

**FCC FACT SHEET**<sup>\*</sup>  
**Wireless Emergency Alerts**  
Second Report and Order and Second Order on Reconsideration  
PS Docket No. 15-91

**Background:** The Wireless Emergency Alerts (WEA) system is a tool for authorized federal, state and local government entities to send geographically targeted alerts and warnings to the WEA-capable mobile devices of participating wireless providers' subscribers. Since it was deployed in April 2012, WEA has been used to issue over 33,000 emergency alerts, including severe weather warnings, evacuate and shelter-in place alerts, and AMBER Alerts. This Report and Order takes action to improve WEA to make alerts and warnings more effective. Most significantly, the Report and Order would improve the geographic accuracy of these alerts so that they reach the intended communities without disturbing others.

**What the WEA Second Report and Order Would Do:**

- Require participating wireless providers to deliver alerts to an area that matches the target area specified by the alert originator, specifically by delivering the alert to 100 percent of the target area that overlaps with the wireless provider's network coverage area, with no more than 0.1 mile overshoot. This enhanced geo-targeting requirement would go into effect November 30, 2019.
- Require participating wireless providers to "best approximate" the target area where their network infrastructure or where the mobile device is technically incapable of matching the specified target area.
- Require that WEA-capable mobile devices preserve alert messages in a consumer-accessible format and location for at least 24 hours after the alert is received on the device. This requirement would also go into effect November 30, 2019.
- Define participation in WEA "in whole" as when wireless providers agree to transmit WEA alert messages in the entirety of their geographic service area, and when all mobile devices that they offer at the point of sale are WEA-capable.
- Define participation in WEA "in part" as when wireless providers agree to transmit WEA alert messages in some, but not all, of their geographic service area, or when not all mobile devices that they offer at the point of sale are WEA-capable.

**What the WEA Second Order on Reconsideration Would Do:**

- Align the effective date for supporting Spanish-language alert messages with the deadline for extending the length of alert messages from 90 to 360 characters; the new compliance deadline for supporting Spanish-language alerts would therefore be May 1, 2019.

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<sup>\*</sup>This document is being released as part of a "permit-but-disclose" proceeding. Any presentations or views on the subject expressed to the Commission or its staff, including by email, must be filed in PS Docket No. 15-91, which may be accessed via the Electronic Comment Filing System (<https://www.fcc.gov/ecfs>). Before filing, participants should familiarize themselves with the Commission's *ex parte* rules, including the general prohibition on presentations (written and oral) on matters listed on the Sunshine Agenda, which is typically released a week prior to the Commission's meeting. See 47 CFR § 1.1200 *et seq.*

**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	)	

**SECOND REPORT AND ORDER AND SECOND ORDER ON RECONSIDERATION\***

**Adopted:** []

**Released:** []

By the Commission:

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\*This document has been circulated for tentative consideration by the Commission at its January 2018 open meeting. The issues referenced in this document and the Commission’s ultimate resolutions of those issues remain under consideration and subject to change. This document does not constitute any official action by the Commission. However, the Chairman has determined that, in the interest of promoting the public’s ability to understand the nature and scope of issues under consideration, the public interest would be served by making this document publicly available. The Commission’s *ex parte* rules apply and presentations are subject to “permit-but-disclose” *ex parte* rules. *See, e.g.,* 47 CFR §§ 1.1206, 1.1200(a). Participants in this proceeding should familiarize themselves with the Commission’s *ex parte* rules, including the general prohibition on presentations (written and oral) on matters listed on the Sunshine Agenda, which is typically released a week prior to the Commission’s meeting. *See* 47 CFR §§ 1.1200(a), 1.1203.

APPENDIX B – Final Regulatory Flexibility Analysis

APPENDIX C – Supplemental Final Regulatory Flexibility Analysis

## I. INTRODUCTION

1. In this *Second Report and Order*, we take measures to enhance the effectiveness of Wireless Emergency Alerts (WEA).<sup>1</sup> In particular, we improve the accuracy with which emergency managers can geographically target the delivery of WEA Alert Messages to areas within their jurisdiction. We ensure that consumers will continue to be able to retrieve and review Alert Message content for 24 hours from receipt. We also define what it means for a Commercial Mobile Service (CMS) Provider to participate in WEA “in whole” versus “in part.”<sup>2</sup> In the *Second Order on Reconsideration*, we align the deadline for supporting Alert Messages initiated in Spanish with the deadline for extending the length of WEA messages from 90 to 360 characters.<sup>3</sup>

## II. BACKGROUND

2. The Warning Alert and Response Network (WARN) Act gives the Federal Communications Commission (Commission) authority to adopt “relevant technical standards, protocols, procedures and other technical requirements” governing WEA.<sup>4</sup> The WARN Act also gives the Commission authority to adopt procedures by which CMS Providers disclose their intent to participate in WEA.<sup>5</sup> Pursuant to this authority, the Commission has adopted requirements to prescribe WEA capabilities, WEA testing, and WEA election procedures.<sup>6</sup> Many CMS Providers, including the four nationwide wireless providers, have elected to participate in WEA at least in part.<sup>7</sup> Since it was deployed

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<sup>1</sup> We address issues raised by the *WEA Further Notice of Proposed Rulemaking* to the extent described herein, and otherwise defer resolution of any remaining issues. See *Wireless Emergency Alerts; Amendments to Part 11 of the Commission’s Rules Regarding the Emergency Alert System*, PS Docket Nos. 15-91, 15-94, *Report and Order and Further Notice of Proposed Rulemaking*, 31 FCC Rcd 11112 (2016) (*WEA R&O* and *WEA FNPRM*).

<sup>2</sup> 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). See also 47 CFR § 10.10(d); 47 U.S.C. § 332(d)(1) (defining the term “commercial mobile service”).

<sup>3</sup> See *Petition of CTIA for Reconsideration of the Wireless Emergency Alerts (WEA) Report and Order*, PS Docket Nos. 15-91, 15-94 (filed Dec. 1, 2016), <https://ecfsapi.fcc.gov/file/1201436312000/CTIA%20WEA%20Petition%20For%20Reconsideration.pdf> (*CTIA Petition*).

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

<sup>5</sup> *Id.* at § 602(b), 47 U.S.C. § 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 U.S.C. § 1202(b)(1)(B).

<sup>6</sup> See, e.g., *The Commercial Mobile Alert System*, PS Docket No. 07-287, *First Report and Order*, 23 FCC Rcd 6144 (2008) (*WEA Capabilities Report and Order*) (adopting requirements for provider-controlled elements within the CMAS architecture, emergency alert formatting and classes, county-level geo-targeting, and roaming availability of Alert Messages); *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 Testing Report and Order*) (requiring periodic testing of CMAS architecture and facilitating the development of a redundant, alternative path for transmitting geo-targeted alerts); *The Commercial Mobile Alert System*, PS Docket 07-287, *Third Report and Order*, 23 FCC Rcd 12561 (2008) revised by Erratum (dated Sep. 5, 2008) (*WEA Election Report and Order*) (adopting subscriber notification requirements, CMS Provider election and withdrawal procedures, and consumer opt-out provisions).

<sup>7</sup> See FCC, *Master CMAS Registry*, <https://www.fcc.gov/pshs/docs/services/cmas/MasterCMASRegistry.xls> (last visited Oct. 26, 2017); PS Docket No. 08-146 (containing a record of all Participating CMS Providers’ elections to participate in WEA).

in April 2012,<sup>8</sup> WEA has been used to issue over 33,000 emergency alerts, including severe weather warnings, evacuate and shelter-in place alerts, and America's Missing: Broadcast Emergency Response (AMBER) Alerts.<sup>9</sup>

3. The WEA system is a tool for authorized federal, state and local government entities to geographically target alerts and warnings to the WEA-capable mobile devices of Participating CMS Providers' subscribers. An alert originator<sup>10</sup> sends a WEA Alert Message<sup>11</sup> using Federal Emergency Management Agency (FEMA)-approved alert origination software in the Common Alerting Protocol (CAP) to the FEMA-operated alert aggregator, the Integrated Public Alert and Warning System (IPAWS).<sup>12</sup> There, it is authenticated, validated and delivered to FEMA's Alert Gateway for dissemination to Participating CMS Providers' Alert Gateways.<sup>13</sup> Currently, Participating CMS Providers' WEA infrastructure removes Alert Message metadata, including a description of the geographic target area for the Alert Message and the Alert Message's expiration time, and then transmits the Alert Message content to their subscribers' WEA-capable devices.<sup>14</sup> While the Commission's WEA rules are technologically neutral, most Participating CMS Providers use cell broadcast technology to transmit WEA Alert Messages to their subscribers.<sup>15</sup> When the Alert Message is received by a WEA-capable mobile device, it is prominently presented to the subscriber as long as the subscriber has not

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<sup>8</sup> 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).

<sup>9</sup> See Mark Lucero, Chief Engineer, IPAWS Division, FEMA, *Integrated Public Alert and Warning System* (Aug. 8, 2017), [https://www.napsfoundation.org/wp-content/uploads/2017/08/FEMA\\_IPAWS\\_Keynote\\_MarkLucero\\_20170708.pptx](https://www.napsfoundation.org/wp-content/uploads/2017/08/FEMA_IPAWS_Keynote_MarkLucero_20170708.pptx). 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 Oct. 26, 2017).

<sup>10</sup> 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. See FEMA, *Alerting Authorities*, <https://www.fema.gov/alerting-authorities> (last visited Oct. 26, 2017). For the purposes of this proceeding, the term "alert originator" is coextensive with the terms "emergency manager" and "emergency management agency" unless otherwise specified.

<sup>11</sup> See 47 CFR § 10.10(a) (defining an "Alert Message" 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").

<sup>12</sup> 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.*

<sup>13</sup> 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.

<sup>14</sup> See ATIS Comments at 4; ATIS 070008, Cell Broadcast Entity (CBE) to Cell Broadcast Center (CBC) Interface Specification (2010).

<sup>15</sup> See *CSRIC V*, Working Group Two, Wireless Emergency Alerts – Recommendations to Improve Geo-targeting and Offer Many-to-One Capabilities, Final Report and Recommendations 8 (2016) (*CSRIC V WEA Geo-targeting Report*); but see Letter from Rebecca Murphy Thompson, EVP and General Counsel, Competitive Carriers Association, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Oct. 10, 2017) (stating that some carriers offer WEA using a software application, rather than cell broadcast).

opted out of receiving Alert Messages of that type.<sup>16</sup>

4. In September 2016, the Commission adopted the *WEA R&O* to improve Alert Message content and delivery, and to create public safety tools for testing and outreach.<sup>17</sup> It also adopted the *WEA FNPRM*, seeking comment on, among other proposals, measures to further improve emergency managers' ability to geographically target (geo-target) Alert Messages;<sup>18</sup> to preserve Alert Messages on mobile devices for consumer review until they expire; and to define the extent of participation in WEA.<sup>19</sup>

### III. SECOND REPORT AND ORDER

#### A. Narrowing Geo-Targeting Requirements

##### 1. Background

5. In the *WEA R&O*, the Commission required Participating CMS Providers to "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."<sup>20</sup> The Commission allowed Participating CMS Providers that were unable to best approximate the target area specified by the alert originator to transmit the Alert Message "to an area not larger than the propagation area of a single transmission site."<sup>21</sup> In adopting the "best approximate" standard, the Commission noted that emergency managers need even more granular geo-targeting and committed to implementing "handset-based, geo-targeting requirements."<sup>22</sup> Accordingly, in the *WEA FNPRM*, the Commission proposed to require Participating CMS Providers to "match" the target area specified by the alert originator within 42 months of the rule's publication in the *Federal Register*, or within 24 months of the completion of all relevant standards, whichever is sooner, as its federal advisory committee, the Communications Security, Reliability and Interoperability Council's V (CSRIC V), recommended.<sup>23</sup> The Commission also sought comment on whether Participating CMS Providers could support matching the target area sooner.<sup>24</sup> The Commission sought comment on whether to define "matching" the target area as 100 percent of devices within the specified area receive the Alert Message with not more than 0.1 of a mile overshoot.<sup>25</sup> The Commission proposed that Participating CMS Providers should continue to transmit the Alert Message to an area that "best approximates" the specified geocode, circle, or polygon in circumstances where they are unable to match the target area.<sup>26</sup>

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<sup>16</sup> See Joint ATIS/TIA CMAS Mobile Device Behavior Specification (ATIS-TIA-J-STD-100). Subscribers' right to opt out of WEA Alert Message receipt extends to all but the Presidential Alert. See 47 CFR § 10.280.

<sup>17</sup> See *WEA R&O* and *WEA FNPRM*, 31 FCC Rcd 11112.

<sup>18</sup> "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.

<sup>19</sup> See *WEA FNPRM*, 31 FCC Rcd at 11181.

<sup>20</sup> *WEA R&O*, 31 FCC Rcd at 11147, para. 52; 47 CFR § 10.450(a).

<sup>21</sup> 47 CFR § 10.450(a).

<sup>22</sup> See *WEA R&O*, 31 FCC Rcd at 11147, para. 52.

<sup>23</sup> *WEA FNPRM*, 31 FCC Rcd at 11218, para. 178; see also CSRIC V WEA Geo-targeting Report at 31. CSRIC is a federal advisory committee that provides recommendations to the FCC regarding ways it can strive for security, reliability, and interoperability of communications systems.

<sup>24</sup> *WEA FNPRM*, 31 FCC Rcd at 11218, para. 178.

<sup>25</sup> *WEA FNPRM*, 31 FCC Rcd at 11198, para. 139-40; see also CSRIC V WEA Geo-targeting Report at 31.

<sup>26</sup> See 47 CFR § 10.450 (requiring CMS Providers to transmit an Alert Message an area that best approximates the specified geocode, circle, or polygon).

## 2. Discussion

6. We require Participating CMS Providers to deliver Alert Messages to an area that matches the target area specified by alert originators, as proposed. This action will ensure that emergency managers can “precisely target at-risk populations while minimizing disruption to others.”<sup>27</sup> The record demonstrates a compelling public interest need for WEA Alert Messages to be delivered in a more geographically targeted manner.<sup>28</sup> Harris County, Texas, Office of Homeland Security and Emergency Management indicates that WEA is currently underutilized because of its limited geo-targeting capabilities.<sup>29</sup> Emergency managers emphasize that more accurate geo-targeting will encourage alert originators to use WEA,<sup>30</sup> enable them to use WEA to more effectively motivate consumers to take protective actions,<sup>31</sup> and will reduce the potential for over-alerting and subscriber opt-out of receiving WEA Alert Messages.<sup>32</sup> In addition to supporting the need for more stringent geo-targeting requirements, the majority of commenters indicate that it is technically feasible to match delivery of WEA Alert Messages to an area prescribed by the alert originator.<sup>33</sup> We define “matching” the target area as

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<sup>27</sup> BCEM Comments at 1-2; Harris County OHSEM Comments at 1.

<sup>28</sup> See APCO Comments at 3; BCEM Comments at 1; Harris County OHSEM Comments at 1; Calhoun CEMA Comments at 1; California Governor’s OES Comments at 5; DHS-S&T Comments at 1; Islip OEN Comments at 1; Nassau County OEM Comments at 1; NYCEM Comments at 11; San Francisco DEM Comments at 1-2; Texas Counties Comments at 1; AC&C Reply Comments at 1; AT&T Comments at 5-6.

<sup>29</sup> See Letter from Francisco Sanchez, Jr., Liaison to the Director and Public Information Officer, Harris County Homeland Security and Emergency Management, to Marlene H. Dortch, Secretary, FCC, PS Docket 15-91 at 1 (filed Jul. 10, 2017) (Harris County July 10, 2017 *Ex Parte*) (“Harris County rarely uses WEA because it does not want to potentially alert the entire county when a WEA message may only pertain to a certain portion of the county.”); APCO Comments at 4; AC&C Reply Comments at 1-2.

<sup>30</sup> Our rules provide emergency managers access to information regarding geo-targeting performance and empower them to work with CMS Providers to increase their confidence in WEA. See *WEA R&O*, 31 FCC Rcd at 11151, para. 57 (requiring Participating CMS Providers to share information about their geo-targeting capabilities with emergency managers upon request); see also *id.* at 11143, para. 47 (requiring Participating CMS Providers to log Alert Messages and to share that data with emergency managers upon request). As of May 1, 2019, emergency managers will also be able to use end-to-end WEA tests to assess how WEA is working within their jurisdictions. See *Wireless Emergency Alerts; Amendments to Rules Regarding the Emergency Alert System*, 81 FR 75710 (Nov. 1, 2016).

<sup>31</sup> NWS Jul. 18, 2017 *Ex Parte* at 1 (“Device-assisted geo-targeting is necessary to ensure that WEA is relevant to those who receive alerts, that people do not become fatigued by alerts which do not apply to their location and are perceived as false alarms, that future WEA messages are not ignored, and that the general public does not opt-out of WEA altogether.”).

<sup>32</sup> Letter from Benjamin J. Krakauer, Assistant Commissioner, New York City Emergency Management, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Jul. 10, 2017) (NYCEM July 10, 2017 *Ex Parte*) (arguing that “[h]ighly accurate message targeting is absolutely necessary in order to prevent both unnecessary panic and warning fatigue”); APCO Comments at 4; Harris County OHSEM Comments at 1.

<sup>33</sup> See, e.g., AT&T Comments at 4-6; Letter from Pamela L. Gist, Counsel for Bluegrass Cellular, Inc., to Marlene H. Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed July 19, 2017) (Bluegrass Jul. 20, 2017 *Ex Parte*); Letter from William Hutchinson McClendon, IV, CEO, AC&C LLC, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 3 (filed Aug. 17, 2017) (AC&C Aug. 17, 2017 *Ex Parte*); Harris County Comments at 1; Big City Emergency Managers Comments at 1; Calhoun CEMA Comments at 1; California Governor’s OES Comments at 4-5; Letter from Michael E. Gerber, Physical Scientist, NOAA/National Weather Service, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 4 (filed Jul. 18, 2017) (NWS Jul. 18, 2017 *Ex Parte*); NYCEM Comments at 11; San Francisco DEM Comments at 1-2; Letter from Keith Kaczmarek, inPhase Wireless, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1-2 (filed Sep. 9, 2016) (inPhase Sep. 9, 2016 *Ex Parte*); Letter from John Carley, Director Product Management, location.io Rx Networks, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sep. 14, 2016) (Rx Networks Sep. 14, 2016 *Ex Parte*); Dr. Hakan Erdogmus, Associate Teaching Professor, Carnegie Mellon University, to Marlene Dortch, Secretary, FCC, PS Docket 15-91, at 1 (filed May 30,

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delivering an Alert Message to 100 percent of the target area with no more than 0.1 of a mile overshoot. The majority of emergency managers support this degree of geo-targeting accuracy as sufficient to meet their alerting needs.<sup>34</sup>

7. Although we do not specify the technological approach Participating CMS Providers should take to comply with our geo-targeting requirement,<sup>35</sup> the record shows that one way Participating CMS Providers can meet both prongs of this requirement is through a technique known as “geo-fencing.”<sup>36</sup> Geo-fencing allows mobile devices to compare their current location to the target area specified by the alert originator and to display the Alert Message only if it is located within the target area.<sup>37</sup>

8. AT&T expresses concern that if Participating CMS Providers are required to include target area coordinates within the Alert Message, this would dramatically reduce the number of characters available for the Alert Message text.<sup>38</sup> The record indicates, however, that it is technically feasible for Participating CMS Providers to transmit polygon coordinates to mobile devices without affecting the 360-character allotment for displayable Alert Message text. For example, Participating CMS Providers could leverage lossless compression techniques<sup>39</sup> to transmit displayable characters along with target area

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2016) (CMU May 30, 2016 *Ex Parte*); Letter from 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) (Comtech Sep. 11, 2016 *Ex Parte*); *but see* T-Mobile Reply at 3 (“[A]lthough a device-based or app-based technology leveraging the handset’s location services capability may be a potential solution as suggested by some commenters, T-Mobile believes further study, which would include a standardization effort along with a security issues analysis, is required.”); Verizon Comments at 5 (stating that it is premature to determine what degree of precision is appropriate for WEA geo-targeting because “standards, technical specifications and the feasibility of particular approaches all will be the subject of stakeholder efforts arising out of the CSRIC V recommendations”); Letter from Matthew Gerst, Assistant Vice President, CTIA, to Marlene H. Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Dec. 20, 2017) (indicating that enhanced geo-targeting is feasible with new or modified “network and device standards and solutions”) (CTIA Dec. 20, 2017 *Ex Parte*).

<sup>34</sup> NWS Comments at 1; NYCEM July 10 *Ex Parte* at 2; Harris County July 10 *Ex Parte* at 1; Calhoun CEMA Comments at 1; Nassau County OEM Comments at 1. Only a couple of emergency managers express preferences for maximum overshoot distances that are slightly larger or smaller. *See* Islip OEM Comments at 1 (preferring 0.5 miles overshoot to allow individuals that have temporarily left the target area to continue to receive alerts); Harris County July 10 *Ex Parte* at 1 (stating that 0.1 miles overshoot may not be specific enough in urban areas).

<sup>35</sup> *See* CTIA Comments at 2 (indicating that enhanced geo-targeting requirements should be technologically neutral); Verizon Comments at 5 (arguing that the Commission should remain technologically neutral in adopting new geo-targeting standards, and not favor device-based over network-based solutions).

<sup>36</sup> *See, e.g.,* AT&T Comments at 4-6; AC&C Aug. 17 *Ex Parte* at 3; Harris County Comments at 1; Big City Emergency Managers Comments at 1; Calhoun CEMA Comments at 1; California Governor’s OES Comments at 4-5; NWS July 18 *Ex Parte* at 4; NYCEM Comments at 11; San Francisco DEM Comments at 1-2; inPhase Wireless Sep. 9 *Ex Parte* at 1-2; Rx Networks Sep. 14, 2016 *Ex Parte* at 1; CMU May 30, 2016 *Ex Parte* at 1; Kim Robert Scovill, Vice President, Legal Regulatory and External Affairs, Comtech Sep. 11, 2016 *Ex Parte* at 1; *see also* National Advertising Institute, PlaceIQ, Location Accuracy Revealed (concluding based on a study of 150 people in five U.S. cities that mobile devices’ location determination is accurate to an average of about 30 meters).

<sup>37</sup> *See WEA FNPRM*, 31 FCC Rcd at 11147, para. 51, n.217.

<sup>38</sup> *See* Letter from Joseph P Marx, Assistant Vice President, AT&T Services Inc., to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1, Appx. A (filed Sep. 26, 2017) (explaining how the treatment of target area coordinates as Alert Message text would dramatically reduce the number of characters available of text) (AT&T Sep. 26, 2017 *Ex Parte*).

<sup>39</sup> Lossless compression is a means by which CMS Providers can reduce the size of Alert Message text and coordinates to facilitate its transmission, without deleting or losing information contained in the text or coordinates. *See* Abhinav Jauhri, Martin Griss and Hakan Erdogmus, Small Polygon Compression at 1 (2016), <https://ecfsapi.fcc.gov/file/60002085023.pdf>.

coordinates using the same cell broadcast approach described by current ATIS standards.<sup>40</sup> Further, FEMA states that the IPAWS platform will only accept targeting polygons with up to 100 vertices, and that it will work with alerting authorities to encourage them to use the polygon with the fewest vertices adequate to describe the intended target area and to encourage discipline with regard to vertex coordinate precision.<sup>41</sup> Accordingly, we specify that Participating CMS Providers may not limit emergency managers' ability to use the full 360 characters of alphanumeric text allocated for displayable WEA Alert Messages.<sup>42</sup> The WEA character limit applies to alphanumeric characters of displayable text and does not include target area data that Participating CMS Providers may transmit to the mobile device in order to permit device-based geo-fencing.<sup>43</sup>

9. We acknowledge that, in certain circumstances, a Participating CMS Provider may be technically incapable of matching the target area. These circumstances include when the target area is outside of the Participating CMS Provider's network coverage area, when mobile devices have location services disabled, and when legacy networks cannot be updated to support this functionality.<sup>44</sup> If some or all of a Participating CMS Provider's network infrastructure is technically incapable of matching the specified target area, Participating CMS Providers must deliver the Alert Message to an area that best

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<sup>40</sup> An ATIS feasibility study describes how Participating CMS Providers use cell broadcast to transmit Alert Messages and associated metadata using "data pages." See Alliance for Telecommunications Industry Solutions, Feasibility Study for LTE WEA Message Length, ATIS -0700023, at 5 (2015) (demonstrating how 372 GSM 7-bit characters fit on four cell broadcast data pages). Available lossless compression techniques would allow Participating CMS Providers to shrink the metadata that describes the target area to between 10.4 percent and 25.6 percent of its original size. See Abhinav Jauhri, Martin Griss and Hakan Erdogmus, Small Polygon Compression at 1 (2016), <https://ecfsapi.fcc.gov/file/60002085023.pdf>. Similarly, 3GPP has standardized lossless compression techniques for the GSM 7-bit characters that Participating CMS Providers use to encode displayable Alert Message text. See Digital Cellular Telecommunications System (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Alphabets and Language-specific Information, 3GPP ETSI TS 23.038 (v.14.0.0). Use of compression techniques such as these represents one feasible approach that Participating CMS Providers could take to transmitting displayable Alert Message text along with associated target area metadata using the same number of data pages described by the ATIS report. See Letter from Joseph Marx, Assistant Vice President, AT&T, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91 (filed Dec. 4, 2017); Letter from Thomas Goode, General Counsel, ATIS, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91 at 1 (filed Dec. 14, 2017) (ATIS Dec. 14, 2017 *Ex Parte*). In the alternative, Participating CMS Providers could use an extra data page to fit additional information within a single WEA alert transmission. See ATIS Dec. 14, 2017 *Ex Parte* at 1; Alliance for Telecommunications Industry Solutions, Feasibility Study for LTE WEA Message Length, ATIS -0700023, at 13 (2015). The ATIS feasibility study shows that associating an additional data page with an Alert Message transmission would increase alert message delivery latency by between 240 milliseconds and 15.36 seconds, and increase the battery-life impact of alert message receipt by approximately 25%. See Alliance for Telecommunications Industry Solutions, Feasibility Study for LTE WEA Message Length, ATIS -0700023, at 12, 17-18 (2015).

<sup>41</sup> See Letter from Alfred Kenyon, IPAWS Customer Support Branch Chief, FEMA, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91 at 1 (filed January 5, 2018).

<sup>42</sup> As of May 2019, Participating CMS Providers must support Alert Messages that contain up to 360 characters of alphanumeric text on networks technically capable of supporting them, and Alert Messages that contain up to 90 characters of alphanumeric text on and only on those elements of its network incapable of supporting a 360-character Alert Message. See 47 CFR § 10.430, as amended.

<sup>43</sup> See Alliance for Telecommunications Industry Solutions, Feasibility Study for LTE WEA Message Length, ATIS -0700023, at 3 (2015) ("Here, the term 'Message Length' refers to the number of displayable characters transmitted over the air to the mobile devices.").

<sup>44</sup> While not an exhaustive list, these examples are intended to illustrate the types of limited circumstances where the record shows Participating CMS Providers may be technically incapable of matching the target area. Any Participating CMS Provider that is technically capable of matching the target area in these circumstances is nevertheless required to do so.



approximates the target area on and only on those aspects of its network infrastructure that are incapable of matching the target area.<sup>45</sup> In addition, the requirement to match the target area applies only to new mobile devices offered for sale after the rule's effective date and to existing devices capable of being upgraded to support this matching standard. For existing mobile devices that cannot be upgraded, Participating CMS Providers must deliver the Alert Message to their "best approximation" of the target area.<sup>46</sup> ATIS and Verizon argue that given the topology of networks, location of cell sites, and the physics of radio frequency propagation, Participating CMS Providers cannot guarantee that 100 percent of devices in a target area will receive a WEA Alert Message in all instances.<sup>47</sup> Neither ATIS nor Verizon specify any particular instance where a mobile device in the target area would not be able to receive an Alert Message. We also acknowledge that Participating CMS Providers cannot accurately match a target area in which they do not offer wireless service; therefore, we only require that a Participating CMS Provider match the portion of the target area that falls within its network's coverage area.

10. Commenters also observe that WEA-capable mobile devices that do not have location services enabled may be unable to accurately determine whether they are located within the specified target area.<sup>48</sup> We agree with commenters that WEA-capable mobile devices with location services turned off (or otherwise unavailable) at the time of Alert Message receipt should display the Alert Message by default, provided they are within a Participating CMS Provider's best approximation of the target area.<sup>49</sup> By recognizing that Participating CMS Providers may only be able to match the target area where the device has location services enabled, we address device manufacturers' concerns that device-based geo-

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<sup>45</sup> We expect network infrastructure constraints to more granular geo-targeting will be a time-limited issue. *See, e.g.,* John Donovan, *2G Sunset Brings Faster Speeds, Newer Technologies*, AT&T (Jan. 16, 2017), [http://about.att.com/innovationblog/2g\\_sunset?CJPID=2942700&EI=20130822074250E&CI=CJ\\_AFFINITY&RI=CJ1&RD=37922](http://about.att.com/innovationblog/2g_sunset?CJPID=2942700&EI=20130822074250E&CI=CJ_AFFINITY&RI=CJ1&RD=37922) (stating that AT&T shut down their 2G network January 1, 2017); Sean Kinney, *Verizon Planning to Shut Down 2G Network*, RCR Wireless News (Jul 14, 2016), <https://www.rcrwireless.com/20160714/carriers/verizon-planning-shut-2g-network-tag17>; Sascha Segan, *T-Mobile Wants to Turn off 2G and 3G - but not Quite Yet*, PC Mag (Feb 27, 2017), <https://www.pcmag.com/news/352024/t-mobile-wants-to-turn-off-2g-and-3g-but-not-quite-yet>.

<sup>46</sup> We no longer allow Participating CMS Providers to transmit an Alert Message to an area not larger than the propagation area of a single transmission site as a backstop. Commenters indicate that the "best approximates" standard provides "sufficient flexibility for participating providers" and the "legacy 'single cell site transmission' standard" is "now superfluous." Letter from Courtney Neville, Policy Counsel, Competitive Carriers Association, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Nov. 21, 2017) (CCA Nov. 21, 2017 *Ex Parte*).

<sup>47</sup> *See* ATIS Aug. 18, 2017 *Ex Parte* at 1; Verizon Sept. 22, 2017 *Ex Parte* at 1-2; *see also* Letter from Benjamin J. Krakauer, Assistant Commissioner, NYCEM, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Dec. 19, 2017) (acknowledging "industry's point that RF propagation challenges exist which makes achieving 100% delivery difficult in *certain* circumstances (e.g. devices in basements).") (NYCEM Dec. 19, 2017 *Ex Parte*).

<sup>48</sup> Letter from Robert G. Morse, Assistant General Counsel, Verizon, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Aug. 1, 2017) (Verizon Aug. 1, 2017 *Ex Parte*).

<sup>49</sup> *See* AC&C Reply at 3 (stating that the "device can be programmed to display alert as a default when device is unable to determine its current location); AT&T Comments at 18-19 (stating that the "WEA App could default to displaying the message" if location data are not available in the handset); Microsoft Aug. 8, 2017 *Ex Parte* at 3 (recommending "that devices default to displaying the WEA message if a position fix cannot be obtained within a time specified"); *cf.* California Governor's OES Comments at 5 (requesting that devices without location services enabled should cache the Alert Message, rather than display it). We suggest, but do not require, that Participating CMS Providers disclose to consumers at the point of sale that if they have not enabled location services on their devices, they may receive Alert Messages that are not relevant to them. We expect that this limitation will apply to relatively few WEA-capable mobile devices. *See, e.g.,* Monica Anderson, *More Americans Using Smartphones for Getting Directions, Streaming TV*, Pew Research (Jan. 26, 2016), <http://www.pewresearch.org/fact-tank/2016/01/29/us-smartphone-use/>.

targeting could create consumer privacy issues by overriding consumers' location preferences,<sup>50</sup> and could drain battery life by requiring mobile devices to get a new location fix upon receipt of a WEA Alert Message.<sup>51</sup> This approach will also alleviate Verizon's concern about network congestion because devices with location services enabled likely will not need to obtain a new location fix upon receipt of an Alert Message.<sup>52</sup> Mobile devices can determine their geographic location in two ways: by utilizing predictive data or by using the CMS Provider's network. Rx Networks indicates that most smartphones currently "utilize predictive data for geolocation . . . which is valid for 7-14 days."<sup>53</sup> According to Rx Networks, utilizing predictive data for geolocation can be set up "without network support," and there is "no need to send location from [the] handset to the network to support device-based WEA."<sup>54</sup> Accordingly, the only mobile devices that would need to use the network to determine their location are the few that have location services enabled, but do not use predictive data for geolocation or otherwise have a valid location fix at the time the Alert Message is received.<sup>55</sup>

11. In addition, we recognize that a Participating CMS Provider's legacy network infrastructure may be incapable, from the standpoint of technological feasibility, of complying with our matching standard. Commenters state that legacy networks and mobile devices may no longer support the software updates needed to support geo-fencing.<sup>56</sup> Legacy mobile devices that support neither geo-fencing nor the software updates that would provide such capability will continue to be considered WEA capable so long as they continue to be able to receive Alert Messages based on a Participating CMS Provider's best approximation of the target area.<sup>57</sup>

12. We require Participating CMS Providers to comply with this requirement by November 30, 2019. CSRIC V proposed a timetable of 42 months after the adoption of a Commission Order requiring precise geo-targeting, which would translate into July 2021.<sup>58</sup> The *WEA FNPRM* proposed a similar compliance deadline.<sup>59</sup> But emergency managers indicate that "improvements to geo-targeting are

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<sup>50</sup> See Letter from Paul Margie, Counsel for Apple, Inc., to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Aug. 14, 2017) (suggesting that overriding consumers' location preferences would create privacy concerns).

<sup>51</sup> See ATIS Aug. 18, 2017 *Ex Parte* at 1 (suggesting that obtaining location information may drain a device's battery).

<sup>52</sup> Verizon Aug. 1, 2017 *Ex Parte* at 1 ("[n]etwork capacity would also be affected if many devices in the same cell sector need to communicate with the network to obtain location and map updates").

<sup>53</sup> Rx Networks Sep. 14 *Ex Parte* at 1; NYCEM Comments at 11 ("[U]tilizing existing predictive technology can allow a device to determine its location within 5-15 seconds.").

<sup>54</sup> Rx Networks Sep. 14, 2016 *Ex Parte* at 1; accord NYCEM Comments at 11.

<sup>55</sup> Rx Networks Sep. 14, 2016 *Ex Parte* at 1.

<sup>56</sup> See ATIS Dec. 14, 2017 *Ex Parte* at 2 (stating that "it is likely that some legacy devices will not be able to support the changes [required to support enhanced geo-targeting] via a software upgrade"); Bluegrass Jul. 20, 2017 *Ex Parte* at 2 ("Cell broadcast is limited because very few changes can be made on legacy networks."); Microsoft Aug. 8, 2017 *Ex Parte* at 3 ("New requirements should apply only to new devices as backward compatibility should not be required as it is not always feasible.").

<sup>57</sup> Cf. Wireless Emergency Alerts; Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System, PS Docket Nos. 15-91, 15-94, *Order on Reconsideration*, FCC 17-143, para. 9 (rel. Nov. 2017) (stating that "[m]obile devices that support neither embedded references nor the software updates that would provide such capability will not be considered WEA capable").

<sup>58</sup> See CSRIC V WEA Geo-targeting Report at 32.

<sup>59</sup> See *WEA FNPRM*, 31 FCC Rcd at 11218-19, para. 178 (proposing to require compliance 24 months from the completion of all relevant standards or 24 months from the rule's publication in the *Federal Register*, whichever is sooner).

critical to the future success of the WEA system” because of the problems associated with over-alerting and subscriber opt-out<sup>60</sup> and strongly urge implementation on a faster timetable.<sup>61</sup> AT&T, Verizon, and AC&C agree that earlier compliance is feasible. Verizon and AC&C observe that industry is already in the early stages of developing technical standards to support device-based geo-targeting,<sup>62</sup> and ATIS is expected to complete its analysis of device support for this requirement by June 30, 2018.<sup>63</sup> Verizon and AT&T agree that compliance is feasible in a shorter timeframe than the Commission proposed, given the approach we describe here.<sup>64</sup> We accordingly believe an earlier deadline than originally contemplated is both necessary and feasible.

13. CTIA states that 36 months is an achievable timeline for implementation of enhanced geo-targeting,<sup>65</sup> and indicates that legacy and existing devices may be capable of supporting enhanced geo-targeting in less than 36 months.<sup>66</sup> Public safety officials, however, state that “a 36-month implementation timeline is simply too long given the current and future threat environment”<sup>67</sup> and urge the Commission to adopt a May 2019 compliance deadline.<sup>68</sup> We find the 36-month timeframe suggested

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<sup>60</sup> NYCEM Comments at 16.

<sup>61</sup> See Letter from Francisco Sanchez, Jr., Liaison to the Director and Public Information Officer, Harris County Homeland Security and Emergency Management, to Marlene H. Dortch, Secretary, FCC, PS Docket 15-91, at 1 (filed Sep. 15, 2017) (arguing against a 42-month implementation timeline) (Harris County Sep. 15, 2017 *Ex Parte*).

<sup>62</sup> See Letter from Robert Morse, Associate General Counsel, Verizon, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sep. 25, 2017) (Verizon Sep. 25, 2017 *Ex Parte*); AC&C Reply Comments at 10-11.

<sup>63</sup> See Letter from Matthew Gerst, Assistant Vice President, CTIA, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 6 (filed Dec. 21, 2017) (CTIA Dec. 21, 2017 *Ex Parte*).

<sup>64</sup> See AT&T Sep. 26, 2017 *Ex Parte* at 2 (stating that compliance is feasible within less than 42 months if “coordinate data for the polygon and the message content are sent in the same WEA Message”). As described above, the availability of effective compression techniques for Alert Messages and associated metadata offer a feasible approach for transmitting coordinate data and displayable text in the same message. See also Verizon Sep. 25, 2017 *Ex Parte* at 1-2 (stating that compliance is feasible within less than 42 months if the Commission makes appropriate allowances for Participating CMS Providers transmission of the Alert Message to 100 percent of the target area, and accounts for the fact that the software updates required to support this requirement may not be available for all mobile devices). As described above, we revise our proposed matching requirement such that Participating CMS Providers are only responsible for transmitting Alert Messages to 100 percent of the target area to the extent that it overlaps with their network coverage area. This will allow for compliance with this requirement even in instances where the target area specified by an alert originator overlaps with a geographic area where a Participating CMS Provider does not provide mobile service. Further, as described below by our definitions of participation in WEA “in part,” a CMS Provider may continue to participate in WEA in part even if not all mobile devices that the carrier offers at the point of sale are WEA-capable.

<sup>65</sup> See Letter from Matthew Gerst, Assistant Vice President, Regulatory Affairs, CTIA, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 3 (filed Jan. 5, 2018).

<sup>66</sup> See CTIA Dec. 21, 2017 *Ex Parte* at 5 (recognizing “the potential for adding enhanced geo-targeting capabilities to at least some legacy or existing devices prior to [a] 36-month deadline”); accord Letter from Rebecca Murphy Thompson, General Counsel & Executive Vice President, Competitive Carriers Association, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Jan. 2, 2018) (CCA Jan. 2, 2018 *Ex Parte*).

<sup>67</sup> Letter from Francisco Sanchez, Public Information Officer, Harris County Office of Homeland Security and Emergency Management, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Dec. 19, 2017) (Harris County Dec. 19, 2017 *Ex Parte*).

<sup>68</sup> See Harris County Dec. 19, 2017 *Ex Parte* at 2 (stating that software updates to achieve enhanced geo-targeting should be implemented no later than May 2019); Letter from Francisco Sanchez, Public Information Officer, Harris County Office of Homeland Security and Emergency Management, to Ajit Pail, Chairman, FCC, PS Docket No. 15-91, at 2 (filed Dec. 28, 2017) (Harris County Dec. 28, 2017 *Ex Parte*) (describing the need to implement enhanced geo-targeting capabilities no later than May 2019); NYCEM Dec. 19, 2017 *Ex Parte* at 2 (“A 36-month implementation timeline is simply too long given the threat environment that local emergency management and

(continued....)

by Participating CMS Providers to lack the kind of precise and detailed justification necessary to outweigh the urgent need for precise geo-targeting articulated by public safety.

14. The record in this proceeding shows that the urgent public safety benefits of enhanced geo-targeting necessitate an expedited compliance timeframe.<sup>69</sup> We are concerned that without decisive Commission action, precise geo-targeting will remain unavailable to emergency managers, that its unavailability will continue to lead to subscriber opt-out due to over-alerting, and that lives may be lost in the meantime. But we recognize that the requirement we adopt today will necessitate completion of ongoing standards development, device updates, software integration and testing.<sup>70</sup> Based on the record currently before us, we disagree that the May 2019 compliance timeframe proposed by public safety is sufficient for Participating CMS Providers to reasonably complete these tasks.<sup>71</sup> The current record suggests that the deployment of 360-character alerting by May 2019 will facilitate the testing and deployment of precise geo-targeting<sup>72</sup> – and so some amount of time thereafter may be necessary. However, Participating CMS Providers concede that the standards process is already underway, and expect that subsequent steps, including software and network updates, can occur in parallel.<sup>73</sup> We note that in the September 2016 *WEA R&O*, the Commission made clear that it “expect[ed] that Participating CMS providers will continue to innovate” to further the “ultimate objective [that] Participating CMS Providers . . . match the target area provided by an alert originator.”<sup>74</sup> We expect that Participating CMS Providers have made advancements towards more accurate geo-targeting in the intervening 16 months and will not need an extensive period for deployment and testing after the deployment of 360-character alerts by May 2019. Accordingly, and given our experience with other wireless standards development processes,<sup>75</sup> we believe that compliance by November 30, 2019 is feasible and required in the public

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public safety officials are operating in.”); Letter from Jeffrey S. Cohen, Chief Counsel, APCO, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Dec. 19, 2017) (indicating that enhanced geo-targeting of Alert Messages should be achieved no later than May 1, 2019) (APCO Dec. 19, 2017 *Ex Parte*); Letter from Dianne Jacob, Chairwoman, San Diego County Board of Supervisors, to Chairman Pai and Commissioners, FCC, PS Docket No 15-91 (filed Jan. 2, 2018); Michael Antonucci, Emergency Services Manager, San Bernardino County Fire Protection District, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Jan. 3, 2018).

<sup>69</sup> See Letter from Benjamin J. Krakauer, Assistant Commissioner, New York City Emergency Management, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91 at 2 (filed Dec. 19, 2017) (NYCEM Dec. 19, 2017 *Ex Parte*).

<sup>70</sup> See CTIA Dec. 21, 2017 *Ex Parte* at 5 (outlining steps CMS Providers must take to implement enhanced geo-targeting); AC&C Reply at 11 (stating that standards are necessary to comply with this requirement, a number of which already exist); AT&T Sep. 26, 2017 *Ex Parte* at 2 (stating that operating systems and mobile device software would need to be updated to comply with this requirement); Microsoft Aug. 8, 2017 *Ex Parte* at 3 (urging the Commission to allow sufficient time for standards, new device development, testing and roll out as part of our compliance timeframe).

<sup>71</sup> See CTIA Dec. 21, 2017 *Ex Parte* at 5.

<sup>72</sup> CTIA Dec. 21, 2017 *Ex Parte* at 3 n.2.

<sup>73</sup> See CTIA Dec. 21, 2017 *Ex Parte* at 5.

<sup>74</sup> *WEA R&O and FNPRM*, 31 FCC Rcd at 11147-48, para. 52.

<sup>75</sup> See Petition of CTIA for Reconsideration of the Wireless Emergency Alerts (WEA) Report and Order, PS Docket Nos. 15-91, 15-94, at 6-8 (filed Dec. 1, 2016) (CTIA Petition) <https://ecfsapi.fcc.gov/file/1201436312000/CTIA%20WEA%20Petition%20For%20Reconsideration.pdf> (stating that whatever the “aspirational desires of the Commission[,] . . . a one-year deadline [*i.e.*, November 1, 2017] to support embedded references into the WEA system would be unworkable and infeasible” for CTIA members, and requesting an indefinite extension). *But see Wireless Emergency Alerts*, Order on Reconsideration, 32 FCC Rcd 9624, para. 9 (2017) (stating that Verizon, AT&T, Sprint, T-Mobile, and US Cellular acknowledged that they can comply with the November 1, 2017 deadline to support embedded references).

interest.

## **B. Alert Message Preservation**

### **1. Background**

15. The Commission's rules currently do not address whether or how WEA Alert Messages should be preserved on consumers' mobile devices after they are dismissed. The *WEA FNPRM* proposed to require WEA-capable mobile devices to preserve Alert Messages in a consumer-accessible format and location until the Alert Message expires, and sought comment on the extent to which Participating CMS Providers currently offer consumers this capability.<sup>76</sup> The Commission proposed to require Participating CMS Providers to support Alert Message preservation within 30 months of the rule's publication in the *Federal Register*—the same timeframe that the Commission adopted for other requirements adopted in the *WEA R&O* that implicated updates to standards and software—and sought comment on whether compliance could be achieved sooner.<sup>77</sup>

### **2. Discussion**

16. We amend Section 10.500 of the WEA rules to state that WEA-capable mobile devices must preserve Alert Messages in a consumer-accessible format and location for at least 24 hours after the Alert Message is received on the subscriber's mobile device.<sup>78</sup> The record shows that allowing consumers to review Alert Messages after they have been dismissed can improve comprehension of potentially life-saving information.<sup>79</sup> The Rehabilitation Engineering Research Center for Wireless Inclusive Technologies (Wireless RERC) and the Georgia Institute of Technology's Center for Advanced Communications Policy (CACP) agreed with our proposal to ensure that Alert Messages are preserved for user review, citing their research finding that many WEA users had difficulty understanding WEA Alert Messages because “the message disappears” and they “need to be able to repeat the message.”<sup>80</sup> APCO and NCMEC confirm that “[c]ontinued access to alert messages is especially important given the Commission's recent adoption of rules that provide for a higher character limit and embedded references such as URLs and phone numbers, and it will become even more important once WEA is enhanced with content-rich features such as multimedia.”<sup>81</sup> NYCEM identifies specific examples where this feature

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<sup>76</sup> *WEA FNPRM*, 31 FCC Rcd at 11186, para. 116.

<sup>77</sup> See *WEA FNPRM*, 31 FCC Rcd at 11217, para. 176. We note that, in proposing to require compliance within 30 months of the rule's publication in the *Federal Register*, the Commission used the same record-supported analysis as it relied upon in the *WEA R&O*. *I.e.*, it allowed 12 months for appropriate industry bodies to finalize and publish relevant standards, 12 months for Participating CMS Providers and device manufacturers to develop and integrate software upgrades consistent with those standards, and an additional six months to deploy this technology in WEA-capable mobile devices. See *WEA R&O*, 31 FCC Rcd at 11161-62, para. 79.

<sup>78</sup> We expect that such devices will preserve any formatting needed to ensure access by all consumers, including those with disabilities.

<sup>79</sup> See Wireless RERC & CACP Comments at 7-8 (citing a 2015 study indicating that subscribers had difficulty understanding WEA Alert Messages because “the message disappears” and they “need to be able to repeat the message”); APCO Comments 2 (arguing that alert preservation is particularly important given recent rules adopting 360-characters and embedded references in Alert Messages); Letter from Preston Findlay, Counsel, Missing Children Division, NCMEC, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 3 (filed Mar. 2, 2016) (NCMEC Mar. 2, 2016 *Ex Parte*) (arguing that the ability to review detailed content multiple times is even more beneficial given the character length increase for WEA messages).

<sup>80</sup> Wireless RERC & CACP Comments at 7-8 *citing* Helena Mitchell and Salimah LaForce, Wireless RERC CACP, Georgia Institute of Technology, Optimizing Ability of Message Receipt by People with Disabilities WEA Survey Findings: Final Report, Department of Homeland Security Science and Technology Directorate (2015) (on file with author).

<sup>81</sup> APCO Comments 2; NCMEC Mar. 2, 2016 *Ex Parte* Letter at 3; Wireless RERC & CACP Comments at 7-8.

would be helpful, including in evacuation situations where the Alert Message contains information about shelter locations, commodity distribution point locations, and emergency hotline telephone numbers, which will continue to be relevant once the alert has been dismissed by the user.<sup>82</sup> In light of this record, we disagree with T-Mobile that “[t]here is no need for action regarding the preservation of alerts.”<sup>83</sup> Further, alert preservation “also has the potential to reduce milling behavior,”<sup>84</sup> as some recipients of Alert Messages “will search for alerts on the internet once dismissed to find the content” of the original message.<sup>85</sup> Preserving access to Alert Messages on user devices may therefore reduce burdens on carrier networks during an emergency, allowing critical traffic to get through to first responders and emergency managers, thereby improving public safety outcomes.

17. Commenters indicate that it is feasible to preserve Alert Messages,<sup>86</sup> and that some WEA-capable mobile devices are already capable of preserving Alert Messages.<sup>87</sup> Microsoft smartphones, for example, preserve Alert Messages in the “Message History” folder,<sup>88</sup> and Blackberry 10 and Android phones keep alerts in an “inbox” that the user can access for later review.<sup>89</sup> Not all WEA-capable mobile devices, however, offer this capability.<sup>90</sup> For those mobile devices that do not currently preserve Alert Messages, the record shows this capability can be enabled through a software update.<sup>91</sup>

18. Requiring that Alert Messages be preserved for 24 hours, rather than “until they expire,” as proposed, meets the needs of emergency managers while addressing concerns raised by industry. The California Governor’s OES and Calhoun CEMA specifically request that Alert Messages be preserved for

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<sup>82</sup> See NYCEM Comments at 3-4.

<sup>83</sup> T-Mobile Reply Comments at 2; see also CTIA Comments at 11 (contending that “there is not documented evidence of a need to preserve Alert Messages”).

<sup>84</sup> APCO Comments at 2. “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](http://www.nap.edu/catalog.php?record_id=15853) (last visited Oct. 25, 2017).

<sup>85</sup> FEMA Mar. 17, 2016 *Ex Parte* at 5. Letter from Alfred Kenyon, IPAWS Program Office, Department of Homeland Security, FEMA, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 5 (filed Mar. 17, 2016) (FEMA Mar. 17, 2016 *Ex Parte*).

<sup>86</sup> Microsoft Comments at 5 (“It is technologically feasible to preserve emergency alerts on a device and, as the Further Notice acknowledges, Windows smartphones already do so.”); T-Mobile Reply Comments at 8-9 (“the preservation of alerts can already be addressed through the feature-set of certain devices.”); CTIA Comments at 11 (noting that “[e]ach individual WEA-capable mobile device . . . generally already has a methodology of retaining notifications of this type”).

<sup>87</sup> See Microsoft Comments at 5; T-Mobile Reply Comments at 8-9; CTIA Comments at 11; Blackberry Mar. 21, 2016 *Ex Parte* at 2.

<sup>88</sup> See Microsoft Comments at 5; Letter from Paula Boyd, Director of Governmental and Regulatory Affairs, Microsoft Corporation, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Mar. 9, 2016) (Microsoft Mar. 9, 2016 *Ex Parte*).

<sup>89</sup> Letter from David T. Blonder, Director and Legal Counsel, Blackberry Corporation, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 2 (filed Mar. 21, 2016) (Blackberry Mar. 21, 2016 *Ex Parte*).

<sup>90</sup> See ATIS Mar. 18, 2016 *Ex Parte* at 23 (indicating that Alert Message preservation is dependent “upon vendor implementation, and is vendor-specific.”).

<sup>91</sup> See Letter from Thomas Goode, General Counsel, ATIS, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 21 (filed Mar. 21, 2017) (ATIS Mar. 21, 2016 *Ex Parte*); Letter from Harris County Office of Homeland Security and Emergency Management, to Marlene Dortch, Secretary, FCC, PS Docket 15-91, at 4 (filed Mar. 7, 2016) (Harris County Mar. 7, 2016 *Ex Parte*).

24 hours.<sup>92</sup> Microsoft and ATIS agree that the Commission should require that Alert Messages be preserved for a specified period of time.<sup>93</sup> ATIS states, on the other hand, that it would not be feasible to preserve Alert Messages until they expire because the CAP parameter defining Alert Message expiration is neither defined nor transmitted to the device in a manner that would allow this information to dictate device behavior.<sup>94</sup> We note that the CAP parameter for Alert Messages expiration has a maximum value of 24 hours.<sup>95</sup> Accordingly, the 24-hour preservation timeframe we adopt today ensures that consumers will be able to review Alert Messages while they remain active, and addresses device manufacturers' and CMS Providers' technical concerns.

19. We allow industry flexibility to preserve Alert Messages in a manner that fits within existing WEA interface designs. AT&T states that "carriers cannot collectively settle upon the design of a WEA mailbox and impose that design upon handset manufacturers, which compete on the basis of their user interfaces and approach the question of message storage independently."<sup>96</sup> Microsoft states that device manufacturers should continue to be allowed to implement Alert Message preservation in the manner of their choosing.<sup>97</sup> We agree with Microsoft, and decline to mandate a uniform approach to Alert Message preservation.

20. We require Participating CMS Providers to comply with this requirement by November 30, 2019. The record shows that 22 months is sufficient time for Participating CMS Providers to implement the software update needed to enable this functionality<sup>98</sup> – and making this requirement align with the precise geo-targeting requirement should ease administration and oversight. Commenters state that, in the absence of standards, many Participating CMS Providers' WEA-capable mobile devices already preserve Alert Messages in a manner that would be compliant with the requirement we adopt today.<sup>99</sup> While we agree with ATIS that standards may have been necessary to support the preservation of Alert Messages in a uniform format, as proposed, standards are not necessary to comply with the more flexible requirement we adopt today.<sup>100</sup> Compliance with this requirement does not implicate changes to the provision of WEA that would necessitate standards development. Rather, we allow industry flexibility to preserve Alert Messages on mobile devices in a manner that fits within their existing WEA interface designs. Accordingly, we find that it is both feasible and in the public interest to require this functionality on WEA-capable mobile devices by November 30, 2019.

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<sup>92</sup> Calhoun CEMA Comments at 1; California Governor's OES Comments at 1. *But see* NYCEM July 10 Ex Parte at 2 (arguing that Alert Messages should be preserved indefinitely, until they are deleted by the consumer).

<sup>93</sup> *See* ATIS Comments at 4; Microsoft Comments at 5-6.

<sup>94</sup> *See* ATIS Comments at 4.

<sup>95</sup> *See* NYCEM Comments at 3; *see also* OASIS CAP v1.2 (IPAWS Profile for the OASIS Common Alerting Protocol IPAWS USA).

<sup>96</sup> AT&T Comments at 6.

<sup>97</sup> Microsoft Comments at 6.

<sup>98</sup> Where we allow twelve months for Participating CMS Providers and mobile device manufacturers to develop and integrate software upgrades into embedded plant and to complete required "technical acceptance testing," and then six more months for Participating CMS Providers and mobile device manufacturers to deploy this new technology to the field. *See WEA R&O*, 31 FCC Rcd at 11161-62, para. 79; *see also WEA FNPRM*, 31 FCC Rcd at 11217, para. 176 (proposing to use this framework to analyze the compliance timeframe for alert preservation). No commenter opposed using this framework as a basis for determining the compliance timeframe for alert preservation.

<sup>99</sup> *See* Microsoft Comments at 5; T-Mobile Reply Comments at 8-9; CTIA Comments at 11; Blackberry Mar. 21, 2016 *Ex Parte* at 2.

<sup>100</sup> ATIS Mar. 21, 2016 *Ex Parte* at 23. Provided that WEA-capable mobile devices continue to implement display modes that meet the needs of people with disabilities and other users. *See WEA Capabilities Report and Order*, 23 FCC Rcd at 6173, para. 68.

## C. Defining the Extent of WEA Participation

### 1. Background

21. Pursuant to the WEA rules, all CMS Providers must notify the Commission and the public of their election to participate in WEA by filing a letter in the WEA election docket stating whether they elect to participate in WEA, and whether they elect to participate “in whole” or “in part.”<sup>101</sup> Further, CMS Providers participating “in part” must notify consumers at the point of sale that “[w]ireless emergency alerts may not be available on all devices or in the entire service area.”<sup>102</sup> The Commission’s rules, however, do not define “in whole” or “in part” WEA participation or specify the difference between these elections.<sup>103</sup>

22. In the *WEA FNPRM*, the Commission proposed to define CMS Providers participating “in whole” as those 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.<sup>104</sup> The Commission proposed to define CMS Providers participating in WEA “in part” as those that have agreed to transmit WEA Alert Messages in the same manner, in some, but not all of their geographic service area, and to some, but not all of the mobile devices on their network.<sup>105</sup> The Commission has previously rejected, and did not seek comment on, the notion that partial compliance with the Commission’s WEA rules in other respects would permit a carrier to classify itself as offering WEA either “in whole” or “in part.”<sup>106</sup> The Commission sought comment on whether to read a commitment to support WEA using “all available network technologies” into Participating CMS Providers’ elections,<sup>107</sup> and whether to revise its definition of a “mobile device” for the purpose of WEA.<sup>108</sup> Finally, the Commission proposed to require Participating CMS Providers to renew their election letters consistent with any new definitions for participation in WEA within 120 days of the new definition’s publication in the *Federal Register*, and sought comment on whether to revisit our requirements for keeping WEA election status up to date.<sup>109</sup>

### 2. Discussion

23. The majority of commenters support the proposed definitions of “in part” and “in whole”

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<sup>101</sup> See *WEA Participation Report and Order*, 23 FCC Rcd at 12575, para. 32; see also 47 CFR § 10.210(a) (requiring that CMS Providers who elect to transmit WEA Alert Messages electronically file an election letter with the Commission); 47 CFR § 10.210(c) (requiring Participating CMS Providers to file in the election letter in the docket).

<sup>102</sup> 47 CFR § 10.240(c).

<sup>103</sup> 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.

<sup>104</sup> *WEA FNPRM*, 31 FCC Rcd at 11182, para. 106.

<sup>105</sup> *WEA FNPRM*, 31 FCC Rcd at 11182, para. 106.

<sup>106</sup> See *Improving Wireless Emergency Alerts and Community-initiated Alerting*, 30 FCC Rcd 13781, 13818, para. 79 (2015) (*WEA NPRM*); *WEA FNPRM*, 31 FCC Rcd at 11181-84, paras. 105-111.

<sup>107</sup> See *WEA FNPRM*, 31 FCC Rcd at 11183 at para. 109 (proposing to define “in whole” participation as a commitment to support WEA using all available network technologies).

<sup>108</sup> *WEA FNPRM*, 31 FCC Rcd at 11182, para. 108. The Commission’s rules currently define “mobile devices” as “[t]he subscriber equipment generally offered by CMS providers that supports distribution of Alert Messages.” See 47 CFR § 10.10(j).

<sup>109</sup> *WEA FNPRM*, 31 FCC Rcd at 11219, para. 179.



participation,<sup>110</sup> and agree that the definitions should reflect the current “rules requiring providers to inform current and prospective customers about their level of participation.”<sup>111</sup> Further, commenters suggest that defining “in part” and “in whole” would provide clarity to subscribers about the support for WEA service on their chosen CMS Provider’s network.<sup>112</sup> Accordingly, we amend Section 10.10 of the Commission’s rules to state that CMS Providers participate in WEA “in whole” when they agree 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 when all mobile devices that they offer at the point of sale are WEA-capable. We further amend Section 10.10 to state that CMS Providers participate in WEA “in part” when they agree 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, but not in all of their geographic service areas, or not all mobile devices that they offer at the point of sale are WEA-capable. This approach achieves the intent of our proposed definitions while offering greater clarity as to the scope of Participating CMS Providers’ responsibilities, and addressing the concerns of the few commenters that identified issues with our proposal.

24. We decline to revise our definition of a “mobile device.” We find that the current definition of a mobile device as “[t]he subscriber equipment generally offered by CMS Providers that supports the distribution of WEA Alert Messages” is sufficient to describe the scope of mobile devices that may support WEA.<sup>113</sup> As we observed in the *WEA FNPRM*, in addition to smartphones and feature phones, WEA is already available on some tablets.<sup>114</sup> Commenters note that not all tablet computers or wearables are currently WEA-capable, and “visual, haptic, and audio signaling capabilities will likely have to be incorporated into [these] technologies to support the WEA notification signal requirements.”<sup>115</sup>

25. Further, we revise our proposed definitions of participation in whole and in part to not require support for mobile devices by virtue of their being connected to Participating CMS Providers’ networks. Microsoft cautions that expanding the definition of “mobile devices” to include “any device connected to a Participating CMS Provider’s network” would mean that WEA-capable mobile devices may be sold by entities other than the Participating CMS Provider, that such entities would not be subject to the Commission’s point-of-sale disclosure rules, and thus, devices could be sold without the required disclosures,<sup>116</sup> creating confusion among consumers about the availability of WEA.<sup>117</sup> To address this concern, the definitions of participation that we adopt appropriately reflect that Participating CMS Providers’ responsibility to support WEA-capable mobile devices extends only to mobile devices that

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<sup>110</sup> See NYCEM Comments at 3 (“NYCEM believes the proposed definition in adequate.”); Wireless RERC & CACP Comments at 5 (“We agree with the definitions outlined in the FNPRM.”); Verizon Comments at 2 (indicating that the proposed definitions of “in whole” and “in part” participation “meet the WARN Act’s requirements and should remain.”); Verizon Aug. 1, 2017 *Ex Parte* at 1 (reiterating that the definitions of “in whole and “in part” participation “should remain simple and straightforward based on service coverage and the capabilities of the devices they offer.”); Bluegrass Cellular Jul. 20, 2017 *Ex Parte* at 2.

<sup>111</sup> Wireless RERC & CACP Comments at 5.

<sup>112</sup> See NYCEM Comments at 2; California Governor’s OES Comments at 1.

<sup>113</sup> 47 CFR § 10.10(j).

<sup>114</sup> See *WEA FNPRM*, 31 FCC Rcd at 1183, para. 108 *citing* Daniel Gonzales, Department of Homeland Security, Science and Technology, Wireless Emergency Alerts Mobile Penetration Strategy at 124 (2013); *see also* Wireless RERC & CACP Comments at 6.

<sup>115</sup> Wireless RERC & CACP Comments at 6; NYCEM Comments at 3 (acknowledging “the limitation of Wi-Fi-only tablets to receive WEA as they are not receiving data services from a CMSP”).

<sup>116</sup> Microsoft Comments at 3-4.

<sup>117</sup> Microsoft Comments at 4.

they offer at the point of sale, and to WEA-capable devices roaming on their networks.<sup>118</sup> For example, subject to applicable roaming requirements, Participating CMS Providers need only provide support for devices they offer for sale.<sup>119</sup> Consistent with our definition of a “mobile device” for the purpose of WEA as being “generally offered by CMS providers,” we decline to require Participating CMS Providers to attest to the WEA functionality of mobile devices that are outside of their control.

26. In adopting these definitions, we decline to define “in whole” and “in part” participation, as initially proposed, with reference to the extent to which Participating CMS Providers make WEA service available using all available technologies on their networks. Verizon opposed this proposal because it “unnecessarily micro-manag[es] how carriers attest to and disclose the alerting capabilities of their networks and devices” and may confuse consumers “because the different [network technology-based] attestations would inaccurately imply material differences between competing providers’ alerting capabilities” even where consumers “enjoy the same access to alerts.”<sup>120</sup> We agree that defining the extent of CMS Providers’ WEA participation based on their use of available network technologies creates an unnecessary and immaterial distinction between Participating CMS Providers who may provide their subscribers with the same access to WEA, but may rely on different network technologies to do so.<sup>121</sup> We find that requiring attestations to the use of all available network technologies as a prerequisite for “in whole” participation would create an unnecessarily high bar to achieving “in whole” WEA participation.<sup>122</sup>

27. CTIA was the only commenter that opposed the Commission’s definitions of “in whole” and “in part” WEA participation, as adopted here. CTIA argues that the proposed definitions “forc[e] a choice on CMS Providers that risks undermining the public interest: support all technical features of WEA or opt out of the program in its entirety.”<sup>123</sup> The Commission already rejected the argument that “in part” participation should allow Participating CMS Providers to support some, but not all, of the WEA rules in the *WEA NPRM*, and we do not reconsider that approach now.<sup>124</sup> The Commission’s rules already require CMS Providers, whether participating “in whole” or “in part,” to “[a]gree to transmit . . . alerts in a manner consistent with the technical standards, protocols, procedures, and other technical

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<sup>118</sup> See 47 CFR § 10.470 (“When, pursuant to a roaming agreement (*see* § 20.12 of this chapter), a subscriber receives services from a roamed-upon network of a Participating CMS Provider, the Participating CMS Provider must support WEA alerts to the roaming subscriber to the extent the subscriber’s mobile device is configured for and technically capable of receiving WEA alerts.”). This action does not modify Participating CMS Providers’ responsibilities to support WEA-capable mobile devices roaming on their networks.

<sup>119</sup> See 47 CFR § 10.470; *see also* Microsoft Comments at 3-4 (providing examples of locations other than CMS Provider retail stores where mobile devices are sold); *but cf.* Bluegrass Cellular Jul. 20, 2017 *Ex Parte* at 2 (stating that even “if a customer supplies his or her own device, as long as the device is WEA capable and follows standards, Bluegrass Cellular should be able to support WEA”).

<sup>120</sup> Verizon Comments at 1-2.

<sup>121</sup> See Verizon Comments at 2 (“The Further Notice suggests, however, that if those same providers deliver alerts ubiquitously via their cellular/broadband PCS and 700 MHz LTE networks, but one of them does not also use its supplemental AWS or 5G spectrum for alerts, then the latter is only delivering alerts ‘in part.’ This would make no sense; all of their customers enjoy the same access to alerts and should file the same attestation.”).

<sup>122</sup> See Verizon Comments at 2. *See also* 47 CFR § 10.240 (requiring CMS Providers to notify consumers at the point-of-sale of their non-participation in WEA or election to participate in WEA “in part”). The Commission’s point-of-sale disclosure rules apply only to CMS Providers and to devices sold by CMS Providers.

<sup>123</sup> CTIA Comments at 15.

<sup>124</sup> See *WEA NPRM*, 30 FCC Rcd at 13818, para. 79 (observing that “[t]here is nothing in the WARN Act that gives a Participating CMS Provider the authority to select which technical standards, protocols, procedures and other requirements with which it will comply” and that allowing Participating CMS Providers to do so would “introduce confusion” and “potentially impede interoperability”).

requirements implemented by the Commission.”<sup>125</sup> Accordingly, all Participating CMS Providers must support all technical features of WEA whether they elect to participate “in whole” or (to the extent that the offering is only over certain geographic areas or devices) “in part.” The definitions of WEA participation that we adopt today do not alter this requirement.

28. We acknowledge, however, that Participating CMS Providers require the flexibility to determine which technology they use to provide WEA service. Accordingly, we decline to adopt our proposal to remove from the rules parallel statements that WEA infrastructure and mobile device functionality are dependent on the capabilities of a Participating CMS Provider’s delivery technologies.<sup>126</sup> Commenters state that the rules, as currently written, appropriately recognize that CMS Providers “are not using the same technology and capabilities at the same time throughout their networks.”<sup>127</sup> We agree that this language preserves flexibility for Participating CMS Providers,<sup>128</sup> and the record does not demonstrate a public benefit for its deletion.<sup>129</sup>

29. These definitions will become effective 60 days from their publication in the *Federal Register*. Commenters who address this issue in their filings indicate that, if the Commission adopts definitions of “in whole” and “in part” participation, CMS Providers should be required to renew their elections.<sup>130</sup> We agree. Accordingly, we allow CMS Providers 120 days from the date of publication in the *Federal Register* of a notice announcing approval by the Office of Management and Budget of the modified information collection requirements to update their WEA election status.<sup>131</sup> CMS Providers are only required to update their WEA election status, however, if a change to their WEA election letter already on file with the Commission is necessary for the attestations it contains to remain accurate and consistent with the definitions of participation we adopt today.<sup>132</sup> This renewal will ensure that Participating CMS Providers’ election notices are consistent with the definitions of “in whole” and “in part” participation we adopt today, and will promote public awareness and understanding of CMS Provider participation.<sup>133</sup>

#### **D. Regulatory Impact Analysis**

30. In this section, we show that the benefits resulting from the improvements to WEA we adopt today should exceed their cost. The cost burden our rules could present to CMS Providers is slightly less than \$41 million. This cost results mainly from modifications to standards and software. We

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<sup>125</sup> 47 CFR § 10.210(a)(1).

<sup>126</sup> *WEA FNPRM*, 31 FCC Rcd at 11185, para 113; *see also* 47 CFR § 10.330; 47 CFR § 10.500.

<sup>127</sup> CTIA Comments at 8.

<sup>128</sup> CTIA Comments at 8 (arguing that the language in Sections 10.330 and 10.500 provides needed flexibility to Participating CMS Providers to develop and deploy new network technologies, driven by consumer demand).

<sup>129</sup> No commenters supported this proposal.

<sup>130</sup> *See* Wireless RERC & CACP Comments at 7 (“If the outcome of this rulemaking defines WEA participation, then all providers should be required to renew their elections to ensure congruence with the new definitions.”).

<sup>131</sup> This requirement applies to CMS Providers not currently participating in WEA, as well as those that currently participate in whole or in part. The 120-day timeline is tied to OMB approval, rather than from the publication of the rule in the *Federal Register* as originally proposed, to accommodate the need to modify this information collection and corresponding Paperwork Reduction Act analysis. *See First WEA R&O*, 31 FCC Rcd at 11219, para. 179; *see also* Election of Whether to Participate in the Commercial Mobile Alert System. Notice of Office of Management and Budget Action, ICR Ref. No. 201704-3060-035, OMB Control No. 2060-1113 (2017).

<sup>132</sup> *See* PS Docket No. 08-146.

<sup>133</sup> *See* Wireless RERC & CACP Comments at 7; NYCEM Comments at 3 (arguing that CMS Providers should “refresh their election status so that the Commission, the emergency management community, and general public have an understanding of participation”).

estimate that the public safety benefit of the rules we adopt today will be in excess of these costs because of the potential of WEA, as a result of these enhancements, to save lives, prevent injuries, and reduce the cost of deploying first responders. We note that we sought comment on the costs and benefits of our proposed rules in the *WEA FNPRM*,<sup>134</sup> but received a sparse record in response, including no dollar figure estimates.<sup>135</sup> We base our assessment of costs on the quantitative framework on which the Commission relied in the *WEA R&O* and *WEA FNPRM*, which no commenter opposed.

### 1. Costs

31. We estimate the cost burden our rules could present to all Participating CMS Providers is slightly over \$41 million as a one-time cost. These costs include \$1,140,000 for updating standards and specifications, \$39,680,000 for new or modified software, and \$20,000 for recordkeeping costs.

32. In the *WEA FNPRM*, we proposed to analyze the costs of the standards-setting process pursuant to the same framework on which we relied in the *WEA R&O*. We received no objections to this approach in the record. The cost of modifying an existing standard is less than the cost of creating a new standard. In the *WEA R&O*, we calculated the cost of creating a single standard to be \$76,000, and concluded that this cost constitutes a ceiling on the cost of modifying a single standard.<sup>136</sup> The Commission estimated in the *WEA FNPRM* that nine standards will potentially require modification. ATIS asserts that, in fact, 12 standards may need to be modified and 3 new standards may need to be created.<sup>137</sup> We conclude that the maximum reasonable cost of standards modifications necessary to support enhanced geo-targeting will be \$76,000 per standard times fifteen standards, or \$1,140,000 as a one-time cost.<sup>138</sup> The actual costs of standards modification to support enhanced geo-targeting will likely

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<sup>134</sup> See *WEA R&O and FNPRM*, 31 FCC Rcd at 11220-25, paras. 184-93.

<sup>135</sup> See, e.g., AC&C Reply at 14 (“These proposed changes are a very low cost solution that will not be a burden to the carriers currently providing the platforms for WEA delivery, nor to potential new carrier participants, but will provide additional capabilities and enhancements to alert originators, and will significantly enhance the likelihood that citizens that receive alert messages are those that were intended to receive the message”); AT&T Comments at 4-5 (“Most of these ‘measures’ are unworkable, burdensome, and go well beyond the original commercial mobile alert system that carriers voluntarily joined for the purpose of alerting the public to imminent threats to life or property.”).

<sup>136</sup> This figure, \$76,000 represents the total labor cost of 30 network engineers salaried at \$97.50/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 to comply with our rules. (30 x \$97.50 x 26 = \$76,050, rounded to \$76,000). See *WEA R&O*, 31 FCC Rcd at 11176-77, para. 98.

<sup>137</sup> See Letter from Thomas Goode, General Counsel, ATIS, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1-2 (ATIS Jan. 5, 2018 *Ex Parte*).

<sup>138</sup> We agree with ATIS that each of the standards that describe WEA may need to be modified, at least to some degree, to facilitate compliance with our geo-targeting and Alert Message preservation requirements: (1) Enhanced Wireless Emergency Alert (eWEA) via GSM/UMTS Cell Broadcast Service Specification (ATIS-0700006.v002); (2) Cell Broadcast Entity (CBE) to Cell Broadcast Center (CBC) Interface Specification, Revision 2 (ATIS-0700008.v002); (3) Enhanced Wireless Emergency Alert (eWEA) via EPS Public Warning System Specification (ATIS-0700010.v002); (4) Enhanced Wireless Emergency Alert (eWEA) International Roaming Specification (ATIS0700025.v002); (5) Enhanced Wireless Emergency Alert (eWEA) Service Description (ATIS-0700035); (6) Enhanced Wireless Emergency Alert (eWEA) Mobile Device Behavior (MDB) Specification (a revised version of J-STD-100) (ATIS-0700036); (7) Enhanced Wireless Emergency Alert (eWEA) Federal Alert Gateway to CMSP Gateway Interface Specification (a revised version of J-STD-101) (ATIS-0700037); (8) Enhanced Wireless Emergency Alert (eWEA) Federal Alert Gateway to CMSP Gateway Interface Test Specification (ATIS-0700038); (9) Technical realization of Cell Broadcast Service (CBS) (3GPP TS 23.041); (10) Public Warning System (PWS) Requirements (3GPP TS 22.268); (11) Common Alerting Protocol, v. 1.2 Standard (OASIS); (12) Common Alerting Protocol, v. 1.2 USA Integrated Public Alert and Warning System (IPAWS) Profile Version 1.0 (OASIS). See ATIS Jan. 5, 2018 *Ex Parte* at 1-2. ATIS further asserts that new standards will need to be created for (1) device-based geo-

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be lower than this estimated cost ceiling, however, because the improvements required by today's Order likely implicate less burdensome modifications to the fifteen applicable standards than did the collective improvements adopted in the *WEA R&O* or proposed in the *WEA FNPRM*.

33. After standards are set, Participating CMS Providers will need to develop and test new software to support enhanced geo-targeting and alert preservation.<sup>139</sup> The *WEA FNPRM* anticipated that the software updates implicated by its proposals would be similar in scope and complexity to the rules adopted in the *WEA R&O*, and the software updates in that Order were estimated to cost, at most, \$39,680,000 over 12 months.<sup>140</sup> No commenters objected to this level of anticipated costs. We conclude, therefore, that the cost of developing and testing new or modified software required to comply with the rules we adopt today would be no more than the cost of software development and testing proposed by the *WEA FNPRM*, \$39,680,000.<sup>141</sup> The actual costs of software modification to support enhanced geo-targeting will likely be lower than this estimated cost ceiling, however, because the improvements required by today's Order likely implicate fewer and less complex modifications to *WEA* software than did the collective improvements adopted in the *WEA R&O* or proposed in the *WEA FNPRM*.

34. As to recordkeeping costs, in the *WEA FNPRM*, we outlined the potential burdens that Participating CMS Providers would incur to renew their election to participate in *WEA* pursuant to revised definitions of participation "in whole" and "in part."<sup>142</sup> We noted that, in response to the *WEA Election Report and Order*, OMB approved our assessment that our election requirement would affect 1,253 entities that would be required to update this report, and that fulfillment of this requirement would take 30 minutes per report by an individual salaried at \$28.85/hr.<sup>143</sup> Accordingly, OMB agreed with the Commission that the total annual cost of our election requirement would be \$18,074.53.<sup>144</sup> We received no objections to this estimate in the record, and so conclude that a reasonable ceiling on the cost of renewing elections under the definitions of "in whole" and "in part" would be \$20,000, rounding to the nearest 10,000 to avoid an illusion of precision. No additional, ongoing or annualized costs will result from this reporting obligation because the requirement that we adopt today does not change the approach that Participating CMS Providers must take to updating their elections once this one-time renewed election is completed.

35. Another potential cost is the possibility that some carriers could either drop out of *WEA* or move from full to partial participation due to increased costs. There is no evidence in the record that any carrier would take such action, but we recognize that we must remain mindful of overall costs to maintain carrier participation. We also note that differences between proposed and adopted compliance timeframes do not alter the foregoing analysis. Our analyses of the costs of standards and software modification are functions of employee hourly wages and benefits that are not increased by shortening the period of time over which the required effort is allocated.<sup>145</sup>

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targeting APIs; (2) end-to-end test and verification for device-based *WEA* geotargeting; and for (3) device-based geo-targeting *WEA* message content. *See id.* at 2.

<sup>139</sup> CTIA Comments at 4.

<sup>140</sup> *See WEA FNPRM*, 31 FCC Rcd at 11222, para 188.

<sup>141</sup> 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. *See WEA R&O*, 31 FCC Rcd at 11177-78, paras. 99-100.

<sup>142</sup> *See WEA FNPRM*, 31 FCC Rcd at 11225, para. 192.

<sup>143</sup> *See OMB 3060-1113 (2011)* (noting that these reports can be completed in 0.5 hours).

<sup>144</sup> *See OMB 3060-1113 (2011)*.

<sup>145</sup> For example, in the record generated by the *WEA NPRM*, ATIS stated that when standards need to be modified for *WEA*, groups of approximately 30 individuals with relevant technical expertise hold approximately 26 bi-

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## 2. The Use of Break-even Analysis

36. We employ a break-even analysis to analyze the regulatory impact of the requirements we adopt today. Enhanced geo-targeting, alert preservation, and defining the extent of WEA participation have distinct public safety benefits, but these benefits are difficult to quantify with precision. Enhanced geo-targeting promotes the use of WEA by allowing emergency managers to avoid over-alerting. As more emergency managers use WEA in times of emergency, the public is better able to take action to ensure their safety. Alert preservation promotes public understanding of WEA alerts by allowing people to review WEA messages. The ability to review details in WEA messages such as shelter locations improves the public's ability to seek safety.<sup>146</sup> Defining the extent of WEA participation allows customers to make an informed decision when choosing a mobile provider. Customers that wish to receive WEA messages throughout their provider's service area able to choose a provider that participates "in whole." Such customers can avoid missing alerts that they would wish to receive. It is not possible to predict the number of alerts that will be received due to informed consumer choice, but for each such alert, the consumer will have access to potentially life-saving information that they would not have otherwise received.

37. Break-even analysis is an important tool and can provide insights when quantification is speculative or impossible."<sup>147</sup> As the Office of Information and Regulatory Affairs explains: "When quantification and monetization are not possible, many agencies have found it both useful and informative to engage in threshold or "break-even" analysis. This approach answers the question, 'How large would the value of the non-quantified benefits have to be for the rule to yield positive net benefits?'"<sup>148</sup> For purposes of a break-even analysis, we calculate the benefits required to exceed the costs imposed by this Order. We make three calculations: How much of a reduction in the likelihood of loss of life would be needed to make the current rules worthwhile? How much of a reduction in the likelihood of injuries? How much of a reduction in the need for emergency responses? Informed by these calculations, we can reasonably conclude that the benefit of these rules exceeds their cost.<sup>149</sup>

## 3. Break-even Analysis Calculations

38. The main public safety benefits made possible by this Order are reductions in the probability of lives lost and injuries sustained, and a reduction in emergency response costs. We perform a break-even analysis for each of these three benefits. We compare these break-even estimates with actual data to determine that, taken together, the benefits of this Order can be reasonably expected to

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weekly, one-hour meetings to discuss the modifications over the course of a year. *See* Letter from Tom Goode, General Counsel, ATIS, to Marlene Dortch, Secretary, FCC, PS Docket No. 15-91, at 1 (filed Sep. 6, 2016). We reason that the cost to compensate these individuals for the 26 hours they dedicate to setting standards will remain the same, irrespective of how this time is allocated during the compliance period. Requiring compliance on a shorter timeframe might actually decrease the cost of compliance because employers would be liable for employee benefits over a shorter period. *See WEA R&O*, 31 FCC Rcd at 11176, para. 98, n.424 (including the cost of employee benefits in its quantification of hourly wages).

<sup>146</sup> *See* NYCEM Comments at 3-4.

<sup>147</sup> Office of Information and Regulatory Analysis (OIRA), *Regulatory Impact Analysis: A Primer*, [https://www.reginfo.gov/public/jsp/Utilities/circular-a-4\\_regulatory-impact-analysis-a-primer.pdf](https://www.reginfo.gov/public/jsp/Utilities/circular-a-4_regulatory-impact-analysis-a-primer.pdf) (last visited Dec. 20, 2017).

<sup>148</sup> *See* Office of Information and Regulatory Analysis (OIRA), *Regulatory Impact Analysis: A Primer*, [https://www.reginfo.gov/public/jsp/Utilities/circular-a-4\\_regulatory-impact-analysis-a-primer.pdf](https://www.reginfo.gov/public/jsp/Utilities/circular-a-4_regulatory-impact-analysis-a-primer.pdf) (last visited Dec. 20, 2017).

<sup>149</sup> We do not include the enhanced consumer choice enabled by our rule defining participation in WEA "in whole" and "in part" in our break-even analysis because of the difficulty in assigning a dollar value to this benefit. However, the cost of this rule is included in the analysis. Therefore, the benefit of consumer choice strengthens our conclusion that the benefits of the rules imposed by this Order exceed their costs.

exceed its cost.

39. First, we estimate the minimum reduction in mortality risk necessary to justify the cost burden imposed by this Order. In order to quantify the value of mortality risk reduction, we use the “Value of a Statistical Life” (VSL).<sup>150</sup> 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.”<sup>151</sup> VSL is not used to value any individual’s life in monetary terms. Its sole purpose is to help estimate the likely benefits of a regulatory action that reduces the risks that people face.<sup>152</sup> The Department of Transportation (DOT) currently estimates that the statistical value of a single life saved is \$9.6 million.<sup>153</sup> Hence, the improvements we adopt to WEA today would have to reduce mortality risk by five times the VSL, or \$48 million in value of mortality risk reduction, to exceed the break-even point of \$41 million.<sup>154</sup> Statistically, we consider reducing the expected mortality risk by five to be reasonable, given the hundreds of lives lost in the United States every year due to severe weather, wild fires, and other imminent threats for which enhanced geo-targeting and alert preservation will be relevant.

40. Improvements to early warning systems have saved many lives over the years in the United States.<sup>155</sup> Nevertheless, in 2016, weather-related events in the United States caused 458 fatalities.<sup>156</sup> A reduction in weather-related fatality risks of less than one half of one percent during the

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<sup>150</sup> See, e.g., 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, 604-605, para. 14 (2016); Amendments to Part 4 of the Commission’s Rules Concerning Disruptions to Communications, PS Docket No. 15-80, ET Docket No. 04-35, PS Docket No. 11-82, *Report and Order, Further Notice of Proposed Rulemaking, and Order on Reconsideration*, 31 FCC Rcd 5817, 5881, para 159, n.402 (2016); Review of the Emergency Alert System, EB Docket No. 04-296, *Sixth Report and Order*, 30 FCC Rcd 6520, 6545, n.178 (2015); Wireless E911 Location Accuracy Requirements, *Fourth Report and Order*, 30 FCC Rcd 1259, 1319, para. 163 (2015).

<sup>151</sup> 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](http://www.dot.gov/sites/dot.gov/files/docs/VSL_Guidance_2013.pdf) (last visited Dec. 20, 2017).

<sup>152</sup> Office of Information and Regulatory Analysis (OIRA), *Regulatory Impact Analysis: A Primer*, [https://www.reginfo.gov/public/jsp/Utilities/circular-a-4\\_regulatory-impact-analysis-a-primer.pdf](https://www.reginfo.gov/public/jsp/Utilities/circular-a-4_regulatory-impact-analysis-a-primer.pdf) (last visited Dec. 20, 2017).

<sup>153</sup> See *WEA R&O*, 31 FCC Rcd at 11169, para. 90; see also See Memorandum from Molly J. Moran, Acting General Counsel, DOT, and Carlos Monje, Assistant Secretary for Transportation Policy, Office of the Secretary for Transportation, *Guidance on Treatment of the Economic Value of a Statistical Life (VSL) in U.S. Department of Transportation Analyses – 2016 Adjustment* (Aug. 8, 2016), <https://www.transportation.gov/sites/dot.gov/files/docs/2016%20Revised%20Value%20of%20a%20Statistical%20Life%20Guidance.pdf>.

<sup>154</sup> Five times the VSL is 5 x \$9.6 million = \$48 million.

<sup>155</sup> 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”).

<sup>156</sup> See National Weather Service, *Summary of Natural Hazard Statistics for 2016 in the United States* (2017), <http://www.nws.noaa.gov/om/hazstats/sum16.pdf> (last visited Dec. 20, 2017) (including among “severe weather” events convection [lightning, tornado, thunderstorm wind, hail], extreme temperatures, flood, marine, tropical cyclones, winter and other). Death totals of 458 for 2016 in the United States due to severe weather were representative of totals in proceeding years, but injury totals of 1276 are notably lower than recent years. See, e.g., National Weather Service, *Summary of Natural Hazard Statistics for 2015 in the United States* (2016), <http://www.nws.noaa.gov/om/hazstats/sum16.pdf> (last visited Dec. 20, 2017) (reporting 522 deaths, 2,143 injuries); National Weather Service, *Summary of Natural Hazard Statistics for 2014 in the United States* (2015),

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first three years these rules are in effect would meet the break-even threshold.<sup>157</sup> Because costs occur only once, while benefits will accrue year after year, we conclude that reaching the break-even point is highly likely even if we were to use a different estimate of VSL.<sup>158</sup> Recent extreme weather and natural disasters have shown that enhanced geo-targeting will make WEA more useful to alert originators. Alert originators in areas affected by Hurricane Harvey report that they are concerned about using WEA because it might lead to over-alerting and inaccurate geographic targeting of Alert Messages.<sup>159</sup> In particular, emergency managers in Harris County, Texas report that “we could have used an enhanced WEA system to alert citizens in Houston, Clear Lake, Galveston, Fort Bend, Sugarland and many other communities about specific threats in their individual areas.”<sup>160</sup> These public safety officials assert that more exacting geo-targeting standards are crucial to WEA’s efficacy and deployment as a life-saving tool during extreme weather events. We conclude that the improvements to geo-targeting we adopt today will lead to more widespread and effective use of WEA, enabling emergency managers to deploy WEA during times of crisis, and reduce mortality risk by at least the threshold amount.

41. In addition to saving lives, enhanced geo-targeting and alert preservation will likely contribute to WEA’s ability to prevent injuries. The Abbreviated Injury Scale (AIS) is a standardized method of placing a monetary value on injuries, based on their severity.<sup>161</sup> As in the *WEA R&O* and *WEA FNPRM*, we note that reducing the expected number of injuries by one produces a public safety benefit valued from \$29,000 (for a mild injury) to \$5.6 million (for a critical injury).<sup>162</sup> For our break-even

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<http://www.nws.noaa.gov/om/hazstats/sum14.pdf> (last visited Dec. 20, 2017) (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 Dec. 20, 2017) (reporting 446 deaths, 2,767 injuries); National Weather Service, Summary of Natural Hazard Statistics for 2012 in the United States (2015), <http://www.nws.noaa.gov/om/hazstats/sum12.pdf> (last visited Dec. 20, 2017) (reporting 538 deaths, 2,653 injuries). Averages over the five-year period from 2012 to 2016 are 470 deaths and 2,262 injuries per year.

<sup>157</sup> 0.36% of the average fatality rate of 470 over three years is 5.076, exceeding the break-even fatality risk reduction of 5.

<sup>158</sup> 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](http://www.dot.gov/sites/dot.gov/files/docs/VSL_Guidance_2013.pdf) (last visited Dec. 20, 2017) (expressing VSL as \$9.6 million); but see Department of Health and Human Services, Food and Drug Administration, Tobacco Product Standard for N-Nitrosornicotine, Docket No. FDA-2016-N-2527, at 32 (2017), <https://www.fda.gov/downloads/aboutfda/reportsmanualsforms/reports/economicanalyses/ucm537872.pdf> (estimating VSL as a range from \$4.4 million to \$14.3 million, with a mid-point value of \$9.5 million); United States Environmental Protection Agency, Mortality Risk Valuation, <https://www.epa.gov/environmental-economics/mortality-risk-valuation#whatisvsl> (last visited Dec. 22, 2017) (expressing VSL as \$7.6 million in 2006, which inflates to \$8.8 million in 2016, based on BLS consumer price index, reflecting a 19.1% increase in prices between 2006 and 2016).

<sup>159</sup> Harris County July 10, 2017 *Ex Parte* at 1 (stating that “Harris County rarely uses WEA because it does not want to potentially alert the entire county when a WEA message may only pertain to a certain portion of the county.”).

<sup>160</sup> Harris County Sep. 15, 2017 *Ex Parte* at 1.

<sup>161</sup> See Association for the Advancement of Automotive Medicine, Overview: Abbreviated Injury Scale, <https://www.aaam.org/abbreviated-injury-scale-ais/> (last visited Dec. 20, 2017).

<sup>162</sup> 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). For example, the prevention of 15 injuries would produce a public benefit of \$437,320 where all injuries were considered to be “minor” on the Abbreviated Injury Scale (AIS). Therefore, the prevention of one minor injury would produce a public benefit of \$437,320 / 15 = 29,155. The prevention of 15 injuries would

(continued....)



analysis, it would take a reduction in the expected risk of injuries equivalent to 1,414 mild injuries or 8 critical injuries, or a combination thereof to meet the break-even cost imposed by our rules.<sup>163</sup> We note that an average of 2,262 injuries per year resulted from weather events in the United States over the past five years.<sup>164</sup> While we cannot conclude with certainty that injury reduction alone would create sufficient benefits to meet the break-even point, we note that injury reduction over the long term, when combined with other benefits, strengthens our conclusion that the benefits of our rules outweigh their cost.

42. In addition to saving lives and reducing injuries, enhanced geo-targeting and alert preservation will contribute to WEA's ability to reduce emergency response costs (*i.e.*, directing fire trucks, ambulances, and police to areas in crisis). Those individuals that are able to effectively reach safety due to their receipt of a WEA Alert Message will not need to call 911. The improvements that we adopt today will also have the benefit of reducing response costs. First responders are deployed at least 456,250 times per year in the United States at a cost of approximately \$3,500 per deployment.<sup>165</sup> In order for emergency response cost savings alone to meet the threshold of our break-even analysis, deployments would have to fall by 11,714.<sup>166</sup> This would be equivalent to a less than one percent reduction in emergency deployments if we constrained our analysis to three years of benefits.<sup>167</sup> We cannot predict with certainty the magnitude of emergency deployment cost reductions, but this benefit further strengthens our conclusion that the benefits of our rules outweigh their cost.

43. We conclude that the expected public safety benefits exceed the costs imposed by the improvements we adopt today. Based on the foregoing analysis, we find it reasonable to expect that these improvements will result in lives saved, injuries avoided, and a reduced need to deploy first responders.

#### IV. SECOND ORDER ON RECONSIDERATION

44. We grant the *CTIA Petition* to the extent that it requests that the Commission extend the compliance deadline for supporting Spanish-language Alert Messages from two years to 30 months from the rule's publication in the *Federal Register*, to be consistent with the deadline for the rule that CMS Providers support WEA messages of up to 360 characters in length.<sup>168</sup> Accordingly, this rule will become effective May 1, 2019.<sup>169</sup>

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produce a public benefit of \$84,466,920 where all injuries were "critical" on the AIS scale. Therefore, the prevention of one critical injury would produce a public benefit of  $\$84,466,920 / 15 = 5,631,128$ . See *Wireless Emergency Alerts*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 11112, 11171-73 (2016).

<sup>163</sup> For mild injuries,  $\$41,000,000 / \$29,000$  per injury = approximately 1,414 injuries. For critical injuries,  $\$41,000,000 / 5,600,000$  per injury = 7.32 injuries.

<sup>164</sup> See National Weather Service, Summary of Natural Hazard Statistics for 2016 in the United States, Summary of 2016 Weather Events, Fatalities, Injuries and Damage Costs, <http://www.nws.noaa.gov/om/hazstats/sum16.pdf> (last visited Dec. 20, 2017). There were 1,276 injuries resulting from weather events in the United States in 2016, much lower than the average injuries per year. See *supra* note 154.

<sup>165</sup> See Alex Tabarrok, *Firefighters Don't Fight Fires*, MarginalRevolution (Jul. 18, 2012), <http://marginalrevolution.com/marginalrevolution/2012/07/firefighters-dont-fight-fires.html> 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>.

<sup>166</sup>  $\$41,000,000 / \$3,500$  per deployment = 11,714 deployments.

<sup>167</sup>  $11,714 / (456,250 \times 3) = 0.86$  (less than one percent).

<sup>168</sup> See *CTIA Petition* at 9-11. With this action, we have resolved all outstanding issues from CTIA's petition for reconsideration of the *WEA R&O*.

<sup>169</sup> See *Wireless Emergency Alerts; Amendments to Rules Regarding the Emergency Alert System* 81 FR 75710 (November 1, 2016).

45. We are persuaded that aligning the Spanish-language alert implementation compliance timeframe with the 360-character length requirement timeframe will both ensure that Spanish-language alerts are as effective as possible and will reduce costs for Participating CMS Providers. Absent such relief, Participating CMS Providers would have to incur separate costs of testing for both Spanish-language and 360 character WEA messages.<sup>170</sup> Moreover, because the alerts in Spanish can require more characters than the equivalent alerts in English,<sup>171</sup> implementing this requirement prior to implementation of the 360-character WEA message length will decrease the “headroom” available to alert initiators to craft WEA messages within the WEA character limit.<sup>172</sup> Further, we find that requiring implementation of Spanish-language alerts six months earlier than the 360-character deadline is burdensome when weighed against the likely benefits.<sup>173</sup> In the *WEA R&O*, the Commission reasoned that Participating CMS Providers would need to engage in only one round of software testing for the new rules.<sup>174</sup> But, in light of new information provided by the *CTIA Petition*,<sup>175</sup> we understand that requiring implementation of Spanish-language alerts six months earlier than longer Alert Messages would require duplicative testing and is therefore not the least burdensome approach to reaching our regulatory goals when weighed against the likely benefits. Accordingly, we find it to be in the public interest to extend the compliance timeframe for our Spanish-language alerting requirement from 24 to 30 months.<sup>176</sup> We anticipate that requiring support for Spanish-language Alert Messages by May 1, 2019 will provide incentives and sufficient lead time for the many authorized WEA alert originators that are not currently able to initiate Alert Messages in Spanish to develop that capability.<sup>177</sup>

## V. PROCEDURAL MATTERS

### A. Accessible Formats

46. 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](mailto:fcc504@fcc.gov) or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (TTY).

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<sup>170</sup> *CTIA Petition* at 11.

<sup>171</sup> *CTIA Petition* at 10.

<sup>172</sup> *Id.*

<sup>173</sup> Based on the cost analysis framework that we used in the *WEA R&O*, we reason that testing these new functionalities together could result in a cost savings of \$28 million. *See WEA R&O*, 31 FCC Rcd at 11178-79, para. 99-100. Maintaining separate compliance timeframes for the Spanish language requirement and the character limit requirement could necessitate a duplicative testing phase.

<sup>174</sup> *WEA R&O*, 31 FCC Rcd at 11179, para. 100.

<sup>175</sup> *CTIA Petition* at 11.

<sup>176</sup> We agree with NYCEM that the deadlines for the two requirements should be concurrent, but do not believe that shortening the compliance timeframe for the expanded character limit is the correct approach. *See NYCEM Opposition* at 4. Rather, we agree with CTIA that the record “shows that implementing an increase in the alert character count to 360 characters would require 30 months.” *CTIA Reply to Opposition* at 7-8.

<sup>177</sup> *See CTIA Comments* at 13 (“[T]he merits surrounding a proposal to offer Spanish language alerts should be informed by support from FEMA and alert originators.”); Letter from Daniel Kolb, Operations Coordinator, Denver Office of Emergency Management & Homeland Security, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 2 (filed Mar. 3, 2016) (Denver OEMHS Mar. 3, 2016 *Ex Parte*) (stating that “Denver would like to be able to release multilingual alerts but cannot currently do so”); *but see, e.g.*, Letter from Benjamin J. Krakauer, Director, Watch Command, New York City Emergency Management, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 15-91, at 3 (filed Mar. 8, 2016) (NYCEM Mar. 8, 2016 *Ex Parte*) (“NYCEM is in the final stages of preparing to offer our 80 most common messages in the 13 most commonly spoken languages in New York City”).

**B. Regulatory Flexibility Analysis**

47. 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), a Supplemental Final Regulatory Flexibility Analysis (Supplemental 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 *Second WEA Report and Order and Second Order on Reconsideration*. The FRFA is set forth in Appendix C. The Supplemental IRFA is set forth in Appendix D.

**C. Paperwork Reduction Analysis**

48. The *Second WEA Report and Order and Second 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.

49. 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.”<sup>178</sup> 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**

50. The Commission will send a copy of this *Second WEA Report and Order and Second 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**

51. 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 *Second WEA Report and Order and Second Order on Reconsideration* in PS Docket Nos. 15-91 and 15-94 IS HEREBY ADOPTED.

52. IT IS FURTHER ORDERED that the Commission’s rules ARE HEREBY AMENDED as set forth in Appendix A.

53. IT IS FURTHER ORDERED that the rules adopted herein WILL BECOME EFFECTIVE as described herein.<sup>179</sup> 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.<sup>180</sup>

54. IT IS FURTHER ORDERED, pursuant to Sections 1, 2, 4(i), 4(o), 301, 303(r), 303(v), 307, 309, 335, 403, 624(g), and 706 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), and 606, 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 CTIA Petition is granted to the extent specified herein and in the *First Order on*

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<sup>178</sup> *See* 44 U.S.C. 3506(c)(4)

<sup>179</sup> *See supra* paras. 8, 12, 27.

<sup>180</sup> Pub. L. No. 104-13, 109 Stat. 163 (May 22, 1995), *codified at* 44 U.S.C. §§ 3501 *et seq.*

*Reconsideration.*<sup>181</sup>

55. IT IS FURTHER ORDERED that, as set forth in this *Second Order on Reconsideration*, the effective date of the requirement imposed by 47 CFR § 10.480 published at 81 FR 75710 is delayed until May 1, 2019, the same effective date as other rules adopted by the *WEA R&O* that were made effective 30 months from the publication of the rules adopted in the *WEA R&O* in the *Federal Register*.

56. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of the *Second WEA Report and Order and Second Order on Reconsideration*, including the Final and Supplemental Final Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration.

57. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of the *Second WEA Report and Order and Second Order on Reconsideration* 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

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<sup>181</sup> See *First Order on Reconsideration*, FCC 17-143 (Nov. 1, 2017).

**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 to read as follows:

**PART 10 – WIRELESS EMERGENCY ALERTS**

1. Add new paragraphs (k) and (l) to § 10.10 to read as follows:

**§ 10.10 Definitions**

\* \* \* \* \*

(k) *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 when all mobile devices that the CMS Providers offer at the point of sale are WEA-capable.

(l) *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, but not in all of their geographic service areas, or CMS Providers that offer mobile devices at the point of sale that are not WEA-capable.

2. Amend § 10.210 by revising paragraph (a) to read as follows:

**§ 10.210 WEA participation election procedures**

(a) A CMS provider that elects to transmit WEA Alert Messages, in part or in whole as defined by §§10.10(k), (l), shall electronically file with the Commission a letter attesting that the Provider:

3. Amend § 10.450 by revising paragraph (a) to read as follows:

**§ 10.450 Geo-targeting**

(a) 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 deliver any Alert Message that is specified by a geocode, circle, or polygon to an area that matches the specified geocode, circle, or polygon. A Participating CMS Provider is considered to have matched the target area when they deliver an Alert Message to 100 percent of the target area with no more than 0.1 of a mile overshoot. If some or all of a Participating CMS Provider’s network infrastructure is technically incapable of matching the specified target area, then that Participating CMS Provider must deliver the Alert Message to an area that best approximates the specified target area on and only on those aspects of its network infrastructure that are incapable of matching the target area.

\* \* \*

4. Add new paragraph (h) to § 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 for at least 24 hours.

## APPENDIX B

### Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA)<sup>1</sup> an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *WEA Notice of Proposed Rulemaking (WEA NPRM)* released in November 2015.<sup>2</sup> The Commission sought written public comment on the proposals in the *WEA NPRM*, including comments on the IRFA. No comments were filed addressing the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.<sup>3</sup>

#### A. Need for, and Objectives of, the Final Rules

2. Today's *Second 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. Specifically, we improve the accuracy with which emergency managers can target the delivery of WEA Alert Messages areas within their jurisdiction by requiring Participating Commercial Mobile Service Providers (CMS Providers) to geo-target Alert Messages to an area that matches the target area specified by alert originators. A compelling public interest need for WEA Alert Messages to be delivered in a more geographically targeted manner was demonstrated by the record and emergency managers emphasized that more accurate geo-targeting will enable them to use WEA to more effectively motivate consumers to take protective actions, while reducing the potential for over-alerting and subscriber opt-out of receiving WEA Alert Messages. We also ensure that consumers will continue to be able to review Alert Message content for 24 hours from receipt. The record showed that allowing consumers to review Alert Messages after they have been dismissed can improve comprehension of potentially life-saving information. In addition, preserving access to Alert Messages on user devices may reduce burdens on carrier networks during an emergency, allowing critical traffic to get through to first responders and emergency managers, thereby improving public safety outcomes. Finally, we define the parameters for CMS Provider participation in WEA, and set a deadline for CMS Providers to renew their participation elections consistent with these definitions. We defer consideration of other issues raised in the *WEA FNPRM*.

#### B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

3. There were no comments filed that specifically addressed the proposed rules and policies presented in the IRFA. Nonetheless, the agency considered the potential impact of the rules proposed in the IRFA on small entities and we conclude that these mandates provide Participating CMS Providers with a sufficient measure of flexibility to account for any technical and/or cost-related concerns. We have determined that implementing these improvements to WEA is technically feasible for small entities and other Participating CMS Providers and the cost of implementation is reasonable.

#### C. Response to Comments by Chief Counsel for Advocacy of the Small Business Administration

4. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the

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<sup>1</sup> See 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 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).

<sup>2</sup> 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.

<sup>3</sup> See 5 U.S.C. § 604.

proposed rules as a result of those comments.<sup>4</sup>

5. The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

**D. Description and Estimate of the Number of Small Entities to Which the 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 rules, adopted herein.<sup>5</sup> The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”<sup>6</sup> In addition, the term “small business” has the same meaning as the term “small-business concern” under the Small Business Act.<sup>7</sup> 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.<sup>8</sup>

7. *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 broad groups of small entities that could be directly affected herein.<sup>9</sup> First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA’s Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.<sup>10</sup> These types of small businesses represent 99.9% of all businesses in the United States which translates to 28.8 million businesses.<sup>11</sup>

8. Next, the type of small entity described as a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”<sup>12</sup> Nationwide, as of Aug 2016, there were approximately 356,494 small organizations based on registration and tax data filed by nonprofits with the Internal Revenue Service (IRS).<sup>13</sup>

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<sup>4</sup> 5 U.S.C. § 604 (a)(3).

<sup>5</sup> See 5 U.S.C. § 603(a)(4).

<sup>6</sup> See 5 U.S.C. § 601(6).

<sup>7</sup> See 5 U.S.C. § 601(3) (incorporating by reference the definition of “small-business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 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.”

<sup>8</sup> See 15 U.S.C. § 632.

<sup>9</sup> See 5 U.S.C. § 601(3)-(6).

<sup>10</sup> See SBA, Office of Advocacy, “Frequently Asked Questions, Question 1 – What is a small business?” [https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016\\_WEB.pdf](https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf) (June 2016)

<sup>11</sup> See SBA, Office of Advocacy, “Frequently Asked Questions, Question 2- How many small business are there in the U.S.?” [https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016\\_WEB.pdf](https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf) (June 2016).

<sup>12</sup> 5 U.S.C. § 601(4).

<sup>13</sup> Data from the Urban Institute, National Center for Charitable Statistics (NCCS) reporting on nonprofit organizations registered with the IRS was used to estimate the number of small organizations. Reports generated using the NCCS online database indicated that as of August 2016 there were 356,494 registered nonprofits with total revenues of less than \$100,000. Of this number, 326,897 entities filed tax returns with 65,113 registered nonprofits reporting total revenues of \$50,000 or less on the IRS Form 990-N for Small Exempt Organizations and 261,784 nonprofits reporting total revenues of \$100,000 or less on some other version of the IRS Form 990 within 24 months of the August 2016 data release date. See <http://nccs.urban.org/sites/all/nccs-archive/html/tablewiz/tw.php> where

(continued....)



9. Finally, the small entity described as a “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”<sup>14</sup> U.S. Census Bureau data from the 2012 Census of Governments<sup>15</sup> indicates that there were 90,056 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States.<sup>16</sup> Of this number there were 37,132 General purpose governments (county,<sup>17</sup> municipal and town or township<sup>18</sup>) with populations of less than 50,000 and 12,184 Special purpose governments (independent school districts<sup>19</sup> and special districts<sup>20</sup>) with populations of less than 50,000. The 2012 U.S. Census Bureau data for most types of governments in the local government category shows that the majority of these governments have populations of less than 50,000.<sup>21</sup> Based on this data we estimate that at least 49,316 local government jurisdictions fall in the category of “small governmental jurisdictions.”<sup>22</sup>

10. *Wireless Telecommunications Carriers (except Satellite)*. This industry comprises

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the report showing this data can be generated by selecting the following data fields: Report: “The Number and Finances of All Registered 501(c) Nonprofits”; Show: “Registered Nonprofits”; By: “Total Revenue Level (years 1995, Aug to 2016, Aug)”; and For: “2016, Aug” then selecting “Show Results”.

<sup>14</sup> 5 U.S.C. § 601(5).

<sup>15</sup> See 13 U.S.C. § 161. The Census of Government is conducted every five (5) years compiling data for years ending with “2” and “7”. See also Program Description Census of Government <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=program&id=program.en.CO G#>.

<sup>16</sup> See U.S. Census Bureau, 2012 Census of Governments, Local Governments by Type and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG02.US01>. Local governmental jurisdictions are classified in two categories - General purpose governments (county, municipal and town or township) and Special purpose governments (special districts and independent school districts).

<sup>17</sup> See U.S. Census Bureau, 2012 Census of Governments, County Governments by Population-Size Group and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG06.US01>. There were 2,114 county governments with populations less than 50,000.

<sup>18</sup> See U.S. Census Bureau, 2012 Census of Governments, Subcounty General-Purpose Governments by Population-Size Group and State: 2012 - United States – States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG07.US01>. There were 18,811 municipal and 16,207 town and township governments with populations less than 50,000.

<sup>19</sup> See U.S. Census Bureau, 2012 Census of Governments, Elementary and Secondary School Systems by Enrollment-Size Group and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG11.US01>. There were 12,184 independent school districts with enrollment populations less than 50,000.

<sup>20</sup> See U.S. Census Bureau, 2012 Census of Governments, Special District Governments by Function and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG09.US01>. The U.S. Census Bureau data did not provide a population breakout for special district governments.

<sup>21</sup> See U.S. Census Bureau, 2012 Census of Governments, County Governments by Population-Size Group and State: 2012 - United States-States - <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG06.US01>; Subcounty General-Purpose Governments by Population-Size Group and State: 2012 - United States–States - <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG07.US01>; and Elementary and Secondary School Systems by Enrollment-Size Group and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG11.US01>. While U.S. Census Bureau data did not provide a population breakout for special district governments, if the population of less than 50,000 for this category of local government is consistent with the other types of local governments the majority of the 38,266 special district governments have populations of less than 50,000.

<sup>22</sup> *Id.*

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.<sup>23</sup> The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.<sup>24</sup> For this industry, U.S. Census Bureau data for 2012 shows that there were 967 firms that operated for the entire year.<sup>25</sup> Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.<sup>26</sup> Thus under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small.

11. *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.<sup>27</sup> 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.<sup>28</sup> These small business size standards, in the context of broadband PCS auctions, have been approved by the SBA.<sup>29</sup> 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 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.<sup>30</sup> On April 15, 1999, the Commission completed the reauction of 347 C-, D-, E-, and F-Block licenses in Auction No. 22.<sup>31</sup> Of the 57 winning bidders in that auction, 48 claimed small business status and won 277 licenses.

12. 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

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<sup>23</sup> 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>>

<sup>24</sup> See 13 CFR 121.201, NAICS Code 517210

<sup>25</sup> U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ5, Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012 NAICS Code 517210 (rel. Jan. 8, 2016). [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5//naics~517210](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517210).

<sup>26</sup> *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”.

<sup>27</sup> 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).

<sup>28</sup> See *PCS Report and Order*, 11 FCC Rcd at 7852, para. 60.

<sup>29</sup> See Letter from Aida Alvarez, Administrator, SBA, to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC (filed Dec. 2, 1998) (*Alvarez Letter 1998*).

<sup>30</sup> See *Broadband PCS, D, E and F Block Auction Closes*, Public Notice, Doc. No. 89838 (rel. Jan. 14, 1997).

<sup>31</sup> 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).

business status.<sup>32</sup> 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.<sup>33</sup> On May 21, 2007, the Commission completed an auction of 33 licenses in the A, C, and F Blocks in Auction No. 71.<sup>34</sup> Of the 12 winning bidders in that auction, five claimed small business status and won 18 licenses.<sup>35</sup> On August 20, 2008, the Commission completed the auction of 20 C-, D-, E-, and F-Block Broadband PCS licenses in Auction No. 78.<sup>36</sup> Of the eight winning bidders for Broadband PCS licenses in that auction, six claimed small business status and won 14 licenses.<sup>37</sup>

13. *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.<sup>38</sup> 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.<sup>39</sup>

14. *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.<sup>40</sup> The SBA has approved these small business size standards.<sup>41</sup> In the Commission’s auction for geographic area licenses in the WCS there were seven winning bidders that qualified as “very small business” entities, and one that qualified as a “small business” entity.

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<sup>32</sup> See *C and F Block Broadband PCS Auction Closes; Winning Bidders Announced*, Public Notice, 16 FCC Rcd 2339 (2001).

<sup>33</sup> See *Broadband PCS Spectrum Auction Closes; Winning Bidders Announced for Auction No. 58*, Public Notice, 20 FCC Rcd 3703 (2005).

<sup>34</sup> See *Auction of Broadband PCS Spectrum Licenses Closes; Winning Bidders Announced for Auction No. 71*, Public Notice, 22 FCC Rcd 9247 (2007).

<sup>35</sup> *Id.*

<sup>36</sup> See *Auction of AWS-1 and Broadband PCS Licenses Closes; Winning Bidders Announced for Auction 78*, Public Notice, 23 FCC Rcd 12749 (WTB 2008).

<sup>37</sup> *Id.*

<sup>38</sup> *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).

<sup>39</sup> See Letter from Aida Alvarez, Administrator, SBA, to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC (filed Dec. 2, 1998) (*Alvarez Letter 1998*).

<sup>40</sup> *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).

<sup>41</sup> See Letter from Aida Alvarez, Administrator, SBA, to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC (filed Dec. 2, 1998) (*Alvarez Letter 1998*).

15. *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.<sup>42</sup> 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.<sup>43</sup> 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.<sup>44</sup> SBA approval of these definitions is not required.<sup>45</sup> An auction of 52 Major Economic Area licenses commenced on September 6, 2000, and closed on September 21, 2000.<sup>46</sup> 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.<sup>47</sup>

16. *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.<sup>48</sup> 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.<sup>49</sup> 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.<sup>50</sup> Additionally, the lower 700 MHz Service had a third category of small 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.<sup>51</sup> The SBA approved these small size standards.<sup>52</sup> 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.<sup>53</sup> A second auction commenced on May 28, 2003, closed on June

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<sup>42</sup> 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*).

<sup>43</sup> See *id.* at 5343, para. 108.

<sup>44</sup> See *id.*

<sup>45</sup> See *id.* at 5343, para. 108 n.246 (for the 746–764 MHz and 776–794 MHz bands, the Commission is exempt from 15 U.S.C. § 632, which requires Federal agencies to obtain SBA approval before adopting small business size standards).

<sup>46</sup> See *700 MHz Guard Bands Auction Closes: Winning Bidders Announced*, Public Notice, 15 FCC Rcd 18026 (WTB 2000).

<sup>47</sup> See *700 MHz Guard Bands Auction Closes: Winning Bidders Announced*, Public Notice, 16 FCC Rcd 4590 (WTB 2001).

<sup>48</sup> 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*).

<sup>49</sup> See *id.* at 1087-88, para. 172.

<sup>50</sup> See *id.*

<sup>51</sup> See *id.*, at 1088, para. 173.

<sup>52</sup> See Letter from Aida Alvarez, Administrator, SBA, to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC (filed Dec. 2, 1998) (*Alvarez Letter 1998*).

<sup>53</sup> See *Lower 700 MHz Band Auction Closes*, Public Notice, 17 FCC Rcd 17272 (WTB 2002).

13, 2003, and included 256 licenses: 5 EAG licenses and 476 Cellular Market Area licenses.<sup>54</sup> 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.<sup>55</sup> 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.

17. In 2007, the Commission reexamined its rules governing the 700 MHz band in the *700 MHz Second Report and Order*.<sup>56</sup> 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.<sup>57</sup> 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.

18. *Upper 700 MHz Band Licenses*. In the *700 MHz Second Report and Order*, the Commission revised its rules regarding Upper 700 MHz licenses.<sup>58</sup> 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.<sup>59</sup> 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.

19. *Advanced Wireless Services*. (AWS) (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,<sup>60</sup> 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

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<sup>54</sup> See *id.*

<sup>55</sup> See *id.*

<sup>56</sup> *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*).

<sup>57</sup> See *Auction of 700 MHz Band Licenses Closes*, Public Notice, 23 FCC Rcd 4572 (WTB 2008).

<sup>58</sup> *700 MHz Second Report and Order*, 22 FCC Rcd 15289.

<sup>59</sup> See *Auction of 700 MHz Band Licenses Closes*, Public Notice, 23 FCC Rcd 4572 (WTB 2008).

<sup>60</sup> The service is defined in section 90.1301 *et seq.* of the Commission’s Rules, 47 CFR § 90.1301 *et seq.*

other factors, such as issues involved in relocating incumbents and developing markets, technologies, and services.<sup>61</sup>

20. *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)).<sup>62</sup>

21. *BRS* - 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.<sup>63</sup> 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.<sup>64</sup> 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.

22. In 2009, the Commission conducted Auction 86, the sale of 78 licenses in the BRS areas.<sup>65</sup> 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.<sup>66</sup> Auction 86 concluded in 2009 with

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<sup>61</sup> 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).

<sup>62</sup> *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).

<sup>63</sup> 47 CFR § 21.961(b)(1).

<sup>64</sup> 47 U.S.C. § 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 U.S.C. § 309(j). For these pre-auction licenses, the applicable standard is SBA’s small business size standard of 1500 or fewer employees.

<sup>65</sup> 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).

<sup>66</sup> *Id.* at 8296 para. 73.

the sale of 61 licenses.<sup>67</sup> 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.

23. *EBS* - 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.<sup>68</sup> 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. Wired Telecommunications Carriers are comprised of 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.<sup>69</sup> The SBA's small business size standard for this category is all such firms having 1,500 or fewer employees.<sup>70</sup> U.S. Census Bureau data for 2012 shows that there were 3,117 firms that operated that year.<sup>71</sup> Of this total, 3,083 operated with fewer than 1,000 employees.<sup>72</sup> Thus, under this size standard, the majority of firms in this industry can be considered small.

24. *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.<sup>73</sup> 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.<sup>74</sup> The SBA has established a small business size standard for this industry of 1,250 employees or less.<sup>75</sup> U.S. Census Bureau data for 2012 shows that 841 establishments operated in

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<sup>67</sup> 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).

<sup>68</sup> 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 U.S.C. §§ 601(4)-(6). We do not collect annual revenue data on EBS licensees.

<sup>69</sup> U.S. Census Bureau, 2017 NAICS Definitions, "517311 Wired Telecommunications Carriers," (partial definition), <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

<sup>70</sup> *See*, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. *See*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

<sup>71</sup> *See* U.S. Census Bureau, 2012 *Economic Census of the United States*, Table No. EC1251SSSZ5, *Information: Subject Series - Estab & Firm Size: Employment Size of Firms: 2012* (517110 Wired Telecommunications Carriers). [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5//naics~517110](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517110).

<sup>72</sup> *Id.*

<sup>73</sup> The NAICS Code for this service is 334220. 13 CFR 121.201. *See also* U.S. Census Bureau, 2012 NAICS Definitions, "334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing" <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.334220#>.

<sup>74</sup> *Id.*

<sup>75</sup> 13 CFR § 121.201, NAICS Code 334220.

this industry in that year.<sup>76</sup> Of that number, 828 establishments operated with fewer than 1,000 employees, 7 establishments operated with between 1,000 and 2,499 employees and 6 establishments operated with 2,500 or more employees.<sup>77</sup> Based on this data, we conclude that a majority of manufacturers in this industry is small.

25. *Software Publishers.* This industry comprises establishments primarily engaged in computer software publishing or publishing and reproduction.<sup>78</sup> Establishments in this industry carry out operations necessary for producing and distributing computer software, such as designing, providing documentation, assisting in installation, and providing support services to software purchasers. These establishments may design, develop, and publish, or publish only.<sup>79</sup> The SBA has established a size standard for this industry of annual receipts of \$38.5 million per year.<sup>80</sup> U.S. Census data for 2012 indicates that 5,079 firms operated in that year.<sup>81</sup> Of that number 4,697 firms had annual receipts of \$25 million or less.<sup>82</sup> Based on that data, we conclude that a majority of firms in this industry are small.

26. *NCE and Public Broadcast Stations.* Non-commercial educational and public broadcast television stations fall within the U.S. Census Bureau's definition for Television Broadcasting.<sup>83</sup> This industry comprises establishments primarily engaged in broadcasting images together with sound and operating television broadcasting studios and facilities for the programming and transmission of programs to the public.<sup>84</sup> The Small Business Administration (SBA) small business size standard for Television Broadcasting entities consists of such businesses having \$38.5 million or less in annual receipts.<sup>85</sup> The 2012 Economic Census reports that 751 firms in this category operated in that year.<sup>86</sup> Of that number, 656 had annual receipts of \$25,000,000 or less, 25 had annual receipts between \$25,000,000 and \$49,999,999 and 70 had annual receipts of \$50,000,000 or more.<sup>87</sup> Based on this data we conclude that the majority of NCEs and Public Broadcast Stations are small entities under the applicable SBA size standard.

27. According to Commission staff review of the BIA Kelsey Inc. Media Access Pro

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<sup>76</sup> U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1231SG2, Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2012, NAICS Code 334220, [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/31SG2//naics~334220](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/31SG2//naics~334220).

<sup>77</sup> *Id.*

<sup>78</sup> See U.S. Census Bureau, 2017 NAICS Definitions, "511210 Software Publishers," <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=511210&search=2017>.

<sup>79</sup> *Id.*

<sup>80</sup> 13 CFR § 121.201, 511210.

<sup>81</sup> See U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012, NAICS code 511210, [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ4//naics~511210](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~511210).

<sup>82</sup> *Id.*

<sup>83</sup> U.S. Census Bureau, 2017 NAICS Definitions, "515120 Television Broadcasting," <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=515120&search=2017+NAICS+Search&search=2017>.

<sup>84</sup> *Id.* (partial definition).

<sup>85</sup> 13 CFR § 121.201; 2012 NAICS code 515120.

<sup>86</sup> U.S. Census Bureau, Table No. EC1251SSSZ4, *Information: Subject Series - Establishment and Firm Size: Receipts Size of Firms for the United States: 2012* (515120 Television Broadcasting). [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ4//naics~515120](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~515120).

<sup>87</sup> *Id.*



Television Database (BIA) on May 9, 2017, approximately 1,263 of the 1,383<sup>88</sup> licensed commercial television stations (or about 91 percent) had revenues of \$38.5 million or less, and therefore these licensees qualify as small entities under the SBA definition. The Commission also estimates that there are 394 licensed noncommercial educational television stations.<sup>89</sup> Notwithstanding, 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. In addition to licensed commercial television stations and NCEs, there are also an estimated 2,382 low power television stations (LPTV), including Class A stations and 3,778 TV translator stations.<sup>90</sup> Given the nature of these services, we will presume that all of these entities qualify as small entities under the above SBA small business size standard.

28. We note however, in assessing whether a business concern qualifies as “small” under the above definition that business (control) affiliations<sup>91</sup> 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. Moreover, the definition of “small business” also requires that an entity not be dominant in its field of operation and that that the entity be independently owned and operated.<sup>92</sup> We are unable at this time to define or quantify the criteria that would establish whether a specific television broadcast station is dominant in its field of operation. The Commission further notes that it is difficult at times to assess these criteria in the context of media entities and therefore its estimates of small businesses to which they apply may be over-inclusive to this extent.

#### **E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements**

29. We expect the amended rules will impose new or additional reporting, recordkeeping and/or other compliance obligations on small entities. In the *Second WEA Report and Order*, we amend our Part 10 rules for Participating CMS Providers, as defined in the WEA rules, to require geo-targeting of Alert Messages to an area that matches the target area specified by alert originators and where matching the target area is not possible the Participating CMS Provider must transmit the Alert Message to an area that best approximates the target area. The compliance timeframe for this requirement is November 30, 2019. We also require Participating CMS Providers to preserve Alert Messages in a consumer-accessible format and location for at least 24 hours after receipt. The compliance time frame for this requirement is November 30, 2019. Finally, we require CMS Providers to renew their election to participate in WEA to the extent a change to their WEA Election letter is necessary, consistent with the definitions of participation adopted today in the *Second Report and Order*. The compliance deadline for this requirement is 120 days from the publication in the *Federal Register* of a notice announcing approval by the Office of Management and Budget (OMB) of the modified information collection requirements.

30. We consider compliance costs associated with election renewal to be reporting and recordkeeping costs. We note that, in response to the *WEA Election Report and Order*,<sup>93</sup> OMB approved our assessment that our election requirement would affect 1,253 entities that would be required to update

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<sup>88</sup> See Broadcast Station Totals as of March 31, 2017, Press Release (MB Apr. 11, 2017) (March 31, 2017 Broadcast Station Totals), [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-344256A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-344256A1.pdf).

<sup>89</sup> *Id.*

<sup>90</sup> *Id.*

<sup>91</sup> “[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 the power to control both.” 13 CFR § 21.103(a)(1).

<sup>92</sup> See 15 U.S.C. § 632.

<sup>93</sup> *WEA Election Report and Order*, 23 FCC Rcd at 12561.

this report, and that fulfillment of this requirement would take 30 minutes per report at a cost of approximately \$20,000.<sup>94</sup> We received no objections to this estimate in the record. We reason that no additional, ongoing or annualized burdens will result from this reporting obligation for small entities and other Participating CMS Providers because the requirement that we adopt today does not change the approach that Participating CMS Providers must take to updating their elections once this one-time renewed election is completed.

**F. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered**

31. The RFA requires an agency to describe any significant, specifically small business 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 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.”<sup>95</sup>

32. Based on our review of the record, we find that it is practicable for small entities and all Participating CMS Providers, including non-nationwide Participating CMS Providers,<sup>96</sup> to implement WEA improvements without incurring unduly burdensome costs. The *Second WEA Report and Order* recognizes that technical and operational issues must be addressed before compliance can be required, and allows sufficient time for both nationwide and non-nationwide Participating CMS Providers to achieve compliance with today’s rules. We decline CCA’s request for an additional 12 to 24 months to support enhanced geo-targeting beyond the 36 months requested by CTIA. The requirement that we adopt today is technologically neutral; non-nationwide CMS Providers may elect to use technologies offered by a variety of vendors to implement enhanced geo-targeting, not only those that provide products to nationwide Participating CMS Providers. Furthermore, to the extent that non-nationwide CMS Providers are technically incapable of matching the target area, they may continue to best approximate the target area on those aspects of their networks that are incapable of supporting this requirement.

33. In considering the record received in response to the *WEA NPRM*, we examined and adopted alternatives to ease the burden on smaller, non-nationwide Participating CMS Providers. These alternatives included exempting mobile devices with location services turned off from our enhanced geo-targeting requirement; requiring mobile devices to preserve Alert Messages for 24 hours, rather than until they expire, as proposed; and declining to revise our definition of mobile devices in a manner that could have created additional obligations for Participating CMS Providers. Additionally, the rules adopted in the *Second WEA Report and Order* are technologically neutral in order to provide small entities the flexibility to comply with our rules using technologies offered by a variety of vendors.

**G. Report to Congress**

34. The Commission will send a copy of the *Second WEA Report and Order*, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act.<sup>97</sup> In addition, the Commission will send a copy of the *Second WEA Report and Order*, including this FRFA, to the Chief

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<sup>94</sup> See OMB 3060-1113 (2011).

<sup>95</sup> 5 U.S.C. § 603(c)(1)-(4).

<sup>96</sup> See 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.”)

<sup>97</sup> See 5 U.S.C. § 801(a)(1)(A).

Counsel for Advocacy of the SBA. A copy of the *Second WEA Report and Order* and FRFA (or summaries thereof) will also be published in the *Federal Register*.

## APPENDIX C

**Supplemental Final Regulatory Flexibility Analysis**

1. As required by the Regulatory Flexibility Act of 1980 (RFA),<sup>1</sup> as amended, an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *WEA Notice of Proposed Rulemaking (WEA NPRM)*, adopted in November 2015.<sup>2</sup> The Commission sought written public comment on the proposals in *NPRM*, including comments on the IRFA. No comments were filed addressing the IRFA. The Commission included a Final Regulatory Flexibility Analysis (FRFA) in Appendix C of the September 2016 *WEA R&O*.<sup>3</sup> This Supplemental Final Regulatory Flexibility Analysis (Supplemental FRFA) supplements the FRFA to reflect the actions taken in the *Second Order on Reconsideration* and conforms to the RFA.<sup>4</sup>

**A. Need for, and Objective of, the Order**

2. In the *WEA R&O*, we took 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 WEA to improve the utility of WEA as a life-saving tool. As pertinent to the *Second Order on Reconsideration* we adopt today, in the *WEA R&O* we adopted rules focused on improving WEA message content by requiring Participating Commercial Mobile Service (CMS) Providers to support Alert Messages initiated in Spanish, and set the deadline for compliance as two years (24 months) from the rules' publication in the *Federal Register*.

3. In this *Second Order on Reconsideration*, we grant, to the extent described herein, CTIA's Petition for Reconsideration of the *WEA R&O*, and extend the compliance deadline for support for Spanish-language alerting until May 1, 2019. The actions we take today allow us to continue to advance down the path outlined in the *WEA R&O* while supplying additional time for compliance in order to minimize compliance costs while retaining the rule's maximum benefit.

**B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA**

4. There were no comments raised that specifically addressed the proposed rules and policies presented in the IRFA.

**C. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration**

5. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rule(s) as a result of those comments.<sup>5</sup>

6. The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

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<sup>1</sup> 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601-612, was amended by the Small Business Regulatory Enforcement Fairness Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996).

<sup>2</sup> See Improving Wireless Emergency Alerts and Community-Initiated Alerting, PS Docket 15-91, *Notice of Proposed Rulemaking*, 30 FCC Rcd 13781 (2015) (*WEA NPRM*), Appendix B.

<sup>3</sup> See Wireless Emergency Alerts; Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System, PS Docket Nos. 15-91, 15-94, *Report and Order and Further Notice of Proposed Rulemaking*, 31 FCC Rcd 11112 (2016) (*WEA R&O* and *WEA FNPRM*), Appendix C.

<sup>4</sup> See 5 U.S.C. § 604.

<sup>5</sup> 5 U.S.C. § 604(a)(3).

**D. Description and Estimate of the Number of Small Entities to Which the 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 rules adopted herein.<sup>6</sup> The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”<sup>7</sup> In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.<sup>8</sup> 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.<sup>9</sup>

8. As noted above, a FRFA was incorporated into the September 2016 *WEA R&O*. In that analysis, we described in detail the small entities that might be significantly affected by the rules adopted in the *WEA R&O*.<sup>10</sup> Those entities may be found in a number of services including, *e.g.*: Wireless Telecommunications Carriers, Broadband Personal Communications Service, Narrowband Personal Communications Service, Wireless Communications Services, Advanced Wireless Services, Lower and Upper 700 MHz Band licenses, Software Publishers, and Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing. In this Supplemental FRFA, we hereby incorporate by reference the descriptions and estimates of the number of small entities from the previous FRFA in this proceeding.

**E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities**

9. The data, information and document collection required by the September 2016 *WEA R&O* as described in the previous FRFA in this proceeding is hereby incorporated by reference.<sup>11</sup> The actions taken in the *Second Order on Reconsideration* do not amend or otherwise revise those requirements, except to supply additional time for compliance with one of the requirements, *i.e.*, support for Alert Messages initiated in Spanish. More specifically, the Commission extends the compliance deadline for supporting Spanish-language Alert Messages from 24 months to 30 months from the rule’s publication in the Federal Register, to be consistent with the deadline for the rule that CMS Providers support WEA messages of up to 360 characters in length. This rule will become effective May 1, 2019.

**F. 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 reaching its proposed 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 or reporting requirements under the rule for small entities; (3) the use of performance, rather

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<sup>6</sup> *Id.* § 603(a)(4).

<sup>7</sup> *Id.* § 601(6).

<sup>8</sup> *Id.* § 601(3) (incorporating by reference the definition of “small-business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 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.”

<sup>9</sup> 15 U.S.C. § 632.

<sup>10</sup> See *WEA R&O*, 31 FCC Rcd at 11236-45, paras. 8-27.

<sup>11</sup> *Id.* at 11245, paras. 28-29.

than design, standards; and (4) and exemption from coverage of the rule, or any part thereof, for small entities.”<sup>12</sup>

11. The analysis of the Commission’s efforts to minimize the possible significant economic impact on small entities as described in the previous FRFA in this proceeding is hereby incorporated by reference.<sup>13</sup> Further, we reason that by requiring compliance with the Spanish-language alerting requirement on the same date as the expanded character limit (May 1, 2019), we prevent Participating CMS Providers, including small entities, from needing to engage in a duplicative testing phase, saving industry approximately \$28 million.

#### **G. Report to Congress**

12. The Commission will send a copy of the *Second Order on Reconsideration*, including this Supplemental FRFA, in a report to Congress pursuant to the Congressional Review Act.<sup>14</sup> In addition, the Commission will send a copy of the *Second Order on Reconsideration*, including this Supplemental FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the *Second Order on Reconsideration* and Supplemental FRFA (or summaries thereof) will also be published in the *Federal Register*.<sup>15</sup>

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<sup>12</sup> 5 U.S.C. § 603(c)(1)-(4).

<sup>13</sup> See *WEA R&O*, 31 FCC Rcd at 11245-46, paras. 30-34.

<sup>14</sup> 5 U.S.C. § 801(a)(1)(A).

<sup>15</sup> *Id.* § 604(b).

## APPENDIX E

List of Commenters to the Wireless Emergency Alerts (WEA) FNPRMPS Docket 15-91

<b>Initial Commenters</b>	<b>Abbreviation</b>
AC&C, LLC	AC&C
APCO International	APCO
AT&T Services Inc.	AT&T
Alliance for Telecommunications Industry Solutions	ATIS
Bill Kivler	Bill Kivler
Bill DeBlasio, Mayor, City of New York	Bill DeBlasio
Bob Iberger	Bob Iberger
Calhoun County, AL, Emergency Management Agency	Calhoun EMA
California Governor's Office of Emergency Services	California Governor's OES
City and County of San Francisco Department of Emergency Management	SF DEM
Craig Craft	Craig Craft
CTIA	CTIA
Darren P. Wilson	Darren Wilson
Harris County Office of Homeland Security & Emergency Management	Harris County OHSEM
Irwin Hoenig	Irwin Hoenig
Lower Colorado River Authority (Austin, TX), Llano County, TX Travis County, TX, City of Austin, TX, Austin Water utility, TX, Caldwell County, TX, Blanco County, TX, Colorado County, TX, Williamson County TX, Bastrop County, TYX, Fayette County, TX, Matagorda County, TX, Burnet County, TX, Wharton County, TX, Hays County, TX	Texas Counties
Microsoft Corporation	Microsoft
Mike Clements	Mike Clements
New Jersey Office of Homeland Security and Preparedness	NJ OHSP
National Oceanic and Atmospheric Administration/ National Weather Service	NOAA/NWS

New York City Emergency Management	NYCEM
Public Broadcasting Service, Association of Public Television Stations, and Corporation for Public Broadcasting	PBS, APTS, and CPB
Ralph Ladiner, Communications Captain, West Feliciana Parish Sheriff's Office	West Feliciana
T-Mobile USA, Inc.	T-Mobile
Verizon	Verizon
Wireless RERC	Wireless RERC

**Reply Commenters****Abbreviation**

AC&C, LLC	AC&C
Apple Inc.	Apple
AT&T Services Inc.	AT&T
CTIA	CTIA
National Oceanic and Atmospheric Administration/ National Weather Service	NOAA/NWS
Ronald Prater	Ronald Prater
Sarah Poss, California Governor's Office of Emergency Services	Cal Gov.'s OES
Telecommunications for the Deaf and Hard of Hearing, Inc.	TDI

***Ex Parte* Filers****Abbreviation**

APCO International	APCO
Apple	Apple
AC&C, LLC	AC&C
Alliance for Telecommunications Industry Solutions	ATIS
AT&T	AT&T
Big City Emergency Managers	BCEM
Bluegrass Cellular	Bluegrass
Competitive Carriers Association	CCA
CTIA	CTIA



Francisco Sanchez, Harris County Office of Homeland Security & Harris County OSHEM  
Emergency Management

Microsoft Corporation

Microsoft

National Center for Missing & Exploited Children

NCMEC

National Oceanic and Atmospheric Administration/ National  
Weather Service

NOAA/NWS

New York City Emergency Management Department

NYCEM

Next-Tech Wireless

Nex-Tech

Sprint

Sprint

US Cellular Corp

US Cellular

Verizon

Verizon