OPHS Comments at 3; DAC Comments at 2.

¹⁴³ According to APCO, enhancing WEA by requiring support for embedded references could “reduce unnecessary 9-1-1 calls and enable more informed and focused 9-1-1 calls to PSAPs.” *See* APCO Comments at 6; *accord* Austin HSEM Comments at 2.

¹⁴⁴ NWS Comments at 3; NCMEC May 5, 2015 *Ex Parte* at 2 (“The ability to direct recipients to the AMBER Alert website through a URL would allow any person continuous access to the most up-to-date information, including cancellations from that website.”).

quickly contact public safety officials.¹⁴⁵ This capability may be particularly relevant to WEA AMBER Alerts where emergency management organizations will often establish special hotlines or call centers to receive reports about missing children that may be reached at a phone number other than 911 that may not be as commonly known.¹⁴⁶ According to FEMA, providing the public with a direct emergency telephone number could hasten emergency response, and help to ensure that calls to 911 will not have to be rerouted.¹⁴⁷ In sum, allowing embedded references to be included in WEA Alert Messages will dramatically improve WEA's effectiveness at moving the public to take protective action.

37. With respect to multimedia, our decision to require support for embedded references in WEA Alert Messages is an important first step towards ensuring that WEA can be used to provide the public with actionable multimedia content during emergencies. The record shows that WEA's effectiveness depends on its ability to help the all members of the public to close the thought-action gap, and that including multimedia content in Alert Messages themselves would hasten protective action taking, reduce milling, and improve Alert Message accessibility.¹⁴⁸ We therefore believe that support for multimedia content has the potential to provide tremendous public safety benefits and should be implemented as soon as technically feasible.¹⁴⁹ Recognizing that further standards development remains necessary to integrate multimedia technology into WEA,¹⁵⁰ we seek comment in the *Further Notice* on how best to implement the support of multimedia content in WEA Alert Messages in a reasonable timeframe.¹⁵¹ In particular, as described in greater detail in the *Further Notice*, we seek comment on the inclusion of thumbnail-sized images, including hazard symbols, in Public Safety Messages on 4G LTE

¹⁴⁵ Maryland Emergency Management Agency Comments, PS Docket No. 15-91, 1 (Jan. 19, 2016) (Maryland EMA Comments) ("Phone numbers and web URLs would be of a great importance as it allows the public another resource to seek assistance in times of emergencies."); Ashtabula County Emergency Management Agency Comments, PS Docket No. 15-91, 2 (Dec. 14, 2015) (Ashtabula County EMA Comments) ("In this modern world, URLs and telephone numbers are a staple of everyday American life. To not allow them in WEA alerts is like giving someone an instruction manual with only half the pages."); TDI Reply at 7.

¹⁴⁶ See CCOEM Comments at 2; see also NCMC May 5, 2015 *Ex Parte* at 3 ("The ability to provide a hotline phone number directing recipients to the investigating law enforcement agency during an AMBER Alert activation would be beneficial. This contact information is standard for every other type of missing child alert, bulletin, notice, and poster that NCMC disseminates."); Morton County Emergency Management Comments, PS Docket 15-91, 1 (Dec. 8, 2015) (Morton County EM Comments).

¹⁴⁷ See FEMA Comments at 2 (stating, for example, that "[t]he Tennessee Emergency Management Agency experienced a situation in which all cellular 911 calls were being incorrectly routed to the wrong county dispatch center. This created a disruption in critical public safety services. The ability to issue a WEA including the correct direct emergency telephone number would have reduced potential delays providing emergency services to the proper areas.").

¹⁴⁸ See NYCEM Comments at 11; TDI Comments at 14; San Joaquin OES Comments at 1; Los Angeles EMD Comments at 1; The Iowa Flood Center at the University of Iowa Comments, PS Docket 15-91, 2 (Feb. 12, 2016) (Iowa Flood Center Comments).

¹⁴⁹ Hazard symbols pictographically represent the type of warning being conveyed (*e.g.*, fire, tornado, flood, chemical spill). Hazard symbols could reinforce the significance of the emergency situation described in the text portion of the Alert Message, particularly for those with access and functional needs.

¹⁵⁰ See AT&T May 5, 2015 *Ex Parte* at 2 (stating that integrating eMBMS into WEA would involve "costly updates to both network infrastructure and handset technology as well as a significant amount of time"); AT&T Comments at 16 ("eMBMS standards do not currently support WEA, and a standards effort will be required to determine the feasibility of incorporating WEA capabilities into eMBMS"); ATIS Comments at 13 ("eMBMS is not widely deployed and the underlying standards are still in a state of flux as enhancements to eMBMS are being considered by the industry. Such standardization efforts, including efforts to make any necessary WEA-related modifications, would take significant time (*i.e.*, minimally several years), as would the implementation of new/revised standards.").

¹⁵¹ See *infra* Section IV.B.1 (Multimedia Alerting).

and future networks.¹⁵² In the interim, in order to facilitate the swift development of standards for supporting multimedia content in WEA, we allow the industry to participate in voluntary prototyping of this functionality in Public Safety Messages, in coordination with FEMA, emergency management agencies, and other relevant WEA stakeholders, as of the effective date of our rule requiring support for Public Safety Messages.¹⁵³

4. Supporting Spanish-language Alert Messages

a. Background

38. Section 10.500 of the Commission's WEA rules requires mobile devices to be able to extract Alert Message content in the subscriber's preferred language.¹⁵⁴ The Commission adopted this requirement in the *WEA First Report and Order*, while encouraging the development and implementation of multilingual alerting capabilities.¹⁵⁵ At the same time, the Commission declined to require Participating CMS Providers to support transmission of alerts in languages other than English because of technical challenges.¹⁵⁶ In the *WEA NPRM*, we sought comment on whether the fundamental technical problems that limited the ability of Participating CMS Providers to provide Alert Messages in languages other than English in 2008 remain barriers to implementation.¹⁵⁷

39. Every commenting organization representing individuals with access and functional needs and nearly every commenting emergency manager strongly supports providing Alert Messages in customers' preferred language.¹⁵⁸ Commenters agree that transmission of Spanish-language Alert Messages is feasible within two years because ATIS has already completed the necessary standards-setting processes to transmit Spanish-language Alert Messages.¹⁵⁹ While some emergency management

¹⁵² *See id.*

¹⁵³ Participating CMS Providers may begin voluntary prototyping of thumbnail-sized pictures and hazard symbols in Public Safety Messages 30 months from the effective date of the rules, the same timeframe for implementation of Public Safety Messages. As with the pilot of the embedded reference functionality discussed above, we emphasize that emergency managers should not expect that any images they include in Alert Messages would be transmitted by Participating CMS Providers absent voluntary agreement, and even then, only to the extent agreed upon by voluntary arrangement. *See id.* (proposing to require support for certain multimedia content only in Public Safety Messages).

¹⁵⁴ 47 CFR § 10.500(e).

¹⁵⁵ *WEA First Report and Order*, 23 FCC Rcd at 6172, para. 77.

¹⁵⁶ *Id.*

¹⁵⁷ *WEA NPRM*, 30 FCC Rcd at 13799, para. 32.

¹⁵⁸ *See, e.g.*, Wireless RERC Comments at 21-22; AWARN Coalition Comments at 5; FEMA Jun. 18, 2015 *Ex Parte* at 3; USGS Comments at 2; Nebraska SECC Comments at 1; Chester County EMA Comments at 2; San Joaquin OES Comments at 1; Lexington Division of EM Comments at 2; Eagle County EM Comments at 2; Douglas County EMA Comments at 1; Jefferson Parish EM Comments at 3; Pinellas County EM Comments at 6; Ashtabula County EMA Comments at 2; California Governor's OES Comments at 4; San Antonio Office of Emergency Management Comments, PS Docket No. 15-91, at 1 (Nov. 25, 2015) (San Antonio OEM Comments); Los Angeles EMD Comments at 1; Austin HSEM Comments at 2; Osage County EMA Comments at 2.

¹⁵⁹ *See Verizon Comments* at 7 ("ATIS has started work to enable service providers to incorporate Spanish language messages into the WEA system within a two-year period. With sizeable Spanish-speaking populations receiving alerts, including Spanish language alerts is a natural and reasonable development of the WEA system. A rule requiring transmission of Spanish alerts within two years for LTE networks and handsets would thus be feasible and in the public interest."); AT&T Mar. 17, 2016 *Ex Parte* at 5; ATIS Implementation Guidelines for CMAS Supplemental Information Retrieval Revision 2 (ATIS-0700012v.002) (detailing the capability of WEA supplemental information retrieval process associated with Alert Message text in Spanish); ATIS Implementation Guidelines for Mobile Device Support of Multi-Language CMAS (ATIS-0700013) (defining the guidelines for mobile devices that support WEA in multiple languages (*e.g.*, English and Spanish); ATIS Implementation

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agencies urge us to encourage the use of machine-based Alert Message translation to facilitate support for WEA in additional languages,¹⁶⁰ the weight of the record shows that these technologies are still not sufficiently mature to merit use in the emergency messaging context.¹⁶¹

b. Discussion

40. We adopt a new Section 10.480 requiring Participating CMS Providers to support the transmission of Spanish-language Alert Messages.¹⁶² This, along with Section 10.500(e) of the Commission's WEA rules, which requires "extraction of alert content in English or the subscriber's preferred language,"¹⁶³ will provide a framework to ensure that Spanish-language Alert Messages will be processed and displayed properly. Pursuant to this framework, we would expect that Spanish-language WEA Alert Messages would be displayed on and only on WEA-capable mobile devices where the subscriber has specified Spanish as their preferred language.

41. The record demonstrates that it is technically feasible for Participating CMS Providers to support Spanish-language Alert Messages.¹⁶⁴ ATIS has developed standards that support the Alert Gateway, the CMS Provider network and mobile devices in receiving, transmitting and displaying Alert Messages in Spanish as well as English.¹⁶⁵ We applaud ATIS for completing these standards, and

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Guidelines for CMSP Handling of CMAS Supplemental Information Broadcast Revision 2 (ATIS-0700014.v002) (describing the functionality of Cell Broadcast based CMAS when the CMAS messages are being broadcast in English and Spanish). *See also infra* Section IV.B.2 (Multilingual Alerting) (seeking comment on how we can continue to deepen WEA's support for additional languages).

¹⁶⁰ NYCEM Comments at 12; CCOEM Comments at 2.

¹⁶¹ AT&T Mar. 17 *Ex Parte* at 5 ("In the CMSAAC and subsequent research, it was shown that automatic translation can result in significant and material changes to the meaning of the message"); FEMA Jun. 18, 2015 *Ex Parte* at 3; Pinellas County EM Comments at 6; Letter from Joseph P. Benkert, Attorney, Boulder Regional Emergency Telephone Service Authority, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 3 (filed Mar. 3, 2016) (BRETSA Mar. 3, 2016 *Ex Parte*).

¹⁶² We note the importance of supporting alerts in a wide variety of languages to achieving emergency managers' public safety goals. *See, e.g.*, FEMA Jun. 18, 2015 *Ex Parte* at 3; Nebraska SECC Comments at 1; Chester County EMA Comments at 2; San Joaquin OES Comments at 1; Lexington Division of EM Comments at 2; Eagle County EM Comments at 2; Douglas County EMA Comments at 1; Jefferson Parish EM Comments at 3; Pinellas County EM Comments at 6; Ashtabula County EMA Comments at 2; California Governor's OES Comments at 4; San Antonio OEM Comments at 1; Los Angeles EMD Comments at 1; Austin HSEM Comments at 2; Osage County EMA Comments at 2. We seek comment on how to further improve WEA's language support in the *Further Notice*. *See infra* Section IV.B.12 (Multilingual Alerting).

¹⁶³ 47 CFR § 10.500(e).

¹⁶⁴ *See, e.g.*, Verizon Comments at 2 ("Transmitting Spanish language alerts is . . . feasible and in the public interest."); FEMA Feb. 13, 2016 *Ex Parte* at 2, 3 ("The IPAWS system as currently deployed and based upon the Common Alerting Protocol standards is capable of supporting multiple languages beyond English."); ATIS Comments at 16 (noting that transmitting alerts in English and Spanish is feasible but transmission of additional languages may be complicated and is not supported by ATIS at this time.); Letter from Paula Boyd, Director, Regulatory and Governmental Affairs, Microsoft Corporation, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 2 (filed Mar. 9, 2016) (Microsoft Mar. 9, 2016 *Ex Parte*); AT&T Mar. 17, 2016 *Ex Parte* at 6.

¹⁶⁵ *See* ATIS Implementation Guidelines for CMAS Supplemental Information Retrieval Revision 2 (ATIS-0700012v.002) (detailing the capability of CMAS supplemental information retrieval process associated with CMAS message text in Spanish); ATIS Implementation Guidelines for Mobile Device Support of Multi-Language CMAS (ATIS-0700013) (defining the guidelines for mobile devices that support CMAS in multiple languages (*e.g.*, English and Spanish)); ATIS Implementation Guidelines for CMSP Handling of CMAS Supplemental Information Broadcast Revision 2 (ATIS-0700014.v002) (describing the functionality of Cell Broadcast based CMAS when the CMAS messages are being broadcast in English and Spanish).

encourage their continued efforts to standardize network functionality for Alert Messages in additional languages. According to Microsoft, multilingual alerting is already taking place in other countries.¹⁶⁶

42. We agree with Participating CMS Providers that they should not be responsible for Alert Message translation.¹⁶⁷ Rather, emergency managers are the entities best equipped to determine message content, including content in other languages.¹⁶⁸ We recognize that some emergency management agencies report that they do not currently have the capability to initiate Alert Messages in languages other than English.¹⁶⁹ Other emergency management agencies, such as Harris County OHSEM, state that they do have this capability,¹⁷⁰ and “NYCEM is in the final stages of preparing to offer . . . [its] 80 most common messages in the 13 most commonly spoken languages in New York City, including American Sign Language,” but those messages would have to be transmitted using alternative alerting platforms until WEA’s multilingual alerting capabilities improve.¹⁷¹

43. We anticipate that requiring Participating CMS Providers to support Spanish-language Alert Messages where available will encourage other emergency management agencies to continue to develop their multilingual alerting capabilities. Indeed, many emergency managers state that they can use State/Local WEA Tests as a tool to exercise and improve their multilingual alerting capability over time with the help of voluntary community feedback.¹⁷² We do not agree with NYCEM and Clark County OEM, however, that we should facilitate Alert Message translation by requiring Participating CMS Providers to “place a ‘translate’ button/link” in WEA Alert Messages.¹⁷³ Rather, we agree with FEMA and the majority of emergency management agencies that automatic translation technologies that may reside on some mobile devices are currently too inaccurate to support emergency messaging.¹⁷⁴

44. The overwhelming majority of emergency management agencies support expanding WEA’s language capabilities because it will help them to reach members of their communities that are currently inaccessible to them.¹⁷⁵ Emergency managers in areas with large Spanish-speaking populations, as well as those in areas popular among tourists, state that requiring support for Spanish-language WEA

¹⁶⁶ Microsoft Mar. 9, 2016 *Ex Parte* at 2 (stating that, in such cases, emergency managers initiate Alert Messages in primary and secondary languages for CMS Providers to transmit to all mobile devices in the target area. Mobile devices extract the Alert Message in the primary language, and extract it in the secondary languages as well if and only if the subscriber’s device language preference is the same as the secondary language Alert Message).

¹⁶⁷ *See, e.g.*, Sprint Comments at 10; T-Mobile Reply at 9; CTIA Comments at 13.

¹⁶⁸ *See* AT&T Mar. 17, 2016 *Ex Parte* at 5; Apple Mar. 21, 2016 *Ex Parte* at 2.

¹⁶⁹ Cochise County OES Comments at 2; *see also* NYCEM Comments at 12 (“[N]ot all alert originators will always have the capacity . . . to offer WEA messages in multiple languages.”); NWS Mar. 9, 2016 *Ex Parte* at 3 (stating that they do not have a multilingual alerting capability, except in Puerto Rico); Pinellas County EM Comments at 6; Houston OPHS Comments at 3; CCOEM Comments at 2; Kansas City EM Comments at 2; Indiana DHS Comments at 4.

¹⁷⁰ *See* Harris County OHSEM Mar. 8, 2016 *Ex Parte* at 4.

¹⁷¹ NYCEM Mar. 8, 2016 *Ex Parte* at 3.

¹⁷² *See, e.g.*, Harris County OSHEM Mar. 7, 2016 *Ex Parte* at 4; NYCEM Mar. 8, 2016 *Ex Parte* at 4.

¹⁷³ NYCEM Comments at 12; CCOEM Comments at 2.

¹⁷⁴ FEMA Jun. 18, 2015 *Ex Parte* at 3; Pinellas County EM Comments at 6; AT&T Mar. 17 *Ex Parte* at 5;; BRETSA Mar. 3, 2016 *Ex Parte* at 3.

¹⁷⁵ *See, e.g.*, Wireless RERC Comments at 21-22; AWARN Coalition Comments at 5; FEMA Jun. 18, 2015 *Ex Parte* at 3; USGS Comments at 2; Nebraska SECC Comments at 1; Chester County EMA Comments at 2; San Joaquin OES Comments at 1; Lexington Division of EM Comments at 2; Eagle County EM Comments at 2; Douglas County EMA Comments at 1; Jefferson Parish EM Comments at 3; Pinellas County EM Comments at 6; Ashtabula County EMA Comments at 2; California Governor’s OES Comments at 4; San Antonio OEM Comments at 1; Los Angeles EMD Comments at 1; Austin HSEM Comments at 2; Osage County EMA Comments at 2..

Alert Messages will be particularly beneficial.¹⁷⁶ We also anticipate that this action will allow emergency managers to better facilitate the inclusion of Spanish-speaking individuals, and particularly those with limited English proficiency, into their emergency response plans.

B. Alert Message Delivery

1. Logging Alert Messages at the Participating CMS Provider Alert Gateway

a. Background

45. Section 10.350 of the WEA rules requires Participating CMS Providers to keep an automated log of Required Monthly Test (RMT) messages received by the Participating CMS Provider Alert Gateway from the FEMA Alert Gateway.¹⁷⁷ The Commission adopted this requirement in the *WEA Second Report and Order*, noting support from commenters and that CMSAAC recommended alert logging in order ensure system reliability and performance.¹⁷⁸ Participating CMS Providers are not currently required, however, to log or analyze their participation in WEA beyond RMT testing. In the *WEA NPRM*, consistent with CMSAAC recommendations, we proposed to require Participating CMS Providers to log messages with time stamps that verify when Alert Messages are received, and when the Alert Messages are acknowledged or rejected by the Participating CMS Provider Alert Gateway, and if an Alert Message is rejected, to provide the specific error code generated by the rejection.¹⁷⁹ Also consistent with CMSAAC's recommendations, we proposed that this log should be maintained for at least 36 months, and that the Participating CMS Providers' Alert Gateways should be capable of generating monthly system performance statistics.¹⁸⁰

46. The majority of emergency managers state that the creation and publication of alert logs are necessary components of mission critical communications that would inform them if their alerts are not delivered, and if not, why not.¹⁸¹ All emergency managers treating the issue agree that alert logs should be shared with the Commission, FEMA, and with alert originators that have a signed Memoranda of Agreement (MOA) with FEMA for use of IPAWS.¹⁸² Participating CMS Providers state that they already log alerts, but that their logging methodologies are not always as uniform, as detailed, or maintained as consistently as what the *WEA NPRM* proposed.¹⁸³ For example, AT&T states that it logs the CMAC alert attributes of each alert and test that it receives from the FEMA Gateway, and that these logs are archived for 90 days, but that their gateway does not generate monthly system performance statistics as we proposed to require.¹⁸⁴ AT&T states that ATIS should be tasked with developing a best

¹⁷⁶ See Eagle County EM Comments at 1; Los Angeles EMD Comments at 1; Austin HSEM Comments at 2. We seek further comment below on how WEA could support additional languages that may be particularly relevant to other major language communities in the United States. See *infra* Section IV.B.2 (Multilingual Alerting).

¹⁷⁷ 47 CFR § 10.350(a)(7).

¹⁷⁸ *WEA Second Report and Order*, 23 FCC Rcd at 10772-73, paras. 18, 21.

¹⁷⁹ *WEA NPRM*, 30 FCC Rcd at 13810, para. 56; see also *CMSAAC Report* at 62-63.

¹⁸⁰ *Id.*

¹⁸¹ See APCO Comments at 9; Henderson OEM Comments at 1; Chester County EMA Comments at 3; NYCEM Comments at 14; Eagle County EM Comments at 1; but see Verizon Comments at 3; Sprint Reply at 7; Kansas City EM Comments at 2.

¹⁸² See, e.g., Chester County EMA Comments at 3; Pinellas County EM Comments at 8; Douglas County EMA Comments at 2; Houston OPHS Comments at 4; CCOEM Comments at 3 (stating that alert origination software should automatically receive such alert logs for presentation to the alert originator).

¹⁸³ See Verizon Comments at 13; T-Mobile Reply at 9; AT&T Mar. 17, 2016 *Ex Parte* at 7; C Spire Jun. 24, 2016 *Ex Parte* at 2; Bluegrass Cellular Jun. 29, 2016 *Ex Parte* at 5; see also *WEA NPRM*, 30 FCC Rcd at 13810, para. 56.

¹⁸⁴ AT&T Mar. 17, 2016 *Ex Parte* at 7 (attaching a sample alert log); but see CTIA Comments at 14 (stating that "the ability to log, track, and verify WEA messages is not possible under the current WEA architecture").

practice standard for WEA logging in a manner that can be used to generate quarterly reports,¹⁸⁵ but Verizon and T-Mobile state that each Participating CMS Provider takes a unique approach to alert logging, and that requiring a uniform approach to creating and sharing alert logs would implicate costs that outweigh the benefits.¹⁸⁶ CTIA asserts that Participating CMS Providers should only be required to maintain alert log data for three months because this data should only be relevant for a short period of time, and will most likely be retrieved by alert originators immediately following tests.¹⁸⁷

b. Discussion

47. We require Participating CMS Providers to log their receipt of Alert Messages at their Alert Gateway and to appropriately maintain those records for review. Specifically, we adopt a new Section 10.320(g) that will require Participating CMS Providers' Alert Gateways to log Alert Messages as described below. Based on the record, we have modified the rules we proposed in the *WEA NPRM* in order to accommodate the varied approaches Participating CMS Providers take to alert logging.¹⁸⁸

- *Logging Requirements.* Participating CMS Providers are required to provide a mechanism to log the CMAC attributes of all Alert Messages received at the CMS Provider Alert Gateway, along with time stamps that verify when the message is received, and when it is retransmitted or rejected by the Participating CMS Provider Alert Gateway. If an alert is rejected, a Participating CMS Provider is required to log the specific error code generated by the rejection.
- *Maintenance of Logs.* Participating CMS providers are required to maintain a log of all active and cancelled Alert Messages for at least 12 months after receipt of such alert or cancellation.
- *Availability of Logs.* Participating CMS Providers are required to make their alert logs available to the Commission and FEMA upon request. Participating CMS Providers are also required to make alert logs available to emergency management agencies that offer confidentiality protection at least equal to that provided by the federal Freedom of Information Act (FOIA) upon request, but only insofar as those logs pertain to alerts initiated by that emergency management agency.¹⁸⁹ We encourage, but do not require, Participating CMS Providers to work with alert origination software vendors to automate transmission of alert log data to emergency managers' alert origination software.

¹⁸⁵ AT&T Mar. 17, 2016 *Ex Parte* at 9; *accord* Sprint Reply at 9; CTIA Comments at 14; Hyper-Reach Comments at 4 (stating that if the Commission were to require alert logging, stakeholders would need to develop a uniform, interoperable protocol for information sharing in order to make effective use of their logs).

¹⁸⁶ *See* Verizon Comments at 13; T-Mobile Reply at 9.

¹⁸⁷ *See* Letter from Brian Josef, Assistant Vice President, Regulatory Affairs, CTIA, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No 15-91, at 3 (filed Sep. 20, 2016) (CTIA Sep. 20, 2016 *Ex Parte*).

¹⁸⁸ *See* Verizon Comments at 13; T-Mobile Reply at 9; AT&T Mar. 17, 2016 *Ex Parte* at 7; C Spire Jun. 24, 2016 *Ex Parte* at 2; Bluegrass Cellular Jun. 29, 2016 *Ex Parte* at 5; *see also* *WEA NPRM*, 30 FCC Rcd at 13810, para. 56 (proposing to require Participating CMS Providers to log alert messages with time stamps and error messages, where appropriate, proposing to require that Participating CMS Providers maintain logs for 90 days and archived logs for 36 months, and seeking comment on how alert logs should be shared); *but see id.* (proposing that the Alert Gateway generate monthly system performance statistics).

¹⁸⁹ *See* 5 USC § 552 (2006), amended by OPEN Government Act of 2007, Pub. L. No. 110-175, 121 Stat. 2524 (stating the FOIA confidentiality standard, along with relevant exemptions); *see also* Review of the Emergency Alert System, EB Docket 04-296, *Sixth Report and Order*, 30 FCC Rcd 6520, 6533, n. 90 (2015) (*Sixth Report and Order*) (requiring federal, state and local entities to have confidentiality protections at least as strong as FOIA in order to receive test result data filed in the EAS Test Reporting System).

48. We find that compliance with these minimal alert logging requirements will be technically feasible. Indeed, the approach we adopt today is a more flexible and less burdensome alternative to that which we proposed in the *WEA NPRM*, and allows Participating CMS Providers to take a variety of approaches to achieve compliance.¹⁹⁰ T-Mobile, Verizon, AT&T, Bluegrass Cellular and C Spire already log Alert Messages, and we anticipate that many other Participating CMS Providers may already be doing so as well, as part of their own system maintenance best practices.¹⁹¹ While Participating CMS Providers have taken different approaches to logging Alert Messages relative to the Trust Model recommended by CMSAAC,¹⁹² we anticipate that those Participating CMS Providers that already do log Alert Messages would log at least the CMAC attributes of all Alert Messages received, and be capable of sending error reports to the FEMA Alert Gateway consistent with those stipulated in the *CMSAAC Report*.¹⁹³ We recognize Verizon's concern that requiring logging of information more granular than CMAC attributes and time stamps, or requiring alert logging at junctures in the WEA system other than the Alert Gateway would "impose burdensome paperwork and IT-related requirements," but the requirements that we adopt today require only basic logging functionality at the Alert Gateway.¹⁹⁴ We also recognize T-Mobile's concern that a uniform system of alert logging would be required in order to aptly compare Participating CMS Provider alert logs.¹⁹⁵ We do not require Participating CMS Providers to take a uniform approach to alert logging today, only that they log the relevant information, maintain that information and make it available to appropriate parties. Further, the *CMSAAC Report* already stipulates a standard set of error code messages for communication between Participating CMS Provider and FEMA Alert Gateways.¹⁹⁶ Finally, we recognize CTIA's concern about requiring alert logs to be maintained longer than necessary.¹⁹⁷ By requiring alert logs to be maintained for 12 months, rather than 36, as proposed, we reduce the burden that alert log maintenance may pose for Participating CMS Providers.¹⁹⁸ CTIA observes that a shorter alert log maintenance timeframe would incentivize emergency management agencies to request alert log data after every test or alert out of concern that alert log data may be deleted if they delay.¹⁹⁹ At the same time, however, necessitating emergency management agencies to request logging information after every test is burdensome for both CMS Providers (who must produce this data) and the emergency managers (who must request the data). We believe that requiring

¹⁹⁰ See *WEA NPRM*, 30 FCC Rcd at 13810, para. 56 (proposing to require Participating CMS Providers to maintain both online and archived logs, and proposing to require the Alert Gateway to generate monthly system performance statistics).

¹⁹¹ See Verizon Comments at 13; T-Mobile Reply at 9; AT&T Mar. 17, 2016 *Ex Parte* at 7; C Spire Jun. 24, 2016 *Ex Parte* at 2; Bluegrass Cellular Jun. 29, 2016 *Ex Parte* at 5.

¹⁹² The "Trust Model" recommends security requirements for CMS Provider network infrastructure, including alert logging. See *CMSAAC Report* at 62-63.

¹⁹³ See *infra* Appx. H (Sample CMAC Attribute Alert Log); see also C Spire Jun. 24, 2016 *Ex Parte* at 2 (stating that they log CMAC Attributes of Alert Messages); Bluegrass Cellular Jun. 29, 2016 *Ex Parte* at 5 ("Bluegrass Cellular currently logs Alert Messages and pulls weekly reports from the SMSC. Bluegrass is able to log, at a minimum, the basic CMAC attributes of the Alert Messages sent, including the county, time and type of alert that was sent."); *CMSAAC Report* at 92.

¹⁹⁴ See Verizon Comments at 13. We seek comment on whether to require logging at additional junctures in the WEA system in the *Further Notice*. See *infra* Section IV.D.2 (Alert Logging Standards and Implementation).

¹⁹⁵ T-Mobile Reply at 9. We seek comment on whether to require a uniform standard for alert logging in the *Further Notice*. See *infra* Section IV.D.2 (Alert Logging Standards and Implementation).

¹⁹⁶ *CMSAAC Report* at 92. While compliance with the *CMSAAC Report's* recommendation is not required, it may be a guide to those looking for a model framework.

¹⁹⁷ CTIA Sep. 20, 2016 *Ex Parte* at 3.

¹⁹⁸ See *WEA NPRM*, 30 FCC Rcd at 13810, para. 56.

¹⁹⁹ See CTIA Sep. 20, 2016 *Ex Parte* at 3.

that alert logs be retained for one year strikes an appropriate balance that will allow emergency management agencies to request reports less frequently, posing lesser burdens on Participating CMS Providers and emergency management agencies, without requiring providers to retain logs for an extended period of time. Further, circumstances may arise that warrant a retrospective examination of prior log data that represents a sufficient period of time to accurately identify and represent trends or anomalies.²⁰⁰

49. Alert logging has been a fundamental aspect of the WEA Trust Model.²⁰¹ As we adopt changes to our rules that reflect our four years of experience with WEA and the underlying advancements of technology, it is time to ensure this fundamental component of system integrity is implemented. Authorized WEA alert originators agree that alert logs maintained at the Participating CMS Provider Alert Gateway have potential to increase their confidence that WEA will work as intended when needed.²⁰² According to emergency managers, this increased confidence in system availability will encourage emergency managers that do not currently use WEA to become authorized.²⁰³ Alert logs are also necessary to establish a baseline for system integrity against which future iterations of WEA can be evaluated. Without records that can be used to describe the quality of system integrity, and the most common causes of message transmission failure, it will be difficult to evaluate how any changes to WEA that we may adopt subsequent to this *Report and Order* affect system integrity. We disagree with AT&T, Sprint and ATIS that the responsibility for alert logging properly belongs with FEMA IPAWS because FEMA has access to sufficient information to generate these reports.²⁰⁴ We find that alert logging is particularly important at Participating CMS Providers' Alert Gateway because even though FEMA IPAWS maintains an alert log at their Alert Gateway as well,²⁰⁵ that alert log alone could not capture and describe alert delivery across the C-interface, which is arguably the most critical interface in the WEA architecture because it describes the connection between the public aspect of WEA (FEMA IPAWS) and the private aspect (CMS Providers). Additionally, the time stamps that we require Participating CMS Providers to log for Alert Message receipt and retransmission may represent a useful model for collecting latency data throughout the WEA system, as proposed in the *Further Notice*.²⁰⁶ As discussed in further detail below, developing a stronger understanding of the extent of alert delivery latency is also crucial to

²⁰⁰ See *infra* Section IV.D.1 (Annual WEA Performance Reporting).

²⁰¹ See *id.* 66 (recommending that alert logs should be kept and preserved as an integral part of the Trust Model for maintaining WEA system integrity, for protecting system security, and for testing and troubleshooting purposes).

²⁰² See NYCEM Comments at 14 (stating additionally that “[d]uring one of our WEA activations (January 2015), NYCEM identified that a particular network’s devices did NOT receive the message. NYCEM escalated the issue to FEMA, who contacted the mobile service provider. The mobile service provider identified a significant gap in its system that required resolution prior to its consumers being able to receive WEA messages”); Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments at 4; Pinellas County EM Comments at 8; APCO Comments at 9, 10; Chester County EMA Comments at 3; Douglas County EMA Comments at 2; Eagle County EM Comments at 1; Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness Comments at 1.

²⁰³ See Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments at 4; Pinellas County EM Comments at 8; APCO Comments at 9, 10; Chester County EMA Comments at 3; Douglas County EMA Comments at 2; Eagle County EM Comments at 1; Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness Comments at 1.

²⁰⁴ See AT&T Comments at 22 (stating that FEMA has broader visibility into Participating CMS Providers' Alert Message management than does any single Participating CMS Provider, enabling them to produce generalized reports); *accord* Sprint Reply at 9; ATIS Comments at 20.

²⁰⁵ See FEMA Mar. 18, 2016 *Ex Parte* at 2-3.

²⁰⁶ See *infra* Section IV.D.1 (Annual WEA Performance Reporting).

building emergency managers' confidence that the system will work as intended when needed.²⁰⁷ We anticipate that the alert log maintenance requirements that we adopt today will serve to ensure that alert logs are available when needed, both to the Commission and to emergency management agencies. Indeed, any alert logging requirement would be seriously undermined if those logs could be overwritten as soon as they were recorded, or if they could not be reviewed in appropriate circumstances. Further, we observe that the alert log maintenance requirements that we adopt today are consistent with CMSAAC's initial recommendations for the WEA system.²⁰⁸ Finally, we observe that implementing these CMSAAC-recommended procedures would be beneficial in harmonizing our WEA logging requirements with those already in place for EAS Participants.²⁰⁹

2. Narrowing Geo-targeting Requirements

a. Background

50. Under Section 10.450 of the Commission's WEA rules, Participating CMS Providers may not transmit Alert Messages to areas larger than the county or county equivalents with which the target area of the Alert Message overlaps.²¹⁰ In the *WEA First Report and Order*, we concluded that it would be premature to require geo-targeting to areas smaller than a county, despite many commenters' statements that cell broadcast technology could already support geo-targeting at the sub-county level, because not all carriers were expected to employ cell broadcast to deliver Alert Messages, and because NWS was currently only targeting its Alert Messages at the county level.²¹¹ In the *WEA NPRM*, we proposed to narrow our WEA geo-targeting requirement such that any Alert Message that is specified by a geocode, circle, or polygon must be transmitted to an area not larger than the specified area.²¹² If, however, a Participating CMS Provider is unable to accurately match the geocode, circle, or polygon provided by the emergency manager, we proposed to retain the current backstop that the Participating CMS Provider may geo-target the Alert Message to an area that approximates the desired alert area, but is no larger than a single transmission site.²¹³

51. All commenters support more stringent geo-targeting requirements for WEA Alert Messages, stating that improvements would reduce alert fatigue and consumer opt out.²¹⁴ Emergency managers, in particular, state that the current county-level geo-targeting requirement is problematic because most emergencies affect areas smaller than a county.²¹⁵ All commenting CMS Providers support

²⁰⁷ See *infra* para. 172 (discussing how improving emergency managers' awareness of how long it takes their messages to be delivered will increase their confidence in using the system during emergencies).

²⁰⁸ See *CMSAAC Report* at 66.

²⁰⁹ See 47 CFR § 11.35 (requiring EAS Participants to "determine the cause of any failure to receive . . . required tests or activations," indicating reasons why a test was not received in a log, and requiring such a log to be maintained for two years); 47 CFR § 11.61(3)(iv) (requiring EAS Participants to log tests results in the Electronic Test Reporting System (ETRS)).

²¹⁰ 47 CFR § 10.450.

²¹¹ *WEA First Report and Order*, 23 FCC Rcd at 6166, paras. 55-56.

²¹² *WEA NPRM*, 30 FCC Rcd at 13801, para. 37.

²¹³ See *id.*

²¹⁴ See, e.g., National Public Safety Telecommunications Council Comments, PS Docket No. 15-91, 5 (Jan. 13, 2016) (NPSTC Comments); Letter from William Hutchinson McClendon IV, CEO AC&C, LLC, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed November 12, 2015) (AC&C Nov. 12, 2015 *Ex Parte*); APCO Comments at 7; Wireless RERC Comments at 25; CTIA Reply at 11.

²¹⁵ See Ventura County Sheriff EMS Comments at 4; Douglas County EMA Comments at 1; Pinellas County EM Comments at 7; Houston OPHS Comments at 3 ("County-level WEA warning is not only inconvenient, but can be dangerous, as protective actions may vary depending on the proximity to the hazard.").

geo-targeting to an area that “best approximates” the target area, as recommended by the *CSRIC IV WEA Messaging Report*.²¹⁶ Participating CMS Providers disagreed with our proposed rule to narrow our geo-targeting standard to an area “not larger than the target area specified by the alert originator” because it would routinely and predictably lead to over-alerting absent the implementation of device-based geo-fencing.²¹⁷ CSRIC V finds that current cellular broadcast technology “has limitations to achieve the necessary geo-fencing precision desired by the [Alert Originators].”²¹⁸

b. Discussion

52. We narrow our WEA geo-targeting requirement from the current county-level standard to a polygon-level standard. Specifically, we amend Section 10.450 to state that a Participating CMS Provider must transmit any Alert Message that is specified by a geocode, circle, or polygon to an area that best approximates the specified geocode, circle, or polygon. While we initially proposed that Participating CMS Providers should transmit the Alert Message to an area “no larger than” the specified area, the record shows that implementation of such a standard, in the absence of geo-fencing, would routinely and predictably lead to under alerting.²¹⁹ We acknowledge, as do many emergency managers, that cell broadcast technology has a limited capacity for accurate geo-targeting.²²⁰ The “best approximates” standard we adopt today, recommended by CSRIC IV and supported by Participating CMS Providers, requires Participating CMS Providers to leverage that technology to its fullest extent, given its limitations.²²¹ At the same time, as we discuss below, we acknowledge that emergency managers need even more granular geo-targeting than the “best approximates” standard requires.²²² We commend Participating CMS Providers for voluntarily geo-targeting Alert Messages more accurately than our rules require, where possible, in the years since WEA’s deployment.²²³ We expect that Participating CMS Providers will continue to innovate in order to provide their subscribers with the best emergency alerting service it is feasible for them to offer. In this regard, we clarify that the geo-targeting requirement we adopt today does not preclude Participating CMS Providers from leveraging the location-sensing capability of WEA-capable mobile devices on their networks to geo-target Alert Message more accurately. As discussed below, the Commission will be adopting even more granular, handset-based,

²¹⁶ *CSRIC IV WEA Messaging Report*, at 44; *see also, e.g., AT&T May 6, 2015 Ex Parte* at 2; T-Mobile Comments at 6; Verizon Comments at 2; CTIA Comments at 7.

²¹⁷ *See, e.g., Sprint Comments* at 11; CTIA Comments at 7. A device-based solution entails an alert originator transmitting geographic coordinates for the target area along with the WEA message, and an end-user device using the device’s location-based technology to display only those WEA messages that are relevant to the geographic area in which the device is located. *CSRIC IV WEA Messaging Report* at 40. This technique is sometimes referred to as “geo-fencing.” *See, e.g., NWS May 21, 2015 Ex Parte Letter* at 2. FEMA agrees that “[g]eo-targeting proficiency can be improved by implementing geographical targeting for WEA broadcasts by cell-sector, including delivery of alert area specifications to the phone enabling mobile-assisted geographical targeting (aka geo-fencing), and other techniques.” FEMA Jun 18 *Ex Parte Letter* at 2.

²¹⁸ CSRIC V, Working Group Two, *Wireless Emergency Alerts – Recommendations to Improve Geo-Targeting and Offer Many-to-One Capabilities*, Final Report, at 30 (2016) (*CSRIC V WEA Geo-targeting Report*).

²¹⁹ *See, e.g., Sprint Comments* at 11; CTIA Comments at 7.

²²⁰ *See, e.g., NPSTC Comments* at 5; Ventura County Sheriff EMS Comments at 4; USGS Comments at 2, NYCEM Comments at 12; *see also CSRIC IV WEA Messaging Report* at 17; *CSRIC V WEA Geo-targeting Report* at 30.

²²¹ *See CSRIC IV WEA Messaging Report* at 40; AT&T Services, Inc. May 5, 2015 *Ex Parte* at 5; Sprint Comments at 11; CTIA Comments at 7; AT&T Services Inc. May 5, 2015 *Ex Parte* at 2.

²²² *See infra* notes 225; 244.

²²³ *See* 47 CFR § 10.450; *see also, e.g., AT&T May 6, 2015 Ex Parte* at 2; Verizon Comments at 12; T-Mobile Comments at 6.

geo-targeting requirements.²²⁴ Our ultimate objective is for all Participating CMS Providers to match the target area provided by an alert originator.

53. Some alert originators remain concerned that a “best approximates” standard will continue to result in over-alerting and subsequent consumer opt-out.²²⁵ NYCEM, for example, warns that the “best approximates” approach is vague and risks weakening our current geo-targeting requirement.²²⁶ While we do not adopt specific parameters for what constitutes “best approximates,” we expect Participating CMS Providers to take reasonable efforts to leverage existing technology to its fullest extent, as noted above. We observe that in a recently adopted report, CSRIC V articulates expectations for cell broadcast-based geo-targeting in rural, suburban and urban areas pursuant to a “best approximates” approach.²²⁷ Specifically, in rural areas, CSRIC V expects that Participating CMS Providers would be able to approximate the target area with 30,000 meters of “overshoot.”²²⁸ In suburban areas, where cell broadcast facilities are likely to be more densely deployed, CSRIC V expects that geo-targeting would become more accurate, achieving an average overshoot of five miles.²²⁹ In urban areas, CSRIC V expects that geo-targeting would be more accurate still, averaging two miles of overshoot.²³⁰ We find that these values would satisfy reasonable efforts to “best approximate” the alert area, consistent with our requirement. In this regard, we believe we strike an appropriate balance between the limitations of Participating CMS Providers’ current geo-targeting capabilities using cell broadcast, and WEA stakeholders’ goal of sending WEA Alert Messages only to those members of the public who are at risk.²³¹

54. We find that compliance with this geo-targeting requirement is technically feasible, and, in fact, every commenting CMS Provider except one states that they already use network-based cell broadcast techniques, such as algorithm-based facility selection and cell sectorization, to geo-target Alert Messages to polygonal areas more granular than required by our current “county-level” requirement.²³² In this sense, the rule we adopt today will require most Participating CMS Providers only to continue to employ the techniques that they have been deploying as a matter of best practice. Emergency managers such as the NWS have also already transitioned from county- to polygon-level geo-targeting, and express a need for WEA to keep pace with their ability to forecast with granularity the areas that will be impacted

²²⁴ See *infra* Section IV.B.3 (Matching the Geographic Target Area).

²²⁵ See, e.g., NPSTC Comments at 5; Ventura County Sheriff EMS Comments at 4; USGS Comments at 2.

²²⁶ See NYCEM Comments at 12.

²²⁷ See John Schanz, Theresa Hennesy, *CSRIC V Working Group Descriptions and Leadership*, at 2 (2015) <https://www.fcc.gov/file/3465/download> (tasking CSRIC V, Working Group 2 with providing recommendations “on how best to encourage the use of emergency alerts by state and local officials at a local/geo-targeted level”); *CSRIC V WEA Geo-targeting Report* at 29.

²²⁸ *CSRIC V WEA Geo-targeting Report* at 29 (approximately 20 miles).

²²⁹ *Id.*

²³⁰ *Id.*

²³¹ See *CSRIC IV WEA Messaging Report* at 18-23, 28.

²³² See *id.* at 40; see also AT&T May 6, 2015 *Ex Parte* at 2; Verizon Comments at 12; but see Letter from Pamela L. Gist, Counsel, Bluegrass Cellular, Inc., to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 5 (filed June 29, 2016) (Bluegrass Cellular Jun. 29, 2016 *Ex Parte*) (stating that “Bluegrass Cellular currently has cell sectorization capabilities on a network level, but sends Alert messages on a county wide basis”). We allow non-nationwide Participating CMS Providers a longer period of time within which to comply with this rule in light of our concern that other non-nationwide Participating CMS Providers that did not contribute to the record of this proceeding may be in a similar situation as Bluegrass Cellular. See *infra* Section III.D (Compliance Timeframes).

by weather events.²³³ We observe that in the event Participating CMS Providers are unable to practice polygon-level geo-targeting, we continue to allow Participating CMS Providers to transmit Alert Messages to an area not exceeding the propagation area of a single transmission site, as described in Section 10.450.²³⁴ We make conforming amendments to Section 10.450, however, to reflect the new geo-targeting standard that we adopt today and specify that “[i]f, however, the Participating CMS Provider cannot broadcast the Alert Message to an area that best approximates the target area, a Participating CMS Provider may transmit the Alert Message to an area not larger than the propagation area of a single transmission site.”²³⁵

55. Participating CMS Providers’ support for polygon-level geo-targeting will produce significant public safety benefits. Relative to county-level geo-targeting, we expect that polygon-level geo-targeting will reduce over-alerting.²³⁶ When the public regularly receives alerts that do not apply to them, it creates alert fatigue,²³⁷ a driving factor behind consumers’ decisions to opt out of receiving WEA Alert Messages.²³⁸ Further, the Houston Office of Public Safety and Homeland Security comments that “[c]ounty-level WEA warning is not only inconvenient, but can be dangerous, as protective actions may vary depending on the proximity to the hazard.”²³⁹ Under-alerting also poses severe public safety risks. According to Austin Homeland Security and Emergency Management, under a county-level geo-targeting standard, “if there are no cell towers physically located in the warning area, the alert may not be transmitted at all by some carriers.”²⁴⁰ This would be impermissible under the “best approximates” standard we adopt today. We also agree with Dennis Mileti, Professor Emeritus of Sociology at The University of Colorado, that with improved geo-targeting, “it is quite likely that milling after a received WEA message would decrease since people would not need to determine if they are in the intended audience for the WEA.”²⁴¹ A reduction in milling is desirable because it reduces the delay between the time an Alert Message is received, and the time that the public will begin to take protective action.²⁴²

²³³ NWS May 21, 2016 *Ex Parte* at 2.

²³⁴ See 47 CFR § 10.450 (providing that “[i]f, however, the propagation area of a provider's transmission site exceeds a single County or County Equivalent, a Participating CMS Provider may transmit an Alert Message to an area not exceeding the propagation area”).

²³⁵ See *infra* Appx. A (Final Rules).

²³⁶ See, e.g., Letter from William Hutchinson McClendon, IV, Chief Executive Officer, AC&C, LLC, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Apr. 21, 2015) (AC&C Apr. 21, 2015 *Ex Parte*); Chester County EMA Comments at 2; Mason County Emergency Management Comments at 1; Ventura County Sheriff EMS Comments at 4; Jefferson Parish EM Comments at 3; Austin HSEM Comments at 3; Indiana DHS Comments at 4; Mark Maxwell Comments at 1.

²³⁷ See, e.g., AC&C Apr. 21, 2015 *Ex Parte* at 1; Chester County EMA Comments at 2; Mason County Emergency Management Comments at 1; Ventura County Sheriff EMS Comments at 4; Jefferson Parish EM Comments at 3; Austin HSEM Comments at 3; Indiana DHS Comments at 4.

²³⁸ See Department of Homeland Security, Science and Technology Directorate, Best Practices in Wireless Emergency Alerts, at 22 (2013), <http://www.firstresponder.gov/TechnologyDocuments/Wireless%20Emergency%20Alerts%20Best%20Practices.pdf> (last visited May 8, 2015) (stating that, “[a]s county residents receive alerts that are not relevant to them, over time this could result in alert fatigue, as the recipients become desensitized to the alerts.”); National Public Safety Telecommunications Council Comments, PS Docket No. 15-91, 5 (Jan. 13, 2016) (NPSTC Comments).

²³⁹ Houston OPHS Comments at 3.

²⁴⁰ Austin HSEM Comments at 3 (stating about flood warnings that “[w]aterways are in low-lying areas and cell towers are typically located at higher elevations,” meaning, alerts may not be issued to the at-risk area).

²⁴¹ Dennis Mileti Apr. 7, 2016 *Ex Parte* at 3.

²⁴² See *supra* para. 30 (discussing milling in greater detail in the context of the impact of requiring support for embedded references).

This reduction in milling behavior is also likely to benefit Participating CMS Providers by reducing network usage at times when their network is otherwise vulnerable to congestion due to the pending emergency event.²⁴³ Finally, we agree with BRETSA and Douglas County Emergency Management that more granular alerting will encourage emergency managers to become authorized as WEA alert originators.²⁴⁴ Simply put, Participating CMS Providers' support for polygon-level geo-targeting is an important step towards ensuring that everyone affected by an emergency has access to the emergency information provided by WEA, and contributes to the public perception that "if you receive a WEA, take action, because it applies to you."

56. Our decision to require support for Participating CMS Providers' best approximation of the target area is an important step towards ensuring that WEA Alert Messages can be sent to only those individuals for whom they are relevant. The record shows that over-alerting leads to alert fatigue, residents that ignore the Alert Messages, and public safety officials who refrain from using WEA in emergencies.²⁴⁵ The record also demonstrates consensus among emergency managers and Participating CMS Providers that we should clear a path forward for even more accurate geo-targeting, and that we should make progress towards the achievement of this goal by adopting an appropriate regulatory framework, and by continuing to collaborate with WEA stakeholders to establish standards and best practices, and to better understand technical issues.²⁴⁶ Recognizing that standards development and network modifications may be necessary to further improve geo-targeting, in the *Further Notice* we seek comment on any issues that remain to be addressed and on an appropriate timeframe for compliance.

57. Finally, we take action to ensure that emergency alert originators better understand the manner in which their messages will be geo-targeted. In the *WEA NPRM* we sought comment on whether to require Participating CMS Providers to report data to alert originators about their provision of WEA

²⁴³ See, e.g., Sprint Reply at 4; NAB and NPR Comments at 2; CTIA Comments at 12.

²⁴⁴ BRETSA Comments at 11 ("WEA is also of limited utility to local public safety agencies because messages cannot be targeted to affected areas."); cf. Douglas County EMA Comments at 1; Lexington Division of Emergency Management Comments at 2 (poor geo-targeting discourages emergency managers from using WEA).

²⁴⁵ See, e.g., Letter from Barb Graff, City of Seattle Office of Emergency Management, to Tom Wheeler, Chairman, FCC, PS Docket No. 15-91, at 1 (filed Sep. 22, 2016) ("The lack of precise targeting makes WEA useless for Seattle in all but the largest events."); Letter from James O'Neil, Police Commissioner, City of New York, to Tom Wheeler, Chairman, FCC, PS Docket 15-91, at 1 (filed Sep. 22, 2016) (stating that when New York City used WEA in connection with a recent bombing, they experienced a degree of over-alerting that is concerning because they "they do not want people opting out of the system because they receive messages that are not relevant to them").

²⁴⁶ See, e.g., *CSRIC V WEA Geo-targeting Report* at 30-32 (recommending that the Commission modify its existing county-level geo-targeting requirement to a best approximate standard, and collaborate with WEA stakeholders to "conduct research, develop standards and implement systems that support enhanced geo-targeting and allow device operating systems and device based applications" to take specific steps to improve geo-targeting accuracy, with new handsets deployed within 34 months of the completion of standards Letter from Brian Josef, Assistant Vice President, Regulatory Affairs, CTIA, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No 15-91 (filed Sep. 22, 2016) ("In recent days, several parties have requested that device-based geo-targeting be included in the upcoming Report and Order, instead of being addressed in a Further Notice. Consistent with the recent CSRIC V recommendations and the rulemaking record, the Commission should absolutely move forward with a technically feasible and appropriate proposal in a Further Notice, and should make clear that nothing in the upcoming Report and Order will preclude service providers from pursuing technically feasible device-based geo-targeting methods in the interim."); Letter from Benjamin Krakauer, Director, Watch Command, NYCEM, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sep. 22, 2016) ("[T]he public interest would best be served by including this issue in the upcoming Rule and Order as opposed to including it in a Further Notice of Proposed Rulemaking"); Letter from Bill de Blasio, Mayor, City of New York, to Tom Wheeler, Chairman, FCC, PS Docket No. 15-91, at 2 (filed Sep. 22, 2016) (encouraging the Commission to adopt a geo-targeting recommendation that leverages the intelligence mobile devices in the Report and Order).

along key performance metrics, including the accuracy of geo-targeting.²⁴⁷ In response, emergency managers observe that information about geo-targeting, in particular, would be helpful to inform their emergency response planning efforts by improving transparency and understanding of IPAWS/WEA among emergency managers authorized to use WEA.²⁴⁸ Commenters also indicate that this transparency, in turn, could increase WEA adoption by non-participating emergency managers.²⁴⁹ In light of the demonstrated benefits of improving emergency managers' understanding of the geographic area to which their WEA Alert Messages will be targeted, we require that, upon request from an emergency management agency, a Participating CMS Provider will disclose information regarding their capabilities for geo-targeting Alert Messages (*e.g.*, whether they are using network-based technology to "best approximate" the target area, or whether they are using device-based geo-fencing). A Participating CMS Provider is only required to disclose this information to an emergency management agency insofar as it would pertain to Alert Messages initiated by that emergency management agency, and only so long as the emergency management agency offers confidentiality protection at least equal to that provided by the federal FOIA.²⁵⁰

3. Presenting Alert Messages Concurrent with Other Device Activity

a. Background

58. With respect to WEA Alert Message prioritization at the Alert Gateway and in transit, Sections 10.320 and 10.410 of the Commission's WEA rules provide that Participating CMS Providers must transmit AMBER and Imminent Threat Alerts on a first in-first out (FIFO) basis, and Presidential Alerts immediately upon receipt.²⁵¹ With respect to WEA Alert Message prioritization at the mobile device, Section 10.510 states that WEA-capable mobile devices "must not enable an Alert Message to preempt an active voice or data session."²⁵² In adopting Section 10.510, the Commission reasoned that the public would be ill-served if, during a crisis, their calls for emergency services were preempted by WEA.²⁵³ In the *WEA NPRM*, we sought comment on whether we should amend our rules to address Alert Message prioritization at the Alert Gateway, in transit, or on the mobile device.²⁵⁴

59. All public safety commenters treating this issue agree that WEA messages should take priority over all device activity except emergency phone calls.²⁵⁵ AT&T and CTIA urge us to maintain

²⁴⁷ See *WEA NPRM*, 30 FCC Rcd at 13810-11, para. 57.

²⁴⁸ See Pinellas County EM Comments at 8; Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments at 4; CCOEM Comments at 3; Los Angeles EMD Comments at 1; Jefferson Parish EM Comments at 4.

²⁴⁹ See, *e.g.*, Hyper-Reach Comments at 5; Chester County EMA Comments; Ventura County Sheriff EMS Comments at 6; Peoria ECC Comments at 1; APCO Comments at 9.

²⁵⁰ See 5 USC § 552 (2006), amended by OPEN Government Act of 2007, Pub. L. No. 110-175, 121 Stat. 2524 (stating the FOIA confidentiality standard, along with relevant exemptions); see also Review of the Emergency Alert System, EB Docket 04-296, *Sixth Report and Order*, 30 FCC Rcd 6520, 6533, n. 90 (2015) (*Sixth Report and Order*) (requiring federal, state and local entities to have confidentiality protections at least as strong as FOIA in order to receive test result data filed in the EAS Test Reporting System). Participating CMS Providers would only be expected to make this information available to an emergency management agency insofar as it pertained to alerts initiated by that emergency management agency.

²⁵¹ 47 CFR § 10.320; 47 CFR § 10.410.

²⁵² 47 CFR § 10.510.

²⁵³ *WEA First Report and Order*, 23 FCC Rcd at 6173, para. 80.

²⁵⁴ *WEA NPRM*, 30 FCC Rcd at 13817, para. 77.

²⁵⁵ See, *e.g.*, The Iowa Flood Center at the University of Iowa Comments, PS Docket No. 15-91, 2 (Feb. 12, 2016) (Iowa Flood Center Comments); NWS Comments at 2; Los Angeles EMD Comments at 1; NYCEM Comments at 16.

our existing rules for Alert Message prioritization at the Alert Gateway and in transit, stating that no approach to Alert Message prioritization other than FIFO is technically feasible.²⁵⁶ With respect to Alert Message Prioritization at the mobile device, AT&T states that all mobile devices display a WEA message as soon as it is received.²⁵⁷ During an active data session, WEA-capable mobile devices on 4G-LTE networks can be simultaneously tuned to the control channel that carries WEA Alert Messages, enabling them to receive Alert Messages as soon as they are available, irrespective of other device activity.²⁵⁸ WEA-capable mobile devices on legacy networks, however, cannot be tuned to both channels simultaneously, so receipt of a WEA Alert Message on the control channel would be delayed until the conclusion of an active session on the data channel.²⁵⁹ AT&T further states that WEA Alert Messages are currently displayed during active phone calls, but that there is no accompanying vibration cadence and attention signal, and that changing this functionality would require a change to standards.²⁶⁰

b. Discussion

60. We amend Section 10.510 to require WEA-capable mobile devices to present WEA Alert Messages as soon as they are received.²⁶¹ We expect that devices engaged in active voice or data sessions on 4G-LTE networks will receive and prominently present WEA Alert Messages as soon as they are available, whereas WEA-capable mobile devices engaged in active voice or data sessions on legacy networks will not be able to receive available Alert Messages until the active voice or data session concludes.²⁶² This approach is consistent with the *ATIS/TIA Mobile Device Behavior Specification's* treatment of Alert Message prioritization.²⁶³

61. We also allow Participating CMS Providers to provide their subscribers with the option to specify how the vibration cadence and attention signal should be presented when a WEA Alert Message is received during an active voice or data session in a manner that does not “preempt” it. Pursuant to the *ATIS/TIA Mobile Device Behavior Specification*, a “momentary interruption of a voice

²⁵⁶ AT&T Comments at 25; CTIA Comments at 14; ATIS Comments at 21; *but see* Letter from Thomas Goode, ATIS General Counsel, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 16-32, at 2 (filed Jul. 19, 2016) (stating that “it should be technically possible to prioritize [] alerts (similar to the prioritization of Presidential Alerts via WEA)”). This *Report and Order* requires no change to the manner in which Participating CMS Providers prioritize Alert Messages at the Alert Gateway or in transit, only at the mobile device. Prioritization at the Alert Gateway and in transit are addressed in the *Further Notice*. *See infra* Section IV.A.4 (Earthquake Alert Prioritization).

²⁵⁷ AT&T Mar. 17, 2016 *Ex Parte* at 6-7.

²⁵⁸ *Id.*; *see also* NYCEM Comments at 16.

²⁵⁹ AT&T Mar. 17, 2016 *Ex Parte* at 6-7.

²⁶⁰ *Id.* at 6; Microsoft Reply at 6 (stating that any other approach to Alert Message prioritization at the mobile device could encourage consumer opt out).

²⁶¹ Pursuant to this rule, all WEA-capable mobile devices will be required to present WEA Alert Messages upon receipt. We expect that legacy WEA-capable mobile devices that cannot receive the Alert Message during an active voice or data session because they cannot be simultaneously tuned to the data and control channels will nonetheless present the Alert Message prominently as soon as it is received (upon the conclusion of the active voice or data session).

²⁶² *See* AT&T Mar. 17, 2016 *Ex Parte* at 6-7; Microsoft Mar. 8, 2016 *Ex Parte* at 2; *see also* *ATIS/TIA Mobile Device Behavior Specification* at 9-10.

²⁶³ The *ATIS/TIA Mobile Device Behavior Specification* states that “[i]t is desirable to have the CMAS displayable message text prominently presented on the mobile device consistent with user settings for presentation of incoming phone calls and SMS messages.” *ATIS/TIA Mobile Device Behavior Specification* at 10 (including the illumination of the visual display without user interaction when the Alert Message is received); *cf.* Microsoft Mar. 9, 2016 *Ex Parte* at 2 (stating that the relevant standard requires “dominance” of the WEA Alert Message); NYCEM Comments at 16 (stating that it is common practice for mobile devices to process multiple tasks concurrently).

call or active data session, such as a brief visual, audible and/or vibration indication that a CMAS message has been received, is not considered preemption so long as the voice call/data session is not terminated and facilities to support that voice call or data session are not seized or released.”²⁶⁴ We note that, according to ATIS, WEA-capable mobile devices currently take a variety of approaches to the use of the vibration cadence and audio attention signal to make the user aware of the receipt of an Alert Message while he/she is engaged in other device activity,²⁶⁵ but, according to AT&T, it “is possible to display the WEA alert in LTE VoLTE with the alert tone suppressed” during active voice sessions.²⁶⁶ We encourage Participating CMS Providers to leverage this capability by providing their customers with the option to change the manner in which the common attention signal and vibration cadence are used during active voice and data sessions.

62. This approach reflects the critical importance of a WEA Alert Message to its recipient, while also respecting that the Alert Message recipient may be using their mobile device to engage in a protective action that should not be interrupted, such as placing a call to 911, at the time the Alert Message is received.²⁶⁷ This approach is consistent with mobile device manufacturers’ perspective that giving full priority to WEA Alert Messages during active voice calls “would be distracting to the user,”²⁶⁸ and that the WEA Alert Message should not disrupt the voice telephony capability of the device.²⁶⁹ It is also consistent with emergency managers’ perspective that the readily recognizable common attention signal and vibration cadence should be presented to the public as quickly as technically possible, particularly during emergency situations where every second is critical.²⁷⁰ Conversely, we agree with commenters that a “priority access” requirement that would require ongoing voice and data sessions to be terminated by the receipt of a WEA Alert Message would not be in the public interest because it could result in the termination of other critical emergency communications.²⁷¹

C. Testing and Outreach

1. Supporting State/Local WEA Testing and Proficiency Training Exercises

a. Background

63. Section 10.350 of the Commission’s WEA rules requires Participating CMS Providers to participate in monthly tests initiated by FEMA and in periodic testing of the C-interface.²⁷² The Commission adopted these requirements in the *WEA Second Report and Order*, consistent with the testing model recommended by CTIA at the time.²⁷³ In the *WEA NPRM*, we proposed to supplement the WEA testing model, as recommended by CSRIC IV, with State/Local WEA Tests, end-to-end system tests

²⁶⁴ See *ATIS/TIA Mobile Device Behavior Specification* at 11.

²⁶⁵ Letter from Thomas Goode, General Counsel, Alliance for Telecommunications Industry Solutions, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 19 (filed Mar. 18, 2016) (*ATIS Mar. 18, 2016 Ex Parte*).

²⁶⁶ AT&T Mar. 17, 2016 *Ex Parte* at 7.

²⁶⁷ See Los Angeles EMD Comments at 1; Iowa Flood Center Comments at 2. Similarly, if someone is sending a text message to 911 when a WEA message is received, the incoming WEA Alert Message must not preempt the ability of the user to complete their action and continue their text exchange.

²⁶⁸ See Blackberry Mar. 21, 2016 *Ex Parte* at 2.

²⁶⁹ See Microsoft Mar. 8, 2016 *Ex Parte* at 2.

²⁷⁰ See USGS Comments at 2; NYCEM Comments at 16; Houston OPHS Comments at 4.

²⁷¹ See Microsoft Reply at 6; CTIA Comments at 14; Blackberry Mar. 21, 2016 *Ex Parte* at 2.

²⁷² 47 CFR § 10.350.

²⁷³ *WEA Second Report and Order*, 23 FCC Rcd at 10773-74, paras. 21-23.

initiated by state and local emergency managers and terminating with members of the public who opt in to receiving them.²⁷⁴

64. The majority of commenters support the proposed State/Local WEA Testing model, and agree that requiring Participating CMS Providers to support State/Local WEA Tests will be beneficial to both alert originators and the public.²⁷⁵ Commenters differ on how frequently emergency managers should be allowed to conduct State Local WEA/Tests, offering preferred rates for testing that range from “constantly” to annually.²⁷⁶ The majority of commenters agree that State/Local WEA Tests should be retransmitted by Participating CMS Providers immediately upon receipt because allowing Participating CMS Providers to delay up to 24 hours before sending a State/Local WEA Test, as they are permitted to do for RMTs, would defeat the purpose of end-to-end testing, and may result in the public receiving test messages at night, which would encourage opt out.²⁷⁷ Verizon and CTIA state that providing consumers with the option to opt in to receive State/Local WEA Tests would require new standards to implement, militating for a 30-month implementation timeframe.²⁷⁸ Emergency managers also agree that proficiency training would be beneficial, but APCO and NYCEM state that this activity does not require live WEA tests, and in fact, may be accomplished more effectively and efficiently via other offline methods using the alert origination software.²⁷⁹

b. Discussion

65. We require Participating CMS Providers to support State/Local WEA Tests, as proposed in the *WEA NPRM*. Specifically, we adopt a new Section 10.350(c) to require Participating CMS Providers to support the receipt of State/Local WEA Tests from the Federal Alert Gateway Administrator, and to distribute such tests to the desired test area in a manner consistent with the Commission’s Alert Message requirements.²⁸⁰ We reason that requiring State/Local WEA Tests to be received and delivered

²⁷⁴ *WEA NPRM*, 30 FCC Rcd at 13806-07, para. 47; *CSRIC IV WEA Testing Report* at 24.

²⁷⁵ See, e.g., Verizon Comments at 3; T-Mobile Reply at 10; APCO Comments at 8; CTIA Comments at 8; NWS Comments at 2 (stating that the phrase “may support” should be replaced with “shall support” opt-in to State/Local WEA Testing); FEMA May 21, 2015 *Ex Parte* at 4; NYCEM Comments at 13; *but see* BRETSA Comments at 19 (stating that, rather than allowing for State/Local WEA Testing, WEA should be connected to other Emergency Notification Services (ENS) through an application programming interface (API)); Sprint Comments at 13 (stating that this could have staffing implications, and that hundreds of tests could overwhelm CMSP resources); APCO Comments at 9 (stating that offline methods of testing alert software present more optimal modes of proficiency training); CTIA Comments at 9 (stating that new rules should limit support for testing to 4G LTE and future networks); DAC Comments at 3-4 (stating that proficiency training opportunities provided by these exercises could “help to ensure that Emergency Man[a]gers have taken the appropriate steps to identify at-risk members of their local communities”).

²⁷⁶ See, e.g., Ventura County Sheriff EMS Comments at 5 (stating the emergency managers need to constantly test and train on sending emergency messages); Matanuska-Susitna Borough Comments (supporting weekly testing); Kansas City EM Comments at 2 (supporting monthly testing); Henderson OEM Comments at 1 (supporting quarterly testing); Pinellas County EM Comments at 7 (supporting biannual testing); Mason County EM Comments at 1 (stating that testing would be useful even if limited to once per year).

²⁷⁷ See Indiana DHS Comments at 5; Henderson OEM Comments at 1; NYCEM Comments at 14; Jefferson Parish EM Comments at 3-4; Pinellas County EM Comments at 7; Kansas City EM Comments at 2; *but see* Douglas County EMA Comments at 1.

²⁷⁸ See Verizon Comments at 13; CTIA Comments at 9.

²⁷⁹ See Henderson OEM Comments at 1; San Joaquin County OES Comments at 2; Peoria ECC Comments; NYCEM Comments at 14; CCOEM Comments at 2; *cf.* APCO Comments at 9; NYCEM Comments at 13; San Joaquin OES Comments at 2.

²⁸⁰ Our Alert Message Requirements are provided in Subpart D of our Part 10 WEA rules. See 47 CFR §§ 10.400 – 10.480. These requirements address classification, prioritization, message elements, character limit, embedded references, geo-targeting, and roaming.

in accordance with our Alert Message requirements will ensure that emergency managers have the opportunity to test in an environment that mirrors actual alert conditions and evaluate, for example, the accuracy with which various Participating CMS Providers geo-target Alert Messages in their community. Unlike other Alert Messages, however, consumers will not receive State/Local WEA Tests by default. Participating CMS Providers should provide their subscribers with the option to receive State/Local WEA Tests, and subscribers would have to affirmatively select this option in order to receive these test messages.²⁸¹ According to CTIA, “[t]his way, unwanted test messages will not disturb wireless consumers who could become confused or annoyed by test messages and opt out of WEA entirely.”²⁸² We also agree with Sprint that making State/Local WEA Tests available on an opt-in basis minimizes any risk of call center congestion.²⁸³ Another respect in which a State/Local WEA Test will differ from an actual Alert Message is that we require State/Local WEA Tests to include conspicuous language sufficient to make clear to the public that the message is, in fact, only a test. This will minimize any chance that such test messages might be misconstrued as actual Alert Messages.

66. The 24-hour delivery window that currently applies to RMTs under Section 10.350(a)(2) will not apply to State/Local WEA Tests. Rather, we require that Participating CMS Providers transmit State/Local WEA Tests immediately upon receipt.²⁸⁴ We agree with commenters that allowing Participating CMS Providers to delay delivery of State/Local WEA Tests would make it impossible for emergency managers to evaluate message delivery latency, and might result in individuals who do opt in to receive State/Local WEA Tests receiving them in the middle of the night, which is unlikely to promote participation.²⁸⁵ A Participating CMS Provider may not forgo or delay delivery of a State/Local WEA Test, except when the test is preempted by actual Alert Message traffic, or if an unforeseen condition in the Participating CMS Provider infrastructure precludes distribution of the State/Local WEA Test.²⁸⁶ If a Participating CMS Provider Gateway forgoes or delays a State/Local WEA Test for one of these reasons, it shall send a response code to the Federal Alert Gateway indicating the reason consistent with how we currently require Participating CMS Providers to handle forgone RMTs.²⁸⁷ We anticipate that allowing Participating CMS Providers to forgo transmittal of a State/Local WEA Test if it is preempted by actual alert traffic or if unforeseen conditions arise will ensure that State/Local WEA Tests do not “overwhelm wireless providers’ limited resources,” as stated by CTIA.²⁸⁸ We defer to emergency managers to determine how frequently testing is appropriate, given this constraint.

67. We encourage emergency management agencies to engage in proficiency training exercises using this State/Local WEA Testing framework where appropriate. We agree with commenters that proficiency training exercises are a helpful and meaningful way for emergency managers to engage

²⁸¹ Notwithstanding Section 10.350(c)(4), for legacy devices no longer supported by software updates, Participating CMS Providers may provide subscribers with the option to receive State/Local WEA Tests, but are not required to do so.

²⁸² CTIA Comments at 8; *accord* T-Mobile Reply 10; Chester County EMA Comments at 2; NYCEM Comments at 14; Cochise County OES Comments at 2; Jefferson Parish EM Comments at 3; Kansas City EM at 2.

²⁸³ *See* Sprint Comments at 12 (stating that support for State/Local WEA Testing will have “significant staffing implications”).

²⁸⁴ *See* Chester County EMA Comments at 3 (requesting testing that accurately reflect latencies).

²⁸⁵ *See* Indiana DHS Comments at 5; Henderson OEM Comments at 1; NYCEM Comments at 14; Jefferson Parish EM Comments at 3-4; Pinellas County EM Comments at 7; Kansas City EM Comments at 2; Denver OEMHS Comments at 2.

²⁸⁶ 47 CFR § 10.350(a) (describing RMTs).

²⁸⁷ *See* 47 CFR § 10.350(a)(3); *CMSAAC Report* at 92.

²⁸⁸ CTIA Comments at 9; *accord* Sprint Comments at 13; *cf.* Verizon Comments at 13 (expressing concern that tests may be received during major network upgrades).

with alert and warning issues.²⁸⁹ Moreover, we agree with San Joaquin County OES that “proficiency training is an essential element of verifying competency” in the alert origination skill set necessary to issue effective WEA Alert Messages.²⁹⁰ We observe that our rules allow such proficiency training exercises now. We agree with APCO that alert origination software can be used to support internal proficiency training exercises where emergency managers wish to iterate alert origination best practices in a closed environment,²⁹¹ and that the State/Local WEA Testing framework described above is sufficient to support cases where emergency management agencies find it appropriate to involve the public in their WEA exercises.²⁹² We hope that proficiency training exercises will provide emergency management agencies with a method of generating their own WEA alert origination best practices, particularly with respect to the kinds of enhanced Alert Messages enabled by this proceeding (*i.e.*, Alert Messages up to 360 characters in length that may include embedded references, may be issued in Spanish, and may be intended to supplement an already-issued Alert Message).

68. We find that requiring Participating CMS Providers to support this State/Local WEA Testing framework is technically feasible, requiring only updates to software and standards in order to allow users the option to opt in to receive such tests,²⁹³ and that it will result in significant public safety benefits.²⁹⁴ Specifically, we agree with Clarion County OES and the Lexington Division of Emergency Management that while occasional system failures are probable, a solid testing and training platform such as this can ensure that failures can be corrected during a period where no real emergency exists.²⁹⁵ We also agree with Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness that regular readiness testing and proficiency training are critical to maintaining WEA alert origination competency because “[i]f you don’t use it you lose it.”²⁹⁶ According to FEMA, requiring Participating CMS Providers to support State/Local WEA Testing will improve WEA by providing confidence to the public that their handsets are capable of receiving an Alert Message from local emergency management agencies, and by rendering WEA suitable for use in coordinated public warning exercises, such as those required by the Nuclear Regulatory Commission for local emergency preparedness programs.²⁹⁷ Further, we agree with Harris County Office of Homeland Security and Emergency Management that State/Local WEA Tests, in conjunction with targeted outreach efforts, may be useful to emergency managers as a tool to improve their competency at initiating Alert Messages in languages other than English.²⁹⁸ Importantly,

²⁸⁹ See San Joaquin County OES Comments at 2; APCO Comments at 9.

²⁹⁰ San Joaquin County OES Comments at 2.

²⁹¹ APCO Comments at 9.

²⁹² *Id.*

²⁹³ See Verizon Comments at 13; ATIS Comments at 20; CTIA Comments at 9.

²⁹⁴ See, e.g., Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness Comments at 1; Clarion County OES Comments at 1; Lexington Division of Emergency Management Comments at 2; FEMA Jun. 18, 2015 *Ex Parte* Letter at 3.

²⁹⁵ See Clarion County OES Comments at 1; Lexington Division of Emergency Management Comments at 2.

²⁹⁶ Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness Comments at 1.

²⁹⁷ See FEMA Jun. 18, 2015 *Ex Parte* Letter at 3; see also U.S. N.R.C., *About NRC*, <http://www.nrc.gov/about-nrc.html> (last visited Jul. 15, 2016). The U.S. Nuclear Regulatory Commission (NRC) was created as an independent agency by Congress in 1974 to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment. The NRC regulates commercial nuclear power plants and other uses of nuclear materials, such as in nuclear medicine, through licensing, inspection and enforcement of its requirement. Each nuclear power plant operator is required to submit the radiological emergency response plans including scheduled tests and exercises for state and local governments that are within the 10-mile plume exposure pathway “Emergency Planning Zones (EPZ),” as well as the plans of state governments within the 50-mile ingestion pathway EPZs. See 10 CFR §§ 50.33(g); 50.54(s).

²⁹⁸ See Harris County OSHEM Mar. 7, 2016 *Ex Parte* at 4.

emergency managers may also use State/Local WEA Tests to voluntarily collect and share information about geo-targeting, alert delivery latency, and other vital performance metrics.²⁹⁹ We encourage emergency managers and related entities to engage in extensive outreach to their respective communities in order to socialize the benefits of public participation in State/Local WEA Tests, and otherwise to raise public awareness about the benefits of receiving WEA messages, including through the use of PSAs.³⁰⁰

2. Testing the NCE Public Television C-interface Back-up

a. Background

69. Under the WARN Act, non-commercial educational (NCE) public television broadcast television stations are required to “install necessary equipment and technologies on, or as part of, any broadcast television digital signal transmitter to enable the distribution of geographically targeted alerts by commercial mobile service providers that have elected to transmit emergency alerts.”³⁰¹ Section 10.340 of the Commission’s rules, in turn, implements this statutory mandate by requiring NCE public broadcast television station licensees and permittees to deploy transmission facilities capable of receiving “WEA alerts from the Alert Gateway over an alternate, secure interface and then to transmit such WEA alerts to CMS Provider Gateways of Participating CMS Providers.”³⁰² In other words, this NCE public broadcasting equipment provides a secure back-up to the C-interface. The Commission adopted this requirement in the *WEA Second Report and Order* in order to satisfy Section 602(c) of the WARN Act, and to serve the public interest by creating a redundant, alternate Alert Message distribution path.³⁰³ In the *WEA NPRM*, we sought to refresh the record on whether and how testing of the broadcast-based WEA infrastructure should be implemented.³⁰⁴

70. PBS, APTS, and CPB state that they already voluntarily test their broadcast-based WEA equipment and its connectivity to FEMA in a continuous manner to detect and address any anomalies.³⁰⁵ These commenters state that in order to fully test and validate message delivery and improve system integrity, they would support a weekly or monthly test the public television broadcast-based backup to the C-interface initiating from the FEMA Gateway and traversing the broadcast-based WEA infrastructure to the CMS Provider Gateway.³⁰⁶ CSRIC V highlights the importance of the broadcast-based backup to the C-interface to protecting system resiliency in its March 2016 *CSRIC V WEA Security Report*, stating that “PBS WARN is a safeguard to ensure delivery of the WEA, even in the event that a cybersecurity or other event disrupts the primary WEA delivery path.”³⁰⁷

²⁹⁹ *See id.*

³⁰⁰ *See infra* Section III.C.3 (Facilitating WEA PSAs).

³⁰¹ WARN Act § 602(c), 47 USC § 1202(c).

³⁰² 47 CFR § 10.340.

³⁰³ *WEA Second Report and Order*, 23 FCC Rcd at 1077-71, paras. 15-16.

³⁰⁴ *WEA NPRM*, 30 FCC Rcd at 13817, para. 74.

³⁰⁵ Public Broadcasting Service, Association of Public Television Stations, and Corporation for Public Broadcasting Comments, PS Docket No. 15-91, 2 (Jan. 13, 2016) (PBS, APTS, and CPB Comments).

³⁰⁶ *See* Letter from Thomas Rosen, Assistant General Counsel, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 1 (filed Mar. 11, 2016) (PBS, APTS, and CPB Mar 11, 2016 *Ex Parte*). This position represents a revision of their previous analysis, in which they asserted that that imposing any additional WEA testing obligations on NCE public broadcast television stations “remains just as infeasible, costly, and ineffective as it was eight years ago when the Commission last considered this same issue.” PBS, APTS, and CPB Comments at 3.

³⁰⁷ *CSRIC V WEA Security Report* at 26.

b. Discussion

71. We agree with the public broadcasting and NCE commenters that in order to be fully effective and reflective of WEA system needs, a test of the public television broadcast-based backup to the C-interface should be implemented as an end-to-end test from the IPAWS to the CMS Provider Gateways. Accordingly, we amend our rules to make it clear that periodic C interface testing must include the testing of its public television broadcast-based backup. Pursuant to this framework, FEMA would initiate a test of the broadcast-based C-interface backup by sending a test message through that infrastructure to the CMS Provider Alert Gateway, which would respond by returning an acknowledgement of receipt of the test message to the FEMA Gateway. This approach ensures reliable continuity between FEMA and Participating CMS Providers, even during a disaster in which internet connectivity may be lost.³⁰⁸ We defer to FEMA as the IPAWS and Federal Alert Gateway administrator to determine the periodicity of these tests in conversation with Participating CMS Providers.³⁰⁹

72. By requiring CMS Providers to participate in periodic testing of the broadcast-based backup to the C-interface, “we develop and implement the appropriate safeguards to ensure delivery of critical infrastructure services,” as recommended by the *CSRIC V WEA Security Report*.³¹⁰ PBS, APTS, and CPB agree that this approach to testing the C-interface backup presents NCE public broadcasting entities with no additional cost burdens.³¹¹ We agree with PBS, APTS, and CPB that this rule will require no “material intervention” by such stations because their receipt and retransmission of test messages will be entirely automated, and will use equipment already installed at their facilities.³¹² Accordingly, we anticipate that stations in compliance with our rules today will have to take no additional steps in order to comply with this new testing requirement.

3. Facilitating WEA PSAs

a. Background

73. Sections 11.45 and 10.520 of the Commission’s EAS and WEA rules, respectively, contain prohibitions on the use of the common emergency alerting attention signal in cases other than an actual emergency.³¹³ The Commission adopted Section 10.520 in the *WEA First Report and Order* in order to ensure WEA accessibility.³¹⁴ The Commission adopted Section 11.45 in the *EAS Deployment Order* in order to prohibit the false or deceptive use of the EAS attention signal.³¹⁵ We have recently granted waivers of these rule provisions to facilitate FEMA’s efforts to create and disseminate WEA PSAs.³¹⁶ In the *WEA NPRM*, we proposed to allow federal, state and local governments to use the

³⁰⁸ *See id.* at 25-28.

³⁰⁹ *Cf.* Joint ATIS/TIA CMAS Federal Alert Gateway to CMSP Gateway Interface Specification, J-STD 101, at 18 (2012) (specifying that FEMA will determine the periodicity of C-interface tests in conversation with Participating CMS Providers).

³¹⁰ *CSRIC V WEA Security Report* at 26.

³¹¹ *See* Letter from Thomas Rosen, Assistant General Counsel, to Marlene Dortch, Secretary, Federal Communications Commission, at 1 (filed Mar. 11, 2016) (PBS, APTS, and CPB Mar. 11, 2016 *Ex Parte*). Similarly, this position represents a revision of their previous analysis. *See* PBS, APTS, and CPB Comments at 3.

³¹² PBS, APTS, and CPB Mar. 11, 2016 *Ex Parte* at 1.

³¹³ 47 CFR § 11.45; 47 CFR § 10.520(d).

³¹⁴ *WEA First Report and Order*, 23 FCC Rcd at 6168-69, paras. 64, 67.

³¹⁵ Amendment of Part 73, Subpart G, of the Commission’s Rules Regarding the Emergency Broadcast System, *Report and Order and Further Notice of Proposed Rulemaking*, FO Docket Nos. 91-301, 91-171, 10 FCC Rcd 1786, 1815, para. 84 (1994) (*EAS Deployment Order*).

³¹⁶ *See, e.g.*, Waiver of Section 11.45 of the Commission’s Rules to Allow Broadcast of Public Service Announcements Produced by the Federal Emergency Management Agency to Educate the Public on the Wireless

(continued....)

attention signal common to EAS and WEA to raise public awareness about WEA, provided the relevant entity makes it clear that the WEA Attention Signal is being used in the context of the PSA, “and for the purpose of educating the viewing or listening public about the functions of their WEA-capable mobile devices and the WEA program,” including by explicitly stating that the WEA attention signal is being used in the context of a PSA for the purpose of educating the public about WEA.³¹⁷

74. Commenters unanimously support our proposal to facilitate WEA PSAs, and NYCEM states that this would be particularly important in light of the creation of the new Alert Message classification and the need to educate the public about the value of the additional information they intend to provide.³¹⁸ Dennis Mileti, Professor Emeritus, University of Colorado, states that the social science research record on public response to warning concludes that “pre-event public education is useful to familiarize the public, among other things, with warning technologies and approaches that may be used in the future.”³¹⁹

b. Discussion

75. We amend Sections 11.45 and 10.520 to allow federal, state and local, tribal and territorial entities, as well as non-governmental organizations (NGOs) in coordination with such entities, to use the attention signal common to EAS and WEA to raise public awareness about WEA. WEA PSAs that use the WEA attention signal must make clear that it is being used in the context of the PSA, “and for the purpose of educating the viewing or listening public about the functions of their WEA-capable mobile devices and the WEA program,” including by explicitly stating that the WEA attention signal is being used in the context of a PSA for the purpose of educating the public about WEA.³²⁰

76. We agree with commenters that facilitating federal, state, local, tribal and territorial governments’ issuance of WEA PSAs, as proposed, is in the public interest,³²¹ and that the utility of WEA PSAs will only be augmented by allowing NGOs to produce them in coordination with governmental entities by promoting effective community partnership.³²² Specifically, WEA PSAs can be effective tools to raise public awareness about, and promote positive perceptions of WEA, which may reduce consumer opt-out and reduce milling.³²³ We note the PSA campaign of Minnesota Emergency, Community Health and Outreach (ECHO), a program and service of Twin Cities Public Television, as an example of how governmental entities can partner with NGOs to raise community awareness about the significance of the

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Emergency Alert System, PS Docket No. 07-287, *Order*, DA 15-1326, para. 6 (2015) (granting a limited waiver of Sections 11.45 and 10.520 of the Commission’s rules to allow the broadcast or transmission of the WEA Attention Signal in PSAs produced as part of FEMA’s WEA public education campaign).

³¹⁷ *WEA NPRM*, 30 FCC Rcd at 13815, para. 70. In the *Alerting Paradigm NPRM*, we sought comment on this same issue in the EAS context. *Alerting Paradigm NPRM*, 31 FCC Rcd at 626-27, paras. 66-68. We resolve this issue here only insofar as it pertains to the broadcast or transmission of the WEA Attention Signal. We will address this issue as it pertains to EAS in the *Alerting Paradigm* proceeding.

³¹⁸ *See, e.g.*, AT&T Comments at 24; USGS Comments at 2; NWS Comments at 4; *see also* NYCEM Comments at 15-16; DAC Comments at 4.

³¹⁹ Dennis Mileti Apr. 7, 2016 *Ex Parte* at 4-5.

³²⁰ Waiver of Section 11.45 of the Commission’s Rules to Allow Broadcast of Public Service Announcements Produced by the Federal Emergency Management Agency to Educate the Public on the Wireless Emergency Alert System, PS Docket No. 07-287, *Order*, DA 15-1326, para. 8 (2015).

³²¹ *See, e.g.*, AT&T Comments at 24; USGS Comments at 2; NWS Comments at 4; NYCEM Comments at 15-16.

³²² *See, e.g.*, California Governor’s OES Comments at 4; USGS Comments at 2.

³²³ *See, e.g.*, AT&T Comments at 24; USGS Comments at 2; NWS Comments at 4; NYCEM Comments at 15-16; Dennis Mileti Apr. 7, 2016 *Ex Parte* at 4-5.

common alerting attention signal for EAS and WEA.³²⁴ We also note that WEA PSAs have become a critical part of FEMA's *Ready* campaign that has "shown that it can enhance the public's understanding of how the WEA functions and increase the public's benefits from the WEA and thereby benefit public safety generally."³²⁵ We agree with commenters that the issuance of WEA PSAs is particularly appropriate in the context of the rules we adopt today.³²⁶ For example, with respect to increasing the maximum WEA character limit, FEMA notes that it will "need to . . . conduct additional public information efforts to inform people of the new format of Alert Messages they may receive on their cellular phones."³²⁷ Additionally, we anticipate that PSAs will be an effective method to acclimate the public to the fact that they may receive supplemental instructions about how to respond to an emergency through the newly adopted WEA Public Safety Message classification. Indeed, we commit to work with WEA stakeholders to develop community outreach plans and raise public awareness about each of the WEA enhancements made possible by this *Report and Order*. Moreover, we agree with Professor Denis Mileti, Professor Emeritus, University of Colorado, that WEA PSAs can reduce milling by "build[ing] the reputation of the WEA system with the American public," making it a more credible and authoritative single resource for emergency information.³²⁸

D. Compliance Timeframes

a. Background.

77. In the *WEA NPRM*, we recognized that while all of our proposed rules are intended to leverage commercially available technologies to improve public safety at minimal cost to Participating CMS Providers, compliance with our WEA message content rules, unlike our WEA testing and geo-targeting rules, would likely require modifications to existing standards in order to ensure that Participating CMS Providers are able to comply with these proposed rules in a uniform manner.³²⁹ Accordingly, we proposed to require Participating CMS Providers to comply with our WEA messaging rules within one year, and with our WEA geo-targeting and testing/outreach rules within sixty days.³³⁰ We also sought comment on reasonable timelines to implement improvements to WEA on which we sought comment, such as multilingual alerting, and testing of the backup to the C-interface.

³²⁴ See, e.g., *Public Service Announcements/Short Videos*, <http://echominnesota.org/topics/psa> (last visited Jul. 23, 2016) (Echo is an NGO that works alongside state and local entities, including Twin Cities Public Television (TPT) to deliver effective PSAs to populations with limited English proficiency).

³²⁵ Waiver of Section 11.45 of the Commission's Rules to Allow Broadcast of Public Service Announcements Produced by the Federal Emergency Management Agency to Educate the Public on the Wireless Emergency Alert System, PS Docket No. 07-287, *Order*, DA 15-1326, para. 7 (2015); About the Ready Campaign, <https://www.ready.gov/about-us> (last visiting Jul. 29, 2016) ("Ready" is a national public service advertising (PSA) campaign designed to educate and empower Americans to prepare for and respond to emergencies including natural and man-made disasters. The goal of the campaign is to get the public involved and ultimately to increase the level of basic preparedness across the nation.").

³²⁶ See, e.g., FEMA Jun. 18, 2015 *Ex Parte* at 1; NWS Comments at 2-3; USGS Comments at 2.

³²⁷ FEMA Jun. 18, 2015 *Ex Parte* at 1.

³²⁸ Dennis Mileti April 7, 2016 *Ex Parte* at 3.

³²⁹ *WEA NPRM*, 30 FCC Rcd at 13819, paras. 82, 84 (including extending the maximum WEA message length, establishing a new Alert message classification, and including embedded references in WEA Alert Messages among our WEA message content rules).

³³⁰ See *id.* at 13819, para. 82.

78. Most emergency management agencies treating the issue agree that our proposed compliance timeframes are reasonable.³³¹ Participating CMS Providers, ATIS, CTIA, and San Joaquin OES, on the other hand, state that our proposed compliance timeframes are insufficient because they do not allow Participating CMS Providers, in conversation with the Commission, FEMA and alert originators, to “jointly identify timelines for enhanced WEA development, testing, and deployment ‘within six months of adoption of rules’ as recommended by CSRIC IV,”³³² and because we have not allowed enough time for the development of new technical standards in all cases.³³³

b. Discussion

79. Where the record shows that compliance with our rules will require Participating CMS Providers to update standards and software, we require compliance thirty months from the date of the rules’ publication in the *Federal Register*.³³⁴ Specifically, we allow Participating CMS Providers thirty months to support 360-character messages on 4G-LTE and future networks and devices, to support Public Safety Messages, to comply with our Alert Message prioritization requirements, and to allow consumers to opt in to receiving State/Local WEA Tests. Participating CMS Providers state that 30 months is a sufficient amount of time to make such changes within their networks,³³⁵ and the record shows that updates to IPAWS and alert origination software can be completed within this timeframe as well.³³⁶ In establishing this compliance timeframe, we take into consideration commenters’ feedback that we should take into account the time necessary to complete all relevant updates to standards and software.³³⁷ Specifically, the record shows that we should allow twelve months for appropriate industry bodies to finalize and publish relevant standards,³³⁸ another twelve months for Participating CMS Providers and mobile device manufacturers to develop and integrate software upgrades consistent with those standards

³³¹ See Omaha-Douglas County Emergency Management Agency Comments, PS Docket No. 15-91, 2 (Jan. 13, 2016) (Omaha-Douglas County EMA Comments); NYCEM Comments at 17; USGS Comments at 1; Vail PSCC and PD Comments at 1.

³³² See T-Mobile Comments at 7 citing *CSRIC IV WEA Messaging Report* at 49; ATIS Comments at 22 (recommending “a meeting of the relevant stakeholders be convened after the new rules are established to develop reasonable implementation timeframes.”).

³³³ See Verizon Comments at 5; Sprint Reply at 2-3 (“[T]he timeline proposed in the NPRM is not sufficient to develop and implement appropriate standards. Moreover, once these standards are developed, carriers, alerting authorities, and FEMA will need additional time to make the requisite changes to their networks, software, and handsets.”); ATIS Comments at 8, 22 (“While ATIS supports the implementation of 360-character WEA notifications (consistent with ATIS’ input above) within one year of the rules’ effective date, ATIS believes that some of the other proposed deadlines may not appropriately consider the work that will need to be completed by all relevant stakeholders.”); San Joaquin OES Comments at 2.

³³⁴ Except as otherwise stated, compliance is required with each of the rules we adopt today as of their effective date.

³³⁵ Verizon Comments at 5 (“[A]t least 30 months will be needed to implement the new technical requirements.”); T-Mobile Comments at 5 (stating that it would take 24-36 months to support a new Alert Message classification); AT&T Mar. 17, 2016 *Ex Parte* at 3-4 (“It will take at least 12 months to standardize, then 18 months for OS development/testing, followed by device roll-out.”).

³³⁶ See Verizon Comments at 5; FEMA Jun. 18, 2015 *Ex Parte* at 1 (stating that it will need to upgrade the IPAWS Alert Aggregator and C-interface in order to comply with the rules we adopt today, which will take a total of twelve months); see also Everbridge May 12, 2016 *Ex Parte* at 1 (stating that one year will be sufficient time for alert origination software vendors to develop and deploy any updates to their software that our rules may require).

³³⁷ See *supra* note 329 (listing commenters urging the Commission to allow appropriate time for the adoption of new standards prior to requiring compliance with its proposed rules).

³³⁸ See T-Mobile Comments at 8; Verizon Comments at 5; ATIS Comments at 21-22.

into embedded plant, and to complete required “technical acceptance testing,”³³⁹ and then six more months for Participating CMS Providers and mobile device manufacturers to deploy this new technology to the field.³⁴⁰ We therefore conclude that 30 months will be a sufficient period of time for all affected parties to complete the necessary steps to deploy improvements to WEA with confidence that they will work correctly when needed, rather than allow them to be beta tested “in the wild.”³⁴¹

80. With respect to embedded references, however, we require Participating CMS Providers to support embedded references in Alert Messages within one year. While the timeline set forth above may be reasonable to apply in most use cases, we believe that the inclusion of embedded URLs and phone numbers is a critical modification that can and must be prioritized. As observed above, the public safety community views this change as the most important among all those we consider in this proceeding, because it will transform WEA from a character-limited text message service to a multimedia-enabled, comprehensive disaster response resource.³⁴² We believe it is feasible for Participating CMS Providers to support embedded references within one year, and also that it is necessary to ensure that WEA evolves along with consumer expectations.³⁴³ We further expect that Participating CMS Providers will be interested in making this functionality available as quickly as possible in the best interest of their subscribers, including by implementing necessary changes to their software without waiting for the completion of industry standards. In addition, by allowing Participating CMS Providers to pilot this functionality prior to the date of required compliance, we enable them to identify and address any technical prerequisites to compliance in a controlled, real-world environment. Finally, we note that any Participating CMS Provider unable to comply within one year may request a waiver of this requirement pursuant to Section 1.3 of our rules.³⁴⁴

³³⁹ See Verizon Comments at 5 (“the need for manufacturers and vendors to incorporate the new standards into their products and test them . . . can take as much as 12 months”); ATIS Comments at 21-22 (stating that work to comply with our proposed rules will include “the modification of existing industry standards and/or development of new standards; the testing and deployment of new WEA capabilities in wireless networks; and the deployment of subscriber devices (if needed) for receipt of new WEA capabilities”); cf. Microsoft Reply at 3 (recommending 24 months from the completion of standards for software testing and deployment).

³⁴⁰ See Verizon Comments at 5; ATIS Comments at 21-22. For example, common to any commenters’ support for expanding the character limit to 360 for 4G-LTE and future networks is the completion of Alliance for Telecommunications Industry Standards (ATIS) standards, the incorporation of those standards into new technologies, and the incorporation of new technologies into existing networks— a process commenters agree is feasible, but would take at least 30 months. See, e.g., AT&T Comments at 7 (“Support for both 90 and 360-character messages will require changes to the interface between the FEMA IPAWS (‘Integrated Public Alert and Warning System’) and the CMSP network, and changes to the CMSP infrastructure. The changes will first require modifications to industry standards, followed by development, testing, and deployment of the changes.”); T-Mobile Comments at 4; Verizon Comments at 6 (“the Commission should expand the allowable WEA character limits to 360 characters for messages on LTE networks and on devices first offered to consumers 30 months after adoption of new rules”); Microsoft Reply at 3 (“Before requiring implementation, the Commission should allow at least 24 months after standards have been completed and accepted to allow for the technology to be developed, tested, and implemented in devices and networks.”).

³⁴¹ Microsoft Comments at 2.

³⁴² See *supra* para. 27.

³⁴³ See Kansas City EM Comments at 1 (“The public expects more detail about the nature of the alert and geography. Even though the alerts theoretically only reach those in the danger area, we need to be able to say what, where, and how long. Simply ‘Tune to local radio’ isn’t cutting it.”); TDI Comments at 12 (“In today’s mobile-savvy environment, the current prohibition against embedded phone numbers and URLs has no public interest benefit and stands only as a testament to the rapid change in mobile usage and public expectations.”).

³⁴⁴ 47 CFR § 1.3.

81. We require Participating CMS Providers to support Spanish-language Alert Messages within two years. Unlike the aforementioned rules where updated standards are prerequisites to compliance, Verizon and Microsoft observe that standards already exist to support Spanish-language Alert Messages.³⁴⁵ Accordingly, Verizon suggests that it would be appropriate to require compliance with this requirement within two years, rather than within 30 months.³⁴⁶ We agree that the record shows that Participating CMS Providers can develop and integrate software upgrades into embedded plant, and deploy this new technology to the field in two years.³⁴⁷

82. The record shows that shorter compliance timeframes are also appropriate for our alert logging requirements, our more narrow geo-targeting requirements, our requirement to test the backup to the C-interface, and our new WEA PSA rules, because stakeholders are already able to comply with these requirements. In instances where the record shows that the “nationwide” Participating CMS Providers are already able to comply with our requirements but small, rural and regional Participating CMS Providers are not, we allow additional time for these “non-nationwide” Participating CMS Providers to establish compliance. The Commission has traditionally considered “nationwide” Participating CMS Providers to be Participating CMS Providers that “cover a majority of the population and land area of the country,” including AT&T, Verizon, Sprint and T-Mobile, and we continue to use that definition here.³⁴⁸ Specifically, the record suggests that nationwide Participating CMS Providers already log Alert Messages consistent with our requirement.³⁴⁹ We note that the 60 day timeframe for compliance with our alert logging rules will begin from the date of publication in the Federal Register of a notice announcing the approval by the Office of Management and Budget of the modified information collection requirements.³⁵⁰ We reason that 60 days will be a sufficient amount of time for nationwide Participating CMS Providers to prepare to make the alert logs that they already generate available upon request.³⁵¹ At the same time, we allow non-nationwide Participating CMS Providers two years from the date of publication in the Federal Register of a notice announcing the approval by the Office of Management and Budget of the modified information collection requirements to comply with our alert logging requirements because, according to T-Mobile, not all Participating CMS Providers log the CMAC attributes of Alert Messages, generate time stamps for receipt and retransmission, and record any error reports that they send to the Federal Alert Gateway.³⁵² We anticipate that non-nationwide CMS Providers that do not already log Alert Messages in this manner will need to update their alert gateway software in order to achieve compliance. The record demonstrates that two years is an appropriate period of time to allow Participating CMS Providers to develop and integrate software upgrades consistent into embedded plant, and deploy this new technology to the field.³⁵³ As with software updates necessary to support Spanish-language alerting, the record demonstrates that that two years will be sufficient time for non-

³⁴⁵ Verizon Comments at 7; *see also* Microsoft Reply at 3-4 (supporting this requirement).

³⁴⁶ Verizon Comments at 7. No commenter opposes Verizon’s assessment.

³⁴⁷ This includes twelve months for Participating CMS Providers and mobile device manufacturers to develop and integrate software upgrades consistent with standards and 6-8 months to implement these changes in their networks and device offerings. *See* Verizon Comments at 5; ATIS Comments at 21-22; Microsoft Reply at 3.

³⁴⁸ *See supra* note 15 (explaining the *Sixteenth Annual Competition Report’s* and the *Eighteenth Annual Competition Report’s* approaches to distinguishing between nationwide and non-nationwide CMS Providers).

³⁴⁹ *See* Verizon Comments at 13; T-Mobile Reply at 9; AT&T Mar. 17, 2016 *Ex Parte* at 7; *CMSAAC Report* at 92.

³⁵⁰ Paperwork Reduction Act of 1995, Public Law 104-13.

³⁵¹ *See supra* para 46 (confirming that nationwide Participating CMS Providers already log alerts).

³⁵² *See* T-Mobile Reply at 9 (“Although wireless carriers generally log WEA performance, each carrier does so in a different way. Thus, if logging information is going to be compared, a uniform system would be required. Such a requirement would be extremely costly and require carriers to revise their existing processes.”).

³⁵³ *See* Verizon Comments at 5; ATIS Comments at 21-22; Microsoft Reply at 3.

nationwide Participating CMS Providers to deploy software capable of meeting out alert logging requirements.³⁵⁴

83. We allow nationwide Participating CMS Providers 60 days, and non-nationwide Participating CMS Providers one year to comply with the more accurate geo-targeting standard we adopt today from the date of its publication in the *Federal Register*. We note that CSRIC IV recommended that we allow two years for all Participating CMS Providers to comply with this rule, but the record shows that a two-year compliance timeframe would unduly delay improvements to geo-targeting that nationwide Participating CMS Providers are already capable of providing through the use of proprietary geo-targeting algorithms.³⁵⁵ While Bluegrass Cellular, a non-nationwide Participating CMS Provider, states that it can develop a polygon-level geo-targeting capability in as little as six months,³⁵⁶ and no other non-nationwide Participating CMS Provider made a statement to the contrary, we find it prudent to allow non-nationwide Participating CMS Providers one year to achieve compliance with this rule in order to accommodate differences among non-nationwide Participating CMS Providers' technical sophistication.³⁵⁷ Further, we note that all Participating CMS Providers (including those subject to our shorter 60-day compliance timeframe noted earlier in this paragraph) would be able to comply with our amended geo-targeting requirement immediately by geo-targeting to an area not larger than the propagation area of a single transmission site.³⁵⁸ We find that this approach, however, would regularly and predictably lead to under-alerting. The public would be better served by allowing non-nationwide Participating CMS Providers that cannot provide polygon-level geo-targeting today to continue to geo-target to the county level, where appropriate, until one year from the rule's publication in the *Federal Register*.³⁵⁹

84. Finally, affected entities state that testing the C-interface backup presents no new cost burdens to NCEs and small stations, and many broadcasters are already performing such testing voluntarily.³⁶⁰ Amending our WEA PSA rules presents no new burdens to WEA stakeholders, but rather,

³⁵⁴ *See id.*

³⁵⁵ *CSRIC IV WEA Messaging Report* at 45 (recommending that that a WEA cell broadcast geo-targeting best practices standard be completed within one year after the issuance of the FCC Report & Order, and that Participating CMS Providers implement this standard within two years after the issuance of the FCC Report & Order); *see also id.* at 8 (stating that “the algorithms for mapping the intended alert area to the relevant cell sites/sectors in the CMSP network are considered proprietary and there is no standard method to perform this mapping. Each CMSP handles the mapping in their own proprietary manner, since the geo-targeting capabilities is dependent upon each individual CMSP cell site topology”); Verizon Comments at 12 (“Existing geo-targeting techniques that superimpose alert areas with network architecture coverage already ensure that WEAs closely target the affected consumers.”).

³⁵⁶ *See* Bluegrass Cellular Jun. 29, 2016 *Ex Parte* at 5 (stating that it will take Bluegrass Cellular between 6-12 months to develop a solution with its equipment manufacturer).

³⁵⁷ *See* CCA Jul. 18 *Ex Parte* (expressing no concerns about our approach to geo-targeting, and providing no reason why non-nationwide Participating CMS Providers need extra time to comply).

³⁵⁸ *See infra* Appx. A (Final Rules) (“If, however, the Participating CMS Provider cannot broadcast the Alert Message to an area that best approximates the target area, a Participating CMS Provider may transmit an Alert Message to an area not larger than the propagation area of a single transmission site.”).

³⁵⁹ For example, if the polygonal target area for an Alert Message were to be larger than the propagation area of a single transmission site, but smaller than a county, it would be preferable for a CMS Provider not able to provide its best approximation of the polygonal alert area to overshoot the target area by geo-targeting the Alert Message to the county level than to undershoot the target area by geo-targeting the Alert Message to a single transmission site.

³⁶⁰ *See WEA Second Report and Order*, 23 FCC Rcd at 10772-73, para. 16 (requiring NCEs to “install necessary equipment,” meaning, no new system architecture would be required); Public Broadcasting Service, Association of Public Television Stations, and Corporation for Public Broadcasting Comments, PS Docket 15-91, 1 (Jan. 13, 2016) (“PTV and its member stations have taken important steps, on a voluntary basis, to monitor and continuously test the redundant back-up path provided for commercial mobile service providers to receive geo-targeted alerts.”).

eases regulatory burdens on emergency management agencies.³⁶¹ Accordingly, we require compliance with our C-interface backup testing, and WEA PSA requirements 30 days from the date of their publication in the *Federal Register*.

85. For ease of reference, we provide the table below to set forth the timeframes for compliance with each of the rules we adopt today.

<u>RULE AMENDMENT</u>	<u>COMPLIANCE TIMEFRAME</u>	<u>RULE(S) AFFECTED</u>
Increasing Maximum WEA Character Length	<i>Within 30 months of the rule's publication in the Federal Register</i>	47 CFR § 10.430
Classifying Public Safety Messages	<i>Within 30 months of the rules' publication in the Federal Register</i>	47 CFR § 10.280(a) 47 CFR § 10.400(d) 47 CFR § 10.410
Supporting Embedded References and Multimedia	<i>The removal of our prohibition on the use of embedded references is effective 30 days from the rules' publication in the Federal Register. Our requirement to support embedded references is effective one year from the rules' publication in the Federal Register.³⁶²</i>	47 CFR § 10.440 47 CFR § 10.441
Spanish-language Alerting	<i>Within 2 years of the rule's publication in the Federal Register</i>	47 CFR § 10.480
Alert Logging	<i>Within 60 days of publication in the Federal Register of a notice announcing the approval by the Office of Management and Budget of the modified information collection requirements³⁶³</i>	47 CFR § 10.320(g)
WEA Geo-targeting	<i>Within 60 days of the rule's publication in the Federal Register³⁶⁴</i>	47 CFR § 10.450
WEA Presentation	<i>Within 30 months of the rule's</i>	47 CFR § 10.510

³⁶¹ See *supra* Section III.C.3 (Facilitating WEA PSAs).

³⁶² See *infra* Appx. A (Final Rules) (abrogating the embedded reference prohibition by removing Section 10.440 from our rules and requiring support for embedded references by adding a new Section 10.441). Participating CMS Providers may begin to prototype support for multimedia in Public Safety Messages as of the effective date of our rule requiring support for Public Safety Messages, 30 months from the rules' publication in the *Federal Register*. See *supra* para. 37 (allowing Participating CMS Providers to voluntarily prototype this functionality in Public Safety Messages).

³⁶³ As explained above, we allow non-nationwide Participating CMS Providers two years from the publication in the *Federal Register* of a notice announcing the approval by the Office of Management and Budget of the modified information collection requirements in order to comply with this rule. See *supra* para. 82.

³⁶⁴ As explained above, we allow non-nationwide Participating CMS Providers one year from the rule's publication in the *Federal Register* to comply with this narrower geo-targeting standard. See *supra* para.81.

<u>RULE AMENDMENT</u>	<u>COMPLIANCE TIMEFRAME</u>	<u>RULE(S) AFFECTED</u>
	<i>publication in the Federal Register</i>	
State/Local WEA Testing	<i>Within 30 months of the rule's publication in the Federal Register</i>	47 CFR § 10.350(c)
C-interface Backup Testing	<i>Within 30 days of the rule's publication in the Federal Register</i>	47 CFR § 10.350(b)
WEA PSAs	<i>Within 30 days of the rule's publication in the Federal Register</i>	47 CFR § 10.520(d)

Figure 3: Compliance Timeframes

86. Therefore, nationwide Participating CMS Providers' subscribers should have greater confidence that WEA Alert Messages they receive are intended for them as of February, 2017.³⁶⁵ Participating CMS Providers' subscribers should expect to be able to receive Alert Messages in Spanish by 2019.³⁶⁶ Then, by June 2019, they should expect to see 360-character maximum alerts on 4G LTE and future networks, Public Safety Messages, Alert Messages that contain embedded references, and State/Local WEA Tests presented as soon as they are received. While we expect that updates to our WEA PSA, C-interface backup testing, and alert logging rules will produce significant public safety benefits, as described below, we do not anticipate that consumers will immediately notice a change in service due to these updates.

E. Benefit-Cost Analysis

87. In this section, we show that we can reasonably expect the minimum benefit resulting from the improvements to WEA we adopt today to exceed their maximum cost. The maximum reasonable cost burden our rules could present to Participating CMS Providers is \$40 million as a one-time cost, and \$2.3 million as an annual cost.³⁶⁷ These costs result from modifications to standards and software, as well as recordkeeping and reporting. The rules we adopt today also present many independent sources of benefit. These benefits include potential prevented fatalities, injuries or property damage during child abductions, severe weather events and other emergencies. Benefits also include significant cost reductions for PSAPs, mass notification providers, and state, local, tribal and territorial government entities.

88. As we observed in the *WEA NPRM*, when Congress adopted the WARN Act, it expressly contemplated that WEA would evolve along with advancements in technology.³⁶⁸ The rules we adopt today leverage existing market-driven advances in technology to improve the Nation's readiness posture during emergencies, as envisioned by Congress. In this regard, as Congress has specifically legislated to

³⁶⁵ Where improvements to geo-targeting will make it less likely that consumers receive Alert Messages when they are outside of the target area specified by the alert originator. *See supra* Section III.B.2 (Narrowing Geo-targeting Requirements). Similarly, non-nationwide Participating CMS Providers' subscribers should expect improved geo-targeting by February, 2018. *See supra* note 364. Each of the premises articulated in this paragraph assume that these final rules will be published in the Federal Register on or before November 30, 2016, and are applicable only insofar as the subscriber has a WEA-capable mobile device.

³⁶⁶ Whether a subscriber actually receives Alert Messages in Spanish will depend on whether the alert originator initiates a Spanish-language version of the Alert Message, and on whether the subscriber has specified their preferred language as "Spanish" on their WEA-capable mobile device.

³⁶⁷ Where the total cost to modify standards required to comply with our rules is \$657,000 as a one-time cost; the total cost of software updates is \$39,680,000 as a one-time cost, and alert logging requirements represent a one-time cost burden of \$6,300 and an annual cost of \$2,281,000. *See infra* paras. 98 (standards), 99-100 (software), 101-102 (recordkeeping). We round these numbers to avoid false precision.

³⁶⁸ *WEA NPRM*, 30 FCC Rcd at 13802, para. 38, *citing* WARN Act § 604(b)(2)(A), 47 USC § 1204(b)(2)(A).

create this system and identified areas in which the Commission should create rules (*e.g.*, technical requirements), it has already assessed that WEA provides benefits to the public. To the extent that a benefit-cost analysis is useful to help explain our decision-making, the estimates below may be helpful. We conclude that costs implicated by the rules we adopt today are consistent with the WARN Act and are appropriate to assure that WEA continues to provide the public with an alert and warning service that works effectively and keeps pace with the evolving capabilities of CMS networks. This is particularly relevant where, as here, the benefits of the rules we adopt today are best expressed in terms of improvements to public safety outcomes, such as the prevention of injury and death, which are difficult to monetize.³⁶⁹ Using existing estimates of the monetary value of injury and death prevention below, we estimate that the total expected benefits far exceed our estimated maximum one-time annual costs. We note that we sought specific comment on the costs and benefits of our proposed rules in the WEA NPRM,³⁷⁰ but received a sparse record in response, including no dollar figure estimates.³⁷¹

³⁶⁹ We note that precision in our estimate of the dollar value of public safety benefits is not necessary to illustrate that it is reasonable to conclude that the benefits of our rules will outweigh their costs. *See* The Office of Information and Regulatory Affairs (OIRA) concludes that “some important benefits and costs . . . may be difficult or impossible to quantify or monetize given current data and methods,” and in such circumstances urges regulatory agencies to explain why quantitative information is not available, and present all available quantitative information. Office of Information and Regulatory Analysis (OIRA), *Regulatory Impact Analysis: A Primer*, https://www.whitehouse.gov/sites/default/files/omb/inforeg/regpol/circular-a-4_regulatory-impact-analysis-a-primer.pdf (stating that in such cases agencies should ask (last visited Aug. 16, 2016); *see also* David Rodgers, Vladimir Tsirkunov, *Costs and Benefits of Early Warning Systems*, Global Assessment Report on Disaster Risk Reduction, at 6 (World Bank, 2010) (“there are relatively few quantitative estimates of the costs and benefits of specific warnings and subsequent actions. This may account for the difficulty in convincing many governments, particularly in developing countries, of the economic and social value or early warning systems as preventative measures for disaster reduction.”)).

³⁷⁰ *See, e.g.*, WEA NPRM, 30 FCC Rcd at 13792, para. 16 (seeking comment on the costs associated with changing the maximum character limit); *id.* at 13793, para. 20 (seeking comment on the costs and benefits of creating an additional Alert Message classification); *id.* at 13796, para. 28 (seeking comment on potential costs associated with incorporating embedded references into WEA Alert Messages); *id.* at 13799, para. 33 (seeking comment on the technical implications and potential costs of supporting multilingual WEA alerting); *id.* at 13803, para. 42 (seeking comment on potential costs of more granular geo-targeting requirements); *id.* at 13808, para. 52 (seeking comment on potential costs that may be imposed by our proposed testing requirements); *id.* at 13812, para. 60 (seeking comment on the potential costs of alert logging and test reporting); *id.* at 13816, para. 75 (seeking comment on the costs of testing the broadcast-based C-interface backup).

³⁷¹ *See, e.g.*, AT&T Comments at 10 (“Any cost for modifications to increase the maximum character length is mainly contained to the WEA-specific CMSP infrastructure and does not affect the underlying cell broadcast technology; these are costs that the CMSP must absorb to continue to meet its obligations as a Participating CMSP.”); T-Mobile Reply at 9 (“Although wireless carriers generally log WEA performance, each carrier does so in a different way. Thus, if logging information is going to be compared, a uniform system would be required. Such a requirement would be extremely costly and require carriers to revise their existing processes.”); ATIS Comments at 16 (“Increasing the number of languages that would need to be supported would increase both the complexity and associated costs.”); Harris County OSHEM Reply at 3 (“Certainly cost is a legitimate issue but the wireless industry has been singularly successful in monetizing innovation in the past and that is one trend that seems likely to continue.”); California Governor’s OES Comments at 4 (“By allowing URL links, messages can be posted on the originators website using translation software at a relatively low cost.”); Letter from Patricia Higginbotham, Telecommunications Industry Association, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Aug. 24, 2016) (citing wide variance in complexity, the nature of issues to be addressed, and the scope of industry participation as factors that frustrate the quantification of the cost of standards development).

a. Benefits

89. The robust record in this docket and media reports demonstrate that WEA saves lives,³⁷² and the improvements to WEA that we adopt today will render WEA an even more powerful life-saving tool.³⁷³ Indeed, scholars agree that “[m]ortality in the United States declined significantly over the years because its early warning systems for recurring hazards such as lightning, floods, storms and heat waves are continually improving.³⁷⁴ Nevertheless, in 2015, in the United States alone, weather-related events caused 522 fatalities and 2,143 injuries.³⁷⁵ Further, we observe that, according to the Federal Bureau of

³⁷² See, e.g., Weather-Ready Nation, Wireless Emergency Alerts: Real Stories, http://www.nws.noaa.gov/com/weatherreadynation/news/130313_wea_stories.html#.VXHyzM_BzRY (last visited June 6, 2015) (detailing life-saving WEA success stories in Connecticut, Illinois, New York, Mississippi, and Virginia); Partnership for Public Service, *Robert Bunge: New Weather Alert System is Saving Lives*, The Washington Post (Nov. 12, 2015), <https://www.washingtonpost.com/news/federal-eye/wp/2015/11/12/robert-bunge-new-weather-alert-system-is-saving-lives/> (“On July 1, 2013, a tornado obliterated a soccer dome in East Windsor, Conn., where 29 children had been playing. Seconds before the tornado struck, a cellphone alert prompted the camp manager to rush the children out of the dome and into an adjacent building, preventing injuries and a possible loss of life.”); World Bank, *Natural Hazards, Unnatural Disasters: Effective Prevention through an Economic Lens*, at 231 (2010) (identifying early warning systems as one among three specific, desirable spending items for disaster prevention).

³⁷³ See, e.g., Jefferson Parish EM Comments at 1 (“By adding more characters to an alert this can help to put more information about an event or what action(s) seniors, tourist, or others should take to save lives and property.”); Ventura County Sheriff Office of Emergency Services Comments at 4 (“The benefits of geotargeted messages are providing accurate, timely and actionable messaging to residents directly impacted from an incident that will ultimately save lives.”); Douglas County EMA Comments at 1 (“Geo-targeting would provide accurate and timely messaging with specific actions to follow. This would save lives for those directly impacted by the emergency.”); Washoe County EM and Homeland Security Comments (stating about State/Local WEA Testing that emergency managers “need to practice perishable alert and warning skills so that during a crises[sic], we can quickly alert and warn our citizens. This can save lives.”); Mason County EM Comments at 1 (In the few instances when a WEA message has been received in our community, the public already turns to internet based news media and/or social media to confirm the alert and learn more. The ability to immediately direct the public’s attention to a specific site would be invaluable to provide life-saving information.”); Wireless RERC Comments at 21-22 (“We strongly agree with MMTC regarding the importance for additional emergency information in languages other than English as a way to provide life-saving emergency alerts to ensure that all individuals have the ability to quickly understand the message – whether the primary language is English, Spanish, Chinese, Vietnamese or one of the many other spoken languages in the U.S.”).

³⁷⁴ David Rodgers, Vladimir Tsirkunov, *Costs and Benefits of Early Warning Systems*, Global Assessment Report on Disaster Risk Reduction, at 3 (World Bank, 2010) (stating that “mortality fell by 45 percent and injuries by 40 percent in 15,000 tornadoes from 1986 to 1999 thanks to more timely warnings that enabled people to take shelter”) citing T.J. Teisberg and R.F. Weiher, *Benefits and Costs of Early Warning Systems for Major Natural Hazards*, World Bank (2009). Similarly, a 2005 study found that, during the 1990s, NWS installed Doppler radar systems which increased the fraction of tornadoes for which a warning was provided from 35 percent to 60 percent, and increased the average warning lead-time from 5.3 minutes to 9.5 minutes. See Kevin Simmons and Daniel Sutter, *WSR-88D Radar, Tornado Warnings, and Tornado Casualties*, *Weather and Forecasting*, Vol. 20, No. 3, at 301, 308 (2005). The authors analyzed nearly 15,000 tornadoes in the U.S. from 1986 to 1999, during which time the Doppler radar systems were progressively installed throughout the United States. See *id.* They conclude that “... expected fatalities after Doppler radar installation were 45% lower and expected injuries 40% lower, a substantial benefit. *Id.* Based on the number of fatalities and injuries observed nationally between 1997 and 1999, this implies that 79 fatalities and over 1050 injuries from tornadoes were avoided per year during this period.” See also Kristie Ebi, et. al., *Heat Watch Warning Systems Save Lives: Estimated Costs and Benefits for Philadelphia, 1995-1998*, *Bulletin of the American Meteorological Society*, at 1067-73 (2004), http://www1.udel.edu/SynClim/BAMS_Ebi_Kalkstein.pdf (last visited Aug. 26, 2016) (estimating that 117 lives were saved as a result of the institution of a warning system for dangerous heat waves in Philadelphia in 1995).

³⁷⁵ See National Weather Service, *Summary of Natural Hazard Statistics for 2015 in the United States* (2016), <http://www.nws.noaa.gov/om/hazstats/sum15.pdf> (last visited Aug. 25, 2016) (including among “severe weather”

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Investigation's (FBI) National Crime Information Center Missing Person File, there were 466,949 entries made for missing children in 2014.³⁷⁶ NCMEC indicates that it "has issued more than 200 Wireless Emergency Alert activations on behalf of AMBER Coordinators" and WEA AMBER Alerts in particular have been credited with the safe return of 19 children since the system's deployment in 2012.³⁷⁷

90. In order to quantify the life-saving value of WEA during these emergencies, we assign a dollar value to reductions in the risk of losing human lives, the "Value of a Statistical Life" (VSL).³⁷⁸ VSL describes "the additional cost that individuals would be willing to bear for improvements in safety (that is, reductions in risks) that, in the aggregate, reduce the expected number of fatalities by one."³⁷⁹ We estimate that the dollar value of VSL in 2016 is \$9.5 million.³⁸⁰ While it would be impossible to determine with any specificity the exact number of fatalities that the improvements we adopt for WEA today would prevent, VSL offers a relevant, quantitative metric for expressing the minimum benefit our rules could produce.³⁸¹ Hence, if the improvements we adopt to WEA today save only three among the

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events convection [lightning, tornado, thunderstorm wind, hail], extreme temperatures, flood, marine, tropical cyclones, winter and other). Death and injury totals for 2015 in the United States due to severe weather were representative of totals in preceding years. *See, e.g.*, National Weather Service, Summary of Natural Hazard Statistics for 2014 in the United States (2015), <http://www.nws.noaa.gov/om/hazstats/sum14.pdf> (last visited Aug. 25, 2016) (reporting 388 deaths, 2,203 injuries); National Weather Service, Summary of Natural Hazard Statistics for 2013 in the United States (2014), <http://www.nws.noaa.gov/om/hazstats/sum13.pdf> (last visited Aug. 25, 2016) (reporting 446 deaths, 2,767 injuries); National Weather Service, Summary of Natural Hazard Statistics for 2014 in the United States (2015), <http://www.nws.noaa.gov/om/hazstats/sum12.pdf> (last visited Aug. 25, 2016) (reporting 538 deaths, 2,653 injuries).

³⁷⁶ *See* FAQs: Missing Children, National Center for Missing and Exploited Children, <http://www.missingkids.com/Missing/FAQ> (last visited Jul. 1, 2016); *citing NCIC Missing Person and Unidentified Person Statistics for 2014 Pursuant to Public Law 101-647, 104 Statute 4967, Crime Control Act of 1990 Requirements*, National Crime Information Center, The Federal Bureau of Investigation (FBI), <https://www.fbi.gov/about-us/cjis/ncic/ncic-missing-person-and-unidentified-person-statistics-for-2014> (last visited Jul. 1, 2016).

³⁷⁷ *See* NCMEC May 5, 2015 *Ex Parte* at 1.

³⁷⁸ *See, e.g.*, *Alerting Paradigm NPRM*, 31 FCC Rcd at 604-605, para. 14; Review of the Emergency Alert System, EB Docket No. 04-296, *Sixth Report and Order*, 30 FCC Rcd 6520, 6545, n.178 (2015).

³⁷⁹ *See* Memorandum from Polly Trottenberg, Under Secretary for Policy, Office of the Secretary for Transportation, and Robert S. Rivkin, General Counsel, Department of Transportation, Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses (Feb. 28, 2013), http://www.dot.gov/sites/dot.gov/files/docs/VSL_Guidance_2013.pdf (last visited Oct. 6, 2014).

³⁸⁰ *See id.* (calculating VSL as \$9.1 million using a base year of 2012); Department of Transportation Analysis – 2015 Adjustment, Memorandum from Kathryn Thomson, General Counsel, to Secretarial Officers and Modal Administrators (Jun. 17, 2015), https://www.transportation.gov/sites/dot.gov/files/docs/VSL2015_0.pdf (last visited Aug. 16, 2016). Income elasticity of 1.0 should be used to project VSL to future years, and estimating based on wage forecasts from the Congressional Budget Office that there will be an expected 1.07 percent annual growth rate in median real wages over the next 30 years). These estimates imply that VSL in future years should be expected to grow by 1.07 percent per year before discounting to present value." *See* Memorandum from Polly Trottenberg, Under Secretary for Policy, Office of the Secretary for Transportation, and Robert S. Rivkin, General Counsel, Department of Transportation, Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses (Feb. 28, 2013), http://www.dot.gov/sites/dot.gov/files/docs/VSL_Guidance_2013.pdf (last visited Oct. 6, 2014). Where \$9.1 million multiplied by 1.07 for each of the years between 2012 and 2016 to account for wage increases equals \$9,496,000, or approximately \$9.5 million.

³⁸¹ This reasoning is an example of a "breakeven analysis" recommended by the Office of Information and Regulatory Affairs (OIRA) in cases where precise quantification and monetization of benefits is not possible. *See* Office of Information and Regulatory Analysis (OIRA), *Regulatory Impact Analysis: A Primer*, https://www.whitehouse.gov/sites/default/files/omb/infocreg/regpol/circular-a-4_regulatory-impact-analysis-a

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hundreds of lives lost in the United States every year due to severe weather – an expectation we find reasonable – their benefits would be approximately \$28.5 million, an amount that would outweigh their one-time implementation cost in just the first two years.³⁸² Indeed, even if only one life were saved each year, the implementation costs would be fully offset within five years and, in subsequent years, the \$9.5 million benefit (*i.e.*, VSL for one life) would far exceed the \$2.3 million annual cost for recordkeeping.³⁸³

91. Real world natural disasters indicate that advanced alert and warning can have a positive impact on public safety outcomes. A comparative analysis of the number of fatalities resulting from tsunamigenic events of similar magnitude in Japan (a country with an advanced alert and warning system at the time of the event) and Indonesia (a country with no alert and warning infrastructure at the time of the event) magnify our conclusion that the improvements we adopt for WEA have life-saving benefits. Specifically, on December 26, 2004, a 9.1 magnitude earthquake occurred in the Indian Ocean off of the coast of Sumatra, Indonesia.³⁸⁴ No early detection, alert and warning systems were able to give people an opportunity to take protective action.³⁸⁵ The resulting tsunami left 166,700 dead in Banda Aceh, Indonesia alone (75 percent of the population).³⁸⁶ By comparison, on March 11, 2011, an 8.9-magnitude

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primer.pdf (last visited Aug. 16, 2016) (urging agencies to ask, “[h]ow large would the value of the non-quantified benefits have to be for the rule to yield positive net benefits?”).

³⁸² See *supra* note 375 (reporting the total number of deaths caused by severe weather in the United States since 2012); see also *supra* para. 373 (expressing record support for the proposition that the improvements we adopt to WEA today are likely to save lives); *supra* para. 89 (stating that WEA AMBER Alerts alone have been credited with the safe return of 19 children since the system’s deployment in 2012). Where \$9.496 million x 3 = \$28,488,000, an amount that, when accrued over the course of two years, would outweigh the one-time cost of compliance with our rules, \$40 million.

³⁸³ See *infra* para. 101 (discussing recordkeeping costs).

³⁸⁴ See *Tsunami of 2004 Fast Facts* (updated Dec. 16, 2015), <http://www.cnn.com/2013/08/23/world/tsunami-of-2004-fast-facts/> (last visited Aug. 18, 2016).

³⁸⁵ See Shuan Sim, *2004 Indian Tsunami 10 Years Later*, International Business Times (Dec. 24, 2014), <http://www.ibtimes.com/2004-indian-ocean-tsunami-10-years-later-warning-system-installed-after-disaster-has-1763662> (last visited Aug. 18, 2016); Lori Valigra, *Indian Ocean’s Tsunami Early Warning System Taking Shape*, National Geographic News (Dec. 23, 2005), http://news.nationalgeographic.com/news/2005/12/1223_051223_tsunami_warning.html (last visited Aug. 18, 2016); cf. Jim Giles, Emma Marris, *Indonesian Tsunami Monitoring System Lacked Basic Equipment*, Nature, <http://www.nature.com/news/2004/041229/full/news041229-4.html> (last visited Aug. 18, 2016) (“A network of seabed pressure sensors and seismographs, run by the United Nations, can detect Pacific Ocean tsunamis within minutes. The system issued a warning about the 26 December earthquake just 15 minutes after it was detected, but the network is designed to serve countries around the Pacific Ocean, such as the United States and Australia. Officials in charge were unable to reach authorities in Indian Ocean nations.”).

³⁸⁶ See *Global Earthquake Model, Earthquake Consequences Database, Banda Aceh, Sumatra Indonesia* (2004), <http://gemecd.org/event/25> (last visited Aug. 18, 2016). Banda Aceh, Indonesia, the city with the highest number of casualties resulting from the Indonesian tsunami, had a population of approximately 223,446 before the December 2004 tsunami. See *City Population, Indonesia: Urban Population of Cities*, <http://www.citypopulation.de/Indonesia-MU.html?cityid=998> (last visited Aug. 8, 2016) (estimating material damages as high as \$574 billion). The total number of people reported missing or presumed dead is 227,898, with over 500,000 injured. See *Tsunami of 2004 Fast Facts* (updated Dec. 16, 2015), <http://www.cnn.com/2013/08/23/world/tsunami-of-2004-fast-facts/> (last visited Aug. 18, 2016). Where 166,700/223,446 = .746, or 75 percent, as rounded to the nearest whole number. See also *The Boxing Day Tsunami Facts and Figures*, The Bolton Council of Mosques, <http://www.thebcom.org/ourwork/reliefwork/96-the-boxing-day-tsunami-facts-and-figures.html?showall=1> (last visited Aug. 18 2016) (estimating \$9.9 billion in material losses).

earthquake triggered a tsunami off of the eastern coast of Japan.³⁸⁷ Nine minutes later (fifteen minutes prior to the arrival of the tsunami) residents of affected prefectures received an early warning about the imminent threat.³⁸⁸ The death toll in Fukushima as a direct result of the tsunami was 1,607 (less than one percent of the population).³⁸⁹ Sources credit Japan's early earthquake warning system, along with its earthquake-ready infrastructure, with helping to lessen the impact of this tragedy.³⁹⁰

92. An event of similar magnitude could occur in the United States. For example, United States Geological Survey researchers identify the Semidi seismic zone along the Aleutian Islands as a potential source of a tsunami that could impact Hawaii and central California.³⁹¹ These researchers estimate that a particular segment of the seismic zone ruptures once every 180 to 270 years, with the last rupture occurring 228 years ago in 1788, and that such an earthquake could cause a tsunami as large as the 2011 tsunami which struck Japan.³⁹² This potential tsunami triggered by an earthquake in the Aleutian Islands is only one example.³⁹³ Extending this analysis nationwide would increase the potential benefits that would arise from improved emergency alerting, as natural disasters can affect large territories. While the probability of a natural disaster and the corresponding number of lives saved by emergency alerts is unknown, we expect our rules to prevent more deaths and injuries than would otherwise occur from natural disasters.

93. In addition to saving lives, the improvements to WEA that we adopt today will contribute to WEA's ability to prevent injuries. Like fatalities, the specific number of injuries that the improvements to WEA we adopt today will prevent is difficult to predict. Like VSL, however, the value of injury

³⁸⁷ See Francine Uenuma, *8.9 Magnitude Earthquake Triggers Tsunami in Japan, Hundreds Killed* (Mar. 11, 2011), <http://www.pbs.org/newshour/runtdown/89-magnitude-earthquake-triggers-tsunami-in-japan-kills-at-least-40/> (last visited Aug. 8, 2016).

³⁸⁸ See Lucy Birmingham, *Japan's Earthquake Warning System Explained*, Time (Mar. 11, 2011), <http://content.time.com/time/world/article/0,8599,2059780,00.html> (last visited Aug. 8, 2016) ("the nationwide earthquake early-warning system has helped to lessen this unimaginable tragedy").

³⁸⁹ See *Fukushima Deaths Now Higher than Tsunami*, SkyNews, <http://news.sky.com/story/fukushima-deaths-now-higher-than-in-tsunami-10416612> (last visited Aug. 8, 2016). The population of the city of Fukushima before the tsunami was 297,894. See *City Population, Japan: Urban Population of Cities*, <http://www.citypopulation.de/php/japan-admin.php?adm2id=07201> (last visited Aug. 8, 2016). The total number of reported deaths resulting from the tsunami is 16,273, with 3,061 missing and 27,074 injured. See also *EarthquakeReport*, <http://earthquake-report.com/2012/03/10/japan-366-days-after-the-quake-19000-lives-lost-1-2-million-buildings-damaged-574-billion/> (last visited Aug. 8, 2016) (estimating material damages as high as \$574 billion).

³⁹⁰ See Lucy Birmingham, *Japan's Earthquake Warning System Explained*, Time (Mar. 11, 2011), <http://content.time.com/time/world/article/0,8599,2059780,00.html> (last visited Aug. 8, 2016) ("the nationwide earthquake early-warning system has helped to lessen this unimaginable tragedy"; <https://sites.google.com/site/japantsunamivsiandiansunami/> (crediting differences in housing with controlling damage totals); see also Michael Dumiak, *Make of Breaker: Can a Tsunami Warning System Save Lives During an Earthquake*, Scientific American (Apr. 14, 2011), http://www.scientificamerican.com/article/can-tsunami-warning-system-save-lives-eartquake/?WT.mc_id=send-to-friend (last visited Aug. 23, 2016).

³⁹¹ See Christopher Joyce, *Aleutian Quake Zone Could Shoot Big Tsunamis to Hawaii, California*, NPR, All Things Considered (Jan. 12, 2016, 7:08 PM EST), <http://www.npr.org/sections/thetwo-way/2016/01/12/462708068/aleutian-quake-zone-could-shoot-big-tsunamis-to-hawaii-california> (last visited Sep. 14, 2016).

³⁹² See *id.*

³⁹³ See, e.g., *Facts About the New Madrid Seismic Zone*, Missouri Department of Natural Resources, <https://dnr.mo.gov/geology/geosrv/geores/techbulletin1.htm> (last visited Aug. 18, 2016) (further estimating that a 7.6 magnitude earthquake along the New Madrid Seismic Zone could result in the death of .2 – 2 percent of the population being killed in counties around New Madrid).

prevention provides an independent, quantitative metric to express the minimum benefit our rules could produce.³⁹⁴ According to the Department of Transportation, “[n]onfatal injuries are far more common than fatalities and vary widely in severity, as well as probability.”³⁹⁵ The Department of Transportation uses the standardized Abbreviated Injury Scale (AIS) to express the monetary value of preventing expected injury outcomes as a proportion of VSL.³⁹⁶ The AIS scale groups injuries according to their severity (Minor, Moderate, Serious, Severe, Critical, or Unsurvivable), and yields coefficients that can be applied to VSL to assign each injury class a value corresponding to a fraction of fatality.³⁹⁷ Pursuant to this approach, we reason that the public benefit of the rules we adopt today would outweigh their cost even if they didn’t save a single life, so long as they prevented a sufficient number of injuries. For example, National Weather Service data for deaths and injuries in the United States caused by severe weather since 2012 reveal that approximately five injuries occur for each death during severe weather events.³⁹⁸ If, as we reason above, these improvements to WEA save three lives during their first year of implementation, they would also likely prevent 15 injuries of various severities during their first year of implementation.³⁹⁹ The prevention of these injuries would produce a minimum public value of \$437,320,⁴⁰⁰ and a maximum public value of \$84.5 million if all injuries were critical.⁴⁰¹ While it is

³⁹⁴ Department of Transportation Analysis – 2015 Adjustment, Memorandum from Kathryn Thomson, General Counsel, to Secretarial Officers and Modal Administrators (Jun. 17, 2015), https://www.transportation.gov/sites/dot.gov/files/docs/VSL2015_0.pdf (last visited Aug. 16, 2016) (stating that, pursuant to this approach, each type of injury is rated on a scale of quality-adjusted life years (QALYs) in comparison with the alternative of perfect health); *see also* Department of Transportation, TIGER Benefit-Cost Analysis (BCA) Resource Guide (2014) (expressing a conversion table for the KABCO scale, a method of measuring injury prevention normally used by law enforcement, to the AIS scale).

³⁹⁵ Department of Transportation Analysis – 2015 Adjustment, Memorandum from Kathryn Thomson, General Counsel, to Secretarial Officers and Modal Administrators (Jun. 17, 2015), https://www.transportation.gov/sites/dot.gov/files/docs/VSL2015_0.pdf (last visited Aug. 18, 2016).

³⁹⁶ Department of Transportation Analysis – 2015 Adjustment, Memorandum from Kathryn Thomson, General Counsel, to Secretarial Officers and Modal Administrators (Jun. 17, 2015), https://www.transportation.gov/sites/dot.gov/files/docs/VSL2015_0.pdf (last visited Aug. 16, 2016) (stating that, pursuant to this approach, each type of injury is rated on a scale of quality-adjusted life years (QALYs) in comparison with the alternative of perfect health); *see also* Department of Transportation, TIGER Benefit-Cost Analysis (BCA) Resource Guide (2014) (expressing a conversion table for the KABCO scale, a method of measuring injury prevention normally used by law enforcement, to the AIS scale). The AIS scale is one of the most widely used methods of describing the severity of traumas. *See, e.g.,* Daniel Davis, et al., The Impact of Hypoxia and Hyperventilation on Outcome after Paramedic Rapid Sequence Intubation of Severely Head-injured Patients, *The Journal of Trauma, Injury, Infection and Critical Care*, (2004); Demetrios Demetriades et al., Mortality Prediction of Head Abbreviated Injury Score and Glasgow Coma Scale: Analysis of 7,764 Head Injuries (2004).

³⁹⁷ *See* Department of Transportation Analysis – 2015 Adjustment, Memorandum from Kathryn Thomson, General Counsel, to Secretarial Officers and Modal Administrators (Jun. 17, 2015), https://www.transportation.gov/sites/dot.gov/files/docs/VSL2015_0.pdf (last visited Aug. 16, 2016). The following coefficients are applicable to injuries of various severities listed in ascending order (Minor, .003), (Moderate, .047), (Serious .105), (Severe .266), (Critical, .593), (Unsurvivable, 1.000). *See id.*

³⁹⁸ *See supra* note 375 (reporting the total number of injuries caused by severe weather in the United States since 2012 as 9,766 and the total number of deaths as 1,814, a ratio of 5.2 to 1).

³⁹⁹ *See supra* para. 90 (reasoning that if the improvements to WEA we adopt today save only three lives, their benefits would outweigh their costs).

⁴⁰⁰ The prevention of 15 injuries would produce a public benefit of \$437,320 where all injuries were considered to be “Minor” on the AIS scale. *See supra* note 397 (using a coefficient of .003 of VSL for injuries considered to be “Minor”).

⁴⁰¹ The prevention of 15 injuries would produce a public benefit of \$84,466,920 where all injuries were considered to be “Critical” on the AIS scale. *See supra* note 397 (using a coefficient of .593 of VSL for injuries considered to

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difficult to predict the severity of the injuries that would be prevented by the improvements to WEA we adopt today, this analysis illustrates that injury prevention alone might produce benefits that outweigh those one-time costs within their first year of implementation. In fact, if these rules prevented only eight critical injuries, their benefits would outweigh their one-time costs.⁴⁰²

94. The improvements to WEA we adopt today will also have the benefit of generating savings for taxpayers by creating opportunities for emergency management agencies to avoid response costs. Barry Ritter, Executive Director of the Indiana Wireless 911 Board, states that he expects our WEA improvements will lead to response cost avoidance benefits similar to what he has seen with respect to our text-to-911 rules.⁴⁰³ If an individual calls 911 and then hangs up before they can communicate whether emergency assistance is required, and a PSAP is not able to confirm the caller's status, the PSAP will deploy resources to the caller's location to ensure that emergency assistance is available if needed.⁴⁰⁴ PSAPs are frequently unable to confirm with 911 callers that hang up whether they actually need emergency assistance through a return phone call.⁴⁰⁵ According to the Indiana Statewide 911 Board, texting a 911 caller results in more frequent return communications from the call than a return phone call, allowing PSAPs to avoid response costs where appropriate.⁴⁰⁶ We anticipate that improved emergency alerting – in terms of both the improved relevance and content that would result from our rules – will help keep people safe from harm during emergencies.⁴⁰⁷ Further, the improvements to WEA that we adopt today, such as the classification of Public Safety Messages, will also help those that are in emergency situations to find shelter, and take measures to protect themselves without calling 911 to request assistance from public officials. Finally, the improvements to WEA we adopt today, such as expanding the maximum character limit, classifying an additional Alert Message type, allowing embedded references, *etc.*, will enable individuals that do need to call 911 to be more informed about the dangers that they face, and may be more able to help 911 call-takers to deploy proper resources.⁴⁰⁸ When people are able to avert situations where they need emergency assistance and therefore do not need to call 911, PSAPs are able to avert the cost of resource deployment.⁴⁰⁹ According to ABC News, it costs \$3,500

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be “Critical”). We decline to consider “Unsurvivable” injuries in this analysis as they would be included in our analysis of WEA’s ability to save lives, above. *See supra* para. 90.

⁴⁰² Where \$9,496,000 (VSL) x .593 (the VSL coefficient for a critical injury) x 8 = \$45,049,024, an amount greater than the \$40 million one-time cost of compliance with our rules.

⁴⁰³ Letter from Barry Ritter, Executive Director, Indiana Statewide 911 Board, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Aug. 23, 2016) (Indiana Statewide 911 Board Aug. 23, 2016 *Ex Parte*); *accord* APCO Comments at 6; Austin HSEM Comments at 2.

⁴⁰⁴ *See, e.g.*, Emergency Communications Frequently Asked Questions, Shenandoah County, <http://shenandoahcountyva.us/emergency-communications/home/frequently-asked-questions/> (last visited Aug. 16, 2016) (stating that “[i]f a caller to 911 hangs up without stating the problem, the caller must be contacted in order to ensure that no actual emergency exists. This may involve the dispatching of a law enforcement officer to your home or place of business in order to ensure that a problem does not exist.”).

⁴⁰⁵ *See* Indiana Statewide 911 Board Aug. 23, 2016 *Ex Parte* at 1.

⁴⁰⁶ *See id.*

⁴⁰⁷ *See supra* para. 89 (describing extent of damage caused by events WEA is designed to mitigate, and the record demonstrating that WEA saves lives and prevents injuries); *see also* Indiana Statewide 911 Board Aug. 23, 2016 *Ex Parte* at 1 (stating that “[i]t is my opinion that an expanded use of Emergency Alert Systems will have the same results” as reverse text-to-911).

⁴⁰⁸ *See supra* para. 15 (describing the benefits of expanding the maximum character length); *see also* APCO Comments at 6; Austin HSEM Comments at 2.

⁴⁰⁹ *See* Indiana Statewide 911 Board Aug. 23, 2016 *Ex Parte* at 1. For example, the record shows that improvements to geo-targeting will help to reduce milling, and hasten protective action taking during emergencies. *See supra* para. 55 (describing the benefits of improved geo-targeting).

every time a fire truck pulls out of a fire station in Washington DC, and “on any given day, they’ll respond to about 25 calls in a 24-hour period.”⁴¹⁰ If we take the number of firefighter deployments per day in Washington DC as the floor for the number of times per day that first responders are deployed in each day in each state,⁴¹¹ it would be reasonable to conclude that first responders in the United States are deployed at least 456,250 times annually, at a cost to taxpayers of \$1.6 billion.⁴¹² If the improvements to WEA that we adopt today were to prevent just 2.7 percent of those deployments, their benefit would outweigh their cost in their first year of implementation, even if they prevented no deaths or injuries.⁴¹³

95. In demonstrating the value proposition of WEA and growing the market opportunity for advanced alert and warning, we also anticipate that some emergency management agencies will choose to use WEA as enhanced by the rules we adopt today, instead of other mass notification services, which could lead to significant cost savings. For example, according to Joseph McConnell, Navy Program Manager for Anti-Terrorism/Force Protection, the United States Navy contracted to pay \$2.25 million to a mass notification provider in Fiscal Year 2015 for an alerting and warning service to cover 375,000 service members.⁴¹⁴ The improvements to WEA that we adopt today have the potential to make WEA an even more effective service for federal, state, local, tribal and territorial governments, presenting a cost-effective early alert and warning solution capable of meeting evolving emergency management needs. Further, WEA is the only mass notification service for commercial mobile service to which all Participating CMS Providers’ subscribers are opted in by default, and that is interoperable across emergency management jurisdictions nationwide.⁴¹⁵ Becoming authorized as a WEA alert originator is free of charge.⁴¹⁶ We recognize that WEA is voluntary and, as such, may not provide sufficient assurance for some enterprise users that all intended recipients will receive an Alert Message, and therefore may not be suitable for all enterprises. Nevertheless, with the improvements we adopt today, we anticipate that some enterprises may choose to use WEA instead of a separate mass notification service. This analysis supports our conclusion that the benefits of the rules we adopt today would exceed their costs, consistent with our overarching approach to this break even analysis.

⁴¹⁰ See Alex Tabarrok, *Firefighters Don’t Fight Fires*, MarginalRevolution (Jul. 18, 2012), <http://marginalrevolution.com/marginalrevolution/2012/07/firefighters-dont-fight-fires.html> (last visited Aug. 23, 2016) citing John Donovan, *Fire Department Takes Medical Calls in Stride*, ABCNews (Mar. 24, 2010), <http://abcnews.go.com/Nightline/firefighters-medical-calls-health-costs/story?id=10181852#.UABoKB3yw1e> (last visited Aug. 23, 2016).

⁴¹¹ This would likely represent a floor on the number of times first responders are deployed to as scene nationwide, as Washington DC, if it were a state, would be the smallest state in the United States.

⁴¹² Where the average number of firefighter deployments per day in Washington DC (25), multiplied by the number of days in a year (365), multiplied by the number of states in the United States (50) is 456,250, and the cost per deployment is \$3,500. $25 \times 365 \times 50 \times \$3,500 = \$1,596,875,000$.

⁴¹³ Where first responders are deployed at least 456,250 times per year in the United States, 1.7 percent of that is 7756.25, and $7756.25 \times \$3,500 = \$27,146,875$, greater than the one-time cost of compliance our rules \$27 million.

⁴¹⁴ See E-mail from Joe McConnell, Navy Program Manager for Anti-Terrorism/Force Protection, to Debra Jordan, Deputy Chief, Public Safety and Homeland Security Bureau, FCC (Aug. 18, 2016) (on file with the Commission); Solicitation/Contract/Order for Commercial items, N66001-14-C-0014, SPAWAR Systems Center Pacific, Jesse Martinez (2014) (on file with the Commission).

⁴¹⁵ See, e.g., ECN, ECN Client Receives Innovation Award for Implementation of CodeRED Weather Warning (Aug. 29, 2012) (describing CodeRed as an alerting service to which consumers are, by default, opted out).

⁴¹⁶ See IPAWS Memorandum of Agreement (MOA) Application, OMB Control No. 1660-0140, http://www.fema.gov/media-library-data/1456953838440-0dfe80f6595d6e593b5a36ffbe65fe08/FEMAForm007-0-25_8-10-2015.pdf (last visited Aug. 16, 2016).

b. Costs

96. We anticipate that Participating CMS Providers will incur three types of costs as a result of this proceeding: the one-time cost of time and labor spent developing technical standards and specifications that Participating CMS Providers state are necessary to comply with our rules, the one-time cost of one-time updates to network and mobile device software; and the one-time and ongoing cost of recordkeeping requirements. Each of these cost categories is a foreseeable consequence of the WARN Act's direction to the Commission to promulgate technical requirements for WEA.⁴¹⁷ In this *Report and Order*, we take appropriate steps to ensure that those costs are not unduly burdensome.⁴¹⁸ At the same time, as we observed in the *WEA NPRM*, CMS Providers' participation in WEA is voluntary.⁴¹⁹ Any Participating CMS Provider that does not wish to comply with the rules we adopt today may withdraw their election to participate in WEA without penalty, and incur no implementation costs as a result.⁴²⁰ The record shows, however, that Participating CMS Providers, including non-nationwide Participating CMS Providers, will continue to participate in WEA as improved by the rules we adopt today in support of the overall public interest and to continue to offer their subscribers competitive services.⁴²¹ In this regard, as a practical matter, Participating CMS Providers will incur implementation costs as a result of these rules. We therefore provide the below analysis of the costs that Participating CMS Providers will likely incur in order to maintain their election to participate in WEA consistent with our Part 10 rules, as amended by this proceeding.

97. We estimate the maximum reasonable cost burden our rules could present to all Participating CMS Providers is \$40 million as a one-time cost, and \$2.3 million as an annual cost.⁴²² These costs include, for one-time costs: \$657,000 for updating standards and specification; \$39,680,000 for new or modified software; and \$6,300 for one-time record keeping costs. Annual costs include \$21,000 for logging messages and \$2,281,000 for respond to requests for logs from state and local emergency management agencies. The derivation of these numbers is in the following paragraphs.

98. We reason that the cost ceiling for time and effort required to update relevant standards and specifications would be \$656,370.⁴²³ We quantify time costs using the hourly wage of a network engineer likely to spend time and effort contributing to the work of standards-setting bodies, \$93.50.⁴²⁴

⁴¹⁷ See WARN Act § 602, 47 USC § 1202.

⁴¹⁸ See *infra* Appx. C, Section E (Final Regulatory Flexibility Analysis, Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered).

⁴¹⁹ *WEA NPRM*, 30 FCC Rcd at 13818, para 79.

⁴²⁰ See WARN Act § 602(b)(2)(D), 47 USC § 1202(b)(2)(D).

⁴²¹ See, e.g., Letter from Pamela Gist, Counsel for Bluegrass Cellular, Inc., to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sept. 1, 2016) (explaining that Bluegrass Cellular "expects to be able to comply with expanded WEA rules if provided adequate lead time, and if the required technology is available from key providers"); Letter from Ben Moncrief, Vice President, Government Relations, C Spire, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91 (filed Aug. 18, 2016) (C Spire Aug. 18, 2016 *Ex Parte*); Letter from Larry Lueck, Associate Legal Counsel, Cellcom, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91 (filed Aug. 22, 2016) (Cellcom Aug. 22, 2016 *Ex Parte*).

⁴²² See *supra* note 367 (describing our method for calculating the one-time total cost imposed on Participating CMS providers for standards development, software modification, and recordkeeping).

⁴²³ See *infra* note 420 (demonstrating that the cost to modify a single standard or specification is \$72,930). Where $\$72,930 \times 9 = \$656,370$; see also *infra* note 428 (listing the nine unique standards that will need to be modified in order to facilitate compliance with our rules).

⁴²⁴ The annual compensation for senior network engineers in the 90th percentile of the industry in 2016 is \$124,486, or \$78.60/hr. See Payscale, Sr Network Engineer, <http://www.payscale.com/research/US/Job=Sr> (last visited Aug. 2, 2016). Network_Engineer/Salary. While individuals other than Senior Network Engineers may participate in standards-setting bodies relevant to WEA, we reason that the majority of participants would be senior network
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Commenters agree that expanding the maximum character limit,⁴²⁵ classifying an additional Alert Message type,⁴²⁶ supporting embedded references,⁴²⁷ and establishing an opt-in framework for State/Local WEA Testing will require changes to existing standards and specifications for the CMS Provider Alert Gateway, CMS Provider cell broadcast infrastructure, and WEA-capable mobile devices.⁴²⁸ Both ATIS

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engineers, and in any case, the compensation for such an individual represents a reasonable benchmark for the compensation of other professionals with special skills that may be appropriate for this purpose, such as attorneys and software engineers. These compensation numbers do not include benefits. According to Bureau of Labor Statistics, benefits (including paid leave, supplementary pay, insurance, retirement and savings, and legally required benefits) add 50% to compensation for the information industry as a whole, and for the category including management, professional and related. See Bureau of Labor Statistics, Employer Costs for Employee Compensation Supplementary Tables March 2016, Table 8, page 9, <http://www.bls.gov/ncs/ect/sp/ecsuptc38.pdf>. We therefore add \$62,243 to the salary of \$124,486, to arrive at a total compensation estimate of \$186,729, which we round to \$187,000, or \$93.50 per hour. Other estimates of compensation follow, all lower than the estimate we use for analysis. Payscale.com is an organization committed to leveraging data and crowdsourcing to provide better intelligence for companies and employees about compensation. See About Payscale, <http://www.payscale.com/about> (last visited Jul. 29, 2016). Glassdoor analysis for a network engineer's compensation is based on 12,385 crowdsources reports. https://www.glassdoor.com/Salaries/network-engineer-salary-SRCH_KO0,16.htm (last visited Aug. 2, 2016).

⁴²⁵ See, e.g., AT&T May 5, 2015 *Ex Parte* at 1 (AT&T believes that [an increased message length] can be accomplished in LTE Networks following the release of the ATIS feasibility study and the completion of appropriate standards."); T-Mobile Comments at 4 ("Because WEA message length will vary depending on whether it is delivered over a legacy or an advanced network, standards and technical changes must be implemented before expanded WEA messages are made available to prevent consumers from receiving multiple WEA messages in cases where they travel from a 4G LTE network (triggering 360-character message) to an earlier generation network (triggering a 90-character message)."); FEMA Comments at 2 ("IPAWS PMO recommends that both a 90 character and a 360 character message should be separately crafted so that each message contains all needed message components presented in the proper order to encourage appropriate action in the public.").

⁴²⁶ See, e.g., T-Mobile Comments at 5 ("In particular, new 3GPP standards would be needed to support well-organized implementation of a new alert class. These standards are international in scope, and even in the best case scenario it would take a minimum of 12-18 months to create such standards, followed by another approximate 12-18 months for implementation. Such a delay is easily avoided by clarifying that the existing Imminent Threat classification may include shelter information, boil water, and other like advisories resulting from an imminent threat to life and property."); Sprint Comments at 6-7 ("Creation of any new categories would have significant technical impacts and would trigger the need for development and implementation of new technical standards and software and hardware changes."); ATIS Comments at 9-10 ("The creation of new classes of alerts with unique attention signal and vibration cadence may have significant technical impacts. To mitigate the impact of new categories and reduce time needed for the development and implementation of new technical standards, software and hardware, ATIS WTSC recommends that any new WEA categories should be supported within existing WEA capabilities, event codes, alert classes, cell broadcast message IDs, and subscriber opt-out capabilities."); CTIA Comments at 10 ("CTIA would not recommend that the Commission create a new, separate alerting category that entails new standards requirements.").

⁴²⁷ See, e.g., Microsoft Reply at 3 ("Microsoft notes that standards around the logic of processes would have to be established for these additional active items. For example, emergency alerts require user-initiated action to dismiss before the next alert is presented. If multiple alerts are stacked and awaiting user engagement, clicking on an active URL will dismiss the alert, but it is not clear whether the next alert waiting in the queue would preempt taking the user to the linked website."); ATIS Comments at 12 ("In addition to new and revised cybersecurity standards, other industry standards would need to be revised before embedded URLs could be included as part of WEA notifications.").

⁴²⁸ See, e.g., AT&T Comments at 9 (stating that support for both 90 and 360-character messages will require changes to standards for the C-interface, the CMSP network, and CMSP infrastructure."); FEMA Comments at 2 (stating that expanding the maximum character length will also "require software modifications to CAP message authoring tools, IPAWS OPEN, the "C" Interface to carriers and carrier systems as will any changes from the existing standard."); Microsoft Reply at 3 (discussing changes to mobile device standards that would be necessary to
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and TIA conduct the processes for developing, modifying and revising their individual and joint “J” standards under the processes developed by the American National Standards Institute (ANSI) for the accreditation of American National Standards.⁴²⁹ As such, all the standards referenced here must follow the ANSI process requirements for American National Standards.⁴³⁰ According to ATIS, when standards need to be modified for WEA, it would be common practice for groups of approximately 30 individuals with relevant technical expertise meet approximately bi-weekly for an hour to discuss the modifications.⁴³¹ Commenters assert that these standards-setting processes can be completed within 12 months, or 26 bi-weekly, one-hour meetings.⁴³² Accordingly, we reason that the maximum cost of a single standards-development process is approximately \$73,000.⁴³³ Nine distinct standards will likely need to be modified in order to enable compliance with our rules, so standards modifications will cost nine times \$73,000, or \$657,000.

99. We reason that the cost ceiling for the development and testing of new or modified software required to comply with the rules we adopt today would be \$39,680,000.⁴³⁴ Commenters assert that compliance with our character length, embedded reference, alert logging and State/Local WEA Testing rules could necessitate software upgrades the CMS Provider Alert Gateway, CMS Provider cell broadcast infrastructure, and for WEA-capable mobile devices.⁴³⁵ Surveys of software developers and

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accommodate embedded references); Verizon Comments at 13 (stating that mobile device standards and specifications will need to be changed to allow the public to opt-in to State/Local WEA Tests). These standards include ATIS-0700006 (CMAS via GSM/UMTS), ATIS-0700008 (Cell Broadcast Entity (CBE) to Cell Broadcast Center (CBC) Interface Specification), ATIS-0700010 (CMAS via EPS Public Warning System Specification), ATIS-0700014 (Implementation Guidelines for CMAS Handling of CMAS Supplemental Information Broadcast), J-STD-100 (Joint ATIS/TIA CMAS Mobile Device Behavior Specification), J-STD-101 (Joint ATIS/TIA CMAS Federal Alert Gateway to CMSP Gateway Interface Specifications), J-STD-102 (Joint ATIS/TIA CMAS Federal Alert Gateway to CMSP Gateway Interface Test Specification), 3GPP TS 23.041 - 3GPP Technical Realization of Cell Broadcast Service (CBS), OASIS CAP v.1.2 IPAWS USA Profile v1.0 - IPAWS Profile for the OASIS Common Alerting Protocol.

⁴²⁹ See American National Standards Institute (ANSI), ANSI Essential Requirements: Due Process Requirements for American National Standards (2016), https://share.ansi.org/shared%20documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/2016_ANSI_Essential_Requirements.pdf (last visited Aug. 2, 2016).

⁴³⁰ See American National Standards Institute (ANSI), ANSI Essential Requirements: Due Process Requirements for American National Standards (2016), https://share.ansi.org/shared%20documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/2016_ANSI_Essential_Requirements.pdf (last visited Aug. 2, 2016).

⁴³¹ See Letter from Tom Goode, General Counsel, ATIS, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sep. 6, 2016) (noting that, in some instances, meetings can last a full day).

⁴³² See, e.g., T-Mobile Comments at 8 (stating that standards work will take “a minimum of 12-18 months”); cf. Verizon Comments at 5 (stating that new technical standards typically take 12 months to establish).

⁴³³ This figure, \$73,000 represents the total labor cost of 30 network engineers salaried at \$93.50/hour dedicating an average of one hour every other week for one year (26 meetings, for 26 total hours) to participation in standards-setting bodies dedicated solely to revising network and device standards for the purpose of complying with our rules. (30 x \$93.50 x 26 = \$72,930, rounded to \$73,000).

⁴³⁴ Where the cost of software modifications for each Participating CMS Provider (\$146,000) + the cost of software testing for each Participating CMS Provider (\$350,000) = \$496,000, and that figure, multiplied by the total number of Participating CMS Providers (80) is \$39,680,000.

⁴³⁵ FEMA Comments at 2 (stating that expanding the maximum character length will require “software modifications to CAP message authoring tools, IPAWS OPEN, the “C” Interface to carriers and carrier systems”); T-Mobile Reply at 6 (“By expanding the information that can be sent over existing WEA alert categories, the Commission can eliminate this potential confusion while at the same time avoiding the need for time-consuming new standards along with complex software development and testing.”); Sprint Comments at 6-7; ATIS Comments (continued....)

industry reports conclude that the maximum reasonable cost of designing a new mobile application is approximately \$500,000.⁴³⁶ We reason that the cost of developing a new mobile application could represent a reasonable ceiling for the cost of any software modifications that may be implicated by the rules we adopt today, as we confirm through the following analysis.⁴³⁷ We observe that software engineers in the ninetieth percentile for their field are compensated at a rate of \$175,000 per year.⁴³⁸ Crowdsourced reports demonstrate that individuals responsible for performance software updates for our licensees are compensated at or around this range.⁴³⁹ Eighty CMS Providers have elected to participate in WEA either in whole or in part,⁴⁴⁰ and each will need to employ software engineers to develop their own software for each aspect of its infrastructure requiring an update. The record shows that software modifications appropriate to enable compliance with the rules we adopt today must be developed, tested and deployed, and that these processes can be completed within twelve months.⁴⁴¹ NIST reports that the various forms of software testing and debugging account for 10-35 percent of the software development

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at 9-10; T-Mobile Reply at 4 (stating that software revisions must be developed in order to comply with our WEA messaging requirements); Verizon Comments at 5 (stating that upgrades to the FEMA gateway, which service providers do not control, will be necessary to initiate end-to-end testing and implementation. Software used by alert originators will require new standards and upgrades to facilitate the FEMA alert gateway's verification and transmission of the message to service providers.”).

⁴³⁶ This figure represents the compensation for a software engineer compensated in the ninetieth percentile for their field nationally (\$175,000) working for the amount of time that it takes to develop software (10 months) = (\$175,000 x 10/12 = \$145,833, rounded to \$146,000). See Clutch, Cost to Build a Mobile App: A Survey, <https://clutch.co/app-development/cost-build-mobile-app-survey> (last visited Jun. 10, 2015) (concluding, based on their study of mobile application developers, that the cost of developing a new application ranges from \$37,913 to over \$500,000, depending on the complexity of the application); see also Kinvey, State of Enterprise Mobility, CIO & Mobile Leader Survey (2014), <http://resources.kinvey.com/docs/State+of+Enterprise+Mobility+Survey+2014+-+Kinvey.pdf> (Sep. 6, 2016) (concluding that the average cost of developing and deploying one app is \$270,000, with 71% spending up to \$500,000); Otreva, <https://www.otreva.com/calculator/stats.php> (last visited Jun. 10, 2015) (estimating that the average cost to develop a mobile app is \$144,525); Alex Moazed, *How Much Does it Cost to Make a Mobile App?*, Applico (May 23, 2016), <http://www.applicoinc.com/blog/much-cost-build-app/> (last visited Sep. 6, 2016).

⁴³⁷ See *supra* note 435 (quoting commenters stating that our proposed rules would necessitate “modifications” or “revisions” to software, rather than the development of new software).

⁴³⁸ Total compensation based on salary of \$116,704. See Payscale, Software Engineer, http://www.payscale.com/research/US/Job=Software_Engineer/Salary (last visited Aug. 2, 2016). To this salary, we add 50%, or \$58,352 for benefits to arrive at a compensation rate of \$175,056, rounded to \$175,000. See *supra* note 424 (specifying guidance for the calculation of benefits); see also *Software Engineer Salaries*, Glassdoor.com, https://www.glassdoor.com/Salaries/software-engineer-salary-SRCH_KO0,17.htm (last visited Aug. 2, 2016) (stating that the national average annual compensation for a software engineer is \$95,195). Glassdoor calculated average salary is based on 283,867 crowdsourced reports. *Software Engineer Salaries*, Glassdoor.com, https://www.glassdoor.com/Salaries/software-engineer-salary-SRCH_KO0,17.htm (last visited Aug. 2, 2016).

⁴³⁹ See *Software Engineer Salaries*, Glassdoor.com, https://www.glassdoor.com/Salaries/software-engineer-salary-SRCH_KO0,17.htm (providing the following average compensations for companies likely to need to update standards in order to comply with our rules (Google, \$126,977, or 190,000 with benefits), (Apple, \$122,067, or \$183,000 with benefits)).

⁴⁴⁰ See PS Docket No. 08-0146 (containing the WEA election letters of all Participating CMS Providers).

⁴⁴¹ See Verizon Comments at 5 (“the need for manufacturers and vendors to incorporate the new standards into their products and test them . . . can take as much as 12 months”); ATIS Comments at 21-22 (stating that work to comply with our proposed rules will include “the modification of existing industry standards and/or development of new standards; the testing and deployment of new WEA capabilities in wireless networks; and the deployment of subscriber devices (if needed) for receipt of new WEA capabilities”); cf. Microsoft Reply at 3 (recommending 24 months from the completion of standards for software testing and deployment).

process (approximately two months).⁴⁴² This would leave approximately 10 months for software development and deployment, where software can be deployed through a simple push.⁴⁴³

100. Accordingly, we estimate that the maximum cost of developing any software update necessary to comply with the rules we adopt today for each Participating CMS Provider would be \$146,000 per update, the cost of compensating a full-time, senior software engineer for 10 months of labor. The cost of testing these modifications (including integration testing, unit testing and failure testing), which requires 12 software engineers working for two months, will be \$350,000 for each Participating CMS Provider, where this testing will be completed once for each Participating CMS Provider and will include all required software modifications.⁴⁴⁴ Thus, the total cost of software modifications for each Participating CMS Provider will be \$496,000, and the total cost to industry will be \$39,680,000.⁴⁴⁵

101. The final kind of cost that the rules we adopt today implicate is recordkeeping cost. Specifically, we anticipate that our alert logging requirements will require Participating CMS Providers to keep records of the CMAC attributes of the Alert Message that they process at their alert gateway, as well as time stamps for the receipt and retransmission of those alerts, and to make their alert logs available to emergency management agencies upon request.⁴⁴⁶ We anticipate that the total cost of compliance with our alert logging rules due to recordkeeping burdens will be a one-time cost of \$6,300 and an annual cost of 2,302,000.⁴⁴⁷ The Office of Management and Budget (OMB) has already approved a collection for logging requirements at the Alert Gateway in connection with our requirement that Participating CMS Providers log their receipt of WEA RMTs.⁴⁴⁸ OMB concludes that each RMT alert log will take 2.5 seconds to generate by an employee salaried at the rate of a GS-13, Step 5.⁴⁴⁹ As of January 6, 2016, emergency management agencies at the federal, state, and local levels had issued 22,232 Alert Messages

⁴⁴² See Gregory Tassey, National Institute of Standards and Technology (NIST), *The Economic Impacts of Inadequate Infrastructure for Software Testing*, at 8-2 (2002), <https://www.nist.gov/sites/default/files/documents/director/planning/report02-3.pdf> (last visited Sep. 6, 2016). Where 10 percent of a 12-month software development process would be 1.2 months, and 35 percent of a 12-month software development process would be 4.2 months.

⁴⁴³ See Letter from Larry Lueck, Associate Legal Counsel, Cellcom, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91 (filed Sep. 16, 2016) (“[I]f the FCC allows sufficient time for software updates to be bundled along with other required software updated, then the incremental cost of software deployment is likely to be minimal”); Microsoft, *How to Deploy Software to Mobile Devices*, <https://technet.microsoft.com/en-us/library/bb693693.aspx> (last visited Aug. 8, 2016).

⁴⁴⁴ Where the compensation for a software engineer compensated in the ninetieth percentile for their field nationally (\$175,000) working for the amount of time that it takes to test software (2 months) is \$29,167 ($\$175,000 \times 2/12 = \$29,167$), and multiplying by the 12 software engineers will be required to complete this task is (\$350,004, rounded to \$350,000).

⁴⁴⁵ See *supra* notes 431 and 432 (describing our method of calculating the one-time total cost imposed on Participating CMS Providers for software modifications and testing).

⁴⁴⁶ See *supra* Section III.B.1 (Logging Alert Messages at the Participating CMS Provider Alert Gateway).

⁴⁴⁷ See *infra* note 453 (describing our methodology for computing CMS Providers’ one-time costs associated with alert logging totaling \$6,300); see also *infra* notes 451, 457 (describing our methodology for computing CMS Providers’ annual costs associated with alert logging). Where \$21,000 (annual cost associated with alert logging) + 2,281,000 (annual cost of responding to requests for alert log data) = \$2,302,000.

⁴⁴⁸ See 47 CFR § 10.350(a)(7); *Commercial Mobile Alert System*, 77 FR 41331 (2012).

⁴⁴⁹ *Commercial Mobile Alert System*, 77 FR 41331 (2012).

at the rate of 4,851 per year.⁴⁵⁰ Anticipating that this trend will continue, we conclude that Participating CMS Providers will need to log 4,851 WEA Alert Messages per year at a total cost of \$21,000 to industry.⁴⁵¹ We also reason that Participating CMS Providers will incur a one-time recordkeeping cost to establish this new capability at their Alert Gateway. In the *Wireless E911 Location Accuracy Requirements Fourth Report and Order*, OMB approved our conclusion that it would take one engineer one hour to install the capability to retain testing and live call data gathered pursuant to our requirements.⁴⁵² We therefore conclude that compliance with our alert logging requirement, like that for our similar live call data requirement, will necessitate a one-time set up of this capability at the Alert Gateway taking about one hour. Accordingly, we conclude that the maximum one-time recordkeeping cost associated with our alert logging rules is \$6,300.⁴⁵³

102. We also require that Participating CMS Provider make their alert logs available to state and local emergency management agencies upon request. In the *Wireless E911 Location Accuracy Requirements Fourth Report and Order*, OMB estimated that it would take a clerical employee two hours to respond to emergency management agencies' requests for Participating CMS Providers' logs of uncompensated barometric data needed to support the 911 location accuracy z-axis requirement.⁴⁵⁴ We reason that the ceiling on the number of requests for alert logs that a CMS Provider could receive would be 782, where 782 is the total number of entities currently authorized as WEA alert originators.⁴⁵⁵ We also reason that the average hourly salary of clerical employee (\$18.23 per hour) is an appropriate metric for assessing the value of time that Participating CMS Providers will need to spend to complete responses to requests for alert log data because this task requires no special skills.⁴⁵⁶ Accordingly, we conclude that

⁴⁵⁰ See FEMA Comment at 1. Where 22,232 divided by the 55 months between January 2016 and the date of WEA's deployment in April 2012, multiplied by the 12 months in a year is 4850.618. We round this figure to the nearest whole number, 4851.

⁴⁵¹ For a wage rate, we use the most recent salary table for GS 13 Step 5 in locality pay area of Washington-Baltimore-Arlington, DC-MD-VA-WV-PA, or \$104,433 per year which is \$52.22 per hour. We add 50% of this wage, or \$26.11 for benefits, for a compensation estimate of \$78.33 per hour. To arrive at the cost of logging alert messages we use: 2.5 seconds is .000694 hours, multiplied by the salary of the person responsible for compiling these reports (\$78.33), multiplied by the number of Participating CMS Providers (80), multiplied by the total number of Alert Messages that each is expected to log per year (4851) = \$21,096.42, rounded to \$21,000.

⁴⁵² See *Wireless E911 Location Accuracy Requirements*, 80 FR 45897 (2015) (announcing OMB approval of the information collection underlying rules adopted in the *Fourth Report and Order*) citing *Wireless E911 Location Accuracy Requirements*, Fourth Report and Order, 30 FCC Rcd 1259 (2015) (*Wireless E911 Location Accuracy Requirements Fourth Report and Order*).

⁴⁵³ Where 80 Participating CMS Providers, multiplied by the salary of the individual responsible for maintaining alert logs (\$78.33/hr), multiplied by the number of hours setting up this capability is expected to take (1), equals \$6,266.40. We round this figure to \$6,300.

⁴⁵⁴ See *Wireless E911 Location Accuracy Requirements*, 80 FR 45897 (2015); *Wireless E911 Location Accuracy Requirements Fourth Report and Order*, 30 FCC Rcd at 1261, para.6. Where, in the 911 context, these records contained uncompensated barometric pressure data and were offered to PSAPs upon request, we reason that the logs that we require Participating CMS providers to keep for WEA would likely include the same or less data, and would elicit a similar number of requests.

⁴⁵⁵ See *Organizations with Alerting Authority Completed*, http://www.fema.gov/media-library-data/1470418455623-3858964cd28632503e3333ef09ef9421/PAA_Complete_08052016.pdf (last visited Aug. 26, 2016).

⁴⁵⁶ We arrived at this hourly compensation by using, as a base, \$12.15 per hour. See Payscale, Clerical Assistant, http://www.payscale.com/research/US/Job=Clerical_Assistant/Hourly_Rate (last visited Aug. 2, 2016). We then add 50% to that figure, or \$6.08 per hour, to account for employee benefits, for a total of \$18.23 per hour. See *supra* note 456 (explaining this method of calculating benefits); see also Clerical Assistant, Glassdoor.com, https://www.glassdoor.com/Salaries/clerical-assistant-salary-SRCH_KO0,18.htm (last visited Aug. 2, 2016) (stating the national average compensation for a clerical assistant is \$22,350). We use the best available crowdsourced data to represent the likely compensation of a clerical employee responsible for this task, rather than, for example, the

(continued....)

Participating CMS Providers will need to employ a clerk for 1,564 hours per year responding to emergency management agencies requests for alert log data at a cost of \$2,281,000 per year.⁴⁵⁷

103. We find that the expected benefit floor far exceeds the ceiling for costs imposed. Based on the foregoing analysis, we find it reasonable to expect that at least three lives will be saved annually, at a benefit of \$28.5 million each year. This implies that the benefit floor will offset the \$40 million one-time cost in just two years, and will far exceed the 2.3 million annually recurring cost. In addition to that benefit floor, there are other benefits which we expect but cannot quantify. One of these is avoided injuries. Because they typically exceed deaths by five to one in storms, they may have a benefit value that approaches that of the lives saved. Total benefit will be further augmented by the reduced need to deploy first responders and the reduced need for alternative systems that currently provide a similar service at much greater cost.

IV. FURTHER NOTICE OF PROPOSED RULEMAKING

104. In this *Further Notice*, we propose measures to continue to improve WEA, leveraging advancements in technology as well as lessons learned from alert originators' experience since WEA was initially deployed. We also propose steps to improve the availability of information about WEA, both to empower consumers to make informed choices about the emergency information that they will receive, as well as to help promote transparency for emergency management agencies and other WEA stakeholders.

A. Ensuring the Provision of Effective WEA Alert Messages

1. Defining the Modes of Participation in WEA

a. Background

105. In the *WEA Third Report and Order*, the Commission required all CMS Providers to notify the Commission of their election to participate in WEA. CMS Providers electing to participate could do so either "in part" or "in whole."⁴⁵⁸ Such election letters were required to include an attestation that the CMS Provider "[a]grees to transmit such alerts in a manner consistent with the technical standards, protocols, procedures, and other technical requirements implemented by the Commission," and "[c]ommits to support the development and deployment of technology for the "C" interface, the CMS provider Gateway, the CMS provider infrastructure, and mobile devices with WEA functionality and support of the CMS provider selected technology."⁴⁵⁹ The Commission's Part 10 rules do not define participation "in whole" or "in part," and do not specify the difference between them.⁴⁶⁰ CMS Providers participating in part, however, must notify potential subscribers at the point of sale that "[w]ireless emergency alerts may not be available on all devices or in the entire service area."⁴⁶¹ While the California Public Utilities Commission argued at the time these rules were adopted that it was "essential" for states to have access to more specific information through CMS Providers' election letters about "the CMS provider Gateway, the CMS provider infrastructure, the mobile device[s] with [WEA] functionality and

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estimate utilized in the *E911 Location Accuracy Requirements Fourth Report and Order*, because the data we use is more recent and reflective of actual compensation practices.

⁴⁵⁷ Where \$18.23 (the national average total compensation for a clerk expressed in dollars per hour) x 2 (the number of hours required to respond to requests for alert log data) x 782 (the number of requests for alert log data that Participating CMS Providers are expected to receive, on average, each year) x 80 (the total number of Participating CMS Providers) = \$2,280,937.60, rounded to \$2,281,000.

⁴⁵⁸ See *WEA Third Report and Order*, 23 FCC Rcd at 12575, para. 32.

⁴⁵⁹ See *id.*; 47 CFR § 10.210.

⁴⁶⁰ See 47 CFR § 10.210. Nationwide CMS Providers, including AT&T, Sprint, T-Mobile, and Verizon, participate in WEA "in part." See PS Docket No. 08-146.

⁴⁶¹ See 47 CFR § 10.240(c).

any geographic variations in the commitment to provide emergency alerts,”⁴⁶² the Commission declined to require that Participating CMS Providers disclose this information because, it reasoned, such a requirement would be unduly burdensome and could force CMS Providers “to divulge competitively sensitive information” that would be “inconsistent with the voluntary nature of the [WEA] program.”⁴⁶³ C Spire now urges the Commission to “do more to clarify the difference between ‘in part’ and ‘in whole’ WEA participation.”⁴⁶⁴

b. Discussion

106. We propose to adopt definitions for participation in WEA “in whole” and “in part” based on the attestations that CMS Providers are required to offer in their election letters, and on the notifications that CMS Providers offer potential subscribers at the point of sale.⁴⁶⁵ Specifically, we propose to define CMS Providers participating in WEA “in whole” as CMS Providers that have agreed to transmit WEA Alert Messages in a manner consistent with the technical standards, protocols, procedures, and other technical requirements implemented by the Commission in the entirety of their geographic service area and to all mobile devices on their network. Similarly, we propose to define CMS Providers participating in WEA “in part” as CMS Providers that have agreed to transmit WEA Alert Messages in a manner consistent with the technical standards, protocols, procedures, and other technical requirements implemented by the Commission in some, if not all of their geographic service area, and to some, if not all of the mobile devices on their network.⁴⁶⁶ We seek comment on these proposed definitions for CMS Provider participation in WEA. What are the technical prerequisites to offering WEA in a geographic area where a commercial mobile service is available? What factors lead Participating CMS Providers to offer WEA in a geographic area smaller than the area in which they offer commercial mobile service, or to fewer than all mobile devices on their network?

107. We also seek comment on our proposal to incorporate the extent to which CMS Providers offer WEA on mobile devices on their networks into our definitions of participation in whole and in part. Bluegrass Cellular states that “participation in whole has no bearing on the number or percentage of devices on the network that are WEA capable.”⁴⁶⁷ If this were the case, however, could a CMS Provider that offers WEA on only one mobile device qualify as participating in whole? Would this be consistent with a common-sense interpretation of “in whole” participation, or with our requirement that only CMS Providers participating in part must disclose at the point of sale that WEA may not be available on all devices on this provider’s network?

108. If participation in WEA in whole entails offering WEA on all mobile devices on the network, we seek comment on how “mobile devices” should be defined.⁴⁶⁸ For purposes of WEA,

⁴⁶² *WEA Third Report and Order*, 23 FCC Rcd at 12574, para. 31.

⁴⁶³ *Id.* at 12575, para. 32.

⁴⁶⁴ C Spire Jun. 24, 2016 *Ex Parte* at 2.

⁴⁶⁵ See 47 CFR § 10.210(a)(1); 47 CFR § 10.240; see also *infra* Section IV.C.1 (Promoting Informed Consumer Choice at the Point of Sale) (proposing to require CMS Providers to disclose sufficient information at the point of sale to allow customers to make an informed decision about whether they would consistently receive WEA Alert Messages if they were to become a subscriber).

⁴⁶⁶ These definitions also reflect the differences between participation in WEA in whole and in part as stated in the point-of-sale notification of CMS Providers participating in part. See 10.240(c) (“Wireless emergency alerts may not be available on all devices or in the entire service area”).

⁴⁶⁷ Bluegrass Cellular Jun. 29, 2016 *Ex Parte* at 4.

⁴⁶⁸ We note the complementary character of our efforts here, and comments we sought in the *Alerting Paradigm NPRM* in these same dockets (15-91 and 15-94), specifically, whether we should consider tablets that consumers use to access mobile services as “mobile devices” under our Part 10 WEA rules. See *Alerting Paradigm NPRM*, 31 FCC (continued....)

Section 10.10(j) defines “mobile devices” as “[t]he subscriber equipment generally offered by CMS providers that supports the distribution of WEA Alert Messages.”⁴⁶⁹ This definition would encompass any mobile device connected to a Participating CMS Providers’ network that is capable of receiving WEA Alert Messages, including but not limited to LTE-enabled and future generation tablet computers, and phablets. The record shows, however, that there is significant variation among Participating CMS Providers with respect to mobile devices on their networks that support WEA capability. For example, the Department of Homeland Security’s *WEA Mobile Penetration Strategy Report* shows that WEA is already available on some tablets, including iPads running iOS 6 or greater,⁴⁷⁰ and emergency managers agree that WEA should be made available to the public “by all available means,” including on tablets.⁴⁷¹ On the other hand, CTIA suggests that while 4G-LTE tablets can be WEA capable, Wi-Fi-only tablets cannot, and states that “even if there are LTE-enabled tablets with the capability to receive cell broadcast messages through the network infrastructure, additional mobile device behavior standards and device development are required to support the handling and presentation of WEA messages.”⁴⁷² AT&T simply concludes that they “do not believe customers could view WEA messages on their existing tablets.”⁴⁷³ We seek comment on the technical characteristics needed in a device to allow it to receive WEA Alert Messages. Would it be advisable for us to revise our definition of the term “mobile device” in our Part 10 rules to reflect the technical prerequisites to supporting WEA service? Finally, we seek comment on whether there are any barriers that may prevent the delivery of WEA to the full range of consumer devices for which Participating CMS Providers may wish to provide emergency alerts, and which could fall within the scope of the WARN Act.⁴⁷⁴

109. In addition to defining participation in WEA in whole and in part with reference to the extent to which Participating CMS Providers offer WEA in the entirety of their geographic service area and to all mobile devices operating on their networks, we seek comment on whether these definitions should include the extent to which Participating CMS Providers make WEA available using all available network technologies. To what extent should Participating CMS Providers’ attestation that they will “support the development and deployment of technology for the ‘C’ interface, the CMS Provider Gateway, the CMS Provider infrastructure, and mobile devices with WEA functionality” be read as a commitment to support WEA using all available network technologies?⁴⁷⁵ To what extent do

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Rcd at 636, para. 93. Those comments inform our consideration in this proceeding, and we invite additional comment as outlined in this section.

⁴⁶⁹ 47 CFR § 10.10(1).

⁴⁷⁰ *WEA Mobile Penetration Strategy* at 124 (explaining that Apple iPads with an operating system of iOS 6 or greater are WEA-enabled, while Android devices are not WEA capable).

⁴⁷¹ Washington State SECC Comments, PS Docket Nos. 15-94 and 15-91, at 28 (May 19, 2016); *see also* Association of Public-Safety Communications Officials’ Comments, PS Docket Nos. 15-94 and 15-91, at 5 (Jun. 8, 2016); New York City Emergency Management Department Comments, PS Docket 15-94 and 15-91, at 8 (Jun. 8, 2016); Alaska ABA, ASECC, DMVA, DHSEM Comments, PS Docket No. 15-91 and 15-94, at 11 (Jun. 8, 2016) (“the more technologies and devices that support WEA reception, the higher the likelihood the alert will be received by the maximum number of individuals”); *cf.* NWS Comments, PS Docket No. 15-91 and 15-94, at 4 (Jun. 3, 2016) (“WEA should focus on cell phones, but the FCC should also be careful about trying to distinguish between tablet and cell phones, given the convergence of the two in phablets.”).

⁴⁷² Cellular Telephone Industries Association Comments, PS Docket Nos. 15-91 and 15-94, at 10 (May 9, 2016).

⁴⁷³ AT&T Services Inc. Comments, PS Docket Nos. 15-94 and 15-91, at 9 (filed June 8, 2016).

⁴⁷⁴ WARN Act § 602(b)(1)(A), 47 USC § 1202(b)(1)(A) (directing the Commission to complete a proceeding “to allow any licensee providing commercial mobile service (as defined in section 332(d)(1) of the Communications Act of 1934 (47 USC § 332(d)(1))) to transmit emergency alerts to subscribers to, or users of, the commercial mobile service provided by such licensee.”)

⁴⁷⁵ *See* 47 CFR § 10.210(a)(2).

Participating CMS Providers currently use available technologies, such as Wi-Fi and small cells, in support of their WEA deployments? To the extent that Participating CMS Providers do not leverage all available technologies to further their participation in WEA, we seek comment on any factors that have contributed to this decision. We seek comment on any additional technologies already commercially deployed in CMS networks that could be leveraged in support of WEA, and on any additional functionalities that they may enable.⁴⁷⁶

110. We seek comment on whether, in the event we adopt new definitions for participation in WEA, it would be appropriate to require CMS Providers to refresh and renew their election to participate in WEA. Further, notwithstanding whether we ultimately adopt new definitions for WEA participation, have the nature of CMS networks (having evolved from 2 and 3G to 4G technologies) and the requirements of Part 10 changed sufficiently since WEA's deployment to merit a renewed election? How frequently, if at all, should Participating CMS Providers be required to update their election in order to provide the Commission and the public with an up-to-date account of their WEA service offerings? Alternatively, should the occurrence of a certain event or events trigger a Participating CMS Provider's obligation to renew their election? If so, what specific event or events should give rise to a requirement for a Participating CMS Provider to renew their election? We seek comment on steps that we can take to mitigate any burden that disclosure of this information may present for Participating CMS Providers, and especially non-nationwide Participating CMS (*e.g.*, small, regional, and rural providers). To what extent would any information that Participating CMS Providers may be required to disclose be considered sensitive? As WEA has evolved into a vital and relied-upon component of the Nation's public safety infrastructure, has this information become necessary to understanding the Nation's readiness in times of disaster?⁴⁷⁷

111. We anticipate that adopting these definitions for the modes of Participation in WEA would improve long-term participation in WEA while incenting achievement of evolving WEA objectives, consistent with Participating CMS Providers technology refresh cycle. We seek comment on this analysis. What steps can we take to encourage Participating CMS Providers to increase their engagement with WEA voluntarily? Further, we seek comment on whether clearly delineated modes of participation in WEA, taken together with a renewed election requirement, would facilitate emergency management agencies' response planning efforts by evincing the extent to which WEA is available in local communities. To what extent could information about each Participating CMS Provider's WEA service offerings by geographic area, device, and technology facilitate community reliance on WEA as an emergency management tool? What steps can we take to make this information as useful as possible to emergency management agencies while limiting burdens on Participating CMS Providers? Are there alternative approaches that we could consider in order to accomplish our objective of incenting increased engagement with WEA by Participating CMS Providers and emergency management agencies?

2. Infrastructure Functionality

a. Background

112. Section 10.330 requires Participating CMS Providers' infrastructure to distribute Alert Messages to mobile devices, and to authenticate interactions with mobile devices.⁴⁷⁸ This functionality is made dependent upon "the capabilities of the delivery technologies implemented by a Participating CMS

⁴⁷⁶ See *infra* Section IV.B.3 (Matching the Geographic Target Area) (seeking comment on the extent to which the use of Wi-Fi or small cells could improve WEA geo-targeting).

⁴⁷⁷ This may be particularly important in light of the role that alerts and warnings have played in recent geo-political events. See, *e.g.*, Angeliqe Chrisafis, *France's Saip Emergency Smartphone App Failed During Nice Attack*, *The Guardian* (Jul. 16, 2016, 7:54 EDT), <https://www.theguardian.com/world/2016/jul/16/nice-terrorist-attack-france-saip-emergency-smartphone-app-failed> (last visited Jul. 29, 2016).

⁴⁷⁸ 47 CFR. § 10.330.

Provider.”⁴⁷⁹ Section 10.500 requires WEA-capable mobile devices to authenticate interactions with CMS Provider infrastructure, monitor for Alert Messages, maintain subscriber alert opt-out selections and language preferences, extract Alert Message content in the subscriber’s preferred language, present Alert Message content to the device consistent with subscriber opt-out selections, and detect and suppress duplicate Alert Messages.⁴⁸⁰ Similarly, compliance with these requirements is contingent upon “the capabilities of a Participating CMS Provider’s delivery technologies.”⁴⁸¹ Emergency managers state that one of the primary obstacles to accelerating emergency management agencies’ authentication as WEA alert initiators is a lack of clarity about the quality of service that WEA provides.⁴⁸²

b. Discussion

113. We propose to amend Sections 10.330 and 10.500 to delete parallel statements that “WEA mobile device functionality is dependent on the capabilities of a Participating CMS Provider’s delivery technologies” and that “[i]nfrastructure functions are dependent upon the capabilities of the delivery technologies implemented by a Participating CMS Provider.”⁴⁸³ Since the time these provisions were adopted, Participating CMS Providers have overwhelmingly elected to utilize cell broadcast technology in fulfillment of their WEA election.⁴⁸⁴ Participating CMS Providers’ infrastructure has proven to be universally capable of the basic functionalities described by Section 10.330 and 10.500. Accordingly, we believe these provisions are no longer necessary. Moreover, removing these provisions from our Part 10 rules would likely clarify for emergency management agencies considering whether to become authorized as WEA alert initiators that the alerting service WEA offers is capable of providing these critical functions, especially when taken together with the performance reporting and alert logging requirements discussed below.⁴⁸⁵ We seek comment on this analysis.

114. We seek comment on whether Providers CMS Providers, and particularly non-nationwide CMS Providers (small, rural or regional Participating CMS Providers), continue to require the flexibility that this language may provide.⁴⁸⁶ There is no record about why these caveats remain necessary given changes in technology over the four years since WEA’s deployment. Does the flexibility that this language may provide enable CMS Providers to participate in WEA that otherwise would be unable to do so? We invite comment from any Participating CMS Provider that would no longer be able to participate in WEA in whole or in part were we to remove this language from Sections 10.330 and 10.500. Such commenters should specify the manner in which their WEA service would be unable to comply with the requirements of Sections 10.330 and 10.500 were we to remove the prefatory language from those Sections, while still being capable of providing the WEA service described elsewhere in Part 10. Similarly, would removing this language make any WEA-capable mobile devices incapable of continuing to support WEA? If so, why? We seek comment on whether, if we retain this language at all, it should be modified to apply only to non-nationwide Participating CMS Providers.

⁴⁷⁹ *Id.*

⁴⁸⁰ 47 CFR § 10.500.

⁴⁸¹ *Id.*; see also *CMSAAC Report* at 12 (recommending this approach to offer Participating CMS Providers flexibility so that they might take advantage of advances in technology).

⁴⁸² See, e.g., Houston OPSHS Comments at 4; CCOEM Comments at 3; Jefferson Parish EM Comments at 4.

⁴⁸³ 47 CFR § 10.330; 47 CFR § 10.500.

⁴⁸⁴ See *CSRIC IV WEA Messaging Report* at 7.

⁴⁸⁵ See *infra* Section IV.D (Improving WEA Transparency).

⁴⁸⁶ See *supra* note 15 (defining “nationwide” and “non-nationwide” Participating CMS Providers).

3. Alert Message Preservation

a. Background

115. The Commission's WEA rules do not address the manner in which WEA Alert Messages should be treated after they are dismissed by the user. Emergency managers state that the ability to access WEA Alert Messages that have already been viewed would be of significant benefit to the public, particularly in light of our expansion of the maximum character limit and establishment of a new Alert Message classification, Public Safety Messages.⁴⁸⁷ Commenters agree that, notwithstanding the benefits of being able to recall WEA Alert Messages and the existence of an applicable mobile device behavior specification,⁴⁸⁸ mobile device manufacturers take different approaches to preserving Alert Messages and consumers have difficulty accessing them after they have been viewed and dismissed.⁴⁸⁹ ATIS states that Alert Message preservation is dependent "upon vendor implementation, and is vendor-specific."⁴⁹⁰ For example, "BlackBerry 10 and Android both keep alerts in an 'inbox' which the user can access later,"⁴⁹¹ whereas Alert Messages are preserved on Microsoft devices in the "Message History" folder.⁴⁹² Harris County OSHSEM "expresses a need for all WEA Alert Messages to be archived at least until the warning expires."⁴⁹³ CSRIC V recommends the development of systems and standards to preserve message content for reference by the user.⁴⁹⁴

b. Discussion

116. We propose to amend Section 10.500 to state that WEA-capable mobile devices must preserve Alert Messages in an easily accessible format and location until the Alert Message expires. We seek comment on this proposal. We seek comment on the various approaches that Participating CMS Providers currently take to Alert Message preservation, and on any best practices that have emerged in this area. We seek comment on whether we should standardize the manner in which Participating CMS Providers preserve Alert Messages, informed by relevant best practices.

117. We seek comment on the extent to which Participating CMS Providers currently offer users the ability to access Alert Messages after they have been viewed and dismissed. Is BlackBerry, Android and Windows' practice of providing access to dismissed Alert Messages in an "inbox" or in "message history" consistent among all devices and providers?⁴⁹⁵ Section 10.420 specifies "Expiration Time" as a required CAP element in WEA Alert Messages.⁴⁹⁶ Is it feasible to use this CAP element as a basis for identifying the time at which an Alert Message should be discarded? If WEA Alert Messages

⁴⁸⁷ See APCO Mar. 22, 2016 *Ex Parte* at 2; NYCEM Mar. 8, 2016 *Ex Parte* at 5-6; FEMA Mar. 17, 2016 *Ex Parte* at 4-5; Harris County OHSEM Mar. 7, 2016 *Ex Parte* at 5; Denver OEMHS Mar. 4, 2016 *Ex Parte* at 3.

⁴⁸⁸ The *ATIS/TIA Mobile Device Behavior Specification* specifies that "[m]obile devices should have the ability to recall alert messages for review by the subscriber." *ATIS/TIA Mobile Device Behavior Specification* at 10; see also *CMSAAC Report* at 82 (specifying the method by which CAP messages should be converted into Commercial Mobile Alert for C-interface (CMAC) format, including a parameter for message expiry that could potentially be used to determine how long a WEA Alert Message should remain available to a consumer).

⁴⁸⁹ See NCMEC Mar. 2, 2016 *Ex Parte* at 3; Denver OEMHS Mar. 4, 2016 *Ex Parte* at 3; FEMA Mar. 17, 2016 *Ex Parte* at 4; BRETSA Mar. 3, 2016 *Ex Parte* at 5.

⁴⁹⁰ ATIS Mar. 18, 2016 *Ex Parte* at 23.

⁴⁹¹ BlackBerry Mar. 21, 2016 *Ex Parte* at 2.

⁴⁹² Microsoft Mar. 9, 2016 *Ex Parte* at 2.

⁴⁹³ See Harris County OHSEM Mar. 7, 2016 *Ex Parte* at 5.

⁴⁹⁴ See *CSRIC V WEA Geo-targeting Report* at 32.

⁴⁹⁵ See BlackBerry Mar. 21, 2016 *Ex Parte* at 2; Microsoft Mar. 8, 2016 *Ex Parte* at 1-2.

⁴⁹⁶ 47 CFR § 10.420.

are retained past this expiration time, Denver OEMHS expresses concern that users will view expired Alert Messages and assume that they are current, causing confusion and panic.⁴⁹⁷ Where Alert Messages are preserved for user review, for how long are they preserved? If Alert Messages continue to be preserved after the underlying emergency condition has expired, are expired Alert Messages clearly marked as such to prevent user confusion? To what extent do Participating CMS Providers' existing practices achieve our goal of providing subscribers with a straightforward method of accessing Alert Messages until they expire?

118. Based on the comments, we believe that having continued access to WEA Alert Messages, including information regarding protective measures the public can take to protect life and property, could promote superior public safety outcomes. NYCEM and APCO have already suggested several use cases in which public response outcomes could be improved through easy access to active Alert Messages, such as to review details about shelter locations and commodity distribution points, and to recall complex information presented in longer WEA Alert Messages.⁴⁹⁸ Further, FEMA states that requiring appropriate alert preservation "would reduce user confusion, make training easier, and would require only one educational campaign if preservation was consistent across platforms."⁴⁹⁹ FEMA further states that requiring appropriate alert preservation "could alleviate some milling behavior, as some will search for alerts on the internet once dismissed to find the content."⁵⁰⁰ We seek comment on these analyses, as well as on additional use cases in which access to pending Alert Messages could have public safety benefits.

4. Earthquake Alert Prioritization

a. Background

119. As we discussed in the *Report and Order*, Sections 10.320 and 10.410 of the Commission's WEA rules require Participating CMS Providers to program their Alert Gateways to process Alert Messages on a FIFO basis, except for Presidential Alerts, which must be processed "upon receipt," before any non-Presidential Alert Messages that may also be queued for transmission.⁵⁰¹ In the *WEA NPRM*, we sought comment on whether we should amend Section 10.410 of the Commission's rules to address prioritization at the CMS Provider's Gateway, in transit, and at the mobile device.⁵⁰² Subsequently, the FY2016 Omnibus Appropriations Explanatory Statement directed the FCC to report to the Appropriations Committee on all regulatory and statutory changes that would be necessary to ensure that earthquake-related emergency alerts can be received by the public in fewer than three seconds using IPAWS and its associated alerting systems, including WEA.⁵⁰³ Earthquake warnings are currently issued as Imminent Threat Alerts, but it is unclear whether Participating CMS Providers' WEA infrastructure is

⁴⁹⁷ Denver OEMHS Mar. 4, 2016 *Ex Parte* at 3, 4.

⁴⁹⁸ NYCEM Mar. 8, 2016 *Ex Parte* at 6; APCO Mar. 22, 2016 *Ex Parte* at 2.

⁴⁹⁹ FEMA Mar. 17, 2016 *Ex Parte* at 4.

⁵⁰⁰ *Id.* at 5.

⁵⁰¹ 47 CFR §§ 10.320(e)(3); 10.410; *supra* para. 58.

⁵⁰² *WEA NPRM*, 30 FCC Rcd at 13817, para. 77.

⁵⁰³ See S. Rept. No. 114-097 (2015), included in the 2016 Appropriations Act by reference in the Explanatory Statement Submitted by Mr. Rogers of Kentucky, Chairman of the House Committee on Appropriations Regarding House Amendment No. 1 to the Senate Amendment on H.R. 2029, Consolidated Appropriations Act, 2016; see Congressional Record, 114th Congress, First Session, Issue: Vol. 161, No. 184, Daily Edition, December 17, 2015 (Explanatory Statement). Prior to reporting to the Appropriations Committee staff, the Public Safety and Homeland Security Bureau determined that more data and information were necessary to properly address the issues raised in the Explanatory Statement language. Accordingly, the Commission established PS Docket No. 16-32 and issued a Public Notice on same. See Public Safety and Homeland Security Bureau Seeks Comment on Ways to Facilitate Earthquake-Related Emergency Alerts, Public Notice, 31 FCC Rcd 3459 (2016).

able to process and transmit these Alert Messages fast enough for them to provide timely warning to the public, particularly to those that are closest to the epicenter.⁵⁰⁴ To be effective, it is crucial that these messages are delivered as rapidly as possible because, in order to be effective, they must be delivered to the public in advance of fast-travelling seismic waves.⁵⁰⁵ ATIS states that it would be technically feasible to transmit earthquake-related Alert Messages from the Alert Gateway upon receipt in order to expedite their transmission to the public.⁵⁰⁶ AT&T states, however that “[w]ithout a re-design of the entire system, it is not possible to prioritize WEA messages on anything other than a FIFO basis.”⁵⁰⁷

b. Discussion

120. We propose to require Participating CMS Providers to deliver earthquake-related Alert Messages to the public in fewer than three seconds, measured from the time an earthquake-related Alert Message is created to when it is delivered and displayed at the mobile device. We seek comment on the parameters for WEA to deliver earthquake alerts in less than three seconds, including any operational or regulatory changes that may be necessary in order to achieve this objective. We seek comment on the appropriate points by which to measure the applicable delivery timeframe. Should the applicable timeframe be measured from the time the alert originator issues the earthquake alert to the time it arrives at the end user device? In order to meet our end-to-end latency objective while respecting the limitations of Participating CMS Provider infrastructure, should the delivery delay from the IPAWS Alert Gateway to the end user be limited to two seconds? If Alert Messages are not received by all WEA-capable mobile devices in the target area simultaneously, how should we determine whether earthquake alerts are being delivered on time to meet our proposed requirement? We seek comment on these proposals, as well as any potential alternatives. We also seek comment on their costs and benefits. In addition, we seek comment on the implementation timeframe in which delivery of earthquake alerts in fewer than three seconds could be achieved. Would this be achievable within the next thirty months? If not, how much time would be needed?

121. In order to help eliminate any delays that could unnecessarily affect the delivery of an earthquake alert, we seek comment on whether we should require prioritization of earthquake-related Alert Messages at the CMS Provider Alert Gateway by processing them “upon receipt,” before any non-Presidential Alert that may also be queued for transmission.⁵⁰⁸ We expect that prioritization at the CMS Provider Alert Gateway would remove the possibility of any queuing delay that may occur due to simultaneous arrival of multiple alerts. We seek comment on the extent to which prioritizing earthquake alerts at the Alert Gateway would reduce their end-to-end latency in instances where the Alert Gateway is processing more than one Alert Message at a time, as well as in other instances. We also seek comment on whether it would be appropriate to prioritize earthquake alerts in transit over other Alert Messages or control channel activity if giving them elevated priority at the Participating CMS Provider Alert Gateway

⁵⁰⁴ 47 CFR § 10.400(b). “The objective of earthquake early warning is to rapidly detect the initiation of an earthquake, estimate the level of ground shaking to be expected, and issue a warning before significant ground shaking begins.” ATIS, *Feasibility Study for Earthquake Early Warning System*, ATIS 0700020, at 11 (2016) (*ATIS Feasibility Study for Earthquake Early Warning*); *see also id.* at 12 (demonstrating how warning time increases with distance from the epicenter); CTIA, *Wireless Emergency Alerts*, <http://www.ctia.org/your-wireless-life/consumer-tips/wireless-emergency-alerts> (last visited Jul. 23, 2016).

⁵⁰⁵ *ATIS Feasibility Study for Earthquake Early Warning* at 11 (“Seismic waves travel through the shallow earth at speeds ranging from one to a few kilometers per second (0.5-3 miles/sec). This means that the shaking can take some seconds or even minutes to travel from where the earthquake occurred to the alert area. . . . To maximize warning time, the system must minimize delays in data processing, communication, and delivery of alerts.”).

⁵⁰⁶ Letter from Thomas Goode, ATIS General Counsel, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 16-32, at 2 (filed July 19, 2016).

⁵⁰⁷ AT&T Comments at 25.

⁵⁰⁸ In case of conflict, a Presidential Alert should have priority over an earthquake-related Alert Message.

would not sufficiently reduce delivery latency for them to arrive on time to save lives. We note that WEA Alert Message segments are transmitted by the Radio Access Network (RAN) every 80ms to 5.12 seconds.⁵⁰⁹ Could standardizing the transmission periodicity of WEA message segments reduce end-to-end alert delivery latency for all WEA Alert Messages? What are the advantages and disadvantages of shorter WEA transmission periods? Can they be changed dynamically? We seek comment on the extent to which giving earthquake alerts priority at the Alert Gateway, in transit, and through other means could enable earthquake-related Alert Messages to be delivered to the public in fewer than three seconds. Even if prioritization of earthquake alerts at the Alert Gateway, by itself, would not be sufficient, should we require such prioritization as an intermediate step towards this goal? We also seek comment on whether any other types of events merit higher priority treatment because of their extreme time sensitivity (*e.g.*, hurricane, tornadoes, bioterrorism, epidemic crises).

122. We seek comment on any technical issues that prioritizing earthquake alerts in transit might present for Participating CMS Providers, and on when this standard could feasibly be achieved. In the alternative, we seek comment on whether a different Alert Message latency requirement would strike a more appropriate balance between the costs of prioritization and the benefits of earthquake early warning.⁵¹⁰ With respect to AT&T's perspective that changing the way that Alert Messages are prioritized would require a "re-design of the entire system,"⁵¹¹ we seek comment on what, if any aspects of the WEA system would need to be redesigned in order to allow earthquake alerts to be delivered to the public in fewer than three seconds. Why, if at all, would changing the way that the Participating CMS Provider Alert Gateway prioritizes WEA Alert Messages affect any aspect of the WEA system other than the Participating CMS Provider Alert Gateway itself? From a technical standpoint, how is it currently possible to prioritize Presidential Alerts but not other types of Alert Messages? We anticipate that changing the manner in which this Gateway handles earthquake alerts would necessitate revisions to Gateway software, and relevant standards. We seek comment on this analysis. Can the Participating CMS Provider Alert Gateway's standards and software be updated to allow it to distinguish earthquake alerts from other Imminent Threat Alerts, for example, by reference to the its CAP "event code" parameter?⁵¹² If not, what steps should we take to allow for earthquake-related alerts to be treated differently from other Imminent Threat Alerts? We anticipate that reducing the end-to-end latency for earthquake alerts will facilitate the use of WEA during such incidents, providing a unique mechanism in the United States for warning the public about earthquakes before the damaging tremors occur. We observe that Japan's Earthquake and Tsunami Warning System (ETWS) is currently the only earthquake early warning service in the world that integrates mass earthquake-related communications with cellular networks.⁵¹³ We anticipate that making WEA an effective platform for early earthquake warnings could, in combination with other earthquake mitigation efforts,⁵¹⁴ help to mitigate the \$4.4 billion dollars in earthquake-related losses FEMA estimates that the United States suffers annually,⁵¹⁵ by saving lives and

⁵⁰⁹ See *ATIS Feasibility Study for LTE WEA Message Length* at 12.

⁵¹⁰ See *supra* para. 91 (describing the benefits of earthquake early warning).

⁵¹¹ AT&T Comments at 25.

⁵¹² We note that the CAP standard that emergency managers use to initiate WEA Alert Messages contains a parameter for an Alert Messages event code. See OASIS, Common Alerting Protocol Version 1.2, at 17. We also note that "EQW" is a specified event code in our Part 11 Emergency Alert System (EAS) rules. See 47 CFR § 11.31.

⁵¹³ See *ATIS Feasibility Study for Earthquake Early Warning* at 15.

⁵¹⁴ See United States Geological Survey, *ShakeAlert – An Earthquake Early Warning System for the United States West Coast* (2016), <https://pubs.usgs.gov/fs/2014/3083/pdf/fs2014-3083.pdf> (last visited Aug. 24, 2016).

⁵¹⁵ See Bob Arguero, *Annual U.S. Earthquake Losses Estimated at \$4.4B*, GovCon, <http://www.govcon.com/doc/annual-us-earthquake-losses-estimated-at-44b-0001> (last visited Jul. 23, 2016) ("[T]he \$4.4 billion estimate is extremely conservative and includes only capital losses (\$3.49 billion) and income losses (continued....)

preventing and mitigating injuries, thereby reducing income loss and by helping to mitigate damage to infrastructure by alerting members of the public who are in a position to take preparatory actions to prevent damage in the event of an earthquake.⁵¹⁶ We seek comment on this analysis, including to on the extent to which such prioritization would mitigate earthquake-related losses and on the costs of any related upgrades to WEA to permit such prioritization.

5. Disaster Relief Messaging

a. Background

123. Commenters address several potential uses for WEA as a secondary messaging service, *i.e.*, a tool for communicating to the public emergency instructions intended to supplement information provided in the initial (primary) message. For example, NYCEM, Ashtabula County EMA and the California Governor’s OES observe that our new Alert Message classification, Public Safety Messages, creates a framework for secondary messaging that can assist with disaster recovery efforts.⁵¹⁷ In the *Alerting Paradigm NPRM* as well as in the *WEA NPRM*, we sought comment on the extent to which emergency managers leverage targeted community feedback during and after emergency situations to disseminate and gather information.⁵¹⁸ We observed that the Peta Jakarta initiative in Indonesia may provide an example of how a government alert initiator can leverage crowdsourced data to increase the overall effectiveness of alerts.⁵¹⁹ While many emergency management agencies expressed concern about the potential for an additional data stream for crowdsourced information to overwhelm already understaffed Public Safety Answering Points (PSAPs),⁵²⁰ “NYCEM strongly believes that the future of

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(\$0.93 billion). This figure does not cover damage and losses to critical facilities, transportation and utility lifelines or indirect economic losses); *see also supra* para. 91 (describing the benefits of earthquake early warning).

⁵¹⁶ Such as notifying a gas pipeline operator to shut off the gas supply and thus potentially avert the potential for an explosion.

⁵¹⁷ NYCEM Comments at 5; Ashtabula County EMA Comments a 2; California Governor’s OES Comments at 3.

⁵¹⁸ We seek comment on the technical feasibility of supporting crowdsourced community feedback using embedded references in the *WEA NPRM*. *WEA NPRM*, 30 FCC Rcd at 13796, para. 28. In the *Alerting Paradigm NPRM*, we seek comment on the extent to which emergency managers at the federal, state, and local levels currently leverage targeted feedback during emergency situations to disseminate and gather information; on whether community feedback via EAS or WEA could be used to prioritize emergency managers’ information gathering efforts; on whether information about the extent of this practice should be included in State EAS Plans; and on whether this capability could be affected by our cable forced tuning rules; and on whether new technologies could facilitate consumer feedback on, and interaction with alert content. *Alerting Paradigm NPRM*, 31 FCC Rcd at 618-19, 621, 628, 632, 635, para. 45-46, 53, 73, 82, 91. We seek further comment on queueing many-back-to-one feedback in the context of WEA here. We leave open the issue of how EAS can be used for this purpose.

⁵¹⁹ *See Alerting Paradigm NPRM*, 31 FCC Rcd at 618-19, para. 46. The Peta Jakarta project piloted a program that monitored Twitter for posts mentioning the word for “flood” during flooding season. *See* Peter Meier, Social Media for Disaster Response Done Right, *Emergency Journalism* (Jul. 29, 2015), <http://emergencyjournalism.net/social-media-for-disaster-response-done-right/> (last visited Jan. 25, 2016); *see also Peta Jakarta*, <https://petajakarta.org/banjir/en/> (last visited Jan. 27, 2016). The system would automatically respond to such messages, asking whether the user saw flooding, at which point the user could confirm their report either by turning geo-location on in their device settings, or by responding, in turn, with the word for “flood.” *See* Peter Meier, Social Media for Disaster Response Done Right, *Emergency Journalism* (Jul. 29, 2015), <http://emergencyjournalism.net/social-media-for-disaster-response-done-right/> (last visited Jan. 25, 2016). Peta Jakarta then incorporated the results of this information-gathering process into a live, public crisis map that depicted in real time areas in the city that were affected by flooding. *See id.*

⁵²⁰ *See* Named State Broadcasters Associations Comments, PS Docket Nos. 15-94 and 15-91, 13 (June 8, 2016); Association of Public-Safety Communications Officials Comments, PS Docket Nos.15-94 and 15-91, 4 (June 8, 2016); Denver OEMHS Mar. 4, 2016 *Ex Parte* at 3; Letter from Joseph Benkert, Counsel, Boulder Regional

(continued....)

crowdsourcing is through leveraging individual consumer cellular phones by upgrading the Wireless Emergency Alert System to support bidirectional, “many-to-one” communication.”⁵²¹ CSRIC V finds that the ability to gather information from the community (many-to-one communication) can make alerting (one-to-many communication) more effective if “appropriately integrated into operations in a way that is responsive to the context of operation.”⁵²² CSRIC V identifies three use cases where many-to-one communications could be a particularly beneficial supplement to one-to-many communications, gathering targeted community feedback, assessing evacuation compliance, and during active shooter scenarios.⁵²³ CSRIC V recommends that “FEMA should investigate modifying IPAWS to support ‘[m]any to one’ communication and data collection,” that “ATIS should study the feasibility of mechanisms for the delivery of “many to one” data to FEMA IPAWS,” and that the Commission should convene a panel of relevant experts to promote data science literacy among emergency managers and establish best practices for using data gathered from “social media” monitoring.⁵²⁴ NAB and NPR also encourage the Commission to recognize the consumer benefits of Alert Messages that direct the public to turn on their radios for additional information during disaster recovery efforts.⁵²⁵

b. Discussion

124. In light of the foregoing, we seek comment on the potential for WEA to serve as a secondary messaging tool for emergency managers, specifically during disaster relief efforts. Specifically, we seek comment on how to enhance WEA’s support for many-back-to-one communication to facilitate emergency managers’ response planning efforts, and on whether WEA can be made a more useful tool during and after emergencies by facilitating its ability to interface other authoritative sources of information. Are there existing needs or gaps in the public communications tools currently available to

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Emergency Telephone Service Authority (BRETSA), to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 3 (filed Mar. 4, 2016) (BRETSA Mar. 4, 2016 *Ex Parte*).

⁵²¹ New York City Emergency Management Department Comments, PS Docket 15-94 and 15-91, 3 (June 8, 2016); NYCEM Comments at 17; *see also* NWS Mar. 9, 2016 *Ex Parte* at 4.

⁵²² CSRIC V, Working Group Two, *Social Media & Complementary Alerting Methods – Recommended Strategies & Best Practices*, Final Report 37 (2016) (*CSRIC V Complementary Alerting Methods Report*).

⁵²³ *CSRIC V WEA Geo-targeting Report* at 26-27 (stating that collecting targeted community feedback could be helpful during disaster recovery efforts where emergency management agencies could ask individuals in the area to describe the damage they see by selecting a number that corresponds to one of four predefined fields); *see also id.* (stating that “many-to-one” communication could be helpful in ensuring evacuation compliance issuing successive messages, determining how many mobile devices received each message, and gauging evacuation compliance with reference to whether the number of devices that receive the message is shrinking); *id.* (stating that “many-to-one” communication could be helpful during an active shooter scenario to determine the number of survivors remaining).

⁵²⁴ *CSRIC V WEA Geo-targeting Report* at 34; *but see id.* (stating that this concept should be further studied outside of the WEA regulatory framework because it falls outside of current obligations of Participating CMS Providers under the WARN Act).

⁵²⁵ *See* NAB and NPR Comments at 2, 5; *see also* IAFC Comments at 1 (stating that radio-linked alert messages could relieve the burden on cellular networks and could reduce impacts on device battery life during post-disaster relief efforts where such factors may be particularly important). Major CMS Providers are committed to enabling FM chips embedded in their smart devices. *See* Jennifer Walsh, *Sprint Customers to Enjoy Local FM Radio on Smartphones via FM Radio Chip*, Sprint Newsroom (Jan. 8, 2013), <http://newsroom.sprint.com/news-releases/sprint-customers-to-enjoy-local-fm-radio-on-smartphones-via-fm-radio-chip.htm> (last visited Mar. 18, 2016); Paul McLane, *AT&T to “Light Up” FM Chips in Android Phones*, Radio World (Jul. 28, 2015), <http://www.radioworld.com/article/att-to-light-up-fm-chips-in-android-phones-/276704#.dpuf> (last visited Mar. 18, 2016); *T-Mobile Throws Support Behind FM Radio Chipsets, Following Sprint and AT&T*, Fierce Wireless (Aug. 17, 2015), <http://www.fiercewireless.com/story/t-mobile-throws-support-behind-fm-radio-chipsets-following-sprint-and-att/2015-08-17> (last visited Mar. 18, 2016).

emergency managers for use during disaster relief efforts that WEA can fill? What, if any, critical capacities does WEA lack that could inhibit its utility for post-disaster communications?

125. We seek comment on improvements to WEA that we should consider in order to ensure that it is optimized for this use, including by enabling WEA to be used as a tool for queuing the collection of targeted community feedback during disaster recovery efforts, to measure evacuation effectiveness, and during active shooter scenarios, as recommended by CSRIC V.⁵²⁶ We seek comment on whether using WEA in this manner could assist emergency management agencies' resource-need pairing during emergencies, and on any additional use cases where "many-to-one" feedback could improve emergency response. We seek comment from technology vendors who have developed innovative solutions to aggregating and analyzing public response on the potential for implementation of those technologies in the emergency management context. We seek comment on whether best practices based in data science literacy are available to facilitate emergency managers' skillful use of targeted community feedback, and if not, on whether we should direct the Public Safety and Homeland Security Bureau to convene a panel of experts to produce recommendations for this purpose, as recommended by CSRIC V.⁵²⁷ We also seek comment on the extent to which WEA can be used to funnel milling behavior towards other authoritative sources of information, such as radio or television, that may be better fit to provide critical information to the public in certain circumstances. Would such an approach make WEA more useful to emergency managers in disaster relief situations?

B. Incorporating Future Technical Advancements to Improve WEA

1. Multimedia Alerting

126. As noted above, we are committed to allowing the public to realize the benefits of multimedia content in WEA, and we propose that an appropriate path to achieve this goal would be to require support for certain multimedia content, including thumbnail-sized images and hazard symbols, in Public Safety Messages on 4G LTE and future networks.⁵²⁸ We recognize that Participating CMS Providers have concerns about message delivery latency and network congestion that may result from including multimedia in WEA Alert Messages.⁵²⁹ Further, we acknowledge the record indicates that further standards development is necessary to support multimedia capabilities in WEA.⁵³⁰ As we discuss in further detail below, we believe these issues can be addressed given an appropriate regulatory framework and timeframe for compliance. Accordingly, we seek to develop the record on data constraints and technical parameters that should be associated with developing and implementing this functionality, and on a reasonable timeframe within which to require Participating CMS Providers to support it. Pursuant to the approach we propose to adopt, emergency management agencies could use Public Safety Messages to transmit thumbnail-sized images of evacuation routes in connection with Imminent Threat Alerts, an image of the face of a missing child after an AMBER Alert, or specific instructions for protective action to the access and functional needs community through the use of hazard symbols. We invite commenters to offer additional use cases where this functionality could help meet the public's need for actionable, multimedia-enabled content during emergencies.

127. With respect to the potential for alert delivery latency, we observe that, according to the *ATIS Feasibility Study for LTE WEA Message Length*, WEA Alert Message segments can be transmitted

⁵²⁶ CSRIC V *Geo-targeting Report* at 26-27.

⁵²⁷ CSRIC V *Complementary Alerting Methods Report* at 37-38.

⁵²⁸ See *supra* Section III.A.3 (Supporting Embedded References and Multimedia).

⁵²⁹ See AT&T Mar. 17, 2016 *Ex Parte* at 3; Verizon Comments at 2; T-Mobile Comments at 6; Microsoft Reply at 4; ATIS Comments at 14; CTIA Comments at 11-12.

⁵³⁰ See *supra* note 108 (describing comments from AT&T, ATIS, and CTIA stating that additional standards efforts are necessary for eMBMS to support WEA).

every 80 milliseconds to 5.12 seconds.⁵³¹ We reason, therefore, that a thumbnail-sized image could be transmitted over WEA cell broadcast in between 0.88 seconds and 56.32 seconds.⁵³² We would not want the transmission of multimedia content to delay receipt of the most time-sensitive Alert Message text. At the same time, however, we also believe that there are circumstances where the public would benefit from the receipt of multimedia content over WEA cell broadcast, even if they have to wait a minute to receive it. We therefore propose to require support for multimedia content only in Public Safety Messages, which may contain information that is not as time-sensitive as other types of Alert Messages. As Alert Messages in the Public Safety Message classification are designed for issuance for in connection with Alert Messages of other types, we believe they would provide an appropriate vehicle for multimedia-enabled content even when they cannot be delivered until minutes after the initial Imminent Threat or AMBER Alert delivers the primary, text-based Alert Message.⁵³³ We seek comment on this analysis.

128. We seek comment on any appropriate technical constraints that should apply to the multimedia content that Participating CMS Providers would be required to support. We anticipate that constraints on the permissible size of multimedia data files would also help Participating CMS Providers to manage network loading. The *ATIS Feasibility Study for WEA Supplemental Text* shows that transmitting a thumbnail-sized photo over WEA cell broadcast would require the transmission of at least eleven WEA binary messages.⁵³⁴ The *ATIS Feasibility Study for WEA Supplemental Text* considers a “thumbnail-sized photo” to be approximately 1.5 x 1.5 inches, to have a resolution of 72 dots per inch (DPI), and to be presented as using 120 x 120 pixels.⁵³⁵ ATIS reasons that a thumbnail-sized image would be 14,400 bytes in size if an 8-bit color scale is used, and would require the broadcast of 3600 octets, assuming 25 percent compression.⁵³⁶ We seek comment on whether that 14,400 bytes would be an appropriate maximum size for any multimedia content that a Participating CMS Provider could be required to transmit, as well as on any additional technical specifications or parameters that could facilitate multimedia transmission. We seek comment on any other implications or considerations we should take into account.

129. With respect to the integration of support for hazard symbols into WEA’s core functionality, CSRIC IV and CSRIC V recommend further study.⁵³⁷ The *ATIS Feasibility Study for WEA Supplemental Text* recommends that a study of the “User Experience Design” covering the “human-computer interaction” between mobile users and hazard symbols should be undertaken by the WEA

⁵³¹ *ATIS Feasibility Study for LTE WEA Message Length* at 12.

⁵³² Where transmitting 11 WEA Alert Messages, one every 80 milliseconds would result in an 880 millisecond delay (0.88 seconds) and transmitting 11 WEA Alert Messages, one every 5.12 seconds would result in a 56.32 second delay).

⁵³³ This is why, in the *Order*, we allow industry prototyping of this functionality as of the effective date of our Public Safety Message requirement. *See supra* para. 37.

⁵³⁴ *ATIS Feasibility Study for WEA Supplemental Text* at 10 (“A thumbnail photo of about 1.5"x1.5" with a resolution of 72 dots per inch (DPI) will produce an image of 120x120 pixels. If 8 bit color scale is used, then a digital image file will be about 14,400 bytes in size. If we assume a 25% compression, then the resulting image file to broadcast would be 3600 octets. If a WEA message for broadcasting binary content were to be defined, the example described above would require at least 11 WEA binary messages to broadcast a small image file at the proposed WEA maximum of 360 characters.”).

⁵³⁵ *Id.*

⁵³⁶ *Id.*

⁵³⁷ *See CSRIC IV WEA Messaging Report* at 46; *CSRIC V Complementary Alerting Methods Report* at 35 (“The adopted symbols should be aligned with the DHS Geospatial Management Office’s existing symbology efforts to ensure alignment and community acceptance across local, state, tribal, and Federal levels in coordination with the National Alliance for Public Safety GIS Foundation’s national symbol set and guideline.”).

stakeholders followed by global standardization.⁵³⁸ According to ATIS, standards would be needed to identify the specific hazard symbols appropriate for this use, and to describe hazard warning icon delivery to the mobile device, either via mobile device software or cell broadcast.⁵³⁹ We seek comment on this analysis. Would it be feasible to integrate support for hazard symbols into WEA using the GSM-7 character set or a Unicode character set?⁵⁴⁰ If so, would this approach offer a less burdensome alternative to supporting hazard symbols in all Alert Messages?

130. With respect to concerns in the record regarding the possibility for increased network load, we propose to allow Participating CMS Providers to use network congestion mitigation strategies to feasibly and timely deliver multimedia-enabled Public Safety Messages. For example, we seek comment on whether staggering transmission of multimedia message segments could facilitate delivery of this content to subscribers, while mitigating potential network congestion concerns. Would it make sense to constrain any requirement to support multimedia to devices operating on 4G LTE and future networks? We seek comment on best practices that emergency management agencies could implement with respect to multimedia messaging if the transmission of such content implicated greater delay than text-only Alert Messages, and if Alert Messages that contained multimedia content could not be received by members of their communities on legacy networks or that are using legacy devices that no longer accept software updates. Recognizing the limitations of cell broadcast technology, to what extent would a requirement to support thumbnail-sized images and hazard symbols spur Participating CMS Providers to integrate new technologies into their WEA systems that could improve their ability to support the low-latency transmission of high-quality multimedia content? For example, commenters agree that Multimedia Broadcast Multicast Service (eMBMS) would permit the broadcast of “large amounts of data, including multimedia content.”⁵⁴¹ We seek comment on the technical steps that would be required to integrate technology that supports the transmission of multimedia content into WEA.

131. Allowing multimedia content in WEA Alert Messages would have tremendous public safety benefits. NYCEM, FEMA and TDI, for example, believe that allowing multimedia content in WEA Alert Messages would significantly contribute to Alert Message comprehension, particularly for individuals with disabilities,⁵⁴² and FEMA adds that the use of graphical symbols could improve Alert Message interpretation by individuals with limited English proficiency.⁵⁴³ NCMEC states that multimedia content would “greatly enhance the immediate usefulness of AMBER Alerts.”⁵⁴⁴ San Joaquin County OES adds that multimedia content in WEA Alert Messages would hasten protective action taking and reduce milling.⁵⁴⁵ We seek comment on these analyses, as well as on any additional public safety benefits that multimedia messaging may enable. Even though Chester County EMA and The Weather Company suggest the inclusion of multimedia would be unnecessary in light of the availability of embedded references and “third party apps and television that users normally use,”⁵⁴⁶ we find that unique benefits

⁵³⁸ ATIS Feasibility Study for WEA Supplemental Text at 22.

⁵³⁹ *Id.* at 11.

⁵⁴⁰ See *infra* Section IV.B.2 (Multilingual Alerting) (seeking comment on whether additional character sets would be needed to support Alert Messages written in ideographic languages).

⁵⁴¹ ATIS Comments at 13; see also AT&T Comments at 16; AT&T May 5, 2015 *Ex Parte* at 2; CTIA Comments at 13.

⁵⁴² See NYCEM Comments at 11; TDI Comments at 14; FEMA Jun. 18, 2015 *Ex Parte* at 2; see also DAC Comments at 2-3 (noting that such content could provide information in American Sign Language as well as messaging for people with limited English proficiency).

⁵⁴³ See FEMA Jun. 18, 2015 *Ex Parte* at 2.

⁵⁴⁴ See NCMEC Comments at 2.

⁵⁴⁵ San Joaquin OES Comments at 1.

⁵⁴⁶ The Weather Company Reply at 2; Chester County EMA Comments at 1.

could result from including multimedia content in Alert Messages, especially as Participating CMS Providers' ability to support this functionality evolves along with advancements in technology. For example, WEA Public Safety Messages could be used to push an authoritative interactive map to every community member with a WEA-capable mobile device that shows the recipient's location relative to evacuation routes, shelter locations or resource distribution points. For communities struggling to recover from natural disasters, for example, this functionality would hold tremendous public safety value above and apart from multimedia-enabled emergency information available through other sources that in any case may not be as readily available as a consumer's mobile device.⁵⁴⁷ We also seek comment on whether those benefits would be particularly acute when implemented in an authoritative alerting services such as WEA that the public receives by default.

2. Multilingual Alerting

a. Background

132. We observe that, according to commenters, expanding the language capabilities of WEA has potential to yield particular benefits for those with limited English proficiency.⁵⁴⁸ The record suggests, however, that the technical issues that prevented Participating CMS Providers from supporting multilingual Alert Messages when WEA was first deployed continue to limit their ability to support Alert Messages in languages other than English and Spanish.⁵⁴⁹ While FEMA states that IPAWS and CAP have the capacity to support Alert Messages in languages other than English and Spanish,⁵⁵⁰ additional languages are not currently supported in Participating CMS Provider networks.⁵⁵¹ According to Participating CMS Providers, significant standards-setting work and potentially support for new character sets would be required in order to enable them to support WEA Alert Messages in languages other than English and Spanish.⁵⁵² Further, AT&T and Verizon observe that each additional WEA Alert Message language option will require Participating CMS Providers to transmit an additional Alert Message, which could threaten network capacity and risk alert delivery delays.⁵⁵³ In light of these ongoing issues and additional data, we agree with T-Mobile that "[t]he Commission should promote further study of the technical impact of multilingual WEA messages so that such messages can be incorporated into the WEA system in the future without creating unintended, adverse impacts."⁵⁵⁴

133. Only 79 percent of individuals living in the United States that are 5-years old or older speak only English at home.⁵⁵⁵ According to the *ACS Language Report*, the top ten most spoken languages in the U.S. among individuals 5-years old or older are English,⁵⁵⁶ Spanish or Spanish Creole,⁵⁵⁷

⁵⁴⁷ See *CSRIC V Geo-targeting Report* at 32 (recommending the development of standards and systems to "[r]ender the alert on the device in a manner that provides a high resolution map clearly illustrating the alert area, the location of the device, and any additional relevant life-safety information" within 48 months of the report's adoption).

⁵⁴⁸ See *supra* note 278 (listing emergency management commenters that agree that adding a multilingual alerting capability to WEA would enable them to reach members of their communities that are currently inaccessible to them).

⁵⁴⁹ See AT&T Comments at 18; CTIA Comments at 13; Verizon Comments at 7.

⁵⁵⁰ FEMA Jun. 18, 2015 *Ex Parte* at 2-3.

⁵⁵¹ See T-Mobile Reply at 7; see also AT&T Comments at 18; Microsoft Reply at 4-5; ATIS Comments at 16.

⁵⁵² See *Id.*

⁵⁵³ AT&T Comments at 18-19; Verizon Comments at 7.

⁵⁵⁴ T-Mobile Reply at 8.

⁵⁵⁵ Of the 291,524,091 people 5-years old or older living in the United States at the time of this survey, only 230,947,071 individuals speak only English at home. See Camille Ryan, *Language Use in the United States: 2011*, American Community Survey Reports, at 3 (2013) (*ACS Language Report*).

⁵⁵⁶ See *id.*

Chinese,⁵⁵⁸ French or French Creole,⁵⁵⁹ Tagalog,⁵⁶⁰ Vietnamese,⁵⁶¹ Korean,⁵⁶² Arabic,⁵⁶³ Russian,⁵⁶⁴ and African languages.⁵⁶⁵ English-speaking ability varies greatly, even among speakers of the top ten languages in the United States.⁵⁶⁶ According to recent census data, “less than 50 percent of those who spoke Korean, Chinese, or Vietnamese spoke English ‘very well.’”⁵⁶⁷ According to the *ACS Language Report*, “[p]eople who cannot speak English ‘very well’ can be helped with translation services, education, or assistance in accessing government services.”⁵⁶⁸

b. Discussion

134. We seek comment on the potential benefits of requiring Participating CMS Providers to support Alert Messages in languages other than English and Spanish. To what extent would emergency management agencies initiate Alert Messages in languages in addition to English and Spanish were Participating CMS Providers required to support them? To what extent would CMS Provider support for additional languages incent emergency management agencies to further develop their capabilities in initiating Alert Messages in those languages where relevant to their respective communities? What, if any, additional steps can we take to support emergency management agencies’ efforts to develop multilingual alerting capabilities? We expect that emergency management agencies already integrate individuals who don’t speak English very well into their communities’ emergency response plans,⁵⁶⁹ and

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⁵⁵⁷ 37,579,787 individuals in the United States 5-years old or older speak Spanish or Spanish Creole at home (56.3 percent also spoke English “very well”). *See id.*

⁵⁵⁸ 2,882,497 individuals in the United States 5-years old or older speak Chinese at home (only 44.3 percent also spoke English “very well”). *See id.*

⁵⁵⁹ 2,055,433 individuals in the United States 5-years old or older speak French or French Creole at home (79.6 percent of French speakers also spoke English “very well,” and 56.8 percent of French Creole speakers also spoke English very well). *See id.*

⁵⁶⁰ 1,594,413 individuals in the United States 5-years old or older speak Tagalog at home (67.2 percent also spoke English “very well”). *See id.*

⁵⁶¹ 1,419,539 individuals in the United States 5-years old or older speak Vietnamese at home (only 39.8 percent also spoke English “very well”). *See id.*

⁵⁶² 1,141,377 individuals in the United States 5-years old or older speak Korean at home (only 44.5 percent also spoke English “very well”). *See id.*

⁵⁶³ 951,699 individuals in the United States 5-years old or older speak Arabic at home (63.3 percent also spoke English “very well”). *See id.*

⁵⁶⁴ 905,843 individuals in the United States 5-years old or older speak Russian at home (52.2 percent also spoke English “very well”). *See id.*

⁵⁶⁵ 884,660 individuals in the United States 5-years old or older speak African languages at home (68.1 percent also spoke English “very well”). *See id.*

⁵⁶⁶ *See id.* at 4.

⁵⁶⁷ *See id.* “The usefulness of the self-rated English-speaking ability question was established in the 1980s, when research confirmed a strong relation between this rating and separate tests of ability to perform tasks in English.” *Id. citing* Department of Education, Office of Planning Budget and Evaluation, Numbers of Limited English Proficient Children: National, State and Language-Specific Estimated (1987); Robert Kominski, How Good is ‘How Well’? An Examination of the Census English-Speaking Ability Question (1989), www.census.gov/hhes/socdemo/language/data/census/ASApaper1989.pdf.

⁵⁶⁸ *See id.* at 1.

⁵⁶⁹ We note that we recently adopted a requirement that EAS Participants provide to their respective SECCs, for inclusion in their State EAS Plan, a description of any actions taken or planned by the EAS Participant to make EAS alert content available in languages other than English to its non-English speaking audience; translation technologies (continued....)

we seek comment on whether increasing emergency management agencies' multilingual alerting capability could help to further improve disaster preparedness for these communities. How do emergency management agencies currently expect individuals with limited English proficiency to receive and respond to emergency information? Are the emergency management mechanisms currently in place sufficient to safeguard those individuals during crises?

135. If we were to adopt rules to deepen WEA's language capabilities, we seek comment on whether we should prioritize support for those languages predominantly spoken in communities where, according to Census data, 50 percent or fewer speak English "very well" (e.g., Vietnamese, Chinese, Korean).⁵⁷⁰ Is the area of greatest need with respect to WEA's language capabilities ensuring that people who struggle with English comprehension can understand emergency communications? In the alternative, should we prioritize support for the largest language communities in the United States, notwithstanding the tendency of individuals in those language groups to speak English "very well"? We observe, for example, that, according to recent Census data, English and Spanish are by far the most popular languages in the United States, with Chinese and French a distant third and fourth.⁵⁷¹

136. We seek comment on whether supporting Alert Messages written in ideographic languages, such as Vietnamese, Chinese and Korean, would pose unique challenges for WEA stakeholders, including Participating CMS Providers and emergency managers. We note that WEA messages use GSM 7-bit encoding, and that the 3GPP standard for cell broadcast allows switching to the basic Unicode (UCS-2) character set, which includes all living languages, in order to provide support for modern, ideographic languages such as Kanji.⁵⁷² Do Participating CMS Providers' WEA infrastructure and WEA-capable mobile devices support this functionality? If not, what steps would be necessary to incorporate Unicode into WEA? We also seek comment on whether emergency management agencies would face particular difficulties in initiating Alert Messages in ideographic languages. Does alert origination software currently support initiating Alert Messages in ideographic languages? If not, what steps would be required in order to upgrade this software? Are there additional standards, protocols and system updates that would be required to enable alerting in Vietnamese, Chinese and Korean in particular? Further, we seek comment on whether WEA Alert Messages can be made available in American Sign Language (ASL) for subscribers that are deaf or hard of hearing. How would the provision of WEA Alert Messages in ASL allow for better accessibility to those who are ASL-fluent?

137. In addition to any potential changes to the WEA character set that may be required, we seek comment on any necessary preconditions to supporting additional languages in WEA in general, and to supporting Korean, Vietnamese or Chinese Alert Messages in particular. We also seek comment on whether support for additional languages would be burdensome for non-nationwide (e.g., regional, small, and rural) Participating CMS Providers, and if so, whether there are steps that we can take to accommodate these entities to make compliance more feasible. Would it be more appropriate for non-nationwide Participating CMS Providers to be required to support only the those particular languages, other than English and Spanish, that are predominant in the particular areas in which they provide service? We seek comment on any alternative approaches that would help achieve our objective of promoting accessibility of WEA Alert Messages.

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or other innovative approaches to providing non-English alerts and emergency information to the public. See Review of the Emergency Alert System; Independent Spanish Broadcasters Association, the Office of Communication of the United Church of Christ, Inc., and the Minority Media and Telecommunications Council, Petition for Immediate Relief Randy Gehman Petition for Rulemaking, *Order*, 31 FCC Rcd 2414, 2426, para. 22 (2016) (on appeal).

⁵⁷⁰ See *ACS Language Report* at 4.

⁵⁷¹ See U.S. Census Bureau, *American Community Survey 2009-2013* (2015).

⁵⁷² See *ATIS Feasibility Study for LTE WEA Message Length* at 3; see also 3GPP TS 23.041 (3GPP Technical realization of Cell Broadcast Service (CBS)).

3. Matching the Geographic Target Area

a. Background

138. While our geo-targeting requirement, as amended above, will improve WEA geo-targeting by facilitating the delivery of Alert Messages to a more granular polygon level, the limitations of cell broadcast-based geo-targeting may result in continued over-alerting.⁵⁷³ According to CSRIC IV, the “ideal case” from an alert originator perspective would be where “all WEA-enabled mobile devices in the geographic area affected by an emergency event would receive the WEA Alert Message broadcast, and no mobile devices outside the defined alert area would receive those particular WEA Alert Message broadcasts.”⁵⁷⁴ “However,” CSRIC IV reports, “this ideal case cannot be realized using currently deployed cell broadcast alone.”⁵⁷⁵ CSRIC V recommends that the Commission collaborate with WEA stakeholders to develop standards and implement systems that support enhanced, device-based geo-targeting.⁵⁷⁶ CSRIC V recommends that the Commission set a goal that Participating CMS Providers geo-target Alert Messages in a manner that includes “100% of the targeted devices within the specified alert area with not more than .10 mile overshoot,” and states that WEA stakeholders, including Participating CMS Providers, “have committed to working to close the gap between current capabilities and aspirational goals.”⁵⁷⁷

b. Discussion

139. As we emphasize above, more granular geo-targeting remains a critical need for both consumers and emergency managers. Accordingly, we propose to require Participating CMS Providers to match the target area specified by alert originators. We anticipate that this may require Participating CMS Providers to leveraging the location sense of WEA-capable mobile devices on their networks. In the following paragraphs, we seek comment on how we should define “matching” the target area for purposes of any such requirement, as well as on steps that alert initiators and Participating CMS Providers can take to minimize alert delivery latency and maximize the amount of data available for other Alert Message content. We also seek comment on the readiness of innovations that could allow alert initiators to geo-target more flexibly, and to smaller areas.

140. As an initial matter, should a Participating CMS Provider be considered to have “matched” the targeted area for the purpose of this requirement if, as recommended by CSRIC V, 100 percent of devices within the targeted area receive the Alert Message with not more than 0.1 mile overshoot?⁵⁷⁸ In the alternative, if providers are leveraging the same technology in the WEA context that is being used to provide indoor location, would it make sense to harmonize our geo-targeting accuracy requirement for WEA with our wireless E911 indoor location accuracy requirements?⁵⁷⁹ If not, why not?

⁵⁷³ See *supra* Section III.B.2 (Narrowing Geo-targeting Requirements).

⁵⁷⁴ See CSRIC IV WEA Messaging Report at 17.

⁵⁷⁵ See *id.*

⁵⁷⁶ CSRIC V WEA Geo-targeting Report at 31-32 (including the identification of methods for transmitting polygon coordinates to mobile devices; identification of changes to cell broadcast needed to enable received messages that contain coordinates to be passed to mobile devices; understanding network impacts of a device determining its location using A-GPS or other location technologies; use of the polygon of the alert area to help the device determine if it is inside the alert area, and if so, to display it; specify behavior if the device is unable to obtain its location; render the alert on compatible devices in a manner that provides a map clearly illustrating the alert area; and provide a method of accessing the archived alert).

⁵⁷⁷ *Id.* at 31

⁵⁷⁸ *Id.*

⁵⁷⁹ See Wireless E911 Location Accuracy Requirements, *Report and Order*, PS Docket No. 07-114, 30 FCC Rcd 1259, 1324-25, paras. 103-04 (2015).

Further, would an alternative accuracy requirement be appropriate for non-nationwide Participating CMS Providers? We seek comment on any alternative approaches to defining “matching” for the purposes of assessing compliance with our proposed requirement.⁵⁸⁰ In circumstances where Participating CMS Providers are unable to match the target area, we propose that they should be required to provide their best approximation of the target area, as we require in the *Order*. We seek comment on this approach.

141. The record indicates that it will be technically feasible for Participating CMS Providers to comply with our requirement that they geo-target Alert Messages to an area that matches the target area, given appropriate time for the development of relevant standards and network modifications.⁵⁸¹ We expect that Participating CMS Providers will be able to geo-fence their transmission of Alert Messages by transmitting target area coordinates to 100 percent of mobile devices in the target area, erring on the side of over-inclusion where necessary.⁵⁸² WEA-capable mobile devices would receive the Alert Message, including the target area coordinates, and determine whether they are currently located within the area those coordinates describe. If and only if the mobile device is within the target area, it would display the Alert Message to the subscriber. Commenters indicate that the suppression of the Alert Messages on mobile devices that are outside of the target area (geo-fencing) would allow Participating CMS Providers to match the target area specified by alert originators.⁵⁸³ We seek comment on this analysis, including any alternative approaches that Participating CMS Providers could use to match the target area or to implement a device-based approach to geo-targeting. The record indicates that technical issues, such as potential increases in message delivery latency, and reductions in the amount of data available for Alert Message text, can be resolved.⁵⁸⁴ We seek comment on how Participating CMS Providers will address these issues in conversation with other relevant WEA stakeholders. We seek comment on feasible methods Participating CMS Providers could use to mitigate sources of alert delivery latency that may be implicated by geo-targeting Alert Messages to an area that matches the target area specified by the alert originator.⁵⁸⁵ Participating CMS Providers and ATIS agree that meeting such an accurate geo-targeting standard could cause message delivery delay due to the device needing to determine its location before displaying the message, and due to network constraints.⁵⁸⁶ ATIS states that “the only currently readily

⁵⁸⁰ We anticipate that variations in geo-targeting accuracy due to the size of the target area can be controlled through alert originator best practices. For example, more coordinate pairs may be necessary to accurately describe a large, complex polygon target area than would be needed to describe a small, square target area.

⁵⁸¹ See, e.g., *CSRIC V WEA Geo-targeting Report* at 30-32 (recommending an appropriate timeframe for the consideration of issues necessary for compliance with a geo-targeting requirement that relies on leveraging the intelligence of mobile devices); Letter from John Carley, Director of Product Management, RxNetworks, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sep. 16, 2016); Letter from Keith Kaczmarek, inPhase Wireless, Christopher Guttman-McCabe, CGM Advisors, LLC, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sep. 15, 2016); Kim Robert Scovill, Vice President, Legal Regulatory and External Affairs, Comtech Telecommunications Corp., to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sep. 11, 2016) (explaining how Comtech has “developed a hybrid geo-targeting solution that uses both a network based geo-targeting algorithm (cell sector level accuracy) and a mobile device application (to determine its own location) to perform precise geo-targeting for WEA alerts.”).

⁵⁸² Using network-based geo-targeting approaches common today, Participating CMS Providers strip target area coordinates from Alert Messages in the RAN in order to minimize the amount of data they must transmit.

⁵⁸³ See FEMA May 21, 2015 *Ex Parte* at 2; USGS Comments at 2; AWARN Coalition Comments at 6; NWS May 21, 2015 *Ex Parte* at 3; *but see* Sprint Reply at 6; Verizon Comments at 3.

⁵⁸⁴ See *supra* note 581.

⁵⁸⁵ See AT&T May 5, 2015 *Ex Parte* at 2 (“Any device-assisted method requires sending down the polygon coordinates to the mobile device, delaying the notification and taking away from the characters used to inform the citizens.”).

⁵⁸⁶ See AT&T Mar. 17, 2016 *Ex Parte* at 6 (“Geo-fencing would require all mobile devices to know the polygon coordinates of the alert area, which is non-trivial. In addition, geo-fencing requires the mobile device to know its location in relation to the polygon; since mobile device location awareness is network-assisted, when many mobile

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available technology [for device-based geo-fencing] is GPS/GNSS” and that, without network assistance, the “time to acquire a GPS position can be over 13 minutes from a cold start . . . and up to 30 seconds for a warm start.”⁵⁸⁷ To what extent could Assisted GPS reduce these times and to what extent would the CMS network be burdened by providing this assistance?⁵⁸⁸ Further, we seek comment on how long the mobile device should wait while attempting to determine its current location (*e.g.*, acceptable Time-To-First-Fix (TTFF))? We note that, in the 911 context, we have established a maximum TTFF latency standard of 30 seconds for outdoor calls.⁵⁸⁹ Would that same standard be appropriate for geo-targeting to an area that matches the target area in light of our concerns about alert delivery latency?⁵⁹⁰ Finally, what should be the action of the mobile device if the mobile device location cannot be determined or cannot be determined within the time limit, for example, if a mobile device is turned off, or if its location services are turned off? Should the default setting be to display the Alert Message?

142. We seek comment on the extent to which polygon compression techniques and alert originator best practices could maximize the amount of data that remains for Alert Message content if Alert Message coordinates are transmitted along with content to WEA-capable mobile devices. ATIS concludes that each coordinate pair would require data equivalent to that needed to display thirteen characters using current methods.⁵⁹¹ However, researchers have examined methods of compressing coordinate data to consume between 9.7 percent and 23.6 percent of this data.⁵⁹² We seek comment on

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devices are attempting to determine their location simultaneously, this will put an extreme load on the network-based location platforms.”); Verizon Comments at 3; Sprint Reply at 6; ATIS Comments at 16-17; Apple Mar. 21, 2016 *Ex Parte* at 2; Blackberry Mar. 21, 2016 *Ex Parte* at 1-2 (stating that “it can be from seconds to up to a minute to lock position, depending on how far the device has changed from its last position and what location references/network assistance are required”); Microsoft Mar. 8, 2016 *Ex Parte* at 2.

⁵⁸⁷ ATIS WEA *Geo-targeting Feasibility Study* at 49 (stating that a “cold start” implicated that there is no, or expired GPS-related data in the mobile device, and a “warm start” implicates that some such information is available).

⁵⁸⁸ Assisted GPS, also known as A-GPS or AGPS, improves the location performance of mobile devices in two ways: 1) A-GPS acquires and stores information about the location of satellites via the cellular network so the information does not need to be downloaded via satellite by helping obtain a faster “time to first fix” (TTFF); and 2) A-GPS uses proximity to cellular towers to calculate position when GPS signals are not available by helping position a phone or mobile device when GPS signals are weak or not available. *See* GPS.About.com, <http://gps.about.com/od/glossary/g/A-GPS.htm> (last visited Jun. 21, 2016).

⁵⁸⁹ Wireless E911 Location Accuracy Requirements, *Report and Order*, PS Docket No. 07-114, 30 FCC Rcd 1259, 1324, para. 174 (2015).

⁵⁹⁰ Similarly, in the 911 context, we required a uniform confidence level of 90 percent for the location fix a CMS Provider offers to a Public Safety Answering Point. What are the minimum accuracy and confidence level values for a mobile device location calculation to be used for mobile-device-assisted geo-targeting? What should be the default action of the mobile device if this threshold is not met?

⁵⁹¹ ATIS, Feasibility Study for WEA Cell Broadcast Geo-targeting, ATIS-0700027 at 44 (2015) (*ATIS WEA Geo-targeting Feasibility Study*) (assuming northern latitudes, and a delimiter character is needed between each pair).

⁵⁹² *See* Abhinav Jauhri, Martin Griss and Hakan Erdogmus, Carnegie Mellon University, Silicon Valley Campus, Small Polygon Compression for Integer Coordinates (2015), <https://ams.confex.com/ams/43BC3WxWarn/webprogram/Paper273645.html>; *see also* W. Song, J. W. Lee, and H. Schulzrinne, Polygon Simplification for Location-based Services Using Population Density, ICC (2011); ATIS WEA *Geo-targeting Feasibility Study* at 47; Letter from Matthew Straeb, Executive Vice President, Global Security Systems, LLC (GSS), to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 2 (filed Apr. 24, 2015) (GSS Apr. 24, 2015 *Ex Parte*) (identifying best practices for transmitting complex polygon coordinates); Cellular Emergency Alert Service Association of Civil Societies, PS Docket No. 15-91, 1 (Dec. 4, 2015) (Cellular Emergency Alert Service Association Comments); TeleCommunication Systems, Inc., PS Docket No. 15-91, 2 (Feb. 10, 2016) (TeleCommunication Systems, Inc. Reply) (stating that they have completed phase one of a study that demonstrates a superior approach to algorithm-based facility selection that can regularly target to areas smaller than a single cell site); Hisham Kassab, On Exposing WEA to Third-Party Developers, at 1, 2 (2012)

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feasible methods of leveraging polygon compression techniques in WEA. Should such techniques be used to set a maximum on the amount of data that can be consumed by polygon coordinates?⁵⁹³ Further, we seek comment on appropriate best practices for the number of decimal places to which a coordinate should be specified in order to conserve Alert Message space for text. CSRIC V recommends that alert originators determine the granularity of alert areas using vertices with two to five decimal places, depending on the nature of the hazard.⁵⁹⁴ CSRIC V finds that this would allow alert originators to target Alert Messages to with precision from 1.1 km to 1.1 meters.⁵⁹⁵ We seek comment on this recommendation and analysis. We note that, under current standards, a valid polygon consists of one-hundred coordinate pairs or fewer.⁵⁹⁶ Would rules or best practices be appropriate to determine the maximum number of coordinate pairs that should be included in an Alert Message? We seek comment on any additional technical challenges that Participating CMS Providers may face in complying with a more accurate geo-targeting standard, and on feasible methods of overcoming them.⁵⁹⁷

143. While we believe that a device-based approach is most likely to enable Participating CMS Providers to match the target area, we seek comment on whether continued focus on network-based approaches could enable Participating CMS Providers to meet this accuracy requirement. For example, could geo-targeting be improved by leveraging the relatively smaller coverage areas of network-based technologies, such as small cell technology, distributed antenna systems (DAS),⁵⁹⁸ Wi-Fi access points,⁵⁹⁹ beacons,⁶⁰⁰ commercial location-based services (cLBS),⁶⁰¹ institutional and enterprise location systems, or

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(urging that a third-party-assisted solution could achieve device-based geo-fencing without imposing additional burdens on CMS Providers if CMS Providers were to open up the WEA app to third-party developers through an Application Programming Interface (API)).

⁵⁹³ See Sprint Comments at 11-12; *ATIS WEA Geo-targeting Feasibility Study* at 14.

⁵⁹⁴ *CSRIC V WEA Geo-targeting Report* at 31; cf. *ATIS WEA Geo-targeting Feasibility Study* at 46 (recommending that no more than three decimal places should be used to specify polygon coordinates).

⁵⁹⁵ *CSRIC V WEA Geo-targeting Report* at 9-10.

⁵⁹⁶ *ATIS WEA Geo-targeting Feasibility Study* at 21.

⁵⁹⁷ Sprint Comments at 11-12 (stating that device-based geo-targeting may “undermine network performance during emergencies,” and also may present issues with subscriber privacy and Participating CMS Provider liability).

⁵⁹⁸ A DAS is “[a] network of spatially separated antenna nodes connected to a common source via transport medium that provides wireless service within a geographic area or structure.” DAS Forum, “Distributed Antenna Systems (DAS) and Small Cell Technologies Distinguished,” http://www.thedasforum.org/wpcontent/uploads/2014/07/DAS-and-Small-Cell-Technologies-Distinguished_HNFForum.pdf (last visited Jan. 21, 2015).

⁵⁹⁹ Cisco already utilizes Wi-Fi access points to provide indoor location data, and is in discussions with competitors Aruba and Ruckus on how all three vendors – which comprise nearly 80 percent of the Wi-Fi market – can work together to provide a robust indoor location solution using Wi-Fi access points. See Cisco/TCS Sept. 12, 2014 *Ex Parte*, PS Docket No 07-114, at 17.

⁶⁰⁰ Beacons are Bluetooth hardware devices that can be detected by and wirelessly exchange data with other Bluetooth-enabled devices, all of which are part of a Bluetooth network “stack.” See Android, “Bluetooth,” available at <http://developer.android.com/guide/topics/connectivity/bluetooth.html> (last visited Jan. 21, 2015).

⁶⁰¹ Commercial location-based services (cLBS) are applications that providers load, or consumers download, onto their phones to provide location services. *Third Further Notice*, 29 FCC Rcd at 2320-21, para. 127. cLBS are currently implemented in all major commercial mobile operating systems with multiple independent Wi-Fi access location databases, maintained by Google, Apple, and Skyhook, among others. See, e.g., Google, “Configure access points with Google Location Service,” <https://support.google.com/maps/answer/1725632?hl=en> (last visited Jan. 21, 2015); Cox, John, “Apple Leverages Wi-Fi location with latest acquisition,” *Network World*, Mar. 25, 2013, available at <http://www.networkworld.com/news/2013/032513-apple-wifislam-268054.html> (last visited Jan. 21, 2015); Skyhook, Coverage Area, available at <http://www.skyhookwireless.com/locationtechnology/coverage.php> (last visited Jan. 21, 2015).

smart building technology?⁶⁰² We observe that these network-based technologies are widely deployed across the United States, and particularly in urban areas.⁶⁰³ Are CMS Provider networks configured to be able to send a WEA Alert Message over the control channel to these network-based technologies? What steps would be necessary to enable these technologies to assist in geo-targeting? Since the radio frequency propagation areas of these technologies are significantly smaller than the propagation areas for large cell sites, do they hold potential to improve geo-targeting? If not, why not? We also seek comment on the reliability of network-based technologies relative to the larger transmission facilities Participating CMS Providers traditionally use for WEA cell broadcast. Would relying on these technologies as a path forward to further improving geo-targeting leave the system vulnerable to becoming far less accurate when its accuracy is needed most, including during Imminent Threat Alerts?

144. Finally, we seek comment on whether additional, incremental improvements to geo-targeting could be achieved through standards updates that could allow Participating CMS Providers to support “nesting polygons.”⁶⁰⁴ Nesting polygons describe overlapping geographic areas where one polygon is situated, or “nests,” at least in part, within the boundaries of another, larger polygon.⁶⁰⁵ We seek comment on the extent to which existing network technologies can be leveraged to support nesting polygons, provided that relevant standards are updated to support them. We anticipate that a scenario

⁶⁰² “Smart buildings” integrate hardware like Wi-Fi antennas, beacons, motion and light sensors, and corresponding wiring into a building’s infrastructure, and shares information from each source to optimize building system function with respect to, *inter alia*, heating and ventilation, power consumption, equipment maintenance, and security. See Institute for Building Efficiency, “What is a Smart Building?”, <http://www.institutebe.com/smart-grid-smart-building/What-is-a-Smart-Building.aspx> (last visited Jan. 21, 2015). See also, e.g., Monica Allevan, Sprint CEO Presses Speedier Small Cell Deployment, FierceWireless, <http://www.fiercewireless.com/tech/story/sprint-ceo-presses-speedier-small-cell-deployment/2015-12-11> (last visited Mar. 30, 2016).

⁶⁰³ Nearly all wireless phones are now equipped with Bluetooth and Wi-Fi capabilities, though some standardization work remains. See Apple, iPhone Tech Specs, <http://www.apple.com/iphone/specs.html> (last visited Jan. 21, 2015); Android, Developers, Connectivity, <http://developer.android.com/guide/topics/connectivity/bluetooth.html> (last visited Jan. 21, 2015); Bluetooth, “Mobile Telephony Market” (2014), <http://www.bluetooth.com/Pages/Mobile-Telephony-Market.aspx> (last visited Jan. 21, 2015); Michael Panzarino, *The Open Secret Of iBeacon: Apple Could Have 250M Potential Units In The Wild By 2014*, TechCrunch (Dec. 7, 2013), <http://techcrunch.com/2013/12/07/the-open-secret-of-ibeacon-apple-could-have-250m-units-in-the-wild-by-2014/> (last visited Jan. 21, 2015). Small cells are increasingly deployed in urban areas, and all four nationwide CMRS providers currently sell or plan to sell in-home consumer products designed to provide improved wireless coverage indoors. See Verizon Network Extended (SCS-2U01), <http://www.verizonwireless.com/accessories/samsung-network-extender-scs-2u01/> (last visited Jul. 19, 2016); Sprint Airave FAQs, http://support.sprint.com/global/pdf/user_guides/samsung/airave/airave_by_sprint_faq.pdf (last visited Jul. 19, 2016); AT&T MicroCell, <http://www.att.com/standalone/3gmicrocell/?fbid=W5aTdQD6xi9> (last visited Jul. 19, 2016); T-Mobile ASUS-made Personal Cellspot Planned as New LTE Cel-Fi Booster Appears Again, <http://www.tmonews.com/2014/09/t-mobile-asus-personal-cellspot-lte-cel-fi/> (last visited Jul. 19, 2016). Bluetooth beacons and Wi-Fi hotspots are increasingly deployed in public spaces. See Letter from H. Russell Frisby, Counsel, TeleCommunication Systems, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, PS Docket No. 07-114 (filed Jan. 16, 2015), Attachment at 28. TeleCommunications Systems, Inc. is now ComTech TCS. See Michael Porcelain, Comtech Telecommunications Corp. Completes Acquisition of TeleCommunication Systems, Inc., BusinessWire (Feb. 23, 2016), <http://www.businesswire.com/news/home/20160223007049/en/Comtech-Telecommunications-Corp.-Completes-Acquisition-TeleCommunication-Systems> (last visited Sep. 6, 2016).

⁶⁰⁴ See *ATIS WEA Geo-targeting Feasibility Study* at 20. “Nesting polygons” describes a scenario where one WEA Alert Message is to be broadcast within Polygon A, and a different WEA Alert Message is to be broadcast within Polygon B, which surrounds, but does not include Polygon A. In this case, two separate WEA Alert Messages must be used, one within the area defining Polygon A, and the second defining the area for Polygon B minus the area of Polygon A. See *id.* According to ATIS, updates to the OASIS CAP standards, and to WEA standards would be necessary to achieve this level of geo-targeting. See *id.*; *CSRIC V WEA Geo-targeting Report* at 15.

⁶⁰⁵ See *ATIS WEA Geo-targeting Feasibility Study* at 20.

where nesting polygons could be useful would be where one WEA Alert Message is appropriate for broadcast in the area where an incident, such as a chemical spill, has occurred (*e.g.*, an instruction to shelter in place), and another WEA Alert Message is appropriate for broadcast in the surrounding area (*e.g.*, an instruction to evacuate). We seek comment on this example, and invite commenters to specify additional use cases where it would be useful to be able to specify nesting polygons as a target area. According to ATIS, current standards support geo-targeting Alert Messages to multiple polygons, but existing standards would interpret multiple, overlapping polygons as the union of those polygons.⁶⁰⁶ Nesting polygons, on the other hand, would require CMS networks to sometimes interpret overlapping polygons as providing an instruction to “subtract” the internal polygon from the external polygon.⁶⁰⁷ According to ATIS, this functionality would require an update to J-STD 101 as well as to the CAP standard.⁶⁰⁸ Would additional updates to alert origination software be required to support sending different messages to nested polygons?

145. We reason that achieving a geo-targeting standard whereby Participating CMS Providers can match the target area specified by an alert originator, either through device- or network-based techniques, would have tremendous benefits for public safety, and would eliminate the current dangers of poor geo-targeting that deter many emergency managers from becoming authorized as WEA alert originators.⁶⁰⁹ As discussed above, alert originators continue to demand more accurate geo-targeting from WEA before they will rely on it for emergency messaging in situations where it could be dangerous for individuals in areas adjacent to the target area to receive instructions intended only for individuals within the target area.⁶¹⁰ Further, each incremental improvement that Participating CMS Providers can make to geo-targeting incrementally reduces alert fatigue,⁶¹¹ and increases the public’s trust in WEA as an alerting platform, thereby reducing milling and,⁶¹² potentially, network congestion. We seek comment on this reasoning. Finally, we note that the *ATIS Feasibility Study for Supplemental Text* observed that delivering target area coordinates to the mobile device consistent with a device-based approach to geo-targeting would be the first step towards enabling WEA Alert Messages to support high-information maps, an improvement that emergency managers universally endorse.⁶¹³ We seek comment on this observation. We also seek comment on alternative approaches we can take to improving WEA geo-targeting that would meet emergency managers’ objectives while presenting lesser cost burdens to Participating CMS Providers.

4. WEA on 5G Networks

146. As we noted in our *Spectrum Frontiers* proceeding in July 2016, 5G networks “will enable valuable new services, and accelerating the deployment of those services is a national priority.”⁶¹⁴

⁶⁰⁶ *See id.*

⁶⁰⁷ *See id.*

⁶⁰⁸ *See id.*

⁶⁰⁹ *See* Houston OPHS Comments at 3.

⁶¹⁰ *See id.*; Austin HSEM Comments at 3.

⁶¹¹ *See, e.g.*, NPSTC Comments at 5; AC&C Nov. 12, 2015 *Ex Parte* at 1; APCO Comments at 7; Wireless RERC Comments at 25; CTIA Reply at 11.

⁶¹² Dennis Mileti Apr. 7, 2016 *Ex Parte* at 3.

⁶¹³ *See ATIS Feasibility Study for WEA Supplemental Text* at 7-8.

⁶¹⁴ *See Spectrum Frontiers*, Report and Order and Further Notice of Proposed Rulemaking, XX FCC Rcd XXXX, XXXX, para. 254 (2016); *see also* GSMA Intelligence, Understanding 5G: Perspectives on Future Technological Advancements in Mobile (2014), <https://www.gsmainelligence.com/research/?file=c88a32b3c59a11944a9c4e544fee7770&download> (last visited May 5, 2016) (stating that 5G networks offer “enormous” potential benefits).

As 5G networks and devices are developed, we expect WEA capabilities to evolve as well, consistent with Congress' vision in enacting the WARN Act.⁶¹⁵ Given the importance of our Nation's public alert and warning systems to promoting emergency response readiness, we must ensure that WEA Alert Messages continue to provide the public with vital and necessary information to take appropriate action to protect their families and property.

147. While we understand that specific WEA capabilities for 5G networks and devices are not yet developed, we believe it is appropriate to seek comment on those capabilities now in light of the importance of designing these networks and devices with WEA capabilities in the early stages of development and throughout their development process. We disagree with CTIA that "it is premature at this time to address specific WEA capabilities that 5G might enable."⁶¹⁶ Participating CMS Providers are already examining how best to integrate 5G technologies into their networks and industry stakeholders are currently working to shape the strategic development of the 5G ecosystem.⁶¹⁷ We observe that Verizon is expected to begin 5G field trials in the next few months,⁶¹⁸ and most experts predict that 5G will be widely available as soon as 2020.⁶¹⁹ Further, the record suggests that technological upgrades can be costly and time-consuming, and we reason that including WEA alerts and warnings in 5G from the beginning can reduce total costs for Participating CMS Providers and hasten the deployment of improvements to WEA that could benefit the public.⁶²⁰ We therefore seek to initiate a dialogue that will foster a better understanding of how Participating CMS Providers intend to incorporate WEA capabilities into their 5G offerings, as well as to identify areas where we can help provide regulatory clarity, where needed, that can drive design and investment. For example, AT&T opines that "[w]ith the standards for 5G now under development, it is important to have agreement that 360 characters is the maximum length for 4G and future services."⁶²¹

148. In light of the foregoing, we seek comment on how to best incorporate alerts and warnings into the development of 5G technologies, and on how 5G technologies may enable further enhancements to WEA. What additional measures could the Commission take to facilitate the incorporation of WEA capabilities into 5G as these networks and devices are being designed? We seek comment on what, if any, steps the Commission should take to continue to ensure that WEA evolves along with advancements in technology in the 5G environment. What standards need to be developed or what other mechanisms need to be in place to ensure that WEA will be incorporated, and what actions are providers undertaking already? Elsewhere in this *Further Notice*, we seek comment on how improvements in technology can help improve WEA, in terms of microtargeting delivery of Alert Messages to a precise geographic location, incorporating multimedia capabilities to improve message content, and facilitating swifter delivery of critical early earthquake alerts where every second counts. Is

⁶¹⁵ See WARN Act § 604, 47 USC § 1204.

⁶¹⁶ See Letter from Brian Josef, Assistant Vice President, Regulatory Affairs, CTIA, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No 15-91 (filed Apr. 20, 2016) (CTIA Apr. 20 *Ex Parte*).

⁶¹⁷ See Michael Nunez, What is 5G and How Will it Make my Life Better?, Gizmodo (Feb. 24, 2016, 12:25pm), <http://gizmodo.com/what-is-5g-and-how-will-it-make-my-life-better-1760847799> (last visited May 5, 2016).

⁶¹⁸ See Roger Cheng, Verizon to be First to Field-Test Crazy-Fast 5G Wireless, CNET (Sept. 8, 2015, 5:00am PDT), <http://www.cnet.com/news/verizon-to-hold-worlds-first-crazy-fast-5g-wireless-field-tests-next-year/> (last visited May 5, 2016).

⁶¹⁹ See Michael Nunez, What is 5G and How Will it Make My Life Better?, Gizmodo (Feb. 24, 2016, 12:25pm), <http://gizmodo.com/what-is-5g-and-how-will-it-make-my-life-better-1760847799> (last visited May 5, 2016); see also Dino Flore, *Tentative 3GPP Timeline for 5G*, 3GPP (Mar. 17, 2015), http://www.3gpp.org/news-events/3gpp-news/1674-timeline_5g (last visited May 6, 2016).

⁶²⁰ See *supra* Section III.E (Benefit-Cost Analysis) (discussing the costs of standards modifications and software updates necessary to comply with the rules we adopt in the *Report and Order*).

⁶²¹ AT&T Comments at 7.

it anticipated that there will be additional space for WEA in 5G system information blocks than is currently allocated on the 4G control channel? To what extent will 5G introduce new capabilities that will permit additional life-saving enhancements to WEA? Are there any existing rules governing WEA that would be inapplicable to 5G or that would otherwise require adaptation to address 5G capabilities? We seek comment on how to enable further enhancements to WEA in 5G technologies, and on the obligations that CMS Providers that elect to provide WEA on 5G networks should incur, including related costs and benefits.

C. Developing Consumer Education Tools

1. Promoting Informed Consumer Choice at the Point of Sale

a. Background

149. In the *WEA Third Report and Order*, the Commission adopted certain disclosure requirements in order to ensure that CMS Providers “convey sufficient information” to the public about the nature of their participation in WEA.⁶²² CMS Providers electing in whole to transmit WEA Alert Messages are not required to provide notification of their participation at the point of sale.⁶²³ CMS Providers participating in part, on the other hand, are required to provide clear and conspicuous notice to new subscribers of their partial election at the point of sale.⁶²⁴ Specifically, CMS Providers participating in part must, at a minimum, state the following:

[[CMS provider]] has chosen to offer wireless emergency alerts within portions of its service area, as defined by the terms and conditions of its service agreement, on wireless emergency alert capable devices. There is no additional charge for these wireless emergency alerts.

Wireless emergency alerts may not be available on all devices or in the entire service area, or if a subscriber is outside of the [[CMS provider]] service area. For details on the availability of this service and wireless emergency alert capable devices, please ask a sales representative, or go to [[CMS provider’s URL]].⁶²⁵

150. Similarly, CMS Providers electing not to transmit WEA Alert Messages are required to offer, at a minimum, the following point-of-sale notification, “[[[CMS provider]] presently does not transmit wireless emergency alerts.”⁶²⁶ We noted that our decision allowed, but did not require the disclosure of additional information regarding the technical limitations of the WEA service offered by a Participating CMS Provider.⁶²⁷

b. Discussion

151. We propose to require CMS Providers to disclose sufficient information at the point of sale to allow customers to make an informed decision about whether they would consistently receive WEA Alert Messages if they were to become a subscriber. To what extent do CMS Providers voluntarily provide additional information at the point of sale regarding the nature of their WEA participation beyond

⁶²² *WEA Third Report and Order*, 23 FCC Rcd at 12567, para. 13 (stating that this language will “serve as the minimum standard for clear and conspicuous notice under the WARN Act”).

⁶²³ *See id.*

⁶²⁴ 47 CFR § 10.240(a).

⁶²⁵ 47 CFR § 10.240(c).

⁶²⁶ *See* 47 CFR § 10.240(d).

⁶²⁷ *See WEA Third Report and Order*, 23 FCC Rcd at 12568, para. 16.

any disclosure required by our rules? Is our existing requirement, which requires CMS Providers participating in part to inform consumers at the point of sale that WEA “may not be available on all devices or in the entire service area,” sufficient to inform potential subscribers of whether they will receive a potentially life-saving alert through the Participating CMS Provider’s network? If this point-of-sale notification is insufficient to support educated consumer choice among providers, what additional information would help to inform this choice and allow market forces to more aptly influence further improvements to WEA?

152. If we base our proposed definitions of modes of participation in WEA on the devices a Participating CMS Provider makes WEA capable, the extent to which WEA is offered in their geographic service area, and the technologies they commit to use in support of their WEA service, would it be reasonable to require corresponding adjustments to consumer disclosures?⁶²⁸ We propose that, as a baseline, CMS Providers should provide information regarding the extent to which they offer WEA (in what geographic areas, and on what devices) at the point of sale. Would this information be sufficient to promote informed consumer choice? Should we also require CMS Providers to disclose at the point of sale the specific network technologies that they commit to use in offering WEA? We seek comment on the extent to which knowledge of the specific technologies that competing CMS Providers will use to support WEA would promote more informed consumer choice between CMS Providers. Should this disclosure also include the extent to which the Participating CMS providers’ networks are able to offer full 360-character Alert Messages? Would it be sufficient for Participating CMS Providers to provide potential subscribers with a link to a website describing their WEA capability at the point of sale, and would this approach help Participating CMS Providers to control costs associated with this proposal? With respect to CMS Providers who elect not to participate in WEA, should they be required to make any additional disclosures at the point of sale to ensure that consumers are aware that they will not be able to receive any potentially life-saving alerts through service with this carrier? We seek comment on the potential benefits and costs that might be associated with additional point-of-sale disclosures.

2. Promoting Informed Consumer Choice about the Receipt of WEA Alert Messages

a. Background

153. Section 602(b)(2) of the WARN Act provides that “any commercial mobile service licensee electing to transmit emergency alerts may offer subscribers the capability of preventing the subscriber’s device from receiving such alerts, or classes of such alerts, other than an alert issued by the President.”⁶²⁹ Section 10.500 of the Commission’s rules requires Participating CMS Providers’ WEA-capable mobile devices to maintain consumers’ opt-out preferences and display alerts to the consumer consistent with those selections.⁶³⁰ Pursuant to Section 10.280, a Participating CMS Provider may provide their subscribers with the option to opt out of Imminent Threat and AMBER Alerts, and must present the consumer “with a clear indication of what each option means, and provide examples of the types of messages the customer may not receive as a result of opting out.”⁶³¹ The Commission adopted these requirements in the *First Report and Order* and the *Third Report and Order*, respectively, in order to allow Participating CMS Providers to accommodate variations in their infrastructures.⁶³² In the *WEA NPRM*, we sought comment on the factors that lead consumers to opt out of receiving certain Alert Messages, including whether the manner in which Participating CMS Providers present their customers

⁶²⁸ See *supra* Section IV.A.1 (Defining Modes of Participating in WEA).

⁶²⁹ WARN Act § 602(b)(2)(E), 47 USC § 1202(b)(2)(E).

⁶³⁰ 47 CFR. § 10.500.

⁶³¹ 47 CFR. § 10.280.

⁶³² *WEA First Report and Order*, 23 FCC Rcd at 6153-54, para. 19; *WEA Third Report and Order*, 23 FCC Rcd at 12578, para. 41.

with opt-out choices impacts customer participation.⁶³³ We sought comment on whether Participating CMS Providers could offer customers a more nuanced opt-out menu in order to improve consumer choice.⁶³⁴

154. Apple states that “enabling users to opt out of certain alerts at particular times or under specified conditions (such as when Do Not Disturb mode is turned on) would likely increase end-user participation.”⁶³⁵ Microsoft agrees that consumers should have control over what types of alerts are received, and when.⁶³⁶ NWS observes that opt-out choices are currently presented in an inconsistent manner across devices and operating systems, and recommends standardizing the presentation of opt-out choices.⁶³⁷ On the other hand, ATIS expresses concern that “adding complexity to the opt-out options may actually increase the number of subscribers choosing to opt-out of WEA,”⁶³⁸ and BlackBerry urges us to leave opt out functionality such as “scheduling” and “time of day” features to device manufacturers’ discretion.⁶³⁹ CSRIC V recommends that Commission collaborate with WEA stakeholders to create a set of “minimum specifications for an enhanced, secured and trusted, standards-based, CMSP-controlled WEA mobile device based application . . . in order to ensure high level support.”⁶⁴⁰

b. Discussion

155. We propose to require Participating CMS Providers to implement changes to the WEA application that would provide the public with more granular options regarding whether they receive WEA Alert Messages. In essence, Participating CMS Providers should provide consumers with tools that allow them to receive the alerts that they want to receive, in the manner they wish to receive them, and during the times they wish to receive them.

156. First, we propose to amend Section 10.280(b) to require that Participating CMS Providers offer their subscribers more informed choices among the Alert Message classifications that they wish to receive. We seek comment on the approaches that Participating CMS Providers currently take to “provide their subscribers will a clear indication of what each [Alert Message] option means,”⁶⁴¹ and on specific improvements that they could make to the WEA application to enable consumers to make more informed choices among the different types of WEA Alert Messages they will receive. As demonstrated in Appendix F, some Participating CMS Providers offer their subscribers the option to choose whether to receive “Extreme” and “Severe” Alert Messages, as well as AMBER Alerts.⁶⁴² Are these options sufficiently clear to empower consumers to make informed choices among Alert Messages? Would it be more clear if the options that Participating CMS Providers offered their subscribers tracked our alert message classifications (*i.e.*, “AMBER Alerts,” “Imminent Threat Alerts,” and “Public Safety Messages”), or would other names or phrases be more effective in promoting clear consumer choice about the types of Alert Messages they will receive? Would it be helpful to offer consumers a full explanation of the kinds of emergency situations about which they will receive information by virtue of remaining opted in to receive Alert Messages of that category? For example, should consumers be informed that by

⁶³³ *WEA NPRM*, 30 FCC Rcd at 13813, paras. 63-65.

⁶³⁴ *Id.* at 13813, para. 65.

⁶³⁵ Apple Mar. 22, 2016 *Ex Parte* at 1.

⁶³⁶ Microsoft Comments at 4.

⁶³⁷ NWS Comments at 1.

⁶³⁸ ATIS Comments at 20-21.

⁶³⁹ BlackBerry Mar. 21, 2016 *Ex Parte* at 2.

⁶⁴⁰ *CSRIC V WEA Geo-targeting Report* at 33-34.

⁶⁴¹ *See* 47 CFR § 10.280(b).

⁶⁴² *See infra* Appx. F (Model Opt-out Menu).

remaining opted in to receive Imminent Threat Alerts they will receive information about imminent threats to their life and property, including significant or extraordinary threats that have either been observed in their area or likely to occur in the near future? Should consumers be informed that by remaining opted in to receive AMBER Alerts they will receive information that will empower them to assist law enforcement in locating abducted, lost, or otherwise missing children in their area that may be in imminent danger? We seek comment on best practices that have been developed with respect to the WEA interface that offer consumers a clear and easy-to-navigate menu of choices about whether and how to receive emergency alerts.

157. We also propose to require that Participating CMS Providers enhance their subscribers' ability to personalize how they receive the Alert Messages of their choosing. In the *Report and Order* we allow Participating CMS Providers to offer their consumers the option to change the attention signal and vibration cadence for Public Safety Messages, and to receive Public Safety Messages only during certain hours.⁶⁴³ We also allow Participating CMS Providers to provide their customers with the option to specify how the vibration cadence and attention signal should be presented when a WEA Alert Message is received during an active voice or data session.⁶⁴⁴ We seek comment on whether we should require Participating CMS Providers to offer their subscribers a more granular suite of choices for Imminent Threat Alerts and AMBER Alerts as well, including but not limited to the options that we allow Participating CMS Providers to offer to their subscribers for Public Safety Messages, and including the ability to modify the attention signal and vibration cadence that is presented when an Alert Message is received when the phone is idle.. For example, would it be feasible to require Participating CMS Providers to allow users to limit the hours within which they receive WEA AMBER Alerts (*e.g.*, only between 8:00 AM and 8:00 PM)? Would it make more sense to offer consumers the option to modify or mute the attention signal and vibration cadence for Imminent Threat Alerts at night than to offer them the option to not receive Imminent Threat Alert during the night?⁶⁴⁵ In the alternative, we seek comment on whether we should require Participating CMS Providers to offer their subscribers the option to cache Alert Messages, rather than simply to opt in or out. Cached Alert Messages could be received without the associated attention signal and vibration cadence, and stored in a "WEA Inbox." We seek comment on this approach. Taken together with our proposal that Alert Messages be appropriately preserved for user review,⁶⁴⁶ would providing users with the option to receive and cache Alert Messages provide many consumers with an appropriate balance between their perceived need to receive critical information during emergencies, and their desire to minimize the intrusiveness of the WEA attention signal and vibration cadence? We seek comment on the most common reasons why consumers opt out of receiving WEA AMBER Alerts and Imminent Threat Alerts, and on any additional steps that we can take to reduce these pain points through changes to the WEA opt-out menu.

158. In the alternative, we seek comment on whether to require all Participating CMS Providers to adopt a standardized opt-out menu, as recommended by NWS, and in a manner consistent with CSRIC V's recommendation.⁶⁴⁷ In particular, we seek comment on the model opt-out menu produced by NWS that we attach as Appendix F.⁶⁴⁸ Would the subscriber choices modeled here be appropriate to standardize among Participating CMS Providers and device manufacturers? Would a standardized opt-out menu facilitate familiarity with emergency alerts across service providers, promote

⁶⁴³ See *supra* para. 24 (allowing Participating CMS providers to offer their consumers the option to change the attention signal and vibration cadence for Public Safety Messages, and to receive Public Safety Messages only during certain hours).

⁶⁴⁴ See *supra* para. 61.

⁶⁴⁵ Cf. 47 CFR § 10.280(a) (stating that consumers may opt out of Imminent Threat Alerts entirely).

⁶⁴⁶ See *supra* Section IV.A.3 (Alert Message Preservation).

⁶⁴⁷ NWS May 3, 2016 *Ex Parte* at 2; see also *supra* para. 154.

⁶⁴⁸ See *infra* Appx. F (Model Opt-out Menu).

personalization and improve the consumer experience with WEA? We seek comment on how we could design a model WEA opt-out menu in a manner that would improve personalization without significantly increasing user-facing interface complexity?⁶⁴⁹ Would it be appropriate for the Commission to host a workshop for this purpose? We encourage commenters to submit visual representations of ideal WEA interfaces into the record to facilitate discussion and review of alternatives to this model opt-out interface. We anticipate that requirements for subscriber opt-out choices would implicate changes to the *ATIS/TIA Mobile Device Behavior Specification* and to WEA application software.⁶⁵⁰ We seek comment on this analysis. In our consideration of whether to require a standardized WEA opt-out menu, should we make any particular accommodations for non-nationwide Participating CMS Providers (*e.g.*, small, regional, and rural providers)?

D. Improving WEA Transparency

1. Annual WEA Performance Reporting

a. Background

159. The Commission's Part 10 WEA rules do not establish a procedure for Participating CMS Providers to report the results of any required tests to alert originators or to government entities. As such, there is no available method for analyzing the success of C-interface, Required Monthly, or State/Local WEA Tests. In the *WEA NPRM*, we sought comment on whether we should formalize a test reporting procedure for WEA and, if so, on the format and specific information that we should require Participating CMS Providers to report.⁶⁵¹

160. Hyper-Reach and the majority of public safety commenters support requiring Participating CMS Providers to report the extent of alert delivery latency,⁶⁵² the accuracy of geo-targeting,⁶⁵³ and the availability and reliability of their WEA network because it would improve transparency and understanding of IPAWS/WEA among emergency managers,⁶⁵⁴ and because this transparency, in turn, could increase WEA adoption by non-participating emergency managers.⁶⁵⁵ CSRIC V states, for example, that "confidence in WEA among [Alert Originators] is dampened by perceived unpredictability of WEA geo-targeting," and building confidence "will require a means by which they can know that the polygon provided is what is actually delivered at the towers for distribution."⁶⁵⁶ Accordingly, CSRIC V recommends that ATIS and CTIA study methods of passively collecting and sharing data on the accuracy of geo-targeting with emergency management agencies.⁶⁵⁷ As demonstrated in Appendix G, NYCEM already independently generates performance reports on WEA geo-targeting,

⁶⁴⁹ ATIS Comments at 16.

⁶⁵⁰ See BlackBerry Mar. 21, 2016 *Ex Parte* at 2.

⁶⁵¹ *WEA NPRM*, 30 FCC Rcd at 13811, paras. 58-59.

⁶⁵² See Jefferson Parish EM Comments at 4.

⁶⁵³ See Pinellas County EM Comments at 8; Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments at 4; CCOEM Comments at 3; Los Angeles EMD Comments at 1; Jefferson Parish EM Comments at 4.

⁶⁵⁴ See Indiana DHS Comments at 5; Chester County EMA Comments at 3; Ventura County Sheriff EMS Comments at 5; NYCEM Comments at 14; Peoria ECC Comments at 1 (requesting data on the number of devices that received the alert); Douglas County EMA Comments at 2; Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments at 4; Jefferson Parish EM Comments at 4.

⁶⁵⁵ See, *e.g.*, Hyper-Reach Comments at 5; Chester County EMA Comments; Ventura County Sheriff EMS Comments at 6; Peoria ECC Comments at 1; APCO Comments at 9.

⁶⁵⁶ See CSRIC V *WEA Geo-targeting Report* at 21.

⁶⁵⁷ *Id.* at 34.

latency and reliability from actual Alert Messages issued in New York City.⁶⁵⁸ These tests demonstrate that some mobile devices in the target area do not receive WEA Alert Messages that are intended for them, and that some mobile devices do not receive Alert Messages intended for them until almost an hour after they are initially transmitted.⁶⁵⁹ APCO and Pinellas County EM urge the Commission to adopt reporting requirements specific enough to result in the production of uniform reports to emergency management agencies.⁶⁶⁰ While AT&T would support a requirement for Participating CMS Providers to report the results of RMTs,⁶⁶¹ Sprint states that the kind of information we proposed to gather through test reporting (*i.e.*, the extent of geo-targeting and alert delivery latency) is not technically feasible to deliver.⁶⁶² Sprint and ATIS state that test reporting should be FEMA's responsibility.⁶⁶³

b. Discussion

161. We propose to amend Section 10.350 to require Participating CMS Providers to submit annual reports to the Commission that demonstrate the following system performance metrics for their nationwide WEA deployment (Annual WEA Performance Reports).

- *Geo-targeting.* The accuracy with which the Participating CMS Provider can distribute WEA Alert Messages to a geographic area specified by an alert originator.
- *Latency.* An end-to-end analysis of the amount of time that it takes for the Participating CMS Provider to transmit a WEA Alert Message.
- *Availability and Reliability.* The annual percentage of WEA Alert Messages that the Participating CMS Provider processes successfully, and a summary of the most common errors with Alert Message transmission.

We seek comment on these reporting elements and on the assessment methodologies Participating CMS Providers could use to produce Annual WEA Performance Reports below.

162. First, we seek comment on whether an annual requirement would achieve the right frequency of reporting. We reason that WEA performance data recorded over a period of one year would be sufficient to provide a statistically significant sample of data to inform Annual WEA Performance Reports. We seek comment on this rationale. We note that the record reflects concern that reporting requirements will “result in an increased burden for carriers participating in the service on a voluntary basis,”⁶⁶⁴ as well as concern that there is currently no method available to alert originators to verify system availability and reliability except anecdotally.⁶⁶⁵ Does our proposed approach strike the appropriate balance between these concerns? If not, we invite commenters to recommend alternative periodicities within which such reports should be required.

163. In the alternative, would a single performance report to become due on a date certain, rather than an annual requirement, suffice to inform emergency managers and the public about WEA's capabilities? What types of changes, if any, would be substantive enough to warrant additional reporting

⁶⁵⁸ See *infra* Appx. G (NYCEM Local WEA Geo-targeting and Latency Test Reports).

⁶⁵⁹ See *id.*

⁶⁶⁰ APCO Comments at 9; Pinellas County EM Comments at 8.

⁶⁶¹ AT&T Comments at 23.

⁶⁶² Sprint Reply at 8.

⁶⁶³ *Id.* at 9; ATIS Comments at 20.

⁶⁶⁴ See, e.g., Sprint Reply at 7.

⁶⁶⁵ See, e.g., Matanuska-Susitna Borough Comments at 2. State/Local WEA Tests, as adopted in the *Report and Order*, may facilitate the collection of anecdotal WEA performance data. See *infra* Section III.C.1 (Supporting State/Local WEA Testing and Proficiency Training Exercises).

beyond the initial report? For example, as Participating CMS Providers make material upgrades to their networks to incorporate new or updated technologies (e.g., 5G network technologies), would additional performance reporting be appropriate to demonstrate that WEA continues to satisfy its performance requirements, or to highlight the extent to which any system improvements may improve a Participating CMS Providers' WEA service? Would it be appropriate to adopt an alternative, less frequent reporting requirement for non-nationwide Participating CMS Providers?

164. We seek comment on the methodology by which Participating CMS Providers may develop Annual WEA Performance Reports. We anticipate that State/Local WEA Tests would be an effective method of collecting annual report data since they are test messages that may be used by state and local emergency managers to evaluate system readiness, and are required to be processed consistent with our Alert Message requirements.⁶⁶⁶ We seek comment on this analysis. Would a different classification of WEA Alert Message be more appropriate for use to collect performance data, be more likely to produce results that are representative of Alert Message delivery under actual emergency conditions, or be less burdensome to implement? For example, AT&T states that Participating CMS Providers' reporting obligations should be limited to RMTs.⁶⁶⁷ We observe that Section 10.350 does not require Participating CMS Providers to deliver RMTs to mobile devices,⁶⁶⁸ and allows RMTs to be distributed "within 24 hours of receipt by the CMS Provider Gateway unless pre-empted by actual alert traffic or unable due to an unforeseen condition."⁶⁶⁹ Given these limitations, we seek comment on the value of RMTs as the basis for collecting Annual WEA Performance Report data. For example, could it be less burdensome and comparably effective for Participating CMS Providers to collect geo-targeting data from cell sites to which RMTs are delivered, as opposed to from mobile devices to which State/Local WEA Tests are delivered? To what extent could an analysis of the radio frequency propagation characteristics of the particular constellation of cell sites and cell sectors chosen to geo-target an RMT be used as an accurate proxy for the geographic area to which an Alert Message with the same target area would actually be delivered? Further, we seek comment on whether RMTs could provide meaningful data about alert delivery latency, given that Participating CMS Providers are allowed to delay up to 24 hours before retransmitting them. For example, would it be less burdensome and comparably effective to allow Participating CMS Providers to schedule performance analyses during times when network usage is light? Would it be feasible and desirable to "pause the timer" on any applicable latency measurement at the CMS Provider Alert Gateway until such a time within 24 hours as becomes convenient to distribute the test message? Would such an approach undermine the representativeness of the latency data collected because actual Alert Messages are not held for any period of time in order to await more ideal network conditions?

165. We seek comment on the specific data that Participating CMS Providers would be required to gather in order to complete statistically significant reports on the accuracy of WEA geo-targeting, the extent of alert delivery latency, and system availability and reliability. Would determining the accuracy of geo-targeting require either a measurement of the contours of the geographic area within which WEA-capable mobile devices receive the message, or an estimation of the radio frequency propagation contours of the cell broadcast facilities selected to geo-target the Alert Message? Would it require comparing the target area to the alert area? Would an average deviation from the target area be an adequate measure of the accuracy of geo-targeting, or would emergency managers benefit from a report on the specific percentage of instances in which a Participating CMS Provider is able to meet our geo-targeting standard? Further, we seek comment on whether there are WEA geo-targeting scenarios that

⁶⁶⁶ See *supra* para. 65 (requiring that State/Local WEA Tests be processed consistent with the Commission's Alert Message requirements).

⁶⁶⁷ AT&T Comments at 23 ("WEA reporting should be required only for RMTs, not localized tests.").

⁶⁶⁸ 47 CFR § 10.350(a)(6).

⁶⁶⁹ 47 CFR § 10.350(a)(5).

pose particular challenges to Participating CMS Providers. If so, should Participating CMS Providers be required to collect, analyze and report on geo-targeting under those specific circumstances? In any case, should Participating CMS Providers be required to collect, analyze and report on their ability to geo-target Alert Messages to geocodes, circles, and polygons of varying complexities, and in varying geographic morphologies? How many samples of each type would be necessary to produce a statistically significant report on the accuracy of a Participating CMS Providers' WEA geo-targeting capability nationwide?

166. Further, we seek comment on the specific data points that Participating CMS Providers would be required to gather in order to measure alert delivery latency. Would it be satisfactory to simply measure the amount of time that elapses from the moment that an alert originator presses "send" using their alert origination software to the moment that the Alert Message is displayed on the mobile device? Would this single measurement suffice to give an alert originator an informed perspective on when the public could reasonably be expected to receive an Alert Message that they may send in a time-sensitive crisis? Would it also provide sufficient insight into system functionality to allow us to diagnose and address specific causes of alert delivery latency? Alternatively, would it be advisable to collect latency data at points in addition to the time of initial transmission and the time of receipt on the mobile device? For example, would it be advisable to analyze time stamps for Alert Messages received and transmitted at each of the A-E interfaces that comprise the WEA system in order to diagnose specific causes of latency, and to promote sufficient transparency to facilitate Commission action in the public interest?⁶⁷⁰ We seek comment on whether there are any particular circumstances in which Alert Messages are delivered more slowly than others. If so, should Participating CMS Providers be required to collect, analyze and report on alert delivery latency under those specific circumstances? In any case, should Participating CMS Providers be required to collect, analyze and report on alert delivery latency in varying geographic morphologies? How many independent measurements would be necessary to produce a statistically significant report on the degree of alert delivery latency at each WEA interface?

167. Similarly, we seek comment on the specific data points that Participating CMS Providers would be required to collect in order to satisfactorily measure the regularity of system availability and reliability. Would the alert logging requirement that we adopt today suffice to determine the WEA system's rate of success at delivering Alert Messages? Where do errors with Alert Message transmission tend to occur? If at junctures other than the C-interface, does this militate for the collection of system availability data at each interface in the alert distribution chain in addition to the CMS Provider Alert Gateway? If less than 100 percent of WEA-capable mobile devices in the target area receive a WEA message intended for them, would this implicate shortcomings in system availability or reliability? If so, should Participating CMS Providers also be required to collect data on the percentage of WEA-capable mobile devices for which an Alert Message is intended that actually receive it, and to report this data to the Commission as a fundamental aspect of system availability and performance? Would this more nuanced approach be necessary in order to allow Participating CMS Providers to diagnose and correct any issues in alert distribution that may arise, and to promote sufficient transparency to facilitate Commission action in the public interest? Would an average measure of the rate of system availability be sufficient to grow emergency managers' confidence that the system will work as intended when needed, or do emergency managers require more granular data? Would it be necessary for Participating CMS Providers to log and report the CMAC attributes of each Alert Message at each of the C-E interfaces in order to establish whether the WEA system is able to deliver Alert Messages with "five nines" of reliability (*i.e.*, to establish whether 99.999 percent of WEA Alert Messages are delivered successfully)?⁶⁷¹ Is this an appropriate standard of reliability for the WEA system? If not, why not?

168. We seek comment on whether emergency managers need any additional information beyond the accuracy of geo-targeting, the extent of alert delivery latency, and the regularity of system

⁶⁷⁰ See *supra* Figure 1 (WEA Infrastructure).

⁶⁷¹ See *supra* Figure 1 (WEA Infrastructure).

availability and reliability in order to understand the strengths and weaknesses of WEA as an alert origination tool. What, if any, additional data could Participating CMS Providers collect without incurring additional cost burdens, if we were to require them to collect each of the aforementioned data points? In the alternative, we seek comment on whether, and if so, to what extent making alert logs available upon emergency management agencies' request could satisfy their need for this information.⁶⁷² Further, in addition to the possibility of requiring performance reports less frequently from non-nationwide Participating CMS Providers, we seek comment on whether such Participating CMS Providers should also be allowed to collect less granular data on system performance in order to reduce any cost burdens entailed by these proposed recordkeeping and reporting requirements.

169. We seek comment on whether we should defer to Participating CMS Providers regarding how they collect annual report data. Does such an approach provide Participating CMS Providers with increased flexibility that will reduce the burdens of these recordkeeping and reporting requirements? Would this approach only be appropriate for non-nationwide Participating CMS Providers? We seek comment on whether one effective and efficient method of generating national data for annual submission to the Commission might be through the use of a representative sample of the different real world environments in which the WEA system would be used (*e.g.*, the dense urban, urban, suburban and rural morphologies defined by the ATIS-0500011 standard).⁶⁷³ We anticipate that the use of a representative sample of geographic morphologies could reduce any burdens that may be associated with providing Annual WEA Performance Reports by allowing Participating CMS Providers to collect less data. We seek comment on this analysis.

170. In the alternative, we seek comment on whether our State/Local WEA Testing model provides a framework to emergency managers that is sufficient to enable them to collect localized geo-targeting, latency, and system availability data without requiring additional involvement from Participating CMS Providers. We observe that, even in the absence of State/Local WEA Tests, NYCEM deployed a network of volunteers using mobile device offered by an assortment of Participating CMS Providers to collect data on WEA geo-targeting and latency in New York City.⁶⁷⁴ We applaud NYCEM for their voluntary effort to improve awareness about WEA system performance. We seek comment on whether such tests demonstrate that it would be feasible for any emergency management agency that wishes to gather performance statistics about WEA to do so for themselves. We seek comment on whether NYCEM's tests were able to produce statistically significant results, and if not, we seek comment on whether emergency managers would be willing to voluntarily collaborate and share test results with one another such that their findings could be aggregated into a statistically significant sample size.

171. We propose to treat Annual WEA Performance Reports submitted to the Commission as presumptively confidential, as we have reports in the E911, Emergency Alert System (EAS), and Network Outage Reporting System (NORS) contexts.⁶⁷⁵ Similarly, we propose to require that Participating CMS Providers grant emergency management agencies' requests for locality-specific

⁶⁷² See *supra* Section III.B.1 (Logging Alert Messages at the Participating CMS Provider Alert Gateway).

⁶⁷³ *CSRIC III Test Bed Report* at 11; ATIS, *Define Topologies & Data Collection Methodology Technical Report* (ATIS-0500011) at 1 (2007) (*ATIS Define Topology Report*).

⁶⁷⁴ See *infra* Appx. G (NYCEM Local Geo-targeting and Latency Test Reports).

⁶⁷⁵ See *Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114, *Report and Order*, 30 FCC Rcd 1259, 1308, para. 131 (2015) (declining to require CMRS providers to make public the details of test results for technologies that have been certified by the independent test bed administrator); *Sixth Report and Order*, 30 FCC Rcd at 6533, para. 27 (stating that test reports collected by ETRS will be treated as presumptively confidential); see also *New Part 4 of the Commission's Rules Concerning Disruptions to Communications*, ET Docket No. 04-35, *Report and Order and Further Notice of Proposed Rulemaking*, 19 FCC Rcd 16830 (2004) (*2004 Part 4 Report and Order* and *2004 Further Notice of Proposed Rulemaking*, respectively).

versions of these performance metrics if and only if the requesting entity agrees to provide confidentiality protection at least equal to that provided by FOIA.⁶⁷⁶ Would the production of the proposed performance metrics require Participating CMS Providers to disclose information that they consider to be proprietary? Would offering such aspects of Annual WEA Performance Reports presumptively confidential treatment and only requiring that Participating CMS Providers share them with entities that agree to provide confidentiality protection at least equal to that provided by FOIA ameliorate any concerns about the disclosure of potentially sensitive competitive information? Further, we seek comment on steps that Participating CMS Providers can take to protect consumer privacy if producing reliable performance data requires information to be extracted from end user mobile devices. We observe that we are not requesting data at the end user/mobile device level, and therefore assume that any such information would be aggregated or, at a minimum, de-identified.

172. We anticipate that requiring Annual WEA Performance Reports would be likely to benefit emergency managers and the public. For example, we agree with Jefferson Parish EM that performance reports would help to improve system transparency with respect to “how long it took for the alert to reach the public,” whether there was “under alerting or overlap of the alerts,” and how often there are network conditions in which “Emergency Managers . . . could not send alerts.”⁶⁷⁷ We also agree with NYCEM that “[a]s with any other mission-critical system, mobile service providers should be required to capture and report system errors” in order to improve the system’s security posture.⁶⁷⁸ Further, FEMA and other commenting emergency management agencies agree that reporting geo-targeting, latency and system availability and reliability data could provide a compelling demonstration of WEA’s capacity to deliver timely, geo-targeted Alert Messages to specific areas and localities on a national scale, which could potentially increase WEA adoption by non-participating emergency managers who are “reluctant to activate WEA” without demonstrations of “coverage and delivery latency within their jurisdiction.”⁶⁷⁹

⁶⁷⁶ See 5 USC § 552 (2006), amended by OPEN Government Act of 2007, Pub. L. No. 110-175, 121 Stat. 2524 (stating the FOIA confidentiality standard, along with relevant exemptions). See also, e.g., Ventura County Sheriff Office of Emergency Services Comments, PS Docket No. 15-91, 6 (Dec. 21, 2015) (Ventura County Sheriff EMS Comments) (“Cell carriers should provide the report to the alerting authority that sent the WEA message.”); Pinellas County Emergency Management Comments, PS Docket 15-91, 8 (Jan. 13, 2016) (Pinellas County EM Comments) (“Reporting information should be shared between applicable cell carriers, the FCC, State Emergency Management agencies and the local alert originators.”); Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments, PS Docket No. 15-91, 4 (Jan. 12, 2016) (Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments) (“Also the information should only be made available to the individuals authorized at the local level to initiate WEA messages. That ensures the data is used for the intended purpose and not given to unauthorized personnel.”). Compare *Sixth Report and Order*, 30 FCC Rcd at 6536, para. 32 (“It is not feasible to provide [State Emergency Coordination Committees (SECCs)] with such access without compromising the confidentiality of EAS Participant’s filings, or risking that the SECC might unintentionally delete or corrupt a filing. Rather, we will, upon request from an SECC, provide the SECC with a report of their state’s aggregated data.”) with CSRIC III Working Group 3, Indoor Location Test Bed Report, 12 (Mar. 14, 2013), http://transition.fcc.gov/bureaus/pshs/advisory/csric3/CSRIC_III_WG3_Report_March_%202013_ILTestBedReport.pdf (last visited Apr. 19, 2016) (*CSRIC III Indoor Location Test Bed Report*) (“To all other parties only summary data will be made available”).

⁶⁷⁷ Jefferson Parish EM Comments at 4; see also, e.g., Houston OPHS Comments at 4 (“Adding a reporting feature to the existing WEA requirements would help to inform local originators about the efficacy of the system on a variety of levels. Having access to this information would help identify gaps in information delivery and message effectiveness . . . Reporting would allow alert originators to better understand the reach of WEA.”).

⁶⁷⁸ NYCEM Comments at 14.

⁶⁷⁹ FEMA Comments at 3; see also Beaufort County Emergency Management, Fire Marshal & Emergency Services Comments at 4 (“We believe these reports would be of great benefit to the Emergency Services agencies at the local level. We could see what the success rates of the alerts were in terms of messages sent and received. We could compare that statistical data with our third party vendor data for similar messages and look for comparisons. We do extensive geo-targeting in our messaging and it the data could be of additional importance in this area.”); Pinellas
(continued....)

We seek comment on this assessment. We also seek comment on whether the greater transparency promoted by Annual WEA Performance Reports would better support alert originator and emergency operations center response planning. At the same time, we anticipate that regular performance reporting requirements may also be useful to us in our efforts to bring to light and address potential areas for improvement in the WEA system nationwide.⁶⁸⁰ Regardless, we seek comment on whether increases in system transparency created by Annual WEA Performance Reports would be likely to improve our ability to act in the public interest to remediate any issues that the reports may reveal.⁶⁸¹ We seek comment on our analysis of these potential benefits, and on any other benefits that Annual WEA Performance Reports may provide.

2. Alert Logging Standards and Implementation

173. As discussed above, we require Participating CMS Providers to log their receipt of Alert Messages at their Alert Gateway and to appropriately maintain those records for review.⁶⁸² We now seek comment on whether and, if so, how to create a uniform format for alert logging, and on how the collection of more detailed system integrity data could be integrated into Annual WEA Performance Reports. We seek comment on the extent to which emergency managers would benefit from standardization of the format of Participating CMS Providers' alert logs. Emergency managers confirm that there is value in log keeping by Participating CMS Providers,⁶⁸³ but CMS Providers confirm there is significant variation among them with respect to log keeping.⁶⁸⁴ Absent standardization of alert logging capabilities, would emergency managers be forced to contend with this variation in a manner that may significantly decrease the value of alert logs? Does this support the value proposition of a uniform standard consistently applied to Participating CMS Providers' log keeping? Would the creation of a uniform format require the modification of standards relevant to Alert Gateway functionality? Would updates to Alert Gateway software also be required?

174. We also seek comment on whether the logging requirements we adopt today should extend beyond the CMS Provider Alert Gateway to the RAN and to WEA-capable mobile devices in furtherance of our goal of improving WEA transparency. We anticipate that alert logging beyond the Alert Gateway will continue to improve the transparency of the WEA system, will contribute to emergency managers' confidence that the system will work as intended when needed, and will improve our ability to detect and remediate any latent issues. We seek comment on this analysis. Will requiring Participating CMS Providers to log error reports and the CMAC attributes of Alert Messages at the CMS Provider Alert Gateway, as we do today, be sufficient to safeguard the integrity of WEA? If not, would it be advisable to require that Participating CMS Providers log this information at each of the C-E interfaces?⁶⁸⁵ We also seek comment on whether data other than, or in addition to error reports and

(Continued from previous page) _____

County Emergency Management Comments at 8 (stating that test reporting is "needed to confirm the system is accurate and working effectively"); Chester County EMA Comments at 3 ("Reporting would benefit alert originators in that it would provide documentation that the carrier did or did not send out the alert and at what time and date the alert was sent. This confirmation is needed to substantiate to the public that government is indeed attempting to provide public safety messages to them.").

⁶⁸⁰ See *infra* Appx. G (NYCEM Local WEA Geo-targeting and Latency Test Reports).

⁶⁸¹ See Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness Comments at 1 (stating that knowing what errors need to be fixed would be very beneficial).

⁶⁸² See *supra* Section III.B.1 (Logging Alerts at the Participating CMS Provider Alert Gateway).

⁶⁸³ See APCO Comments at 9; Henderson OEM Comments at 1; Chester County EMA Comments at 3; NYCEM Comments at 14; Eagle County EM Comments at 1; *but see* Verizon Comments at 3; Sprint Reply at 7; Kansas City EM Comments at 2.

⁶⁸⁴ See Verizon Comments at 13; T-Mobile Reply at 9.

⁶⁸⁵ See *supra* Figure 1 (WEA Infrastructure).

CMAC attributes can be utilized as indicia of system integrity. Do Participating CMS Providers currently safeguard WEA system integrity through mechanisms other than, or in addition to alert logging? Further, we seek comment on whether requiring Participating CMS Providers to log data relevant to the accuracy of geo-targeting, the extent of alert delivery latency, and the system availability and reliability could contribute to the collection of data for Annual WEA Performance Reports? For example, if we were to require Participating CMS Providers to log alert receipt and transmission time stamps at each of the C-E interfaces, would that data contribute to their ability to report on specific sources of alert delivery latency?

E. Compliance Timeframes

175. The rules we propose in this *Further Notice* would leverage commercially available technologies to improve public safety. In this regard, we take notice of the current state of technology, and propose timeframes that are informed by the processes and procedures that Participating CMS Providers and mobile device manufacturers state are necessary to implement changes to their WEA service.⁶⁸⁶ For ease of reference, the table below sets forth proposed timeframes for compliance with our proposed rules. We also seek comment on timeframes within which we could reasonably expect Participating CMS Providers to reach other policy objectives we discuss in this *Further Notice*.

<u>RULE AMENDMENT</u>	<u>COMPLIANCE TIMEFRAME</u>
Defining the Modes of Participation in WEA	<i>Within 120 days of the rules' publication in the Federal Register</i>
Infrastructure Functionality	<i>Within 30 days of the rule's publication in the Federal Register</i>
Alert Message Preservation	<i>Within 30 months of the rule's publication in the Federal Register</i>
Earthquake Alerting	<i>Within 30 months of the rules' publication in the Federal Register</i>
Multimedia Alerting	<i>Within 30 months of the rules' publication in the Federal Register</i>
Multilingual Alerting	<i>We seek comment on reasonable timelines for Participating CMS Providers to support the transmission of WEA Alert Messages in various languages</i>
Matching the Geographic Target Area	<i>Within 42 months of the rules' publication in the Federal Register, or within 24 months of the completion of all relevant standards, whichever is sooner</i>
Promoting Informed Consumer Choice at the Point of Sale	<i>Within 120 days of the rules' publication in the Federal Register</i>
Promoting Informed Consumer Choice through the WEA Interface	<i>Within 30 months of the rules' publication in the Federal Register</i>
Annual WEA Performance Reporting	<i>Within 30 months of publication in the Federal Register of a notice announcing the approval by</i>

⁶⁸⁶ See, e.g., AT&T Mar. 17, 2016 *Ex Parte* at 2-3.

<u>RULE AMENDMENT</u>	<u>COMPLIANCE TIMEFRAME</u>
	<i>the Office of Management and Budget of the modified information collection requirements.</i> ⁶⁸⁷
Alert Logging	<i>We seek comment on reasonable timeframes for Participating CMS Providers to improve their tracking of system performance through alert logging</i>

Figure 4: Proposed Compliance Timeframes

176. We propose a 30-month compliance timeframe for each proposed rule where compliance would be expected to require updates to standards and system specifications, as well as software updates for various components of the WEA system. These proposals include requiring Participating CMS Providers make changes to the WEA interface to promote informed consumer choice, requiring them to expedite delivery of earthquake-related Alert Messages, requiring them to provide a method of accessing pending Alert Messages, requiring support for multimedia content in Public Safety Messages, and requiring them to track and report on critical system performance metrics.⁶⁸⁸ We seek comment on this approach and analysis. In the *Report and Order*, we concluded that 30 months was an appropriate timeframe within which to require Participating CMS Providers to comply with rules that required updates to software and standards because it takes twelve months for appropriate industry bodies to finalize and publish relevant standards,⁶⁸⁹ another twelve months for Participating CMS Providers and mobile device manufacturers to develop and integrate software upgrades consistent with those standards into embedded plant and to complete required “technical acceptance testing,”⁶⁹⁰ and then six more months for Participating CMS Providers and mobile device manufacturers to deploy this new technology to the field.⁶⁹¹ We seek comment on whether, unlike changes to WEA Alert Message content we adopt in the *Report and Order*, our WEA interface and Alert Message preservation proposals will likely only require

⁶⁸⁷ As described below, the first annual WEA performance report will be due 12 months from the date of required compliance (*i.e.*, within 42 months of publication in the Federal Register of a notice announcing the approval by the Office of Management and Budget of the modified information collection requirements). *See infra* para. 156.

⁶⁸⁸ *See, e.g.*, ATIS Mar. 18, 2016 *Ex Parte* at 23 (observing that standardizing Alert Message preservation will require changes to the *ATIS/TIA Mobile Device Behavior Specification* and updates to software consistent with that standard); BlackBerry Mar. 21, 2016 *Ex Parte* at 2 (requesting that if the Commission were to adopt consumer opt-out menu requirements, it do so in such a manner that allows all mobile device manufacturers to implement changes to mobile devices in the same way); Sprint Reply at 9 (stating that there are no standards available to support the test reporting and alert logging requirements that we proposed in the *WEA NPRM*).

⁶⁸⁹ *See* T-Mobile Comments at 8; Verizon Comments at 5; ATIS Comments at 21-22.

⁶⁹⁰ *See* Verizon Comments at 5; ATIS Comments at 21-22 *cf.* Microsoft Reply at 3 (recommending 24 months from the completion of standards for software testing and deployment).

⁶⁹¹ *See* Verizon Comments at 5; ATIS Comments at 21-22. For example, common to any commenters’ support for expanding the character limit to 360 for 4G-LTE and future networks is the completion of Alliance for Telecommunications Industry Standards (ATIS) standards, the incorporation of those standards into new technologies, and the incorporation of new technologies into existing networks— a process commenters agree is feasible, but would take at least 30 months. *See, e.g.*, AT&T Comments at 7 (“Support for both 90 and 360-character messages will require changes to the interface between the FEMA IPAWS (‘Integrated Public Alert and Warning System’) and the CMSP network, and changes to the CMSP infrastructure. The changes will first require modifications to industry standards, followed by development, testing, and deployment of the changes.”); T-Mobile Comments at 4; Verizon Comments at 6 (“the Commission should expand the allowable WEA character limits to 360 characters for messages on LTE networks and on devices first offered to consumers 30 months after adoption of new rules”); Microsoft Reply at 3 (“Before requiring implementation, the Commission should allow at least 24 months after standards have been completed and accepted to allow for the technology to be developed, tested, and implemented in devices and networks.”).

changes to WEA-capable mobile devices, not Participating CMS Providers' networks. If so, would mobile device manufacturers be able to integrate these enhanced capabilities into their mobile devices on a faster timeline than we allow for compliance with rules that implicate more systemic changes?

177. With respect to our proposal to require Participating CMS Providers to produce and share critical system performance metrics, we anticipate that compliance would require updates to software and standards, as well as the coordinated efforts of professionals employed by Participating CMS Providers in order to design and implement appropriate data collection and sharing mechanisms. We seek comment on this reasoning. We seek comment whether compliance with this proposal would require updates to software and standards akin to those required by rules we adopt in the *Report and Order*, and, relatedly, on whether we could reasonably expect Participating CMS Providers to complete these updates within thirty months.⁶⁹² We anticipate that some portion of the design planning required to determine the types of data and data collection methodologies appropriate for this task will take place during the course of this proceeding as industry stakeholders consider what compliance with our proposal would require of them. We also anticipate that this work could continue in parallel with the development of appropriate standards that describe this data collection task. Accordingly, we do not anticipate that any unique project planning component of this proposal will militate for allowing Participating CMS Providers additional time within which to comply, but we seek comment on this analysis. We also propose to provide Participating CMS Providers with a period of one year from the date of required compliance to produce their first annual WEA performance report (*i.e.*, within 42 months of publication in the Federal Register of a notice announcing the approval by the Office of Management and Budget of the modified information collection requirements).⁶⁹³ We anticipate that one year will be sufficient for Participating CMS Providers to schedule any required data collections, and to aggregate that data into useful reports. We seek comment on this analysis.

178. We propose to require Participating CMS Providers to match the target area specified by alert originators within 42 months of the rules' publication in the *Federal Register*, or within 24 months of the completion of all relevant standards, whichever is sooner. This is consistent with CSRIC V's recommendations that we allow 18 months for the development of standards "in consideration of device compatibility, potential privacy issues, network congestion and consumer impacts due to increased data plan usage,"⁶⁹⁴ and that "[o]nce the standards work is complete, full system deployment including new handsets should be deployed within no more than 24 months."⁶⁹⁵ We seek comment on this proposal. We also seek comment on whether and how this timeframe could be expedited, given the critical public need to employ more precise geo-targeting standards. Rather than adopting a single implementation timeframe, should we benchmark compliance timeframes based on a percentage of Alert Messages that meet the standard (*e.g.*, 40 percent of Alert Messages within two years, 80 percent of Alert Messages within six years)? Could this approach enable compliance for a percentage of Alert Messages in a shorter timeframe by enabling Participating CMS Providers to implement improvements to geo-targeting by facilitating implementation on a rolling basis and without waiting for industry standardization? We note that Participating CMS Providers voluntarily improved geo-targeting relative to our foregoing county-level requirement without industry standardization. We seek comment on why standards would be necessary to support a "matching" requirement where they do not seem to have been needed to support a "best approximate" requirement. Further, CSRIC V finds that Participating CMS Providers would need 36-48 months to support nesting polygons, where 18-24 months is allocated to the modification of appropriate standards, and 18-24 months is allocated for development and implementation in Participating

⁶⁹² See *supra* Section III.D (Compliance Timeframes).

⁶⁹³ See *infra* Section IV.D.1 (Annual WEA Performance Reporting).

⁶⁹⁴ See *id.* at 32.

⁶⁹⁵ CSRIC V WEA Geo-targeting Report at 30, 32

CMS Providers' networks.⁶⁹⁶ We seek comment on this analysis. Why would enabling geo-targeting to nesting polygons require more time than the record shows is necessary to modify standards and software to support rules we adopt today? We seek comment on a reasonable timeframe within which to integrate additional network-based technologies, such as small cells, into the WEA infrastructure in order to achieve incremental improvements to WEA geo-targeting. Could such an integration take place within a shorter timeframe that that which we may allow for the integration of eMBMS or another ulterior technology into WEA because the network components that we consider above are already integrated into Participating CMS Providers 4G-LTE networks?⁶⁹⁷

179. We propose to require compliance with our proposed point-of-sale notification requirements, and with our new definitions of the modes of participation in WEA insofar as they necessitate a renewed obligation to file election letters within 120 days of the rule's publication in the *Federal Register*. We anticipate that compliance with these proposed rules would require time and effort on the part of attorneys and communications professionals employed by Participating CMS Providers in order to update any required point-of-sale notifications, and potentially to update Participating CMS Providers' election letters on file with the Commission. We seek comment on this analysis, and relatedly, we seek comment on whether 120 days would be a sufficient period of time within which to expect Participating CMS Providers to complete this task. We observe that in the *Ensuring the Continuity of 911 Communications Report and Order*, the record supported allowing Participating CMS Providers 120 days to update their point-of-sale notification to advise consumers of the availability of a backup power solution that provides 911 access during a commercial power loss.⁶⁹⁸ We seek comment on whether 120 days would also be adequate in this context, and if not, we invite commenters to provide specific details as to how our proposal presents unique challenges. We also seek comment on whether we could reasonably expect Participating CMS Providers to file any required update to their election letter within this 120-day timeframe, noting that in the *WEA Third Report and Order*, we required CMS Providers to file their election letter within 30 days.⁶⁹⁹

180. We propose to require compliance with our WEA infrastructure functionality proposal within 30 days of the rules' publication in the *Federal Register*. We do not anticipate that Participating CMS Providers would need to take any action to achieve compliance with this proposed rule, if adopted, because, as we reason above, Participating CMS Providers do not rely on the language we propose to remove.⁷⁰⁰ We seek comment this analysis. If the deletion of this language would require CMS Providers otherwise in compliance with our Part 10 rules to take action in order to continue to participate, what specific steps would be necessary to comply with these rules as revised? How much time would those steps take to complete? If any Participating CMS Provider were to fall within this category, would it likely be a non-nationwide Participating CMS Provider? If so, would it be appropriate to make any special accommodations for non-nationwide Participating CMS Providers to facilitate their continued participation?

181. We also seek comment on reasonable timeframes in which to expect Participating CMS Providers to be able to reach the other policy objectives that we discuss above, including developing a uniform standard for alert log formatting and developing additional alert logging capabilities throughout the WEA system and deepening WEA's language support capabilities. With respect to alert logging, we

⁶⁹⁶ *CSRIC V WEA Geo-targeting Report* at 15.

⁶⁹⁷ See *supra* para. 142 (discussing whether it is possible to leverage technologies such as Wi-Fi, Bluetooth, and small cells already integrated into Participating CMS Providers' networks in support of WEA to improve geo-targeting).

⁶⁹⁸ See *Ensuring the Continuity of 911 Communications*, Report and Order, PS Docket No. 14-174, 30 FCC Rcd 8677, 8716, para. 96 (2015).

⁶⁹⁹ *WEA Third Report and Order*, 23 FCC Rcd at 12575, para. 32.

⁷⁰⁰ See *supra* Section IV.A.2 (Infrastructure Functionality).

seek comment on whether one year would be sufficient for industry to complete a standard to describe a uniform alert log format that will facilitate comparison of Participating CMS Providers' WEA services, as we concluded would be appropriate for standards necessitated by rules we adopt in the *Report and Order*.⁷⁰¹ We also seek comment on whether 30 months would be an appropriate period of time within which to require logging at additional junctures in the WEA system.⁷⁰² Would software updates be required to implement this change?

182. We seek comment on a reasonable timeframe within which to require Participating CMS Providers to support transmission of Alert Messages in languages in addition to English and Spanish. Could standards appropriate to support additional languages in WEA, including ideographic languages, be completed or otherwise integrated into WEA within one year, consistent with our reasoning about the time that it takes to complete standards in the *Report and Order*.⁷⁰³ We seek comment on whether software would need to be updated in order to support additional languages as well given the two-year timeframe that we allow Participating CMS Providers to update software to support a language in addition to English (*i.e.*, Spanish) in the *Report and Order*.⁷⁰⁴ Would it be possible for Participating CMS Providers to bundle software upgrades enabling support for additional languages into any software upgrades that they may undertake in order to comply with our Spanish-language requirement? If not, why not?

183. Finally, we seek comment on a reasonable implementation timeframe for our proposal to prioritize earthquake-related Alert Messages at the Participating CMS Provider Alert Gateway. Would Participating CMS Providers be able to implement this change on the same 30-month timeframe that we allow for other proposals anticipated to necessitate changes to software and standards? Could any changes to the prioritization of earthquake-related Alert Messages in transit be completed within the same timeframe? If not, what additional considerations should we take into account in our analysis of what changes in Alert Message prioritization in transit will require? We seek to implement each of our proposed rules in as swift of a timeframe as possible, while ensuring that our proposed rules do not pose undue burdens for Participating CMS Providers, recognizing the current state and technology. We invite commenters to offer into the record any additional considerations relevant to compliance with our proposed rules.

F. Benefit-Cost Analysis

184. We seek comment on the minimum benefit expected to result from the policy changes we examine in this *Further Notice*, and on the cost that Participating CMS Providers would incur in order to achieve compliance. In the *Report and Order*, we leverage market-driven advances in technology that offer opportunities to improve WEA and produce significant public benefit without imposing undue burdens on Participating CMS Providers.⁷⁰⁵ In this *Further Notice*, our goal is to continue that approach. We observe that CMS Provider participation in WEA is voluntary,⁷⁰⁶ and that any Participating CMS Provider that does not wish to comply with the rules we adopt today, or proposed rules herein that may be adopted in the future, may withdraw their election to participate in WEA without penalty, and incur no compliance costs as a result.⁷⁰⁷ We seek comment on steps that we can take to tailor implementation of

⁷⁰¹ See T-Mobile Comments at 8; Verizon Comments at 5; ATIS Comments at 21-22.

⁷⁰² See *supra* para. 79 (describing the 30-month approach to complying with rules that require updates to standards and software that the record supports).

⁷⁰³ See Verizon Comments at 5 (stating that new technical standards typically take 12 months to develop).

⁷⁰⁴ See *supra* para.81 (stating that, consistent with the record we allow Participating CMS Providers two years to complete any software updates that may be necessary to integrate existing Spanish-language standards).

⁷⁰⁵ See *supra* para. 88.

⁷⁰⁶ See *WEA NPRM*, 30 FCC Rcd at 13818, para 79.

⁷⁰⁷ See WARN Act § 602(b)(2)(D), 47 USC § 1202(b)(2)(D).

each of our proposals to accomplish our goals of ensuring the provision of effective Alert Messages that provide the public with an alert and warning service commensurate with technical capabilities, and to improve consumer education tools and WEA transparency consistent with the WARN Act.

185. We seek comment on whether the policy changes we examine in this *Further Notice*, taken alone or together, would decrease the risk of death or injury otherwise implicated by severe weather events and child abductions – emergencies that WEA is designed to mitigate that result in hundreds of casualties and thousands of injuries in the United States each year.⁷⁰⁸ We note that, in its brief history, WEA has been cited as a leading factor in the prevention of such losses.⁷⁰⁹ To what extent would the measures on which we seek comment in this *Further Notice* increase the scalability of WEA’s life-saving impact? Specifically, we seek comment on situations where, were the improvements to WEA on which we seek comment today in place, causes of death and injury could have been prevented or mitigated. We also seek comment on any enhancements to our proposals that would make WEA more likely to save lives and prevent injury. We reason that VSL should continue to be our chosen method to quantify the public value of improvements to public safety that reduce the expected number of fatalities by one, and that the AIS scale should continue to be our chosen method of quantifying the value of injury prevention.⁷¹⁰ We seek comment on these choices, as well as on any alternative modes of quantifying benefits that may strengthen our analysis and conclusions. What other types of public benefits would commenters expect to result from our adoption of rules requiring Participating CMS Providers to comply with the policy changes we examine here? Would adoption of our proposed rules generate cost avoidance for emergency management agencies and therefore the public, provide a free alternative for government agencies’ mass notification needs, or lead to cost reductions for subscription-based alert systems? Further, to the extent that adoption of our proposed rules could reduce network congestion by minimizing milling, we seek comment on how to quantify the value to Participating CMS Providers of decreases in network load.

186. We also seek comment on the costs that Participating CMS Providers would expect to incur as a result of required compliance with the policy changes we examine in this *Further Notice*. We anticipate that these policy changes could lead Participating CMS Providers to incur costs associated with modifying standards and software, and recordkeeping and reporting costs. We seek comment on the specific sources of cost or burden involved in each. Are there any other types of costs that we should consider as relevant to our analysis? We seek comment on steps that we can take to tailor implementation of any rules we may adopt as a result of this proceeding to avoid imposing undue costs on Participating CMS Providers, and on steps that we can take to provide appropriate allowances for non-nationwide Participating CMS Providers that facilitate their ongoing participation. Further, for each cost implicated, we seek comment on the factors that contribute to that cost, such as hours of labor, special skills, training, and obseletion.

187. We anticipate that our proposed alert preservation and WEA interface rules would implicate changes to standards and specifications for WEA-capable mobile devices, and that our Annual WEA Performance Reporting requirements and changes to earthquake alert prioritization would implicate changes to a more inclusive set of standards and specifications describing CMS Providers’ WEA

⁷⁰⁸ See *supra* note 375 (reporting the total number of deaths caused by severe weather in the United States since 2012); see also FAQs: Missing Children, National Center for Missing and Exploited Children, <http://www.missingkids.com/Missing/FAQ> (last visited Jul. 1, 2016); citing *NCIC Missing Person and Unidentified Person Statistics for 2014 Pursuant to Public Law 101-647, 104 Statute 4967, Crime Control Act of 1990 Requirements*, National Crime Information Center, The Federal Bureau of Investigation (FBI), <https://www.fbi.gov/about-us/cjis/ncic/ncic-missing-person-and-unidentified-person-statistics-for-2014> (last visited Jul. 1, 2016).

⁷⁰⁹ See *supra* para. 89 (describing the benefits of WEA and the incremental benefits of the improvements to WEA that we adopt today); see also NCMEC May 5, 2015 *Ex Parte* at 1.

⁷¹⁰ See *supra* note 397 (defining the AIS scale).

infrastructure. We seek comment on the specific constellations of standards and specifications needed to standardize performance of these functions. Should we continue to view updates to standards and specifications as necessary prerequisites to compliance? We seek comment on the total number of labor hours that revising these standards and specifications would take. Would this standards-revision process take 30 individuals 26 hours over the course of one year, as we conclude would be the case for standards implicated by the rules we adopt in the *Report and Order*?⁷¹¹ What kinds of professional expertise would be necessary for this purpose, and what would be an appropriate method to quantify the value of these individuals' time and effort? Would it continue to be appropriate to use the salary of a senior network engineer compensated in the 90th percentile for their field as the basis for valuing the time of individuals that participate in the process of amending standards and specifications relevant to WEA?⁷¹² Should we continue to follow the Bureau of Labor Statistics' recommended approach and use fifty percent of salary as the basis for calculating employee benefits (including paid leave, supplementary pay, insurance, retirement and savings, and legally required benefits) as an additional cost of employee compensation?⁷¹³ What other types of employees' services might be needed to facilitate these improvements, and how much might their time cost? We seek comment on any additional or alternative method of quantifying the costs of the standards-setting process that would produce a more accurate estimate for the total burden presented by this aspect of compliance. Would other policy changes we examine in this *Further Notice* lead industry to modify standards or specifications? For example, what standards or specifications would need to be modified to comply with the policy changes we discuss for multimedia, multilingual and disaster relief messaging, further improvements to geo-targeting, Annual WEA Performance Reporting, and for alert logging at each of the C-E interfaces?⁷¹⁴ What would be the incremental cost of building alert and warning capabilities into the development of standards for 5G networks? Are there alternative methods of achieving our goals in these areas that would present Participating CMS Providers with lesser burdens? If so, we seek comment on costs associated with these alternative methods.

188. We anticipate that our proposed alert preservation and WEA interface rules would also implicate changes to software for WEA-capable mobile devices, and that our Annual WEA Performance Reporting requirements and changes to earthquake alert prioritization would implicate changes to a software throughout the WEA infrastructure. We seek comment on this assessment, and on the specific interfaces where software updates would be required. We anticipate that these software updates would present a similar level of complexity as those we adopt in the *Report and Order*.⁷¹⁵ Should we continue to consider separately the costs of software development and testing? With respect to software development, should we continue to reason that these modifications can be completed by one senior software engineer compensated in the 90th percentile for his field over the course of ten months?⁷¹⁶ In the alternative, should we quantify the cost of software modifications with reference to the Constructive Cost Model II (COCOMO II) as we did in the *Text-to-911 Bounce Back Message Order*?⁷¹⁷ What specific

⁷¹¹ See *supra* para. 98.

⁷¹² See *supra* para. 99.

⁷¹³ See *supra* note 424.

⁷¹⁴ See *supra* Figure 1 (WEA Infrastructure).

⁷¹⁵ See *supra* paras. 99, 100 (discussing software costs of the rules we adopt in the *Report and Order*).

⁷¹⁶ See *supra* note 439 (substantiating our analysis of the compensation of software engineers likely responsible for this task).

⁷¹⁷ The COCOMO II web-based tool requires one to enter the total new source lines of code and the cost per person-month in dollars and to set a number of software scale and cost drivers at subjective levels (*e.g.*, very low, low, nominal, high, very high, extra high). See COCOMO II, Constructive Cost Model, <http://csse.usc.edu/tools/COCOMOII.php> (last visited Aug. 9, 2016). See also *Text-to-911 Bounce Back Message Order, Report and Order*, 28 FCC Rcd 7556, 7565, para. 24, n. 58 (2013) (estimating that 10 new lines of code would need to be created in order to comply with a requirement that CMS Providers send a bounce-back text when someone texts to 911 but text-to-911 service is not available).

software programs would need to be modified in order to enable compliance with these rules and how many lines of code would need to be changed to affect the modifications? With respect to software testing, should we continue to reason that it would require the labor of as many as 12 software engineers working together of the course of as many as two months?⁷¹⁸ Further, we seek comment on whether these rule amendments implicate changes to mobile device operating systems, the WEA application, or both. We seek comment on whether and how changes to operating system and application software may implicate distinct issues for Participating CMS Providers. We seek comment on the specific changes to software that would be required in order to enable compliance with our proposed rules as they could be implemented in the varied mobile device environments used to support WEA. What other types of employees' services might be needed to facilitate these improvements, and how much might their time cost? Would other policy changes we examine in this *Further Notice* lead Participating CMS Providers to modify software? For example, what, if any, software modifications would be implicated by the policy changes we examine with respect to multimedia, multilingual, or disaster relief messaging, further improvements to geo-targeting, and for alert logging at each of the C-E interfaces?⁷¹⁹ Are there alternative methods of achieving our goals in these areas that would present Participating CMS Providers with lesser burdens? If so, we seek comment on costs associated with these alternative methods.

189. We seek additional comment on the changes to Participating CMS Provider infrastructure that would be required in order to generate, analyze and share information critical to their participation in WEA pursuant to our proposed performance reporting rule because the record reflects concern about the IT-related requirements that such obligations might impose.⁷²⁰ We continue to be sensitive to this issue, and so we seek comment on cost-effective mechanisms that Participating CMS Providers could use in order to collect, aggregate and transmit data in fulfillment of these proposed requirements. For example, could the collection, aggregation and transmittal of such data be automated? How should we quantify the paperwork burden of producing performance reports if the production of such reports is automated? We seek comment above on whether an alternative, potentially less frequent reporting period would meet emergency managers' need for information about how well WEA works.⁷²¹ If so, to what extent would less frequent reporting reduce costs for Participating CMS Providers? Would software modification be required in order to implement any necessary data collection mechanisms? If so, would it be reasonable to expect any required software to be developed and deployed within the same 30-month timeframe as adopted above for rules that will require Participating CMS Providers to develop upgrades to existing software and to modify relevant standards, and would such software updates implicate similar costs?

190. We also seek comment on reporting and recordkeeping costs implicated by the policy changes we examine in this *Further Notice*. Would Participating CMS Providers incur such costs in connection with the Annual WEA Performance Reporting, election and point-of-sale notification requirements we consider? With respect to the recordkeeping and reporting costs associated with our proposed annual performance reporting requirements, we seek comment on whether the cost burdens that Participating CMS Providers will confront in order to comply with these rules would be analogous to those OMB concluded that CMS Providers would confront in order to establish, analyze and report on the results of E911 location accuracy test beds.⁷²² In the *E911 Location Accuracy Requirements Fourth Report and Order*, the Commission adopted requirements for all CMS Providers to improve the accuracy of 911 location information from wireless devices delivered to PSAPs.⁷²³ Specifically, OMB concluded

⁷¹⁸ See *supra* para. 99.

⁷¹⁹ See *supra* Figure 1 (WEA Infrastructure).

⁷²⁰ See, e.g., Sprint Reply at 7; ATIS Comments at 20; San Joaquin OES Comments at 2; CTIA Comments at 13, 14; Cochise County OEM Comments at 2.

⁷²¹ See *supra* para. 163.

⁷²² See E911 Location Accuracy Requirements, OMB 3060-1210, 80 FR 30235 (2015).

⁷²³ See *supra* note 4.

that the establishment of a location accuracy test bed would require each nationwide CMS Provider to spend a sum of 1,000 hours between two engineers and one attorney. By analogy, we seek comment on whether it would take each Participating CMS Provider 1,000 hours between two network engineers and one attorney to establish a collection mechanism appropriate for gathering and analyzing data relevant to Annual WEA Performance Reports where establishment of a method to analyze and report on network performance using a representative sampling of devices and geographic areas may be one cost-effective mode for Participating CMS Providers to comply with this reporting requirement. Further, in the E911 location accuracy context, OMB concluded that it would take two hours for an engineer to generate, format and submit live call data to the Commission.⁷²⁴ Similarly, we posit it would reasonably take each Participating CMS Provider two hours to generate, format and submit data for each of the three key performance metrics for which reporting is proposed (geo-targeting, latency, reliability) for a total of six hours per report per CMS Provider. We seek comment on this position. We seek comment on any steps that we can take to minimize reporting burdens on Participating CMS Providers in connection with our annual performance reporting proposal that would still increase transparency into WEA geo-targeting, latency, and availability and reliability.⁷²⁵ With respect to costs that Participating CMS Providers would incur in order to comply with these proposals, if adopted, we note that NYCEM already performs regional tests of the extent of system reliability, alert delivery latency, and the accuracy of geo-targeting.⁷²⁶ We seek comment on the costs that emergency management agencies would be required to incur in order to perform testing that is comparable to that performed by NYCEM, and to share and analyze test report data among themselves. We seek comment on whether it makes more sense for state and local emergency management agencies to bear these costs than Participating CMS Providers. In any case, we reason that NYCEM's success demonstrates that it is feasible to collect data on WEA system performance. We seek comment on this analysis.

191. We seek comment on the costs that Participating CMS Providers would incur in order to modify their point-of-sale notifications to more accurately reflect their WEA service offerings. In response to the *WEA Third Report and Order*, OMB approved our assessment that 1,253 CMS Providers might need to produce one record annually in order to comply with our point-of-sale notification requirements, and that each report would require 10 hours to complete by an individual salaried at \$28.85/hr.⁷²⁷ Accordingly, OMB agreed with the Commission that the total annual cost of our point-of-sale notification requirement was \$361,490.⁷²⁸ We seek comment on whether we should revise this assessment in light of our proposal. Specifically, has the total number of entities this recordkeeping obligation may affect changed since we first adopted this rule? In light of the fact that CMS Providers participating in part or not at all in WEA are required to provide notifications to consumers at the point of sale, but not CMS Providers participating in whole, we seek comment on the number of entities our proposed point-of-sale notification requirements are likely to impact. Should the obligation to update this point-of-sale notification continue to be considered as an annual requirement? Would Participating CMS Providers need more than ten hours to update their point-of-sale notifications pursuant to our proposed

⁷²⁴ See *id.*

⁷²⁵ See, e.g., *supra* paras. 163 (seeking comment on whether it would be appropriate to adopt a less frequent reporting requirement for non-nationwide Participating CMS Providers), 168 (seeking comment on whether non-nationwide Participating CMS Providers should also be allowed to collect less granular data on system performance in order to reduce any cost burdens entailed by these proposed recordkeeping and reporting requirements), 169 (seeking comment on whether to be implementation agnostic with respect to how Participating CMS Providers collect performance data, and on whether such an approach would provide Participating CMS Providers, and especially non-nationwide Participating CMS Providers, with increased flexibility that would reduce the burdens of these recordkeeping and reporting requirements).

⁷²⁶ See *infra* Appx. G (NYCEM Local Geo-targeting and Latency Test Reports).

⁷²⁷ See OMB 3060-1113 (2011) (totaling a 12,530 hour burden).

⁷²⁸ Where $\$28.85 \times \text{carriers} \times 1,253 \text{ report/annually} \times 10 \text{ hours per report} = \$361,490.00$.

approach, and if so, how much time would they need?⁷²⁹ Does \$28.85/hr. continue to be a reasonable valuation for the employee time needed for this task? If not, what would be a reasonable valuation of employee time required to update CMS Providers' point-of-sale notifications? We seek comment on whether allowing Participating CMS Providers to update their point-of-sale notification using a hyperlink to a website would help to control the costs of maintaining this consumer notification. How much employee time, if any, would Participating CMS Providers need to dedicate to maintaining up-to-date information about the extent to which they offer WEA if they made such information available through a hyperlink to a website? We seek comment on any steps the Commission could take to lessen this burden on CMS Providers.

192. We also seek comment on the specific costs and burdens Participating CMS Providers would incur if required to renew their election to participate in WEA pursuant to revised definitions of participation. In response to the *Third Report and Order*, OMB also approved our assessment that our election requirement would affect 1,253 entities that would be required to update this report on occasion, but at most once per year, and that fulfillment of this requirement would take 30 minutes per report by an individual salaried at \$28.85/hr.⁷³⁰ Accordingly, OMB agreed with the Commission that the total annual cost of our election requirement would be \$18,074.53.⁷³¹ We seek comment on whether we should revise this assessment if we revise our election requirement consistent with the approach on which we seek comment above.⁷³² We seek comment on steps that we can take to help Participating CMS Providers to control the costs of renewing their election to participate in WEA, including by adopting definitions of participation in WEA that more closely reflect industry's understanding.

193. We seek comment on any other costs that we should consider in our analysis. Would compliance with our proposed rules implicate any hardware replacement costs, or other capital expenditures? Are there any additional costs of labor or recordkeeping that we should consider? Our analysis of these estimated costs and benefits is intended to compare the maximum possible cost of compliance with our proposed rules against the minimum possible benefit. To this end, we urge WEA stakeholders, and in particular smaller, rural, and/or non-nationwide CMS providers, to file as detailed an analysis as possible of the maximum dollar values that they would ascribe to compliance with each of the policy changes we examine here. We also seek comment on special accommodations that would be appropriate to help non-nationwide Participating CMS Providers, in particular, to control costs.

V. PROCEDURAL MATTERS

A. Accessible Formats

194. To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (TTY).

B. Regulatory Flexibility Analysis

195. As required by the Regulatory Flexibility Act of 1980, *see* 5 U.S.C. § 604, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) and an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and rules addressed in this document. The FRFA is set forth in Appendix C. The IRFA is set forth in Appendix D.

⁷²⁹ *See* OMB 3060-1113 (2011) (noting that these reports can be completed in 5-10 hours).

⁷³⁰ *Id.*

⁷³¹ Where \$28.85 x 1,253 carriers x 1 report/annually x .5 hours per report = \$18,074.53. *See* OMB 3060-1113 (2011). *Id.*

⁷³² *See supra* Section IV.A.IV.A.1 (Defining the Modes of Participation in WEA).

C. Paperwork Reduction Analysis

196. The *WEA Report and Order and Further Notice of Proposed Rulemaking* contains new information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law No. 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new information collection requirements contained in this proceeding.

197. We note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. 3506(c)(4), we previously sought specific comment on how the Commission might “further reduce the information collection burden for small business concerns with fewer than 25 employees.”⁷³³ In addition, we have described impacts that might affect small businesses, which includes most businesses with fewer than 25 employees, in the FRFA in Appendix C, *infra*.

D. Congressional Review Act

198. The Commission will send a copy of this *WEA Report and Order and Further Notice of Proposed Rulemaking* in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act (CRA), see 5 U.S.C. § 801(a)(1)(A).

VI. ORDERING CLAUSES

199. Accordingly, IT IS ORDERED, pursuant to Sections 1, 2, 4(i), 4(o), 301, 303(r), 303(v), 307, 309, 335, 403, 624(g), 706, and 715 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 154(i), 154(o), 301, 301(r), 303(v), 307, 309, 335, 403, 544(g), 606, and 615, as well as by sections 602(a),(b),(c), (f), 603, 604 and 606 of the WARN Act, 47 U.S.C. §§ 1202(a),(b),(c), (f), 1203, 1204 and 1206, that the *WEA Report and Order and Further Notice of Proposed Rulemaking* in PS Docket Nos. 15-91 and 15-94 IS HEREBY ADOPTED.

200. IT IS FURTHER ORDERED that the Commission’s rules ARE HEREBY AMENDED as set forth in Appendix A.

201. IT IS FURTHER ORDERED that the rules adopted herein WILL BECOME EFFECTIVE as described herein,⁷³⁴ including those rules and requirements which contain new or modified information collection requirements that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act that WILL BECOME EFFECTIVE after publication in the *Federal Register* of a notice announcing such approval and the relevant effective date.⁷³⁵

202. IT IS FURTHER ORDERED that the Commission’s Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of the *WEA Report and Order and Further Notice of Proposed Rulemaking*, including the Final and Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

⁷³³ See *EAS Operational Issues NPRM*, 29 FCC Rcd at Appx. B.

⁷³⁴ See *supra* Section III.D (Compliance Timeframes).

⁷³⁵ Pub. L. No. 104-13, 109 Stat. 163 (May 22, 1995), *codified at* 44 USC §§ 3501 *et seq.*

203. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of the *WEA Report and Order and Further Notice of Proposed Rulemaking* to Congress and the Government Accountability Office pursuant to the Congressional Review Act, see 5 U.S.C. § 801(a)(1)(A).

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Final Rules

The rules in this part are issued pursuant to the authority contained in the Warning, Alert, and Response Network Act, Title VI of the Security and Accountability for Every Port Act of 2006, Pub. L. 109-347, Titles I through III of the Communications Act of 1934, as amended, and Executive Order 13407 of June 26, 2006, Public Alert and Warning System, 71 Federal Register 36975 (2006).

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 C.F.R. Part 10 and 47 C.F.R. Part 11 to read as follows:

PART 10 – WIRELESS EMERGENCY ALERTS

1. Amend § 10.280 by revising paragraph (a) to read as follows:

§ 10.280 Subscribers' right to opt out of WEA notifications.

(a) CMS providers may provide their subscribers with the option to opt out of ~~both, or either,~~ the “Child Abduction Emergency/AMBER Alert,” ~~and~~ “Imminent Threat Alert” **and “Public Safety Message”** classes of Alert Messages.

2. Add new paragraph (g) to § 10.320 to read as follows:

§ 10.320 Provider alert gateway requirements

* * * * *

(g) Alert Logging. The CMS provider gateway must perform the following functions:

(1) Logging Requirements. Log the CMAC attributes of all Alert Messages received at the CMS Provider Alert Gateway, including time stamps that verify when the message is received, and when it is retransmitted or rejected by the Participating CMS Provider Alert Gateway. If an Alert Message is rejected, a Participating CMS Provider is required to log the specific error code generated by the rejection.

(2) Maintenance of Logs. Participating CMS Providers are required to maintain a log of all active and cancelled Alert Messages for at least 12 months after receipt of such alert or cancellation.

(3) Availability of Logs. Participating CMS Providers are required to make their alert logs available to the Commission and FEMA upon request. Participating CMS Providers are also required to make alert logs available to emergency management agencies that offer confidentiality protection at least equal to that provided by the federal Freedom of Information Act (FOIA) upon request, but only insofar as those logs pertain to Alert Messages initiated by that emergency management agency.

3. Amend introductory paragraph and paragraph (b), and add new paragraph (c) to § 10.350 to read as follows:

§ 10.350 WEA testing and proficiency training requirements.

This section specifies the testing that ~~will be~~ is required of **Participating CMS Providers** ~~no later than the date of deployment of the WEA, or WEA components.~~

* * *

(b) *Periodic C interface testing.* In addition to the required monthly tests, a Participating CMS Provider must participate in periodic testing of the interfaces between the Federal Alert Gateway and its CMS Provider Gateway, **including the public television broadcast-based backup to the C-interface.** This periodic interface testing is not intended to test the CMS Provider's infrastructure nor the mobile devices but rather is required to ensure the availability/viability of both gateway functions. Each CMS Provider Gateway shall send an acknowledgement to the Federal Alert Gateway upon receipt of such interface test messages. Real event codes or Alert Messages shall not be used for this periodic interface testing.

(c) *State/Local WEA Testing.* **A Participating CMS Provider must support State/Local WEA Tests in a manner that complies with the Alert Message Requirements specified in Subpart D.**

(1) **A Participating CMS Provider's Gateway shall support the ability to receive a State/Local WEA Test message initiated by the Federal Alert Gateway Administrator.**

(2) **A Participating CMS Provider shall immediately transmit a State/Local WEA Test to the geographic area specified by the alert originator.**

(3) **A Participating CMS Provider may forego a State/Local WEA Test if the State/Local WEA Test is pre-empted by actual alert traffic or if an unforeseen condition in the CMS Provider infrastructure precludes distribution of the State/Local WEA Test. If a Participating CMS Provider Gateway forgoes a State/Local WEA Test, it shall send a response code to the Federal Alert Gateway indicating the reason.**

(4) **Participating CMS Providers shall provide their subscribers with the option to opt in to receive State/Local WEA Tests.**

5. Amend introductory paragraph and add new paragraph (d) to § 10.400 to read as follows:

§ 10.400 Classification.

A Participating CMS Provider is required to receive and transmit ~~three~~ **four** classes of Alert Messages: Presidential Alert; Imminent Threat Alert; ~~and~~ Child Abduction Emergency/AMBER Alert; **and Public Safety Message.**

* * *

(d) *Public Safety Message.* **A Public Safety Message is an essential public safety advisory that prescribes one or more actions likely to save lives and/or safeguard property during an emergency. A Public Safety Message may only be issued in connection with an Alert Message classified in paragraphs (a), (b) or (c) of this Section.**

5. Amend § 10.410 to read as follows:

§ 10.410 Prioritization.

A Participating CMS Provider is required to transmit Presidential Alerts upon receipt. Presidential Alerts preempt all other Alert Messages. A Participating CMS Provider is required to transmit Imminent Threat Alerts, ~~and~~ AMBER Alerts **and Public Safety Messages** on a first in-first out (FIFO) basis.

6. Revise § 10.430 to read as follows:

§ 10.430 Character limit.

~~A WEA Alert Message processed by a Participating CMS Provider must not exceed 90 characters of alphanumeric text.~~

A Participating CMS Provider must support transmission of an Alert Message that contains a maximum of 360 characters of alphanumeric text. If, however, some or all of a Participating CMS Provider's network infrastructure is technically incapable of supporting the transmission of a 360-character maximum Alert Message, then that Participating CMS Provider must support transmission of an Alert Message that contains a maximum of 90 characters of alphanumeric text on and only on those elements of its network incapable of supporting a 360 character Alert Message.

7. Remove Section 10.440.

8. Add a new Section 10.441

§ 10.441 Embedded references

Participating CMS Providers are required to support Alert Messages that include an embedded Uniform Resource Locator (URL), which is a reference (an address) to a resource on the Internet, or an embedded telephone number.

9. Amend § 10.450 by adding new paragraphs (a) and (b) to read as follows:

§ 10.450 Geographic targeting.

This section establishes minimum requirements for the geographic targeting of Alert Messages.

(a) A Participating CMS Provider will determine which of its network facilities, elements, and locations will be used to geographically target Alert Messages. A Participating CMS Provider must transmit any Alert Message that is specified by a geocode, circle, or polygon to an area ~~not larger than the provider's approximation of coverage for the Counties or County Equivalents with which that geocode, circle, or polygon intersects~~ **that best approximates the specified geocode, circle, or polygon. If, however, the Participating CMS Provider cannot broadcast the Alert Message to an area that best approximates the specified geocode, circle, or polygon, a Participating CMS Provider may transmit an Alert Message to an area not larger than the propagation area of a single transmission site. If, however, the propagation area of a provider's transmission site exceeds a single County or County Equivalent, a Participating CMS Provider may transmit an Alert Message to an area not exceeding the propagation area.**

(b) **Upon request from an emergency management agency, a Participating CMS Provider will disclose information regarding their capabilities for geo-targeting Alert Messages. A Participating CMS Provider is only required to disclose this information to an emergency management agency insofar as it would pertain to Alert Messages initiated by that emergency management agency, and only so long as the emergency management agency offers confidentiality protection at least equal to that provided by the federal FOIA.**

10. Add a new Section 10.480:

§ 10.480 Language support.

Participating CMS Providers are required to transmit WEA Alert Messages that are issued in the Spanish language or that contain Spanish-language characters.

11. Amend § 10.510 to read as follows:

§ 10.510 Call preemption prohibition.

Devices marketed for public use under part 10 must **present an Alert Message as soon as they receive it, but may not enable an Alert Message to preempt an active voice or data session. If a mobile device receives a WEA Alert Message during an active voice or data session, the user may be given the option to control how the Alert Message is presented on the mobile device with respect to the use of the common vibration cadence and audio attention signal.**

12. Amend § 10.520 by revising paragraph (d) to read as follows:

§ 10.520 Common audio attention signal

* * * * *

~~(d) The audio attention signal must be restricted to use for Alert Messages under part 10.~~ **No person may transmit or cause to transmit the WEA common audio attention signal, or a recording or simulation thereof, in any circumstance other than in an actual National, State or Local Area emergency or authorized test, except as designed and used for Public Service Announcements (PSAs) by federal, state, local, tribal and territorial entities, and non-governmental organizations in coordination with those entities, to raise public awareness about emergency alerting, provided that the entity presents the PSA in a non-misleading manner, including by explicitly stating that the emergency alerting attention signal is being used in the context of a PSA for the purpose of educating the viewing or listening public about emergency alerting.**

PART 11 – EMERGENCY ALERT SYSTEM

1. Amend § 11.45 to read as follows:

§ 11.45 Prohibition of false or deceptive EAS transmissions.

No person may transmit or cause to transmit the EAS codes or Attention Signal, or a recording or simulation thereof, in any circumstance other than in an actual National, State or Local Area emergency or authorized test of the EAS, **or as specified in Section 10.520(d).**

APPENDIX B

Proposed Rules

The rules in this part are issued pursuant to the authority contained in the Warning, Alert, and Response Network Act, Title VI of the Security and Accountability for Every Port Act of 2006, Pub. L. 109-347, Titles I through III of the Communications Act of 1934, as amended, and Executive Order 13407 of June 26, 2006, Public Alert and Warning System, 71 Federal Register 36975 (2006).

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 C.F.R. Part 10 and 47 C.F.R. Part 11 to read as follows:

PART 10 – WIRELESS EMERGENCY ALERTS

1. Add new paragraphs (h), (i), and (j) to § 10.10 to read as follows:

§ 10.10 Definitions.

* * *

(h) *CMS Provider participation “in whole.”* CMS Providers that have agreed to transmit WEA Alert Messages in a manner consistent with the technical standards, protocols, procedures, and other technical requirements implemented by the Commission in the entirety of their geographic service area and to all devices on their network.

(i) *CMS Provider participation “in part.”* CMS Providers that have agreed to transmit WEA Alert Messages in a manner consistent with the technical standards, protocols, procedures, and other technical requirements implemented by the Commission in some, if not all of their geographic service area, and to some, if not all of the devices on their network.

* * * * *

2. Amend paragraph (c) to read as follows:

§ 10.240 Notification to new subscribers of non-participation in WEA.

* * *

(c) CMS providers electing to participate in WEA “in part” shall use the following notification:

NOTICE REGARDING TRANSMISSION OF WIRELESS EMERGENCY ALERTS
(Commercial Mobile Alert Service)

[[CMS provider]] has chosen to offer wireless emergency alerts within portions of its service area, as defined by the terms and conditions of its service agreement, on wireless emergency alert capable devices. There is no additional charge for these wireless emergency alerts.

Wireless emergency alerts may not be available on all devices or in the entire service area, or if a subscriber is outside of the [[CMS provider]] service area. For details on the availability of this service and wireless emergency alert capable devices, please ask a sales representative, or go to [[CMS provider's URL]].

Notice required by FCC Rule 47 CFR 10.240 (Commercial Mobile Alert Service).
CMS providers electing to participate in WEA “in part” shall also include in their point-of-sale notification a statement attesting to whether they offer WEA service in the geographic area within

which the point of sale is located, and whether the specific device subject of the point-of-sale agreement is WEA-capable.

* * *

3. Amend paragraph (b) of § 10.280 to read as follows:

§ 10.280 Subscribers' right to opt out of WEA notifications.

* * *

(b) **Participating** CMS Providers shall provide their subscribers with a clear indication of what each option means, and provide examples of the types of messages the customer may not receive as a result of ~~opting out~~ and informed choices among the Alert Message classifications that they may receive.

* * * * *

4. Amend paragraph (e) to read as follows:

§ 10.320 Provider alert gateway requirements

* * * * *

(e)

* * *

(3) *Prioritization.* The CMS provider gateway must process an Alert Message on a first in-first out basis except for Presidential Alerts **and earthquake-related Imminent Threat Alerts**, which must be processed before all non-Presidential alerts.

5. Amend introductory paragraph of § 10.330 and add a new paragraph (a)(1) to read as follows:

§ 10.330 Provider infrastructure requirements.

This section specifies the general functions that a Participating CMS Provider is required to perform within their infrastructure. ~~Infrastructure functions are dependent upon the capabilities of the delivery technologies implemented by a Participating CMS Provider.~~

* * *

(a)

* * *

(1) **Delivery of earthquake-related Alert Messages in fewer than three seconds, measured from the time the Alert Message is created to when it is delivered and displayed on the mobile device.**

* * * * *

6. Add a new paragraph (d) to § 10.350 to read as follows:

§ 10.350 WEA testing and proficiency training requirements.

This section specifies the testing that is required of Participating CMS Providers.

* * *

(d) **Annual WEA Performance Reports.** Participating CMS Providers must submit Annual WEA Performance Reports to the Commission that reliably demonstrate the following system performance metrics for their nationwide WEA deployment.

(1) *Geo-targeting.* The accuracy with which the Participating CMS Provider can distribute WEA Alert Messages to a geographic area specified by an alert originator.

(2) *Latency.* An end-to-end analysis of the amount of time that it takes for the Participating CMS Provider to transmit a WEA Alert Message.

(3) Availability and Reliability. The annual percentage of WEA Alert Messages that the Participating CMS Provider processes successfully, and a summary of the most common errors with alert transmission.

(4) Participating CMS Providers shall grant requests from emergency management agencies for locality-specific versions of these performance metrics at least annually, and only so long as the emergency management agency offers confidentiality protection at least equal to that provided by federal FOIA.

7. Amend § 10.410 to read as follows:

§ 10.410 Prioritization.

A Participating CMS Provider is required to transmit Presidential Alerts **and earthquake-related Imminent Threat Alerts** upon receipt. Presidential Alerts preempt all other Alert Messages, **and earthquake-related Imminent Threat Alerts preempt all non-Presidential Alert Messages.** A Participating CMS Provider is required to transmit **other** Imminent Threat Alerts, AMBER Alerts, and Public Safety Messages on a first in-first out (FIFO) basis.

8. Amend § 10.450 to read as follows:

§ 10.450 Geographic targeting.

This section establishes minimum requirements for the geographic targeting of Alert Messages. A Participating CMS Provider will determine which of its network facilities, elements, and locations will be used to geographically target Alert Messages. A Participating CMS Provider must transmit any Alert Message that is specified by a geocode, circle, or polygon to an area that ~~best approximates~~ **matches** the specified geocode, circle, or polygon. If, however, the Participating CMS Provider cannot broadcast the Alert Message to an area that ~~best approximates~~ matches the target area, a Participating CMS Provider may transmit an Alert Message to an area ~~not larger than the propagation area of a single transmission site that best approximates the target area.~~

9. Add a new Section 10.490:

§ 10.490 Multimedia support.

Participating CMS Providers are required to support the transmission of hazard symbols and thumbnail-sized photos in Public Safety Messages.

10. Amend introductory paragraph and add a new paragraph (h) of § 10.500 to read as follows:

§ 10.500 General requirements.

~~WEA mobile device functionality is dependent on the capabilities of a Participating CMS Provider's delivery technologies. Mobile devices are required to perform the following functions:~~

* * *

(h) Preservation of Alert Messages in a consumer-accessible format and location at least until the Alert Message expires.

APPENDIX C

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA)¹ the Commission incorporated an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in the *WEA NPRM*.² No comments were filed addressing the IRFA regarding the issues raised in the *WEA NPRM*. Because the Commission amends the rules in this *WEA Report and Order*, the Commission has included this Final Regulatory Flexibility Analysis (FRFA). This present FRFA conforms to the RFA.³

A. Need for, and Objectives of, the Final Rules

2. Today's *WEA Report and Order* adopts rules to empower alert originators to participate more fully in WEA and to enhance the utility of WEA as an alerting tool. In this *WEA Report and Order*, we adopt rules that fall into three categories, message content, message delivery, and testing and outreach.

3. Specifically, with respect to message content, we increase the maximum Alert Message length from 90 to 360 characters for 4G-LTE and future networks only. We classify Public Safety Messages as an Alert Message eligible to be issued in connection with any other class of Alert Message. We require Participating Commercial Mobile Service (CMS) Providers to support embedded references, and allow Participating CMS providers to include embedded references in all Alert Message types for the purpose of an industry-led pilot of this functionality. We also require Participating CMS Providers to support transmission of Spanish-language Alert Messages.⁴

4. With respect to message delivery, we require Participating CMS Providers to narrow their geo-targeting of Alert Messages to an area that best approximates the alert area specified by the alert originator. We require that mobile devices process and display Alert Messages concurrent with other device activity. We also require Participating CMS Providers to log Alert Messages, to maintain those logs for at least 12 months, and to make those logs available upon request.

5. With respect to testing and outreach, we require support for State/Local WEA Tests and encourage emergency managers to engage in proficiency training exercises using alert origination software. We require periodic testing of the broadcast-based backup to the C-interface. Finally, we allow federal, state, local, tribal and territorial entities, as well as non-governmental organizations (NGOs) in coordination with such entities to issue Public Service Announcements (PSAs) aimed at raising public awareness about WEA.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

6. No commenter raised issues in response to the IRFA included in the *WEA NPRM*. We conclude that these mandates provide Participating CMS Providers with a sufficient measure of flexibility

¹ See 5 USC § 603. The RFA, see 5 USC § 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996, (SBREFA) Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² See *Improving Wireless Emergency Alerts and Community-Initiated Alerting*, PS Docket No. 15-91, Notice of Proposed Rulemaking, 30 FCC Rcd 13781 (2015) (*WEA NPRM*), Appx. B.

³ See 5 USC § 604.

⁴ "A Commercial Mobile Service Provider (or CMS Provider) is an FCC licensee providing commercial mobile service as defined in section 332(d)(1) of the Communications Act of 1934 (47 USC § 332(d)(1)). Section 332(d)(1) defines the term commercial mobile service as any mobile service (as defined in 47 USC 153) that is provided for profit and makes interconnected service available to the public or to such classes of eligible users as to be effectively available to a substantial portion of the public, as specified by regulation by the Commission." 47 CFR § 10.10(d).

to account for technical and cost-related concerns.⁵ In the event that small entities face unique circumstances that restrict their ability to comply with the Commission's rules, we can address them through the waiver process. We have determined that implementing these improvements to WEA is technically feasible and the cost of implementation is small.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

7. The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.⁶ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."⁷ In addition, the term "small business" has the same meaning as the term "small-business concern" under the Small Business Act.⁸ A small-business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.⁹

8. Small Businesses, Small Organizations, and Small Governmental Jurisdictions. Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards.¹⁰ First, nationwide, there are a total of approximately 27.5 million small businesses, according to the SBA.¹¹ In addition, a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."¹² Nationwide, as of 2007, there were approximately 1,621,315 small organizations.¹³ Finally, the term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."¹⁴ Census Bureau data for 2011 indicate that there were 89,476 local governmental jurisdictions in the United States.¹⁵ We estimate that, of this total, as many as 88, 506

⁵ See *supra* para. 48, **Error! Reference source not found.** (identifying measures in place to ensure flexibility in compliance and avoidance of unduly burdensome costs).

⁶ See 5 USC § 603(b)(3).

⁷ See 5 USC § 601(6).

⁸ See 5 USC § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 USC § 632). Pursuant to 5 USC § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

⁹ See 15 USC § 632.

¹⁰ See 5 USC §§ 601(3)–(6).

¹¹ See SBA, Office of Advocacy, "Frequently Asked Questions, http://www.web.sba.gov/sites/default/files/FAQ_March_2014_0.pdf (last accessed Jan. 25, 2015) (figures are from 2009).

¹² 5 USC § 601(4).

¹³ INDEPENDENT SECTOR, *THE NEW NONPROFIT ALMANAC & DESK REFERENCE* (2010).

¹⁴ 5 USC § 601(5).

¹⁵ U.S. CENSUS BUREAU, *STATISTICAL ABSTRACT OF THE UNITED STATES: 2012*, Section 8, page 267, tbl. 429, <https://www.census.gov/compendia/statab/2012/tables/12s0429.pdf> (data cited therein are from 2011, Table 427 (2007)).

entities may qualify as “small governmental jurisdictions.”¹⁶ Thus, we estimate that most governmental jurisdictions are small.

9. Wireless Telecommunications Carriers (except satellite). This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular phone services, paging services, wireless Internet access, and wireless video services.¹⁷ The appropriate size standard under SBA rules for the category Wireless Telecommunications Carriers (except satellite) is that a business is small if it has 1,500 or fewer employees.¹⁸ Census data for 2012 show that there were 967 firms that operated for the entire year. Of this total, 955 firms had employment of fewer than 1000 employees.¹⁹ Thus under this category and the associated small business size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small.²⁰

10. Broadband Personal Communications Service. The broadband personal communications services (PCS) spectrum is divided into six frequency blocks designated A through F, and the Commission has held auctions for each block. The Commission initially defined a “small business” for C- and F-Block licenses as an entity that has average gross revenues of \$40 million or less in the three previous calendar years.²¹ For F-Block licenses, an additional small business size standard for “very small business” was added and is defined as an entity that, together with its affiliates, has average gross revenues of not more than \$15 million for the preceding three calendar years.²² These small business size standards, in the context of broadband PCS auctions, have been approved by the SBA.²³ No small businesses within the SBA-approved small business size standards bid successfully for licenses in Blocks A and B. There were 90 winning bidders that claimed small business status in the first two C-Block

¹⁶ The 2007 U.S. Census data for small governmental organizations indicate that there were 89,476 “Local Governments” in 2007. (U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 2011, Table 428.) The criterion by which the size of such local governments is determined to be small is a population of 50,000. However, since the Census Bureau does not specifically apply that criterion, it cannot be determined with precision how many of such local governmental organizations is small. Nonetheless, the inference seems reasonable that substantial number of these governmental organizations has a population of less than 50,000. To look at Table 428 in conjunction with a related set of data in Table 429 in the Census’s Statistical Abstract of the U.S., that inference is further supported by the fact that in both Tables, many entities that may well be small are included in the 89,476 local governmental organizations, e.g. county, municipal, township and town, school district and special district entities. Measured by a criterion of a population of 50,000 many specific sub-entities in this category seem more likely than larger county-level governmental organizations to have small populations. Accordingly, of the 89,476 small governmental organizations identified in the 2007 Census, the Commission estimates that a substantial majority is small.

¹⁷ U.S. Census Bureau, North American Industry Classification System, Definition of “Wireless Telecommunications Carriers (except Satellite),” NAICS code 517210, available at <<http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517210&search=2007%20NAICS%20Search>>

¹⁸ See 13 CFR 121.201, NAICS Code 517210

¹⁹ *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees. The largest category provided is for firms with “1,000 employees or more”.

²⁰ *Id.*

²¹ See *Amendment of Parts 20 and 24 of the Commission’s Rules – Broadband PCS Competitive Bidding and the Commercial Mobile Radio Service Spectrum Cap; Amendment of the Commission’s Cellular/PCS Cross-Ownership Rule*; WT Docket No. 96-59, GN Docket No. 90-314, Report and Order, 11 FCC Rcd 7824, 7850-52, paras. 57-60 (1996) (*PCS Report and Order*); see also 47 CFR § 24.720(b).

²² See *PCS Report and Order*, 11 FCC Rcd at 7852, para. 60.

²³ See *Alvarez Letter 1998*.

auctions. A total of 93 bidders that claimed small business status won approximately 40 percent of the 1,479 licenses in the first auction for the D, E, and F Blocks.²⁴ On April 15, 1999, the Commission completed the reauction of 347 C-, D-, E-, and F-Block licenses in Auction No. 22.²⁵ Of the 57 winning bidders in that auction, 48 claimed small business status and won 277 licenses.

11. On January 26, 2001, the Commission completed the auction of 422 C and F Block Broadband PCS licenses in Auction No. 35. Of the 35 winning bidders in that auction, 29 claimed small business status.²⁶ Subsequent events concerning Auction 35, including judicial and agency determinations, resulted in a total of 163 C and F Block licenses being available for grant. On February 15, 2005, the Commission completed an auction of 242 C-, D-, E-, and F-Block licenses in Auction No. 58. Of the 24 winning bidders in that auction, 16 claimed small business status and won 156 licenses.²⁷ On May 21, 2007, the Commission completed an auction of 33 licenses in the A, C, and F Blocks in Auction No. 71.²⁸ Of the 12 winning bidders in that auction, five claimed small business status and won 18 licenses.²⁹ On August 20, 2008, the Commission completed the auction of 20 C-, D-, E-, and F-Block Broadband PCS licenses in Auction No. 78.³⁰ Of the eight winning bidders for Broadband PCS licenses in that auction, six claimed small business status and won 14 licenses.³¹

12. Narrowband Personal Communications Service. To date, two auctions of narrowband personal communications services (PCS) licenses have been conducted. For purposes of the two auctions that have already been held, “small businesses” were entities with average gross revenues for the prior three calendar years of \$40 million or less. Through these auctions, the Commission has awarded a total of 41 licenses, out of which 11 were obtained by small businesses. To ensure meaningful participation of small business entities in future auctions, the Commission has adopted a two-tiered small business size standard in the Narrowband PCS Second Report and Order.³² A “small business” is an entity that, together with affiliates and controlling interests, has average gross revenues for the three preceding years of not more than \$40 million. A “very small business” is an entity that, together with affiliates and controlling interests, has average gross revenues for the three preceding years of not more than \$15 million. The SBA has approved these small business size standards.³³

²⁴ See *Broadband PCS, D, E and F Block Auction Closes*, Public Notice, Doc. No. 89838 (rel. Jan. 14, 1997).

²⁵ See *C, D, E, and F Block Broadband PCS Auction Closes*, Public Notice, 14 FCC Rcd 6688 (WTB 1999). Before Auction No. 22, the Commission established a very small standard for the C Block to match the standard used for F Block. *Amendment of the Commission’s Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees*, WT Docket No. 97-82, Fourth Report and Order, 13 FCC Rcd 15743, 15768, para. 46 (1998).

²⁶ See *C and F Block Broadband PCS Auction Closes; Winning Bidders Announced*, Public Notice, 16 FCC Rcd 2339 (2001).

²⁷ See *Broadband PCS Spectrum Auction Closes; Winning Bidders Announced for Auction No. 58*, Public Notice, 20 FCC Rcd 3703 (2005).

²⁸ See *Auction of Broadband PCS Spectrum Licenses Closes; Winning Bidders Announced for Auction No. 71*, Public Notice, 22 FCC Rcd 9247 (2007).

²⁹ *Id.*

³⁰ See *Auction of AWS-1 and Broadband PCS Licenses Closes; Winning Bidders Announced for Auction 78*, Public Notice, 23 FCC Rcd 12749 (WTB 2008).

³¹ *Id.*

³² *Amendment of the Commission’s Rules to Establish New Personal Communications Services, Narrowband PCS*, GEN Docket No. 90-314, ET Docket No. 92-100, PP Docket No. 93-253, Second Report and Order and Second Further Notice of Proposed Rulemaking, 15 FCC Rcd 10456 (2000).

³³ See Letter to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC, from Aida Alvarez, Administrator, SBA (Dec. 2, 1998).

13. Wireless Communications Services. This service can be used for fixed, mobile, radiolocation, and digital audio broadcasting satellite uses. The Commission defined “small business” for the wireless communications services (WCS) auction as an entity with average gross revenues of \$40 million for each of the three preceding years, and a “very small business” as an entity with average gross revenues of \$15 million for each of the three preceding years.³⁴ The SBA has approved these definitions.³⁵

14. 700 MHz Guard Band Licensees. In 2000, in the 700 MHz Guard Band Order, the Commission adopted size standards for “small businesses” and “very small businesses” for purposes of determining their eligibility for special provisions such as bidding credits and installment payments.³⁶ A small business in this service is an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding \$40 million for the preceding three years.³⁷ Additionally, a very small business is an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$15 million for the preceding three years.³⁸ SBA approval of these definitions is not required.³⁹ An auction of 52 Major Economic Area licenses commenced on September 6, 2000, and closed on September 21, 2000.⁴⁰ Of the 104 licenses auctioned, 96 licenses were sold to nine bidders. Five of these bidders were small businesses that won a total of 26 licenses. A second auction of 700 MHz Guard Band licenses commenced on February 13, 2001, and closed on February 21, 2001. All eight of the licenses auctioned were sold to three bidders. One of these bidders was a small business that won a total of two licenses.⁴¹

15. Lower 700 MHz Band Licenses. The Commission previously adopted criteria for defining three groups of small businesses for purposes of determining their eligibility for special provisions such as bidding credits.⁴² The Commission defined a “small business” as an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding \$40 million for the preceding three years.⁴³ A “very small business” is defined as an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$15 million for the preceding three years.⁴⁴ Additionally, the lower 700 MHz Service had a third category of small

³⁴ *Amendment of the Commission’s Rules to Establish Part 27, the Wireless Communications Service (WCS)*, GN Docket No. 96-228, Report and Order, 12 FCC Rcd 10785, 10879, para. 194 (1997).

³⁵ See Letter from Aida Alvarez, Administrator, SBA, to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, Federal Communications Commission (filed Dec. 2, 1998) (*Alvarez Letter 1998*).

³⁶ See *Service Rules for the 746–764 MHz Bands, and Revisions to Part 27 of the Commission’s Rules*, WT Docket No. 99-168, Second Report and Order, 15 FCC Rcd 5299 (2000) (*746–764 MHz Band Second Report and Order*).

³⁷ See *id.* at 5343, para. 108.

³⁸ See *id.*

³⁹ See *id.* at 5343, para. 108 n.246 (for the 746–764 MHz and 776–794 MHz bands, the Commission is exempt from 15 USC § 632, which requires Federal agencies to obtain SBA approval before adopting small business size standards).

⁴⁰ See *700 MHz Guard Bands Auction Closes: Winning Bidders Announced*, Public Notice, 15 FCC Rcd 18026 (WTB 2000).

⁴¹ See *700 MHz Guard Bands Auction Closes: Winning Bidders Announced*, Public Notice, 16 FCC Rcd 4590 (WTB 2001).

⁴² See *Reallocation and Service Rules for the 698–746 MHz Spectrum Band (Television Channels 52–59)*, GN Docket No. 01-74, Report and Order, 17 FCC Rcd 1022 (2002) (*Channels 52–59 Report and Order*).

⁴³ See *id.* at 1087-88, para. 172.

⁴⁴ See *id.*

business status for Metropolitan/Rural Service Area (MSA/RSA) licenses—“entrepreneur”—which is defined as an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$3 million for the preceding three years.⁴⁵ The SBA approved these small size standards.⁴⁶ An auction of 740 licenses (one license in each of the 734 MSAs/RSAs and one license in each of the six Economic Area Groupings (EAGs)) commenced on August 27, 2002, and closed on September 18, 2002. Of the 740 licenses available for auction, 484 licenses were won by 102 winning bidders. Seventy-two of the winning bidders claimed small business, very small business or entrepreneur status and won a total of 329 licenses.⁴⁷ A second auction commenced on May 28, 2003, closed on June 13, 2003, and included 256 licenses: 5 EAG licenses and 476 Cellular Market Area licenses.⁴⁸ Seventeen winning bidders claimed small or very small business status and won 60 licenses, and nine winning bidders claimed entrepreneur status and won 154 licenses.⁴⁹ On July 26, 2005, the Commission completed an auction of 5 licenses in the Lower 700 MHz band (Auction No. 60). There were three winning bidders for five licenses. All three winning bidders claimed small business status.

16. In 2007, the Commission reexamined its rules governing the 700 MHz band in the *700 MHz Second Report and Order*.⁵⁰ An auction of 700 MHz licenses commenced January 24, 2008 and closed on March 18, 2008, which included, 176 Economic Area licenses in the A Block, 734 Cellular Market Area licenses in the B Block, and 176 EA licenses in the E Block.⁵¹ Twenty winning bidders, claiming small business status (those with attributable average annual gross revenues that exceed \$15 million and do not exceed \$40 million for the preceding three years) won 49 licenses. Thirty three winning bidders claiming very small business status (those with attributable average annual gross revenues that do not exceed \$15 million for the preceding three years) won 325 licenses.

17. Upper 700 MHz Band Licenses. In the *700 MHz Second Report and Order*, the Commission revised its rules regarding Upper 700 MHz licenses.⁵² On January 24, 2008, the Commission commenced Auction 73 in which several licenses in the Upper 700 MHz band were available for licensing: 12 Regional Economic Area Grouping licenses in the C Block, and one nationwide license in the D Block.⁵³ The auction concluded on March 18, 2008, with 3 winning bidders claiming very small business status (those with attributable average annual gross revenues that do not exceed \$15 million for the preceding three years) and winning five licenses.

⁴⁵ See *id.*, at 1088, para. 173.

⁴⁶ See *Alvarez Letter 1999*.

⁴⁷ See *Lower 700 MHz Band Auction Closes*, Public Notice, 17 FCC Rcd 17272 (WTB 2002).

⁴⁸ See *id.*

⁴⁹ See *id.*

⁵⁰ *Service Rules for the 698–746, 747–762 and 777–792 MHz Band; Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems; Section 68.4(a) of the Commission’s Rules Governing Hearing Aid-Compatible Telephones; Biennial Regulatory Review—Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services; Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission’s Rules; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band; Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010; Declaratory Ruling on Reporting Requirement under Commission’s Part 1 Anti-Collusion Rule*, WT Docket Nos. 07-166, 06-169, 06-150, 03-264, 96-86, PS Docket No. 06-229, CC Docket No. 94-102, Second Report and Order, 22 FCC Rcd 15289, 15359 n. 434 (2007) (*700 MHz Second Report and Order*).

⁵¹ See *Auction of 700 MHz Band Licenses Closes*, Public Notice, 23 FCC Rcd 4572 (WTB 2008).

⁵² *700 MHz Second Report and Order*, 22 FCC Rcd 15289.

⁵³ See *Auction of 700 MHz Band Licenses Closes*, Public Notice, 23 FCC Rcd 4572 (WTB 2008).

18. Advanced Wireless Services. *AWS Services (1710–1755 MHz and 2110–2155 MHz bands (AWS-1); 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz bands (AWS-2); 2155–2175 MHz band (AWS-3)).* For the AWS-1 bands,⁵⁴ the Commission has defined a “small business” as an entity with average annual gross revenues for the preceding three years not exceeding \$40 million, and a “very small business” as an entity with average annual gross revenues for the preceding three years not exceeding \$15 million. For AWS-2 and AWS-3, although we do not know for certain which entities are likely to apply for these frequencies, we note that the AWS-1 bands are comparable to those used for cellular service and personal communications service. The Commission has not yet adopted size standards for the AWS-2 or AWS-3 bands but proposes to treat both AWS-2 and AWS-3 similarly to broadband PCS service and AWS-1 service due to the comparable capital requirements and other factors, such as issues involved in relocating incumbents and developing markets, technologies, and services.⁵⁵

19. Broadband Radio Service and Educational Broadband Service. Broadband Radio Service systems, previously referred to as Multipoint Distribution Service (MDS) and Multichannel Multipoint Distribution Service (MMDS) systems, and “wireless cable,” transmit video programming to subscribers and provide two-way high speed data operations using the microwave frequencies of the Broadband Radio Service (BRS) and Educational Broadband Service (EBS) (previously referred to as the Instructional Television Fixed Service (ITFS)).⁵⁶ In connection with the 1996 BRS auction, the Commission established a small business size standard as an entity that had annual average gross revenues of no more than \$40 million in the previous three calendar years.⁵⁷ The BRS auctions resulted in 67 successful bidders obtaining licensing opportunities for 493 Basic Trading Areas (BTAs). Of the 67 auction winners, 61 met the definition of a small business. BRS also includes licensees of stations authorized prior to the auction. At this time, we estimate that of the 61 small business BRS auction winners, 48 remain small business licensees. In addition to the 48 small businesses that hold BTA authorizations, there are approximately 392 incumbent BRS licensees that are considered small entities.⁵⁸ After adding the number of small business auction licensees to the number of incumbent licensees not already counted, we find that there are currently approximately 440 BRS licensees that are defined as small businesses under either the SBA or the Commission’s rules.

⁵⁴ The service is defined in section 90.1301 *et seq.* of the Commission’s Rules, 47 CFR § 90.1301 *et seq.*

⁵⁵ See *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket No. 02-353, Report and Order, 18 FCC Rcd 25162, Appx. B (2003), modified by *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket No. 02-353, Order on Reconsideration, 20 FCC Rcd 14058, Appx. C (2005); *Service Rules for Advanced Wireless Services in the 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz Bands; Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket Nos. 04-356, 02-353, Notice of Proposed Rulemaking, 19 FCC Rcd 19263, Appx. B (2005); *Service Rules for Advanced Wireless Services in the 2155–2175 MHz Band*, WT Docket No. 07-195, Notice of Proposed Rulemaking, 22 FCC Rcd 17035, Appx. (2007).

⁵⁶ *Amendment of Parts 21 and 74 of the Commission’s Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service and Implementation of Section 309(j) of the Communications Act—Competitive Bidding*, MM Docket No. 94-131, PP Docket No. 93-253, Report and Order, 10 FCC Rcd 9589, 9593, para. 7 (1995).

⁵⁷ 47 CFR § 21.961(b)(1).

⁵⁸ 47 USC § 309(j). Hundreds of stations were licensed to incumbent MDS licensees prior to implementation of Section 309(j) of the Communications Act of 1934, 47 USC § 309(j). For these pre-auction licenses, the applicable standard is SBA’s small business size standard of 1500 or fewer employees.

20. In 2009, the Commission conducted Auction 86, the sale of 78 licenses in the BRS areas.⁵⁹ The Commission offered three levels of bidding credits: (i) a bidder with attributed average annual gross revenues that exceed \$15 million and do not exceed \$40 million for the preceding three years (small business) received a 15 percent discount on its winning bid; (ii) a bidder with attributed average annual gross revenues that exceed \$3 million and do not exceed \$15 million for the preceding three years (very small business) received a 25 percent discount on its winning bid; and (iii) a bidder with attributed average annual gross revenues that do not exceed \$3 million for the preceding three years (entrepreneur) received a 35 percent discount on its winning bid.⁶⁰ Auction 86 concluded in 2009 with the sale of 61 licenses.⁶¹ Of the ten winning bidders, two bidders that claimed small business status won 4 licenses; one bidder that claimed very small business status won three licenses; and two bidders that claimed entrepreneur status won six licenses.

21. In addition, the SBA's Cable Television Distribution Services small business size standard is applicable to EBS. There are presently 2,436 EBS licensees. All but 100 of these licenses are held by educational institutions. Educational institutions are included in this analysis as small entities.⁶² Thus, we estimate that at least 2,336 licensees are small businesses. Since 2007, Cable Television Distribution Services have been defined within the broad economic census category of Wired Telecommunications Carriers; that category is defined as follows: "This industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies."⁶³ The SBA has developed a small business size standard for this category, which is: all such firms having 1,500 or fewer employees. To gauge small business prevalence for these cable services we must, however, use the most current census data that are based on the previous category of Cable and Other Program Distribution and its associated size standard; that size standard was: all such firms having \$13.5 million or less in annual receipts.⁶⁴ According to Census Bureau data for 2007, there were a total of 996 firms in this category that operated for the entire year.⁶⁵ Of this total, 948 firms had annual receipts of under \$10 million, and 48 firms had receipts of \$10 million or more but less than \$25 million.⁶⁶ Thus, the majority of these firms can be considered small. In the Paging *Third Report and Order*, we developed a small business size standard for "small businesses" and "very small businesses" for purposes of determining their eligibility for special provisions such as bidding credits and installment

⁵⁹ Auction of Broadband Radio Service (BRS) Licenses, Scheduled for October 27, 2009, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 86, AU Docket No. 09-56, *Public Notice*, 24 FCC Rcd 8277 (2009).

⁶⁰ *Id.* at 8296 para. 73.

⁶¹ Auction of Broadband Radio Service Licenses Closes, Winning Bidders Announced for Auction 86, Down Payments Due November 23, 2009, Final Payments Due December 8, 2009, Ten-Day Petition to Deny Period, *Public Notice*, 24 FCC Rcd 13572 (2009).

⁶² The term "small entity" within SBREFA applies to small organizations (nonprofits) and to small governmental jurisdictions (cities, counties, towns, townships, villages, school districts, and special districts with populations of less than 50,000). 5 USC §§ 601(4)-(6). We do not collect annual revenue data on EBS licensees.

⁶³ U.S. Census Bureau, 2012 NAICS Definitions, "517110 Wired Telecommunications Carriers," (partial definition), <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517110&search=2012>.

⁶⁴ 13 CFR § 121.201, NAICS code 517110.

⁶⁵ U.S. Census Bureau, 2007 Economic Census, Subject Series: Information, Receipts by Enterprise Employment Size for the United States: 2007, NAICS code 517510 (rel. Nov. 19, 2010).

⁶⁶ *Id.*

payments.⁶⁷ A “small business” is an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding \$15 million for the preceding three years. Additionally, a “very small business” is an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$3 million for the preceding three years.⁶⁸ The SBA has approved these small business size standards.⁶⁹ An auction of Metropolitan Economic Area licenses commenced on February 24, 2000, and closed on March 2, 2000.⁷⁰ Of the 985 licenses auctioned, 440 were sold. Fifty-seven companies claiming small business status won. Also, according to Commission data, 365 carriers reported that they were engaged in the provision of paging and messaging services.⁷¹ Of those, we estimate that 360 are small, under the SBA-approved small business size standard.⁷²

22. Wireless Communications Service. This service can be used for fixed, mobile, radiolocation, and digital audio broadcasting satellite uses. The Commission established small business size standards for the wireless communications services (WCS) auction.⁷³ A “small business” is an entity with average gross revenues of \$40 million for each of the three preceding years, and a “very small business” is an entity with average gross revenues of \$15 million for each of the three preceding years. The SBA has approved these small business size standards.⁷⁴ The Commission auctioned geographic area licenses in the WCS service. In the auction, there were seven winning bidders that qualified as “very small business” entities, and one that qualified as a “small business” entity.

23. Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing. This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.⁷⁵ The Small Business Administration has established a size standard for this industry of 750 employees or less.⁷⁶ Census data for 2012 show that 841 establishments operated in this

⁶⁷ *Amendment of Part 90 of the Commission’s Rules to Provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service*, PR Docket No. 89-552, Third Report and Order and Fifth Notice of Proposed Rulemaking, 12 FCC Rcd 10943, 11068-70, paras. 291-295, 62 FR 16004 (Apr. 3, 1997).

⁶⁸ See Letter to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC, from A. Alvarez, Administrator, SBA (Dec. 2, 1998).

⁶⁹ *Revision of Part 22 and Part 90 of the Commission’s Rules to Facilitate Future Development of Paging Systems*, Memorandum Opinion and Order on Reconsideration and Third Report and Order, 14 FCC Rcd 10030, paras. 98-107 (1999).

⁷⁰ *Id.* at 10085, para. 98.

⁷¹ FCC Wireline Competition Bureau, Industry Analysis and Technology Division, “Trends in Telephone Service” at Table 5.3., page 5-5 (Feb. 2007). This source uses data that are current as of October 20, 2005.

⁷² *Id.*

⁷³ Public Notice, “Auction of Wireless Communications Services, Auction Notes and Filing Requirements for 128 WCS Licenses Scheduled for April 15, 1997,” DA 97-386, Feb. 21, 1997.

⁷⁴ SBA Dec. 2, 1998 Letter.

⁷⁵ <https://www.census.gov/cgi-bin/sssd/naics/naicsrch>

⁷⁶ 13.CFR121.201, NAICS Code 334220

industry in that year. Of that number, 819 establishments operated with less than 500 employees.⁷⁷ Based on this data, we conclude that a majority of manufacturers in this industry is small.

24. Software Publishers. Since 2007 these services have been defined within the broad economic census category of Custom Computer Programming Services; that category is defined as establishments primarily engaged in writing, modifying, testing, and supporting software to meet the needs of a particular customer.⁷⁸ The SBA has developed a small business size standard for this category, which is annual gross receipts of \$25 million or less.⁷⁹ According to data from the 2007 U.S. Census, there were 41,571 establishments engaged in this business in 2007. Of these, 40,149 had annual gross receipts of less than \$10,000,000. Another 1,422 establishments had gross receipts of \$10,000,000 or more.⁸⁰ Based on this data, the Commission concludes that the majority of the businesses engaged in this industry are small.

25. NCE and Public Broadcast Stations. The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in broadcasting images together with sound. These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public.”⁸¹ The SBA has created a small business size standard for Television Broadcasting entities, which is: such firms having \$13 million or less in annual receipts.⁸² According to Commission staff review of the BIA Publications, Inc., Master Access Television Analyzer Database as of May 16, 2003, about 814 of the 1,220 commercial television stations in the United States had revenues of \$12 (twelve) million or less. We note, however, that in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations⁸³ must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies.

26. In addition, an element of the definition of “small business” is that the entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimate of small businesses to which rules may apply do not exclude any television station from the definition of a small business on this basis and are therefore over-inclusive to that extent. Also as noted, an additional element of the definition of “small business” is that the entity must be independently owned and operated. We note that it is difficult at times to assess these criteria in the context of media entities and our estimates of small businesses to which they apply may be over-inclusive to this extent. There are

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http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_31SG2&prodType=table

⁷⁸ <http://www.census.gov/cgi-bin/sssd/naics/naicsrch>

⁷⁹ 13 CFR Section 121.201

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http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_54SSSZ1&prodType=table

⁸¹ U.S. Census Bureau, 2002 NAICS Definitions, “515120 Television Broadcasting” (partial definition); <http://www.census.gov/epcd/naics02/def/NDEF515.HTM>.

⁸² 13 CFR § 121.201, NAICS code 515120.

⁸³ “Concerns are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has to power to control both.” 13 CFR § 21.103(a)(1).

also 2,117 low power television stations (LPTV).⁸⁴ Given the nature of this service, we will presume that all LPTV licensees qualify as small entities under the above SBA small business size standard.

27. The Commission has, under SBA regulations, estimated the number of licensed NCE television stations to be 380.⁸⁵ We note, however, that, in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations⁸⁶ must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. The Commission does not compile and otherwise does not have access to information on the revenue of NCE stations that would permit it to determine how many such stations would qualify as small entities.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

28. In the *WEA Report and Order*, we amend our Part 10 rules for Participating CMS Providers, as defined in the WEA rules, to require them to create and maintain logs of Alert Messages received at their Alert Gateway from FEMA IPAWS,⁸⁷ and to make available to emergency management agencies information about the measures they take to geo-target Alert Messages transmitted by that agency.⁸⁸

29. We consider compliance costs associated with the alert logging and geo-targeting disclosure rules that we adopt today to be reporting and recordkeeping costs.⁸⁹ These costs include a one-time expense to establish the Alert Gateway logging capability for the few Participating CMS Providers that may not already have this capability, and the small, annual expense of automatically generating and maintaining alert logs, and the potentially larger expense of the employment of a clerical worker to respond to emergency management agencies' requests for alert log data or requests for information about geo-targeting.⁹⁰ These alert logging and reporting requirements represent a somewhat more lenient version of the alert logging requirements we proposed in the *WEA NPRM*.⁹¹ To the extent these costs may still present a burden to non-nationwide Participating CMS Providers, we offer such entities an extended timeframe for compliance in order to allow them to standardize appropriate gateway behavior and integrate any updates into their regular technology refresh cycle.⁹²

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

30. The RFA requires an agency to describe any significant, specifically small business alternatives that it has considered in reaching its conclusions, which may include the following four

⁸⁴ *FCC News Release*, "Broadcast Station Totals as of September 30, 2005."

⁸⁵ See *Broadcast Station Totals*, *supra* IRFA note 11.

⁸⁶ "[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has to power to control both." 13 CFR § 121.103(a)(1).

⁸⁷ See *supra* Section III.B.1 (Logging Alert Messages at the Participating CMS Provider Alert Gateway).

⁸⁸ See *supra* Section III.B.2 (Narrowing Geo-targeting Requirements).

⁸⁹ See *supra* paras. 101, 102 (discussing the costs of our alert logging requirements).

⁹⁰ See *id.*

⁹¹ See *WEA NPRM*, 30 FCC Rcd at 13810, para. 56 (proposing to require Participating CMS Providers to log alert messages with time stamps and error messages, where appropriate, proposing to require that Participating CMS Providers maintain logs for 90 days and archived logs for 36 months, and seeking comment on how alert logs should be shared); *but see id.* (proposing that the Alert Gateway generate monthly system performance statistics).

⁹² See *supra* para. 82 (discussing the compliance timeframes for our alert logging rules).

alternatives (among others): “(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.”⁹³

31. The compliance requirements in this *WEA Report and Order* have been adjusted to accommodate the special circumstances of non-nationwide Participating CMS Providers with respect to our WEA geo-targeting requirements and our alert logging requirements. According to the *Annual Competition Report*, “there are four nationwide providers in the U.S. with networks that cover a majority of the population and land area of the country – Verizon Wireless, AT&T, Sprint, and T-Mobile.”⁹⁴ Consistent with the *Annual Competition Report*, we refer to other providers with “networks that are limited to regional and local areas” as non-nationwide Participating CMS Providers.⁹⁵ We allow non-nationwide Participating CMS Providers one year within which to comply with our WEA geo-targeting rules and two years to comply with our alert logging rules, instead of sixty days from the rules’ publication in the *Federal Register*, in light of a non-nationwide Participating CMS Provider’s inability to meet that standard immediately, and our concern that other non-nationwide Participating CMS Providers may be similarly situated.⁹⁶ We believe that applying the same rules equally to all entities in this context is not necessary to alleviate potential confusion from adopting different rules for Participating CMS Providers because most consumers do not have insight into the relative accuracy of various Participating CMS Providers geo-targeting capabilities, and because alert logging is not a consumer facing service. We believe, and the record in this proceeding confirms, that the costs and/or administrative burdens associated with the rules will not unduly burden small entities, particularly in light of the special consideration we provide to them. These requirements will implicate no additional legal concerns, and will require no additional professional assistance for non-nationwide Participating CMS Providers.

32. Based on our review of the record, we find that it is practicable for all Participating CMS Providers, including non-nationwide Participating CMS Providers, to implement WEA improvements without incurring unduly burdensome costs, especially considering the special treatment that we afford non-nationwide Participating CMS Providers. The *WEA Report and Order* recognizes that technical and operational issues must be addressed before compliance can be required, and allows sufficient time for nationwide and non-nationwide Participating CMS Providers to achieve compliance with today’s rules.

33. In considering the record received in response to the *WEA NPRM*, we examined additional alternatives to ease the burden on non-nationwide EAS Participants. These alternatives included adopting longer compliance timeframes than those initially proposed; requiring Participating CMS Providers to support WEA Alert Messages that contain only 360 characters, as opposed to 1,380, as considered by the *Updated START Report*;⁹⁷ requiring support for only additional languages that are currently supported by standards, as opposed to others as initially proposed; and allowing Participating CMS Providers geo-target an Alert Message to an area that “best approximates” the target area, as opposed to one that is “no larger than” the target area using device-based geo-fencing techniques, as proposed. Additionally, the rules adopted in this *WEA Report and Order* are technologically neutral in order to enable small entities flexibility to comply with our rules using technologies offered by a variety

⁹³ 5 USC §§ 603(c)(1)-(c)(4).

⁹⁴ *Sixteenth Annual Competition Report*, 28 FCC Rcd at 3736-37, para. 26; *supra* note 15.

⁹⁵ *Sixteenth Annual Competition Report*, 28 FCC Rcd at 3736-37, para. 26; *supra* note 15.

⁹⁶ See *supra* paras. 82, 83 (explaining our rationale for adopting longer compliance timeframes for non-nationwide Participating CMS Providers with respect to our geo-targeting and alert logging rules).

⁹⁷ See *Updated START Report* at 1

of vendors. Finally, we sought further comment on some issues where the record demonstrated that it would be premature to adopt rules at this time, particularly for non-nationwide CMS Providers.

34. Finally, in the event that small entities face unique circumstances with respect to these rules, such entities may request waiver relief from the Commission. Accordingly, we find that we have discharged our duty to consider the burdens imposed on small entities.

F. Legal Basis

35. The legal basis for the actions taken pursuant to this *WEA Report and Order* is contained in sections 1, 4(i) and (o), 201, 303(r), 403, and 706 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i) and (o), 201, 303(r), 403, and 606, as well as sections 602(a),(b),(c), (f), 603, 604 and 606 of the WARN Act.

36. **Report to Congress:** The Commission will send a copy of the *WEA Report and Order*, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act.⁹⁸ In addition, the Commission will send a copy of the *WEA Report and Order*, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the *WEA Report and Order* and FRFA (or summaries thereof) will also be published in the Federal Register.

⁹⁸ See 5 USC § 801(a)(1)(A).

APPENDIX D

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ we have prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this *Further Notice of Proposed Rulemaking (Further Notice)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *Further Notice*. We will send a copy of the *Further Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).² In addition, the *Further Notice* and IRFA (or summaries thereof) will be published in the Federal Register.³

A. Need for, and Objectives of, the Final Rules

2. With this *Further Notice*, we take another step towards strengthening Wireless Emergency Alerts (WEA) by proposing revisions to our rules to empower alert originators to participate more fully in WEA, to empower consumers to make more informed decisions about the kind of WEA service that their CMS Provider offers, and to enhance the utility of WEA as an alerting tool. Our proposals fall into four categories, ensuring the provision of effective WEA Alert Messages, incorporating future technical advancements to improve WEA, developing consumer education tools, and improving WEA transparency.

3. Specifically, with respect to ensuring the provision of effective WEA Alert Messages, we propose to establish clear definitions and requirements for CMS Providers participating in WEA in whole and in part.⁴ We ensure the provision of effective WEA Alert Messages by removing language from our rules that may contribute to emergency management agencies' uncertainty about WEA's quality of service.⁵ We require Participating CMS Providers to offer subscribers a method of accessing pending Alert Messages.⁶ We propose to require that earthquake-related alerts be delivered to the public in fewer than three seconds.⁷ We also seek comment on how to leverage the improvements to WEA that we adopt today to continue to improve WEA's value during disaster relief efforts.⁸ With respect to incorporating future technical advancements into WEA, we seek comment on and propose of a number of technological innovations that could expand WEA's multimedia,⁹ multilingual and geo-targeting capabilities,¹⁰ including innovations on 5G networks.¹¹ With respect to developing consumer education tools, we propose to promote more informed consumer choice through improvements to the point-of-sale

¹ See 5 USC § 603. The RFA, see 5 USC §§ 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² See 5 USC § 603(a).

³ *Id.*

⁴ See *supra* Section IV.A.1 (Defining the Modes of Participation in WEA).

⁵ See *supra* Section IV.A.2 (Infrastructure Functionality).

⁶ See *supra* Section IV.A.3 (Alert Message Preservation).

⁷ See *supra* Section IV.A.4 (Earthquake Alert Prioritization).

⁸ See *supra* Section IV.A.5 (Disaster Relief Messaging).

⁹ See *supra* Section IV.B.1 (Multimedia Alerting).

¹⁰ See *supra* Section IV.B.2 (Multilingual Alerting); see also *supra* Section IV.B.3 (Matching the Geographic Target Area).

¹¹ See *supra* Section IV.B.4 (WEA on 5G Networks).

notifications for Participating CMS Providers' mobile devices,¹² and to the WEA interface.¹³ Finally, we propose to improve WEA transparency through requiring Participating CMS Providers to disclose their performance along three key metrics, latency, geo-targeting, and reliability,¹⁴ and we seek comment on whether additional alert logging could be instrumental in allowing them to collect relevant data.¹⁵

4. This *Further Notice* represents another step towards achieving one of our highest priorities – “to ensure that all Americans have the capability to receive timely and accurate alerts, warnings and critical information regarding disasters and other emergencies.”¹⁶ This *Further Notice* also is consistent with our obligation under Executive Order 13407 to “adopt rules to ensure that communications systems have the capacity to transmit alerts and warnings to the public as part of the public alert and warning system,” and our mandate under the Communications Act to promote the safety of life and property through the use of wire and radio communication.¹⁷ We take these steps as part of an overarching strategy to advance the Nation’s alerting capability, which includes both WEA and the Emergency Alert System (EAS), to keep pace with evolving technologies and to empower communities to initiate life-saving alerts.

B. Legal Basis

5. The proposed action in this *WEA Further Notice of Proposed Rulemaking* is authorized on the basis of sections 1, 4(i) and (o), 201, 303(r), 403, and 706 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i) and (o), 201, 303(r), 403, and 606, as well as sections 602(a),(b),(c), (f), 603, 604 and 606 of the WARN Act.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

6. The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.¹⁸ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”¹⁹ In addition, the term “small business” has the same meaning as the term “small-business concern” under the Small Business Act.²⁰ A small-business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.²¹

¹² See *supra* Section IV.C.1 (Promoting Informed Consumer Choice at the Point of Sale).

¹³ See *supra* Section IV.C.2 (Promoting Informed Consumer Choice about the Receipt of WEA Alert Messages).

¹⁴ See *supra* Section IV.D.1 (Annual WEA Performance Reporting).

¹⁵ See *supra* Section IV.D.2 (Alert Logging Standards and Implementation).

¹⁶ See Lisa Fowlkes, 21st Century Emergency Alerting: Leveraging Multiple Technologies to Bring Alerts and Warnings to the Public, at 1 (2010), <https://www.fcc.gov/news-events/blog/2010/05/26/21st-century-emergency-alerting-leveraging-multiple-technologies-bring> (last visited Jul. 21, 2016).

¹⁷ See White House, Executive Order 13407, Public Alert and Warning System (2006); 47 USC § 151.

¹⁸ See 5 USC § 603(b)(3).

¹⁹ See 5 USC § 601(6).

²⁰ See 5 USC § 601(3) (incorporating by reference the definition of “small-business concern” in the Small Business Act, 15 USC § 632). Pursuant to 5 USC § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

²¹ See 15 USC § 632.

7. See *Appendix C, Final Regulatory Flexibility Analysis* for a detailed description of, and an estimate of, the number of small entities that may be affected by any rules that may be adopted in response to the *FNPRM*.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

8. This *Further Notice* proposes new or modified reporting or recordkeeping requirements. We seek comment on whether the reporting, recordkeeping, and other compliance requirements we adopt today should affect all entities in the same manner, or whether we should make special accommodations for non-nationwide entities.²²

9. We propose to require Participating CMS Providers to offer potential subscribers notice at the point of sale that more accurately reflects the extent to which they will offer WEA.²³ We propose to require Participating CMS Providers, to gather, analyze and report on system performance metrics such as the geo-targeting, latency, and availability and reliability.²⁴ We seek comment on whether to increase system transparency further by adopting additional alert logging requirements.²⁵ We seek comment on the costs of compliance with these proposed rules. With respect to our Annual Performance Reporting Requirements, we also seek comment on whether non-nationwide Participating CMS Providers merit special consideration as regards their collection of relevant data.²⁶

E. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

10. The RFA requires an agency to describe any significant alternatives that it has considered in developing its approach, which may include the following four alternatives (among others): “(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities.”²⁷

11. As noted in paragraph 1 above, this *Further Notice* initiates a rulemaking to update the rules governing the WEA system by which Participating CMS Providers may elect to transmit emergency alerts to the public, a goal mandated by the WARN Act and consistent with the Commission’s obligation to protect the lives and property of the public. Primarily, this *Further Notice* seeks comment on four general categories of proposed rule changes: ensuring the provision of effective WEA Alert Messages, incorporating future technical advancements to improve WEA, developing consumer education tools, and improving WEA transparency.

²² See, e.g., *supra* para.180 (seeking comment on alternative compliance timeframes for non-nationwide Participating CMS Providers); *supra* para. 186 (seeking comment on how to minimize costs and burdens, particularly for non-nationwide Participating CMS Providers).

²³ See *supra* Section IV.C.1 (Promoting Informed Consumer Choice at the Point of Sale).

²⁴ See *supra* Section IV.D.1 (Annual WEA Performance Reporting).

²⁵ See *supra* Section IV.D.2 (Alert Logging Standards and Implementation).

²⁶ See *supra* para. 165 (seeking comment on whether non-nationwide Participating CMS Providers should be subject to less frequent reporting requirements); *supra* para. 168 (seeking comment on whether to allow non-nationwide Participating CMS Providers to collect less granular data); *supra* para. 169 (seeking comment on whether to remain implementation agnostic, at least with respect to how non-nationwide Participating CMS Providers collect data).

²⁷ 5 USC § 603(c)(1) – (c)(4).

12. With respect to ensuring the provision of effective WEA Alert Messages, we seek comment on whether there are any particular considerations that we should take into account when defining the nature of a Participating CMS Provider's participation in WEA due to the electing entity's size.²⁸ We also seek comment on whether non-nationwide Participating CMS Providers require the regulatory flexibility implicated by certain provisions of Sections 10.330 and 10.500, and if so, whether we should retain the flexibility that the current language of those rules may provide only as applicable to them.²⁹ With respect to incorporating technical advancements to improve WEA, we seek comment on whether support for additional languages would be unduly burdensome for non-nationwide Participating CMS Providers, and if so, whether there are steps that we can take to accommodate these entities to make compliance more feasible.³⁰ We also seek comment on whether alternative geo-targeting standards would be appropriate for non-nationwide Participating CMS Providers.³¹ With respect to developing consumer education tools, we seek comment on whether we should give special consideration to non-nationwide entities if we were to require Participating CMS Providers to offer a consistent menu of opt-out choices, and on whether non-nationwide Participating CMS Providers should be required to make more lenient disclosures at the point of sale.³² Finally, with respect to improving WEA transparency, we propose the use of performance, rather than design standards to collect information relevant to our analysis of WEA's system integrity.³³ We also seek comment on whether it would be appropriate to adopt an alternative, less frequent reporting requirement for non-nationwide Participating CMS Providers, and on whether such Participating CMS Providers should also be allowed to collect less granular data on system performance in order to reduce any cost burdens entailed by these proposed recordkeeping and reporting requirements.³⁴

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

13. None.

²⁸ See *supra* para. 110 (seeking comment on whether and how to mitigate disclosure burdens for non-nationwide Participating CMS Providers for disclosures related to their participation in WEA).

²⁹ See *supra* para. 114 (seeking comment on whether, if we remove certain language from our rules, we should retain flexibility for non-nationwide Participating CMS Providers).

³⁰ See *supra* para. 137 (seeking comment on whether to make special accommodations for non-nationwide Participating CMS Providers with respect to their multilingual service offerings).

³¹ See *supra* para. 140 (seeking comment on whether non-nationwide Participating CMS Providers should be subject to alternative geo-targeting accuracy requirements).

³² See *supra* para. 158 (seeking comment on whether to make accommodations for non-nationwide Participating CMS Providers with respect to the consumer opt-out menu).

³³ See *supra* para. 169 (seeking comment on whether to remain implementation agnostic, at least with respect to how non-nationwide Participating CMS Providers collect data).

³⁴

APPENDIX E

List of Commenters to the Wireless Emergency Alerts (WEA) NPRMPS Docket 15-91

Initial Commenters	Abbreviation
AC&C, LLC	AC&C
AccuWeather, Inc.	AccuWeather, Inc.
Adolph Holmes	Adolph Holmes
Art Botterrell	Art Botterrell
Association of Public-Safety Communications Officials	APCO
Ashtabula County Emergency Management Agency	Ashtabula County EMA
AT&T Services Inc.	AT&T
Alliance for Telecommunications Industry Solutions	ATIS
Andrew Brown	Andrew Brown
AWARN Coalition	AWARN Coalition
Beaufort County Emergency Management, Fire Marshal & Emergency Services	Beaufort County
Bosque County Office of Emergency Management	Bosque County OEM
Boulder Regional Emergency Telephone Service Authority	BRETSA
Calcasieu Parish Police Jury Office of Homeland Security and Emergency Preparedness	Calcasieu Parish
California Governor's Office of Emergency Services	California Governor's OES
Carter County Emergency Management	Carter County EM
Cellular Telephone Industries Association	CTIA
City of Austin Homeland Security and Emergency Management	Austin HSEM
City of Henderson, Nevada Office of Emergency Management	Henderson OEM
City of Houston Office of Public Safety and Homeland Security	Houston OPHS
City of Lexington, Division of Emergency Management of Emergency Management	City of Lexington, Division
City of Peoria Emergency Communications Center	Peoria ECC

Clark County Office of Emergency Management	CCOEM
Cochise County Office of Emergency Services	Cochise County OES
County of San Joaquin Office of Emergency Services	San Joaquin OES
Denver Office of Emergency Management	Denver OEMHS
Department of Homeland Security – FEMA	FEMA
Douglas County, WA Emergency Management	Douglas County EMA
Douglas Hilton	Douglas Hilton
Eagle County, Colorado Emergency Management	Eagle County EM
Eliot Christian	Eliot Christian
Emergency Communications Network	ECN
Emmis Communications Corporation	Emmis
Eric Brewer	Eric Brewer
Florida Department of Law Enforcement	FL Law Enforcement
Fort Riley Emergency Management	Fort Riley EM
Franklin William Bell	Franklin William Bell
Gary Timm	Gary Timm
Global Security Systems, LLC	GSS
Harris County Office of Homeland Security & Emergency Management	Harris County OHSEM
Hisham Kissab	Hisham Kissab
Indiana Department of Homeland Security	Indiana DHS
International Association of Firefighters	IAFC
Iowa Flood Center at the University of Iowa	Iowa Flood Center
Jefferson Parish Emergency Management	Jefferson Parish EM
Kansas City Emergency Management	Kansas City EM
Karen Kempert	Karen Kempert
Kathi Metzler	Kathi Metzler
Ken Daughtry	Ken Daughtry
Kimball Croft	Kimball Croft
Kimberly Prosser	Kimberly Prosser

Kristin Card	Kristin Card
Krown Manufacturing	Krown Manufacturing
Lew Pettit	Lew Pettit
Lloyd Colston	Lloyd Colston
Lloyd Ewing	Lloyd Ewing
Los Angeles Emergency Management Department	Los Angeles EMD
Mark Maxwell	Mark Maxwell
Mark Wood	Mark Wood
Martinsville-Henry County 911 Communication Center Maryland Emergency Management Agency	Martinsville-Henry County Maryland EMA
Mason County Emergency Management	Mason County EM
Matanuska-Susitna Borough	Matanuska-Susitna Borough
Matthew Biddle	Matthew Biddle
Michelle Lloyd	Michelle Lloyd
Microsoft Corporation	Microsoft
Mona Barnes	Mona Barnes
Nathan Garibay	Nathan Garibay
National Association of Broadcasters and National Public Radio	NAB & NPR
National Center for Missing & Exploited Children	NCMEC
National Public Safety Telecommunications Council	NPSTC
Nebraska State Emergency Communication Committee	Nebraska SECC
New York City Emergency Management	NYCEM
Newaygo County Emergency Services	Newaygo County EM
NOAA/National Weather Service	NWS
Northern Illinois University Environmental Health and Safety Department	N. Illinois University EHSD
Omaha-Douglas County Emergency Management Agency	Omaha-Douglas Cnty. EMA
Osage County Emergency Management Agency	Osage County EMA
Patrick Harvey	Patrick Harvey
Pinellas County Emergency Management	Pinellas County EM

Public Broadcasting Service, Association of Public Television Stations, and Corporation for Public Broadcasting	PBS, APTS, and CPB
Ron Wolbert	Ron Wolbert
Sam Asher Computing Services, Inc. dba Hyper-Reach	Hyper-Reach
San Antonio Office of Emergency Management	San Antonio OEM
San Francisco International Airport Safety & Security Services	San Francisco Int'l Airport
Sprint Corporation	Sprint
Steve Mathews	Steve Mathews
Sylvia Murdolo	Sylvia Murdolo
T-Mobile USA, Inc.	T-Mobile
TeleCommunication Systems, Inc.	Telecommunication Systems
Telecommunications for the Deaf and Hard of Hearing, Inc.	TDI
The Weather Company	The Weather Company
Tom Doering	Tom Doering
Tom Glass	Tom Glass
University of Southern Mississippi Department of Geography and Geology	University of S. Mississippi
United States Coast Guard	USCG
United States Geological Survey	USGS
Vail Public Safety Communications Center and Vail Police Department	Vail PSCC and PD
Ventura County Sheriff Office of Emergency Services	Ventura County Sheriff EMS
Verizon	Verizon
Washoe County Emergency Management and Homeland Security	Washoe County EMHS
Winnebago County Emergency Management	Winnebago County EM
Wireless RERC	Wireless RERC
Wyoming Department of Transportation	Wyoming DOT
Zane Steves	Zane Steves

Reply Commenters

Boulder Regional Emergency Telephone Service Authority	BRETSA
Cellular Telephone Industries Association	CTIA
Harris County Office of Homeland Security & Emergency Management	Harris County OHSEM
Hubbard Radio, LLC	Hubbard
Microsoft Corporation	Microsoft
Sprint Corporation	Sprint
T-Mobile USA, Inc.	T-Mobile
Telecommunications for the Deaf and Hard of Hearing, Inc.	TDI

Abbreviation***Ex Parte* Filers**

Aaron Conti	Aaron Conti
Advanced Computer and Communications, LLC	AC&C
Alliance for Telecommunications Industry Solutions	ATIS
Apple Inc.	Apple
Association of Public-Safety Communications Officials	APCO
AT&T Services Inc.	AT&T
BlackBerry Corporation	Blackberry
Bluegrass Cellular, Inc.	Bluegrass
Boulder Regional Emergency Telephone Service Authority	BRETSA
Calhoun County Emergency Management Agency	Calhoun Co. EMA
Carnegie Mellon University – Silicon Valley	CMU-SV
Catherine Clubb-Brown	Catherine Clubb-Brown
Cellular South (dba C Spire)	C Spire
Cellular Telephone Industries Association	CTIA
City of Houston Office of Emergency Management	Houston OEM
City of Houston Office of Public Safety and Homeland Security	Houston PS&HS
City of Los Angeles Emergency Management Department	LA EMD

Abbreviation

City of San Francisco Department of Emergency Management	SF DEM
City of Seattle Office of Emergency Management	Seattle OEM
Competitive Carriers Association	CCA
Comtech Telecommunications Corp.	Comtech
CTIA	CTIA
Denis Gusty, Department of Homeland Security	Denis Gusty
Dennis Mileti	Dennis Mileti
Denver Office of Emergency Management & Homeland Security	Denver OEMHS
Department of Homeland Security – FEMA	FEMA
Disability Advisory Committee	DAC
District of Columbia Homeland Security & Emergency Management Agency	DC HSEMA
Emergency Communications Network	ECN
Everbridge	Everbridge
Gary Bootay	Gary Bootay
Harris County Office of Homeland Security & Emergency Management	Harris County OHSEM
Indiana Statewide 911 Board	Indiana 911 Board
inPhase Wireless	inPhase
Iowa Homeland Security and Emergency Management	Iowa HS & EM
Jacob Epstein	Jacob Epstein
location.io RX Networks	location.io
Mark Wood	Mark Wood
Mayco Ayala	Mayco Ayala
Microsoft Corporation	Microsoft
Nassau County Office of Emergency Management	Nassau Co. OEM
National Alliance of State Broadcasters Associations	State Broadcasters Assoc.
National Association of Broadcasters	NAB
National Center for Missing & Exploited Children	NCMEC
New York City Emergency Management Department	NYCEM

New York City Fire Department	NYFD
New York City Office of the Mayor	Mayor Bill de Blasio
New York City Police Department	NYPD
NOAA/National Weather Service	NWS
Nolan Peek	Nolan Peek
Nsighttel Wireless, LLC (dba Cellcom)	Cellcom
Public Broadcasting Service	PBS
Public Broadcasting Service, Association of Public Television Stations, and Corporation for Public Broadcasting	PBS, APTS, and CPB
Public Broadcasting Service and Wavetech Services LLC	PBS and Wavetech
Riverside Fire Department Office of Emergency Management; New York City Emergency Management; Harris County Office of Homeland Security & Emergency Management; Calhoun County Emergency Management Agency; AC&C, LLC; Federal Emergency Management Agency	Riverside FDOEM; NYCEM; Harris County OSHEM; Calhoun Co. EMA; AC&C; FEMA
Robert Kluver	Robert Kluver
Sean Avne	Sean Avne
Sean Digiacomio	Sean Digiacomio
SecuLore Solutions, LLC	SecuLore Solutions
State of Alaska	Alaska
Sylvana Berry	Sylvana Berry
Telecommunications for the Deaf and Hard of Hearing, Inc., National Association of the Deaf, Deaf and Hard of Hearing Consumer Advocacy Network, Hearing Loss Association of America, Association of Late-Deafened Adults, Inc., and Gallaudet University Rehabilitation Engineering Research Center on Technology for the Deaf and Hard of Hearing	TDI, NAD, DHHCAN, HLAA, ALDA, and DHH- RERC
Telecommunications Industry Association	TIA
United States Cellular Corporation	U.S. Cellular
Verizon	Verizon
William W. Shields	William W. Shields

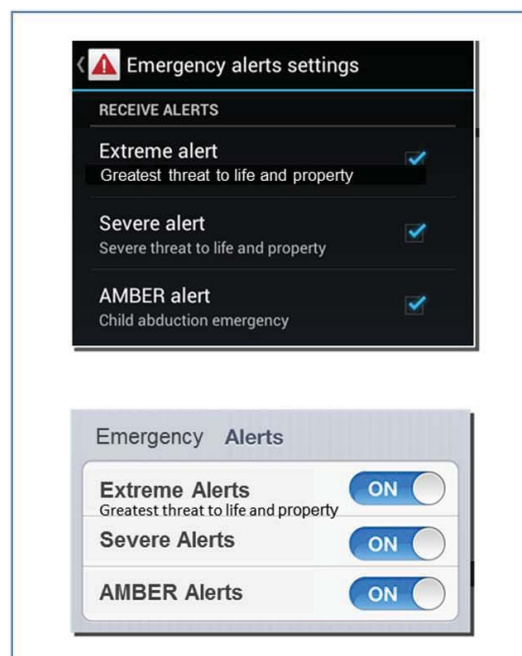
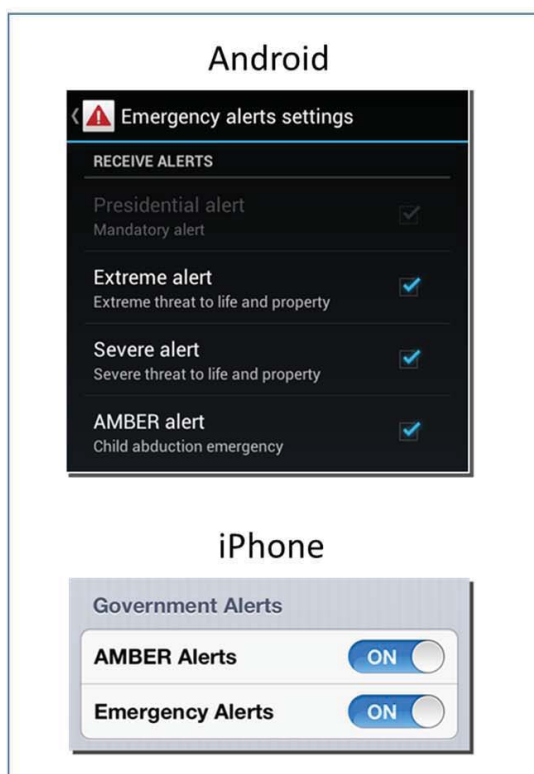
APPENDIX F

Model Opt-out Menu for WEA-capable Mobile Devices

We are including the relevant portion of NWS’s May 3, 2016 *Ex Parte* Letter for the purpose of illustrating one potential approach to revising the WEA application interface. The entire filing can be found in PS Docket No. 15-91.

Current

Proposed



APPENDIX G

**New York City Emergency Management (NYCEM)
Local WEA Geo-targeting and Latency Test Reports**

We are including the relevant portion of NYCEM's Apr. 26, 2016 *Ex Parte* Letter for the purpose of illustrating geo-targeting, latency and reliability of the WEA system as currently implemented, as well as the capacity to produce reports on such metrics. The entire filing can be found in PS Docket No. 15-91.

WEA Survey Results - 3/12/2016

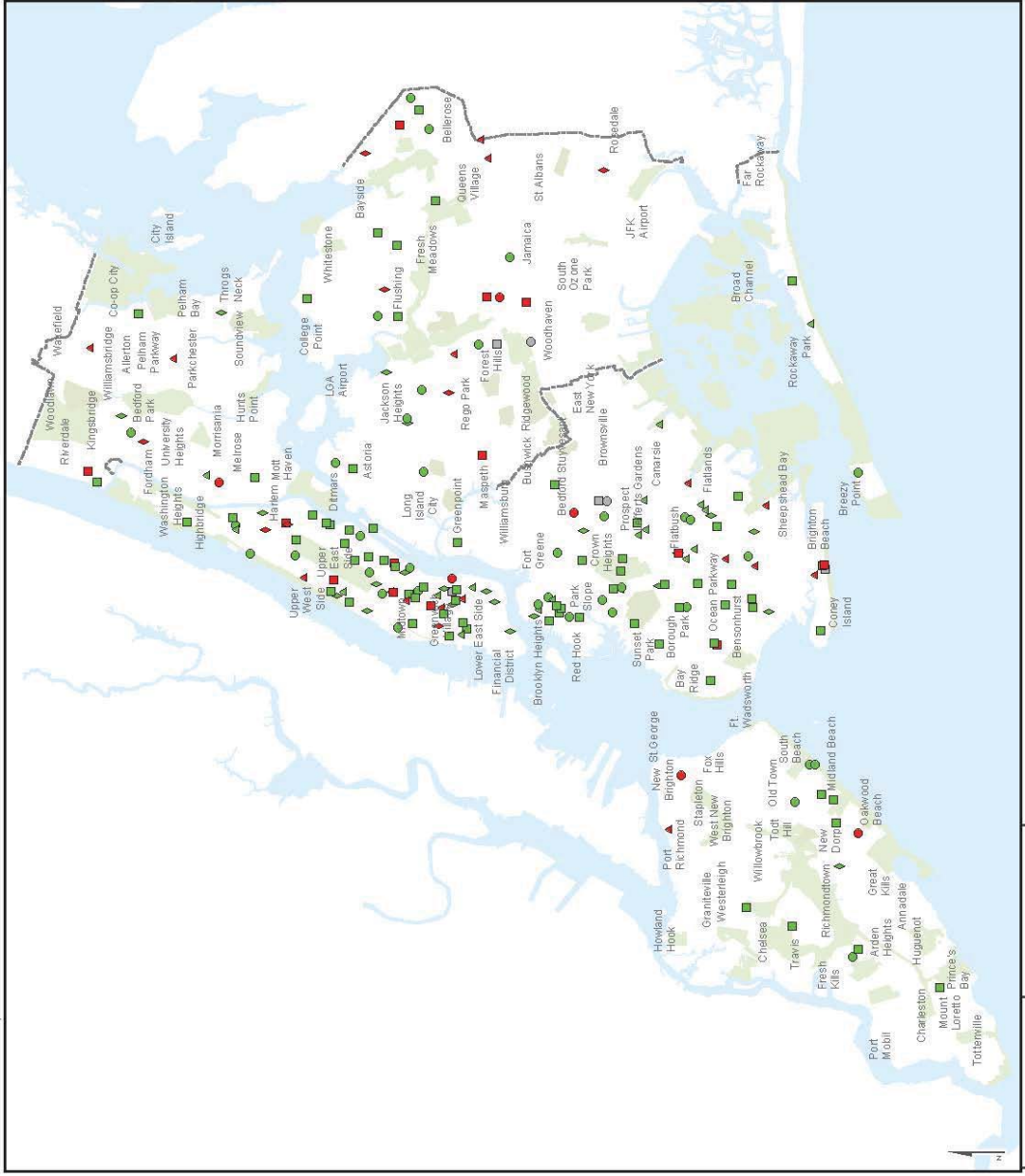
Source: Watch Command; NYCEM/GIS/7 GIS Track-It #2405

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Produced: 30 MAR 2016

- Received Alert**
- Yes
 - No
 - I don't know
- Carrier**
- Verizon Wireless
 - AT&T Mobile
 - △ T-Mobile
 - ◇ Other

Survey Statistics

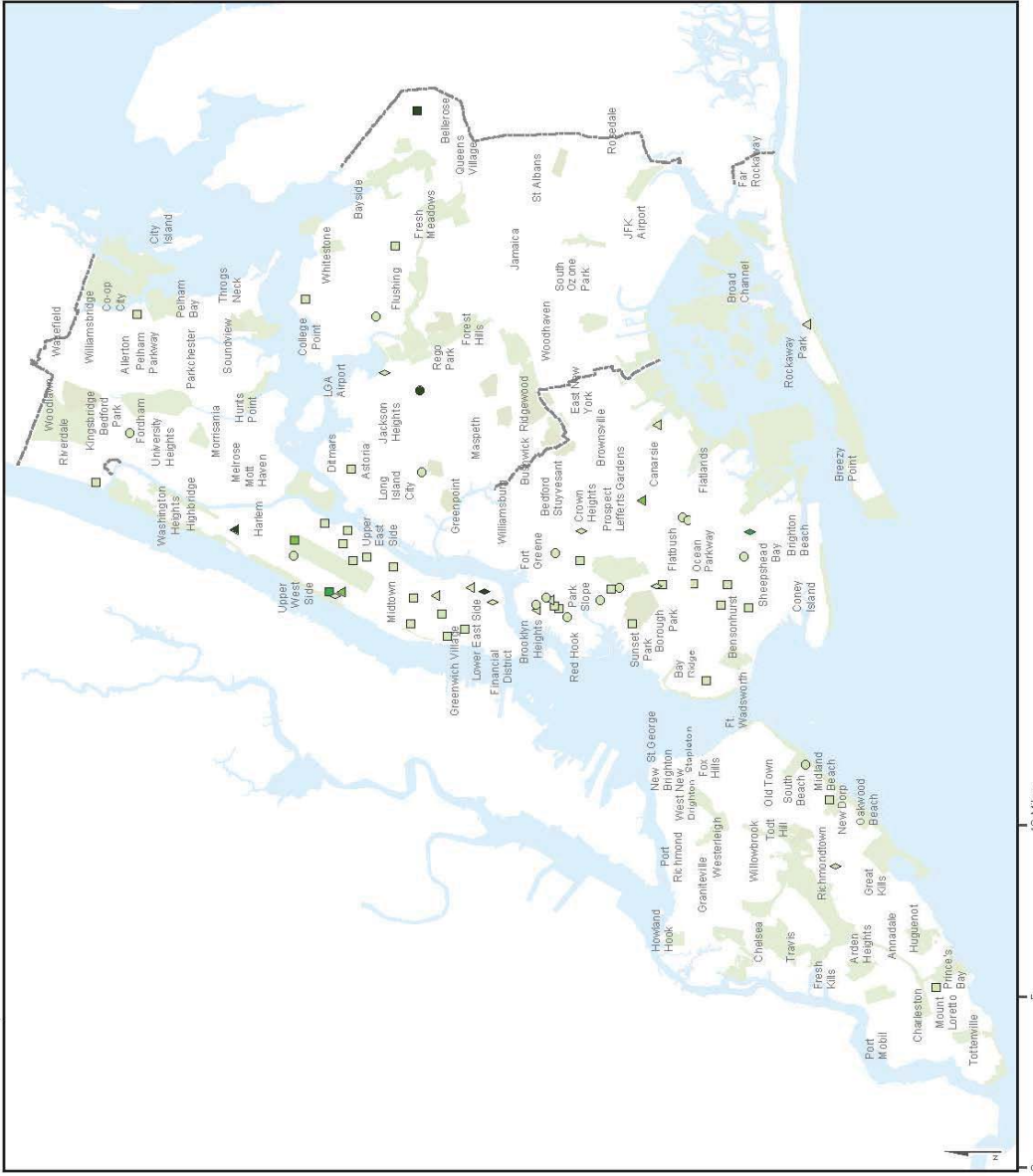
Total survey responses: 460
 NYC survey responses: 374
 199 of 374 NYC responses were geocoded based on sufficient location information
 149 of 199 geocoded NYC responses received the alert



WEA Survey Results by Time Received - 3/12/2016

Source: Watch Command, NYCEN/GIS/7_GIS_Track-IT-#2405

FOR OFFICIAL USE ONLY
Produced: 04 APR 2016



APPENDIX H

Sample CMAC Attribute Alert Log

We are including the relevant portion of AT&T Mar. 17, 2016 *Ex Parte* Letter for the purpose of illustrating alert logging that currently occurs. The entire filing can be found in PS Docket No. 15-91.

Message type	Parameter Name	Parameter Value
NEW	Message Number	A6D00660
	Sent Date Time	Tue Feb 23 23:52:22 CST 2016
	Category	MET
	Expires Date Time	Wed Feb 24 00:30:00 CST 2016
	Sender Name	NWS Tallahassee FL
	Text Alert Message	Tornado Warning in this area til 1:30 AM EST. Take shelter now. Check local media. -NWS
	Alert Description	Worth; Dougherty; Terrell; Lee; Calhoun
	Polygon(s)	31.9,-83.93 31.84,-83.94 31.84,-83.87 31.82,-83.85 31.83,-83.84 31.81,-83.83 31.81,-83.82 31.8,-83.8 31.79,-83.8 31.55,-84.45 31.64,-84.51 31.91,-84.2 31.91,-83.92 31.9,-83.93
	Geocode(s)	13321, 13095, 13273, 13177, 13037

**STATEMENT OF
CHAIRMAN TOM WHEELER**

Re: *Wireless Emergency Alerts*, PS Docket No. 15-91; *Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System*, PS Docket No. 15-94

Benjamin Franklin once said, "Without *continual* growth and improvement, such words as improvement, achievement and success have no meaning." No doubt, Wireless Emergency Alerts (WEA) are a proven success at improving public safety. But Franklin's wisdom and the march of technological progress compel the Commission to continually reevaluate these alerts – and all our rules – to ask if we can do better. With today's Order, we are meeting this mandate and in the process, improving public safety.

Since its launch in 2012, Wireless Emergency Alerts have notified Americans via their cell phones about severe weather, missing children, and other emergencies. These notifications have, quite simply, saved lives.

Just take the case of WEA-enabled AMBER alerts. The National Center for Missing and Exploited Children reports that over 30 children have been saved as a result of AMBER Alerts to cell phones. This past May, in Las Vegas, for instance, WEA was instrumental in the safe return of a kidnapped 22-month toddler; the WEA alert itself alarmed the abductors who fled from their hideout without the child, who was returned to her home.

Perhaps the most high-profile use of the Wireless Emergency Alert system came days after today's item was circulated, when a bomb was set off in the New York City neighborhood of Chelsea. This example is particularly relevant to today's item because it highlights both the value and limitations of the current system.

Much has been made of the fact that the alert notifying the public of the identity of the Chelsea bombing suspect lacked a picture of the at-large suspect – a shortcoming addressed by today's Order. But it's important to note that when a secondary device was discovered after the initial bombing, the WEA system was used to alert people to "shelter in place." The system works - and now it will work better.

With these new rules, we are taking action to make this life-saving service even more useful by incorporating lessons learned from the first four years of service and by leveraging technological advances.

Acting on recommendations from public safety officials, the new Wireless Emergency Alerts will carry more information and will better targeted geographically. For example, emergency managers will be able to send more informative messages, because the maximum alert length will be expanded from 90 characters to 360.

I'm particularly pleased that we were able to answer Senator Schumer's call to expedite enhancements to the system, such as ensuring all alerts will soon be able to include embedded links, so that you will be able click to see a photo of the missing child, a suspected terrorist, a map, or to call authorities. I'd like to thank the National Center for Missing and Exploited Children, in particular, Bob Lowery, Vice President of Missing Children Division, John Bischoff, Executive Director of Missing Children Division, Bob Hoever, retired NCMEC Director of AMBER Alert program, and Preston Findlay, Legal Counsel, who worked closely and productively with the Public Safety Bureau staff to make sure these amended rules can become an ever-more effective way of making sure children are found and returned home safely.

Today's decision will help local public safety officials better meet the needs of specific communities. It will enable, for instance, local officials to send Spanish-language alerts, and seeks

comment on transmitting alerts in additional languages as well as with multimedia content.

Today's rules also take into consideration the so-called "car alarm" or "alert syndrome," where the alert goes out to too many people who are physically far away from the unfolding situation. The rules will lessen that problem by requiring participating wireless providers to deliver alerts to more specific geographic areas, including by relying on the capabilities of a consumer's wireless device to target messages, and by allowing carriers to provide their subscribers with more flexibility in how alerts are presented.

The amended rules are informed by stakeholder input and experience – wireless providers, the public safety community, representatives of the consumers and individuals with access and functional needs, child protection advocates, and our Federal partners.

How important is today's item? NYPD Commissioner James P. O'Neill said it best in the closing line of his letter supporting today's rules, "Lives are truly on the line." That's as important as it gets, and that's why I'm pleased the Commission is moving to improve Wireless Emergency Alerts.

Thank you to the Public Safety Bureau for your work on this item.

**STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN**

Re: *Wireless Emergency Alerts*, PS Docket No. 15-91; *Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System*, PS Docket No. 15-94

It is in our darkest hours that we, unfortunately, are most reminded of the importance of robust, reliable connectivity. In the wake of the recent bombing in Manhattan, the Wireless Emergency Alert system enlisted millions of New Yorkers to be the eyes and ears of law enforcement. Thanks in large part to this valuable tool, the suspect was swiftly captured. This first of its kind message is a poignant example of the innovative ways WEA can be utilized to help save lives.

Today's item enhances WEA's effectiveness and utility by adopting rules to improve message content, delivery, and testing. Notably, we increase the maximum Alert Message length from 90 to 360 characters for 4G-LTE and future networks to enable alert originators to more clearly communicate with their communities.

We also require participating mobile providers to support embedded references in all alerts as contemplated in the underlying NPRM. Indeed, as the recent incidents in New York and New Jersey underscore, providing emergency managers with the ability to direct their communities to a comprehensive and authoritative resource in an emergency situation is a must.

Equally important, is ensuring that alerts are delivered to the intended audience. To support this goal, we require participating wireless providers to narrow their geo-targeting of Alert Messages to locations that best approximate the areas specified by the alert originator, and we affirm our commitment to ensuring that WEA Alert Messages are only received by those for whom they are relevant. The Further Notice tees up a series of questions and technical considerations that must be resolved before we get there, but we are unwavering in our goal to reduce over-alerting and improve WEA's effectiveness in that regard.

In addition, the Further Notice seeks comment on a number of important issues, such as expanding the language capabilities of WEA beyond English and Spanish, providing the public more choice in the types of alerts received, as well as the manner and timing of the alerts, and ensuring that enhanced WEA capabilities are considered and factored into the 5G development process.

The importance of this life-saving tool cannot be overstated, and I encourage all stakeholders to continue to participate in the ongoing dialogue, as technological improvements are made to mobile networks. We have a lot to be proud of today, but more work remains, and time is of the essence.

How appropriate it is, that we are releasing this item during National Preparedness Month. It gives us another opportunity to thank the nation's emergency professionals for all they do to keep us safe, including those who came to the rescue during yesterday's tragic shooting incident at Townville Elementary in South Carolina. I would also like to thank Admiral David Simpson for his leadership and the staff of the Public Safety and Homeland Security Bureau, for their dedication and tireless efforts on behalf of the American people.

**STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL**

Re: *Wireless Emergency Alerts*, PS Docket No. 15-91; *Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System*, PS Docket No. 15-94

September is National Preparedness Month. It was also in September—more years ago than I care to count—that I moved into an apartment in New York. It was small and unlovely. It was also within easy walking distance of the neighborhood where a bomb exploded earlier this month. What I learned from my time in New York is that its residents may shuffle down the sidewalks in an anonymous blur, but when crisis ensues they rally. They love their city. So on September 19 when mobile phones blared with the piercing sound of a wireless emergency alert urging them to look for the bombing suspect, they took note. He was located a few hours later and last week charged by state and federal prosecutors.

The question now is how we can make alerts like this better. That's not just a question for New York. It's a question for all of us. Our wireless devices are in our palms, our pockets, our purses—they are with us always. Let's recognize them for what they are: a formidable tool for public safety.

Congress saw this very clearly when it created the Warning, Alert and Response Network Act ten years ago. But the engineering and approach behind this emergency alert system is dated—and though its power has been demonstrated in New York and elsewhere, so have its limitations.

We tackle some of those limitations today. We update and modernize key elements of the wireless emergency alert system. In particular, we increase the length of alerts from 90 to 360 characters. This will allow them to include embedded references, like telephone numbers. In addition, we better target the geographic delivery of messages. We also expand testing opportunities for state and local public safety authorities.

But by no means should we stop here. Because the episode near my old neighborhood did more than burn and damage buildings. It demonstrated that going forward we can do more with these messages. Vague directives in text about where to find more information about the suspect—as we saw in New York—are not good enough. As we move into the 5G future we need to ensure that multimedia is available in all of our alert messages. Because as Senator Schumer has said, “[w]hen it comes to a terrorist or other very dangerous criminal on the run, a picture not only is worth a thousand words, it could save a thousand lives if the right person sees it.” Amen. Let's make it happen.

**STATEMENT OF
COMMISSIONER AJIT PAI**

Re: *Wireless Emergency Alerts*, PS Docket No. 15-91; *Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System*, PS Docket No. 15-94

The Wireless Emergency Alert (WEA) system has a simple purpose: to send public safety information to Americans on their mobile devices during emergencies.

The implementation of the WEA system has been a little more complicated. Last year, I noted the importance of allowing public safety officials to target wireless alerts to more specific geographic locations.¹ That's because of a phenomenon sometimes referred to as "over-alerting." This happens (and has happened to me) when you get an alert that has no real connection to your location. Instead, the alert is about a storm or other event that will only impact a neighboring or even distant community. Receiving an irrelevant message isn't just an annoyance. It undermines the effectiveness of the entire WEA system by causing people to tune out all alerts.

This has serious public safety consequences, as we've seen over the past weeks and months. For instance, as Louisiana was drenched by catastrophic floods this August, officials used WEA to send out at least six flash flood alerts. But as the FCC's Communications Security, Reliability and Interoperability Council (CSRIC) determined, the alerts "went un-heeded by tens of thousands" of people.² Residents ignored the messages because they had previously received flood alerts that only applied to homes located within a traditional flood zone. According to CSRIC, this time around people "assumed the alert was not for them since their home had never flooded before."³ In the end, over 30,000 people had to be rescued.

The need for enhanced geo-targeting was brought home again less than two weeks ago during the bombings in New York and New Jersey. Public safety officials activated the WEA system three times in response to the bombing in Manhattan on September 17. When they found a suspicious package in the Chelsea neighborhood, for example, they attempted to send targeted alerts to residents in the immediate vicinity, directing them to stay away from their windows. But those messages were broadcast far beyond that neighborhood. To ensure that this kind of overshoot doesn't happen in the future, New York City's public safety officials urged the FCC to adopt a device-assisted, geo-fencing approach, which would ensure that EAS messages are delivered only to areas where they're relevant.⁴

But the problem with over-alerting is not limited to cases where too many people are receiving messages. The opposite is also true. Citizens and public safety officials alike are opting out of the system altogether. The City of Seattle says that it "doesn't use WEA because" of over-alerting.⁵ The City of Houston says that it has "shied away from using WEA" because of "the high-likelihood of over-alerting."⁶ Harris County, Texas reports that it chose not to use WEA during four recent disasters "solely

¹ *Improving Wireless Emergency Alerts and Community-Initiated Alerting*, PS Docket No. 15-91, Notice of Proposed Rulemaking, 30 FCC Rcd 13781, 13843 (2015) (Statement of Commissioner Ajit Pai), available at <http://go.usa.gov/xKtnC>.

² CSRIC V, Working Group 2, Emergency Alerting Platforms, *Wireless Emergency Alerts – Recommendations to Improve Geo-Targeting and Offer Many-to-One Capabilities*, Final Report & Recommendations at 10 (Sept. 2016) (CSRIC V WEA Geo-targeting Report), available at <http://go.usa.gov/xKtnx>.

³ *Id.*

⁴ See, e.g., Letter from Benjamin J. Krakauer, MPA, Director, Watch Command, New York City Emergency Management, to Marlene H. Dortch, Secretary, FCC (Sept. 20, 2016), <http://go.usa.gov/xKtnj>.

⁵ Letter from Barb Graff, Director, Seattle Office of Emergency Management, City of Seattle, to Hon. Tom Wheeler, Chairman, FCC (Sept. 22, 2016) (Seattle Emergency Management Letter), <http://go.usa.gov/xKtnK>.

⁶ Letter from Dennis Storemski, Director, Mayor's Office of Public Safety & Homeland Security, City of Houston, to Marlene H. Dortch, Secretary, FCC (Sept. 22, 2016), <http://go.usa.gov/xKtnk>.

due to significant concerns over [the] granularity” of alerts.⁷ Millions of people who live in these communities could miss out on potentially life-saving information because WEA’s current brushstroke is too broad.⁸ This is why the public safety community has said that “[e]nabling more precise alerting is the single most important action the FCC can take to make WEA relevant for first responders.”⁹

After studying the record and speaking with public safety officials, including in New York City, I agreed that we need to do more than just codify the status quo. So I proposed that we be more forward-leaning, that we commit in this *Order* to moving ahead with a device-based approach to geo-targeting. By enabling devices to screen emergency messages and only allow the relevant ones through, this approach would allow public safety officials to target information to specific geographic areas. And it would advance WEA as a platform by reducing “alert fatigue.” I’m happy to report that the *Order* incorporates this approach in addition to adopting other enhancements to our geo-targeting rules. Moreover, the *Further Notice* now seeks additional comment on ways we can implement our commitment to device-assisted geo-targeting.

These are major steps toward promoting a public safety solution as advanced as wireless services themselves. And so, because today’s *Order* moves us in the right direction, it has my support.¹⁰

⁷ Letter from Francisco Sanchez, Jr., Liaison to the Director & Public Information Officer, Harris County Office of Homeland Security, Harris County, Texas, to Hon. Tom Wheeler, Chairman, FCC (Sept. 15, 2016), <http://go.usa.gov/xKtnE>.

⁸ These examples demonstrate why CSRIC reached the conclusion that “the effectiveness of WEA alert messages may remain suppressed until they can be distributed to finer geospatial areas, so that messages only reach the people who are at risk.” CSRIC IV, Working Group 2, Geographic Targeting, Message Content and Character Limitation Subgroup Report at 59 (Oct. 2014), *available at* <http://go.usa.gov/xKtny>; *see also* CSRIC V WEA Geo-targeting Report at 8. A Carnegie Mellon study also found that public safety officials didn’t think WEA was adequate due to the “lack of sufficiently fine-grained geo-targeting.” Carnegie Mellon University, Silicon Valley, *Opportunities, Options and Enhancements for the Wireless Emergency Alerting System* at 14 (Dec. 2015), *available at* <http://go.usa.gov/xKtnd>. The CSRIC and Carnegie Mellon reports also found that public safety officials would be more likely to use WEA if the system targeted recipients more precisely and that the public would be more likely to respond to those more targeted warnings. *See id.* at 18, *see also* CSRIC V WEA Geo-targeting Report at 11.

⁹ Seattle Emergency Management Letter at 1.

¹⁰ I recognize that there’s a decent distance between where we are and where we want to go—between the current system and a device-based approach to geo-targeting. There are technical challenges, standards-setting processes, and network considerations that we need to work through. But that’s the core purpose of the *Further Notice*—to work through them. The WEA system will be much stronger and more effective once we do that.

**STATEMENT OF
COMMISSIONER MICHAEL O'RIELLY
APPROVING IN PART AND DISSENTING IN PART**

Re: *Wireless Emergency Alerts*, PS Docket No. 15-91; *Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System*, PS Docket No. 15-94

Wireless alerts are one of the many tools that provide Americans with information during emergencies. From tornados to AMBER alerts to terror attacks, these messages can provide beneficial warnings that there is danger ahead or to be on the lookout for a missing child. For this reason, I can generally support such ideas as 360-character alerts, a new category of public safety messages, and narrower geographic targeting as a means to improve the wireless emergency alert (WEA) system. And I appreciate that certain of my edits, including the elimination of the requirement that all legacy networks must support 360-character alerts by a date certain and a reduction in the message log retention mandates, were incorporated into the text.

At the same time, as we make changes to the functionality of WEA, it is necessary to encourage participation by weighing the burdens placed on industry and recipients with ensuring that the system is reliable so that consumers receive necessary information but not annoyed by over alerting. I believe that portions of this item fail to strike such a balance, and this is where my views differ from my colleagues.

First, I cannot support requiring participating wireless providers to add functions that are not based on what can reasonably be achieved with existing technology in realistic timelines. Today's order requires certain components to be completed in 30 months and others in a year. While people will undoubtedly say these timelines are sufficient, these solutions will need to go through the standards process, device and network development, testing, and be deployed into the marketplace. That's not likely to happen within these tight timeframes.

Oddly enough, the further notice appears to acknowledge the difficulties in rolling out changes to WEA when it suggests far more lenient deadlines for the proposals regarding additional improvements to geo-targeting. In this context, participating wireless providers would be given 42 months or 24 months from the completion of all relevant standards, whichever is earlier. This is a far more reasonable timeframe.

We have seen this approach on multiple occasions in the public safety context, such as location accuracy, where political pressures and headlines take precedent over technological feasibility. Big announcements lead to big expectations, which eventually result in multiple waivers because the technology lags behind the hype. Overpromising and underdelivering does not improve public safety.

We also need to consider that standards bodies have their hands full right now preparing for next-generation technologies. I certainly wouldn't want to see 5G deployments stuck on the sidelines in order to incorporate not-ready WEA solutions into the development of 5G networks and devices. This is exactly what is being contemplated by provisions in the further notice.

This trend also permeates the further notice where we propose earthquake alert prioritization and delivery within three minutes, which the system is currently not designed to do and which may not be feasible. We also seek comment on multilingual alerting beyond English and Spanish, which would also require standards and new character sets. To top it all off, the item even acknowledges that many emergency management agencies do not have the capability to send such messages.

Second, we seem completely oblivious to the potential unintended consequences of unproven technologies. The requirement to include embedded references, such as URLs and phone numbers, in WEA alerts is a "beware what you wish for" situation. While the availability of these links may seem

useful, affected individuals may not be able to use them, because encouraging Internet use and phone calls at those exact moments could lead to additional congestion on networks that are already at or beyond capacity during an emergency. This is directly contrary to comments from network operators and technical experts, such as the Alliance for Telecommunications Industry Standards, in the record.

Further, the pilot program that is initiated in this item is more than troubled. Take for example the fact that the period for such a trial will conclude and the requirements will go into effect before the standards are likely to be finalized. How does that allow us to determine if network congestion is an issue? Instead of getting answers, we are ignoring the warnings of network operators and experts in network congestion.

The item doubles down on this idea by committing to incorporate multimedia – such as photos, images and maps – into Public Safety Message WEA alerts. This issue will be considered in the further notice, but thorough consideration will need to be given, along with real testing beyond the “voluntary prototyping” envisioned in the order, to the network effects of such messages before we force providers to accommodate additional data-intensive messaging.

Third, we must ensure that WEA is only used when appropriate, otherwise there is increased risk that consumers will opt out of these alerts. My colleagues have claimed that the bombing in New York is illustrative of how the WEA system works and can be improved. But, after the alert was issued to be on the lookout for the suspect, there were articles and social media posts about how it frightened and annoyed some recipients.¹ Now, if some people found the screeching tone of countless cellphone alerts going off in the subway off putting in that context, imagine if the message received was a public service announcement (PSA) informing you of the benefits of WEA alerts. On that point, I strongly oppose the use of emergency alert signals for such purposes as PSAs.

Lastly, the further notice adds a host of questionable ideas, such as requiring a uniform format for alert logging, standardized opt-out menus for consumers, and extensive data collection and annual reporting requirements which will add unnecessary costs for wireless providers with little benefit to consumers. Additionally, the unnecessary point-of-sale disclosures are burdensome and could mislead consumers, because your WEA experience can change depending upon your geographic area, what network you are on, and whether there is congestion.

While I approve a good portion of this item, I must dissent in part for these reasons.

¹ See, e.g., Rafi Schwartz & Casey Tolan, *The FBI Sent a Massive, Unprecedented, Troubling Emergency Alert About the New York Bombing Suspect* (Sept, 19, 2016), <http://fusion.net/story/348563/fbi-phone-alert-chelsea-bombing-ahmad-khan-rahami/>; Jane Flowers, *Emergency Alert for Terror Suspect Ahmad Rahami Sets Off Phones – NYC* (Sept, 19, 2016), <http://us.blastingnews.com/news/2016/09/emergency-alert-for-terror-suspect-ahmad-rahami-sets-off-phones-nyc-001129285.html>.