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

In the Matter of	)	
	)	
Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission's Rules	)	GN Docket No. 11-117
	)	
	)	PS Docket No. 07-114
Wireless E911 Location Accuracy Requirements	)	
	)	WC Docket No. 05-196
E911 Requirements for IP-Enabled Service Providers	)	
	)	

NOTICE OF PROPOSED RULEMAKING, THIRD REPORT AND ORDER, AND SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: July 12, 2011 **Released: July 13, 2011**

Comment Date: [60 days after publication in the Federal Register]
Reply Comment Date: [90 days after publication in the Federal Register]

By the Commission: Chairman Genachowski and Commissioners Copps, McDowell, and Clyburn issuing separate statements.

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I. INTRODUCTION

1. In this Third Report and Order, Second Further Notice of Proposed Rulemaking, and Notice of Proposed Rulemaking, we enhance the public's ability to contact emergency services personnel during times of crisis and enable public safety personnel to obtain accurate information regarding the location of the caller. In the Report and Order, we continue to strengthen our existing Enhanced 911 (E911) location accuracy regime for wireless carriers by retaining the existing handset-based and network-based location accuracy standards and the eight-year implementation period established in our September 2010 *E911 Location Accuracy Second Report and Order*[1] but providing for phasing out the network-based standard over time. We also require new Commercial Mobile Radio Service (CMRS) networks to comply with the handset-based location criteria, regardless of the location technology they actually use. In addition, we will require wireless carriers to periodically test their outdoor E911 location accuracy results and to share the results with Public Safety Answering Points (PSAPs), state 911 offices, and the Commission, subject to confidentiality safeguards.

2. In the Second Further Notice of Proposed Rulemaking, we propose measures to improve 911 availability and location determination for users of interconnected Voice over Internet Protocol (VoIP) services. First, we consider whether to apply our 911 rules to "outbound-only" interconnected VoIP services, i.e., services that support outbound calls to the public switched telephone network (PSTN) but not inbound voice calling from the PSTN. These services, which allow consumers to place IP-based outbound calls to any telephone number, have grown increasingly popular in recent years. We ask whether such services are likely to generate consumer expectations that they will support 911 calling and consider whether to extend to outbound-only interconnected VoIP service providers the same 911 requirements that have applied to other interconnected VoIP service providers since 2005.

3. We also seek comment on whether we should develop a framework for ensuring that all covered VoIP service providers can provide automatic location information (ALI) for VoIP 911 calls. Currently, interconnected VoIP customers must provide their location information manually by registering the physical location of their phones with their VoIP service providers. While there are benefits to this Registered Location approach, in light of the increasing popularity of VoIP calling, the enhanced mobility of VoIP devices, and the evolution of consumer expectations, we consider how we might continue working towards automatic location solutions for VoIP calls to 911. We do not propose specific automatic location accuracy requirements for VoIP at this time but instead seek comment on whether we should adopt general governing principles for the development of automatic location identification solutions. To ensure that ALI can be generated and transmitted in the most technologically efficient and cost-effective manner, we anticipate that some of these solutions will require participation by both "over the top" VoIP service providers that offer service directly to customers and broadband providers that provide underlying network connectivity for VoIP calls. General governing principles might apply to both types of providers but could also afford flexibility to VoIP service providers and broadband providers to develop alternative solutions appropriate to specific VoIP 911 scenarios.

[1] In the Matter of Wireless E911 Location Accuracy Requirements, PS Docket No. 07-114, *Second Report and Order*, 25 FCC Rcd 18909 (2010) (*E911 Location Accuracy Second Report and Order*).

4. We seek comment on an array of issues associated with extending 911 calling and location accuracy requirements to broadband-based voice services other than interconnected and outbound-only interconnected VoIP services. We request comment on whether we should seek to support 911 location determination through leveraging of location technologies that are already being developed for commercial broadband applications. We also seek comment on the possibility of developing operational benchmarks based on location accuracy performance to enhance consumer decision-making with respect to device capabilities. In addition, we seek comment on technological approaches to improve location accuracy for 911 communications originating from indoor environments. Finally, in the Notice of Proposed Rulemaking, we seek comment on whether our proposal to amend the definition of interconnected VoIP service for 911 purposes has any impact on our interpretation of certain statutes that reference the FCC's existing definition of interconnected VoIP service.

II. BACKGROUND

5. In 1996, the Commission required CMRS providers to implement basic 911 and Enhanced 911 services. Under the Commission's wireless E911 rules, CMRS providers are obligated to provide the telephone number of the originator of a 911 call and information regarding the caller's location to any PSAP that has requested that such information be delivered with 911 calls.[2] Recently amended Section 20.18(h) of the Commission's rules states that licensees subject to the wireless E911 requirements:

> Shall comply with the following standards for Phase II location accuracy and reliability: (1) For network-based technologies: 100 meters for 67 percent of calls, 300 meters for 90 percent of calls; (2) For handset-based technologies: 50 meters for 67 percent of calls, 150 meters for 90 percent of calls.[3]

6. In June 2005, the Commission released a *First Report and Order and Notice of Proposed Rulemaking* adopting rules requiring providers of interconnected VoIP service to supply E911 capabilities to their customers as a standard feature from wherever the customer is using the service.[4] The rules adopted in the *VoIP 911 Order* apply only to providers of interconnected VoIP services, which the Commission defined as services that (1) enable real-time, two-way voice communications; (2) require a broadband connection from the user's location; (3) require Internet protocol-compatible customer premises equipment (CPE); and (4) permit users generally to receive calls that originate on the public switched telephone network (PSTN) and to terminate calls to the PSTN.[5] Interconnected VoIP service providers generally must provide consumers with E911 service and transmit all 911 calls, including Automatic Number Identification (ANI) and the caller's Registered Location for each call, to the PSAP,

[2] *See* 47 C.F.R. § 20.18(d)-(e), (h); *see also* Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, *Third Report and Order*, 14 FCC Rcd 17388, 17417-23 ¶¶ 66-77 (1999) (concerning requirements for location accuracy at that time).

[3] 47 C.F.R. § 20.18(h)(1)(i), (ii) (applying to network-based technologies); 47 C.F.R. § 20.18(h)(2)(i), (ii) (applying to handset-based technologies). *See E911 Location Accuracy Second Report and Order*, 25 FCC Rcd at 18947-48.

[4] In the Matters of IP-Enabled Services; E911 requirements for IP-Enabled Service Providers, WC Docket No. 04-36, WC Docket No. 05-196, *First Report and Order and Notice of Proposed Rulemaking*, 20 FCC Rcd 10245, 10246 (2005) (*VoIP 911 Order and VoIP 911 NPRM*) *aff'd sub nom. Nuvio Corp. v. FCC*, 473 F.3d 302 (D.C. Cir. 2007).

[5] 47 C.F.R. § 9.3.

designated statewide default answering point, or appropriate local emergency authority.[6] In 2008, Congress codified these requirements and granted the Commission authority to modify them.[7]

7. In June 2007, the Commission released the *Location Accuracy NPRM*, seeking comment on several issues relating to wireless E911 location accuracy and reliability requirements.[8] Specifically, the Commission sought comment on the capabilities and limitations of existing and new location technologies; the advantages of combining handset-based and network-based location technologies (a hybrid solution);[9] the prospect of adopting more stringent location accuracy requirements;[10] and compliance testing methodologies in different environments, such as indoor versus outdoor use and rural versus urban areas.[11] The Commission also invited comment on how to address location accuracy issues for 911 calls placed when roaming, particularly when roaming between carriers using different location technologies.[12] Further, the Commission requested comment on a number of tentative conclusions and proposals, including establishing a single location accuracy standard rather than the separate accuracy requirements for network and handset-based technologies,[13] adopting a mandatory schedule for accuracy testing,[14] and applying the same location accuracy standards that apply to circuit-switched CMRS services to interconnected VoIP services used in more than one location.[15]

8. In October 2008, as required by the NET 911 Improvement Act (NET 911 Act),[16] the Commission released a *Report and Order* adopting rules providing "interconnected VoIP providers rights

[6] 47 C.F.R. § 9.5(b). The Registered Location is "[t]he most recent information obtained by an interconnected VoIP service provider that identifies the physical location of an end user." 47 C.F.R. § 9.3.

[7] 47 U.S.C. § 615a-1(a) ("It shall be the duty of each IP-enabled voice service provider to provide 9-1-1 service and enhanced 9-1-1 service to its subscribers in accordance with the requirements of the Federal Communications Commission, as in effect on July 23, 2008 and as such requirements may be modified by the Commission from time to time."). *See generally* New and Emerging Technologies 911 Improvement Act of 2008, Pub. L. No. 110-283, 122 Stat. 2620 (2008) (NET 911 Improvement Act) (amending Wireless Communications and Public Safety Act of 1999, Pub. L. No. 106-81, 113 Stat. 1286 (1999)), *codified at* 47 U.S.C. §§ 615-615a-1.

[8] Wireless E911 Location Accuracy Requirements; Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems for IP-Enabled Service Providers, PS Docket No. 07-114, CC Docket No. 94-102, WC Docket No. 05-196, *Notice of Proposed Rulemaking*, 22 FCC Rcd 10609, 10613-16 ¶¶ 8-19 (2007) (*Location Accuracy NPRM*).

[9] *See id*. at 10613-14 ¶ 11.

[10] *See id*. at 10614 ¶ 12.

[11] *See id*. at 10614 ¶ 14 (also requesting comment on whether the FCC should make the OET Bulletin No. 71 guideline mandatory).

[12] *See id*. at 10615 ¶ 17.

[13] *See id*. at 10613 ¶¶ 9-10.

[14] *See id*. at 10614-15 ¶ 15.

[15] *See id*. at 10615-16 ¶ 18.

[16] 47 U.S.C. § 615a-1(b) ("An IP-enabled voice service provider that seeks capabilities to provide 9-1-1 and enhanced 9-1-1- service from an entity with ownership or control over such capabilities, to comply with its obligations under subsection (a), shall, for the exclusive purpose of complying with such obligations, have a right of access to such capabilities, including interconnection, to provide 9-1-1 and enhanced 9-1-1 service on the same rates, terms, and conditions that are provided to a provider of commercial mobile service (as such term is defined in Section 332(d) of the Communications Act of 1934), subject to such regulations as the Commission prescribes under subsection (c)."); *id.* § 615(a)-1(c) ("The Commission – (1) within 90 days after July 23, 2008, shall issue regulations implementing such Act, including regulations that – (A) ensure that IP-enabled voice service providers have the ability to exercise their rights under subsection (b).").

of access to any and all capabilities necessary to provide 911 and E911 service from entities that own or control those capabilities."[17] In the *NET 911 Improvement Act Report and Order*, the Commission declined to "issue highly detailed rules listing capabilities or entities with ownership or control of these capabilities" because the nation's 911 system varies depending on the locality and "overly specific rules would fail to reflect these local variations."[18] The Commission also declined "to expand the applicability of the rights granted in the NET 911 Improvement Act to entities beyond those encompassed within that statute."[19]

9. On March 16, 2010, the Commission staff released the National Broadband Plan, which recommended that the Commission examine approaches for leveraging broadband technologies to enhance emergency communications with the public by moving towards Next Generation 911 (NG911),[20] because NG911 will provide a "more interoperable and integrated emergency response capability for PSAPs, first responders, hospitals and other emergency response professionals."[21] Further, the National Broadband Plan notes that the Commission is "considering changes to its location accuracy requirements and the possible extension of…ALI…requirements to interconnected VoIP services."[22] The National Broadband Plan recommends that the Commission "expand [the *Location Accuracy NPRM*] proceeding to explore how NG911 may affect location accuracy and ALI."[23]

10. On September 23, 2010, the Commission adopted the *E911 Location Accuracy Second Report and Order*,[24] addressing wireless E911 location accuracy, and the *Location Accuracy FNPRM and NOI*, seeking comment on additional location accuracy issues affecting wireless, VoIP, and emerging broadband voice services.[25] The *E911 Location Accuracy Second Report and Order* required CMRS providers to satisfy the E911 Phase II location accuracy requirements at either a county-based or PSAP-based geographic level.[26] The order provided for implementation of this standard over an eight-year

[17] Implementation of the NET 911 Improvement Act of 2008, WC Docket No. 08-171, *Report and Order*, 23 FCC Rcd 15884, 15885 (2008) (*NET 911 Improvement Act Report and Order*).

[18] *NET 911 Improvement Act Report and Order*, 23 FCC Rcd at 15893 ¶ 22.

[19] *NET 911 Improvement Act Report and Order*, 23 FCC Rcd at 15894 n.66.

[20] *See* National Broadband Plan, Chapter 16, "Public Safety," Section 16.3, "Leveraging Broadband Technologies to Enhance Communications with the Public," at 313 (National Broadband Plan).

[21] *Id*. NG911 relies on IP-based architecture rather than the PSTN-based architecture of legacy 911 to provide an expanded array of emergency communications services that encompasses both the core functionalities of legacy E911 and additional functionalities that take advantage of the enhanced capabilities of IP-based devices and networks. *See* Framework for Next Generation 911 Deployment, PS Docket No. 10-255, *Notice of Inquiry*, 25 FCC Rcd 17869, 17877-80 ¶¶ 18-26 (2010). The National Emergency Number Association (NENA) defines NG911 as "a system comprised of hardware, software, data and operational policies and procedures …, to: provide standardized interfaces from call and message services; process all types of emergency calls including non-voice (multi-media) messages; acquire and integrate additional data useful to call routing and handling; deliver the calls/messages and data to the appropriate PSAPs and other appropriate emergency entities; support data and communications needs for coordinated incident response and management; and provide a secure environment for emergency communications."

[22] National Broadband Plan at 326, Recommendation 16.15.

[23] *Id*.

[24] *E911 Location Accuracy Second Report and Order*.

[25] Wireless E911 Location Accuracy Requirements and E911 Requirements for IP-Enabled Service Providers, PS Docket No. 07-114, WC Docket No. 05-196, *Further Notice of Proposed Rulemaking and Notice of Inquiry*, 25 FCC Rcd 18957 (2010) (*Location Accuracy FNPRM and NOI*).

[26] *See E911 Location Accuracy Second Report and Order*, 25 FCC Rcd at 18910 ¶ 2; 47 C.F.R. § 20.18(h).

period with interim benchmarks.[27] The Commission determined, however, that the revised location accuracy requirements would apply to outdoor measurements only and not to accuracy measurements for indoor locations.[28] Additionally, regardless of whether a carrier employs handset-based or network-based location technology, the Commission required wireless carriers to provide confidence and uncertainty data on a per-call basis upon PSAP request.[29] The Commission also extended the requirement to deliver confidence and uncertainty data to entities responsible for transporting this data between wireless carriers and PSAPs, including LECs, CLECs, owners of E911 networks, and emergency service providers (collectively, System Service Providers (SSPs)).[30]

11. In the *Location Accuracy FNPRM and NOI*, the Commission sought comment on several issues with respect to amending the Commission's wireless 911 and E911 requirements and extending 911 and E911 requirements to additional VoIP and wireless services.[31] In the *Location Accuracy FNPRM*, the Commission sought comment on a number of issues initially raised in the *Location Accuracy NPRM*, including: whether the Commission should consider more stringent location parameters for wireless E911 Phase II location accuracy and reliability;[32] potential modifications to the accuracy standard, including adoption of a unitary or single standard;[33] the methodology carriers should use to verify compliance, both initially and during ongoing testing; the format in which accuracy data should be automatically provided to PSAPs; how to address location accuracy while roaming; how to improve location information and accuracy in more challenging environments, such as indoors; and whether the Commission's location accuracy standards should include an elevation (z-axis) component.[34] In the *NOI*, the Commission requested comment on a number of 911 and E911 issues related to VoIP services, including whether the Commission should require interconnected VoIP service providers to automatically identify the geographic location of a customer without the customer's active cooperation and whether the Commission should apply its E911 regulations to VoIP services that are not fully interconnected to the PSTN.[35]

12. In March 2011, the Communications Security, Reliability, and Interoperability Council's (CSRIC's) Working Group 4C released a report entitled "Technical Options for E9-1-1 Location Accuracy."[36] CSRIC is a Federal Advisory Committee that was tasked with providing guidance and expertise on the nation's communications infrastructure and public safety communications.[37] CSRIC

[27] *Id*.

[28] *Id*. at 18920 ¶ 29, 18927-28 ¶¶ 48-49.

[29] *Id*. at 18929 ¶ 54; *see* 47 C.F.R. § 20.18(h)(3).

[30] *See id*. at 18930 ¶ 55; 47 C.F.R. § 20.18(h)(3).

[31] *Location Accuracy FNPRM and NOI*, 25 FCC Rcd at 18958 ¶ 2.

[32] *See id*. at 18958 ¶ 3.

[33] *See id*. at 18963-64 ¶ 17.

[34] *See id*. at 18958 ¶ 3.

[35] *See Location Accuracy NOI*, 25 FCC Rcd at 18958-59 ¶ 4.

[36] Technical Options for E9-1-1 Location Accuracy, Communications Security, Reliability and Interoperability Council Working Group 4C Final Report, March 14, 2011, available at: http://transition.fcc.gov/pshs/docs/csric/CSRIC_4C_Comprehensive_Final_Report.pdf (last accessed May 23, 2011) (CSRIC 4C Report).

[37] CSRIC was originally chartered in March 2007, and in March 2009, the Commission renewed CSRIC's charter through March 18, 2011. *See* 74 Fed. Reg. 11721-11722 (Mar. 19, 2009). The Commission's renewal of the charter was pursuant to the Federal Advisory Committee Act. *See* 5 U.S.C. Appendix 2. The Commission recently renewed CSRIC's charter again, through March 18, 2013. *See* FCC Recharters the Communications, Security, (continued….)

Working Group 4C was responsible for examining E911 and public safety location technologies currently in use, identifying current performance and limitations for use in next generation public safety applications, examining emerging E911 public safety location technologies, and recommending options to CSRIC for the improvement of E911 location accuracy timelines.[38] The CSRIC 4C Report made a number of recommendations, including that the FCC should: establish an E9-1-1 Technical Advisory Group to address specific location technology issues for 911, such as how to improve location accuracy in challenging environments, including indoor settings; actively engage in discussion on how to implement 911 auto-location for nomadic VoIP services; and consider extending E911 and location obligations to providers of over-the-top VoIP applications that are not subject to the FCC's interconnected VoIP regulations.[39]

III. THIRD REPORT AND ORDER

A. Unitary Location Accuracy Standard

13. *Background*. In the *Location Accuracy FNPRM*, the Commission sought comment on whether to change the current location accuracy requirements in Section 20.18(h) of our rules, including whether to adopt a unitary standard, rather than maintaining separate standards for network- and handset-based carriers.[40] The Commission also sought to refresh the record developed on this issue in response to the *Location Accuracy NPRM*, in which the Commission had tentatively concluded that it should adopt a unitary location accuracy requirement.[41]

14. *Comments*. Some commenters support the adoption of a unitary location accuracy requirement. APCO supports the adoption of a unitary standard "to the extent feasible,"[42] while NENA urges the FCC to "lay out a regulatory vision for achieving [one] harmonized accuracy standard."[43] Verizon Wireless and Intrado also support the use of a unitary standard, contending that the bifurcated handset and network standards create "an unacceptable disparity" among wireless users.[44]

15. Other commenters oppose adoption of a unitary location accuracy standard. AT&T, Sprint Nextel, T-Mobile, the Telecommunications Industry Association (TIA), Andrew Corporation, Motorola, and CTIA contend that a unitary standard is not technically or economically feasible at this time.[45] For instance, T-Mobile asserts that "[f]or carriers using network-based E911 solutions. . .the [*E911 Location Accuracy Second Report and Order*] establishes a migration path from those technologies

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Reliability, and Interoperability Council; Seeks Nominations by April 22, 2011, *Public Notice*, 26 FCC Rcd 4031 (Mar. 22, 2011) (CSRIC Renewal PN).

[38] CSRIC 4C Report at 5.

[39] *Id* at 6-7.

[40] *See Location Accuracy FNPRM*, 25 FCC Rcd at 18963-64 ¶ 17.

[41] *See Location Accuracy NPRM*, 22 FCC Rcd at 10613 ¶¶ 9-10.

[42] APCO Comments at 3.

[43] NENA Comments at 7-8.

[44] Verizon and Verizon Wireless Comments at 1-2; Intrado at 5 (asserting that "the Commission should hold to the . . . handset[-based] standard"). *See generally* Qualcomm Comments at 1 (stating that the Commission "may be able to implement a single location accuracy standard" as 3G and 4G-capable networks "become ubiquitous").

[45] *See* AT&T Comments at 5-7; Sprint Nextel Comments at 4 (asserting that "it would be premature to adopt a single standard); T-Mobile Comments at 5; TIA Comments at 2, 5, 7; Andrew Corporation Comments at 2, Motorola Comments at 6. *See also* CTIA Comments at 3 (contending "it would be inappropriate…to promulgate further standards before the current ones can be implemented and evaluated.").

to the handset-based A-GPS solution."[46] T-Mobile submits that the "[*Second Report and Order*] already contemplates a handset change out for all non-A-GPS-capable handsets" and urges the Commission to be "reluctant to order another handset change out, especially before it can fully evaluate the results of the [*Second Report and Order*]."[47] T-Mobile contends that "[d]oing so would likely impose significant additional unnecessary costs on consumers and providers without an ascertainable benefit[,]" while "continued refinements in GPS receiver performance and location algorithms, and the likely availability of additional navigation satellite systems will improve A-GPS capabilities during the eight-year transition."[48] Also, TIA "encourages the Commission not to impose a single uniform standard for location accuracy rules[,]" because "[m]andating a single standard for both network and device location accuracy will drive technological innovation and investment towards meeting such a standard, rather than developing location accuracy enhancements that go beyond any new requirements."[49] Polaris argues that a single location accuracy standard should not be implemented "until [the Commission] adopts a hybridization timeline."[50]

16. *Discussion*. Given the Commission's recent revisions to the handset- and network-based location accuracy requirements in the *E911 Location Accuracy Second Report and Order* and the establishment of an eight-year implementation period for these requirements, we find that it would be premature to replace the existing location accuracy rules with a unitary location accuracy standard. To comply with the *E911 Location Accuracy Second Report and Order*, CMRS providers are already making substantial efforts to improve their ability to provide accurate location information. We see no reason, at this time, to alter the amount of time provided to carriers under the *E911 Location Accuracy Second Report and Order* to comply with the rules adopted there.[51]

17. Nevertheless, the record in this proceeding clearly signals that the wireless industry is engaged in a broad migration away from the dichotomy between network- and handset-based approaches to location accuracy. Current handset-based carriers are increasingly combining A-GPS technologies with refinements based on location determinations using network-based technologies. For instance, Sprint uses "a combination of handset-based and network-based location technologies," and while its "Phase II E-911 solution for its CDMA network has been categorized as a handset-based solution," it also deploys "network-based components."[52] Similarly, Verizon Wireless submits that it uses a mix of technologies, including "A-GPS (network-assisted), Hybrid (A-GPS & AFLT), AFLT, and several default location technologies (cell sector with timing, mixed cell sector, cell sector) to provide location information for 9-1-1 calls."[53] T-Mobile adds that besides "A-GPS improvements, carriers have also

[46] T-Mobile Comments at 5.

[47] *Id*. at 6.

[48] *Id*.

[49] TIA Comments at 5.

[50] Polaris Comments at 5.

[51] Based on the effective date of the *E911 Location Accuracy Second Report and Order*, the eight-year implementation period commenced on January 19, 2011, and will conclude on January 19, 2019.

[52] Sprint Nextel Comments at 4-5 (The carrier is "supplement[ing] [its A-GPS handset] technology with Advanced Forward Link Trilateration ('AFLT') on its network. AFLT utilizes network transmissions observed at the handset for time difference of arrival calculations ('TDOA') calculations.").

[53] Verizon Wireless May 18, 2011 Ex Parte, May 18, 2011.

made improvements in the use of the timing and triangulation technologies that serve as fallback location technologies implemented today as complements to A-GPS."[54]

18. As network-based carriers migrate to A-GPS and increase the penetration of A-GPS-capable handsets in accordance with our implementation benchmarks for location accuracy, the technological distinctions between handset- and network-based wireless E911 solutions will continue to diminish. We concur with T-Mobile that "[a]s carriers transition to A-GPS, they will also transition from network-based accuracy standards to handset-based standards, moving toward a *de facto* unified standard" and that "the likely result…at least for major nationwide carriers, is that all will be using similar A-GPS E911 location technologies across nearly their entire subscriber base by the end of the ordered eight-year transition."[55]

19. Therefore, we decide not to alter the rules adopted in the *E911 Location Accuracy Second Report and Order* as they apply to existing wireless carriers and networks. Rather, we conclude that the network-based standard should sunset at an appropriate point after the end of the eight-year implementation period, at which point all carriers would be obligated to meet the handset-based location accuracy standard in the Commission's current rules. In adopting this approach, we assess the benefits of requiring, at a later date, the handset-based location accuracy standard as the unitary standard. The handset-based standard is more stringent than the network-based standard.[56] This stricter standard is consistent with the Commission's chief objective of "ensur[ing] that PSAPs receive accurate and meaningful location information"[57] while considering that "compliance timeframes, limitations, and exemptions . . . provide carriers with a sufficient measure of flexibility to account for technical and cost-related concerns."[58] With the more precise handset-based standard as the unitary standard, we expect it to be easier for first responders to locate wireless customers in emergency situations. It is reasonable to expect that the more accurate location information under the handset-based location accuracy parameters will lead to more direct and quicker response by first responders addressing wireless 911 calls, and that expediting their response time will have significant public safety benefits.[59] For instance, we note that, in cardiac arrest emergencies, reducing response times by even three minutes improves a victim's chances of survival "almost four-fold."[60]

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[54] T-Mobile Comments at 10 (noting that "[t]hese [network-based] methods help to ensure that callers who are unable to be located using A-GPS can still likely be located with medium accuracy (i.e., some location information is provided, but not within the accuracy standards required for 67% of 911 calls)").

[55] T-Mobile Comments at 5; *see also* Sprint Nextel Comments at 4 ("[I]t would appear that carriers are generally moving toward a device centric GPS location technology.").

[56] *Cf.* 47 C.F.R. § 20.18(h)(2)(iii) (mandating that eight years from January 18, 2011, the Phase II accuracy standard will be "50 meters for 67 percent of calls, and 150 meters for 90 percent of calls on a per-county or per-PSAP basis."); 47 C.F.R. § 20.18(h)(1)(ii)(C) (mandating that eight years from January 18, 2011, the Phase II accuracy standard will be 300 meters for 90 percent of calls on a per-county or per-PSAP basis in "85 percent of counties or PSAP service areas .").

[57] *E911 Location Accuracy Second Report and Order*, 25 FCC Rcd at 18915 ¶ 16.

[58] *Id*. at 18919 ¶ 25. Further, the Commission found that the record did not show that costs in meeting the handset requirements would be either prohibitive or impose financial strain. *See id*. The Commission noted that financial considerations "will be taken into account should a service provider request waiver relief." *Id*.

[59] *See E911 Location Accuracy Second Report and Order*, 25 FCC Rcd at 18921, 18924 ¶¶ 34, 41; see also T-Mobile Comments at 6 (submitting that "continued refinements in GPS receiver performance and location algorithms, and the likely availability of additional navigation satellite systems will improve A-GPS capabilities during the eight-year transition").

[60] R. Davis, *Six Minutes to Live or Die*, USA Today (May 20, 2005), *available at* http://www.usatoday.com/news/nation/ems-day2-cover.htm (last visited July 8, 2011). *See also* American Heart Association, Stroke Patients Who Reach Hospitals within "Golden Hour" Twice as Likely to Get Clot-busting Drug, (continued….)

20. There are substantial benefits to retaining the existing location accuracy rules with the eight-year implementation periods for both handset-based and network-based location accuracy solutions. The record shows convincing support from wireless carriers and the public safety community for retaining the Commission's current bifurcated approach for cost reasons. We agree with T-Mobile that adopting a unitary location accuracy standard now "would likely impose significant additional unnecessary costs on consumers and providers without an ascertainable benefit."[61] AT&T adds that "mandating a specific technology or standard would prevent carriers from implementing E911 solutions that fully leverage their unique network characteristics,"[62] especially since, as we note above, carriers are currently taking initial steps to comply with our first location accuracy benchmarks. Also, although NENA supports a unitary location accuracy standard, it recognizes that the bifurcated regulatory regime in effect "represent[s] a reasonable compromise between cost [and] capability."[63] We thus conclude that continuing this approach will provide the benefit of regulatory certainty without the likely precipitate costs of a unitary standard at this time, as the growing migration to A-GPS handsets continues and network-based carriers increasingly incorporate those handsets in accordance with their respective location accuracy benchmarks.

21. The phasing out of the network-based standard that we are adopting will allow carriers using network-based technologies to spread over the eight-year implementation period their actions to comply with the location accuracy benchmarks. Because in 2010 almost all 2G and 3G handsets shipped by manufacturers were equipped with GPS- chips,[64] by the end of the eight-year implementation period, network-based carriers will likely have complied with their location accuracy benchmarks by "blending in"[65] such location-capable handsets. Therefore, the costs of meeting the handset-based standard within a reasonable sunset period after 8 years should be minimal. Moreover, the fact that the eight-year benchmark permits "a network-based carrier to comply…using only handset-based measurements, as long as it has achieved at least 85% A-GPS handset penetration among its subscribers"[66] should provide incentives to network-based carriers to achieve 85 percent A-GPS handset penetration by the end of the eight years and thereby contribute to minimizing subsequent costs. Nevertheless, given the constantly evolving nature of location technologies, we recognize that it is premature to adopt a specific sunset date at this time. Instead, we will seek comment on selecting a sunset date and on considering the costs and benefits associated with a particular sunset date at a later time. We believe that as the end of the eight-year period draws closer, the public safety community, wireless carriers, location technology vendors and other stakeholders will have a significantly better understanding of how much time network-based

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Feb. 18, 2009*, available at* http://www.newsroom.heart.org/index.php?s=43&item=660 ("Patients who arrived at specific hospitals within one hour of experiencing stroke symptoms received a powerful clot-busting drug twice as often as those who arrived later in the approved time window for treatment").

[61] T-Mobile Comments at 6.

[62] AT&T Comments at 5; *see also* AT&T Comments at 7; Sprint Nextel Comments at 2-3 (regarding consideration of the varied technologies in use by carriers and the significant costs carriers have already expended to meet the . . . recently revised E-911 location accuracy requirements."); TIA Comments at 5-7.

[63] NENA Comments at 7.

[64] *See* Paul Rasmussen, *Study: GPS Enabled Chipsets Rocketed by 100% in 2010*, Fierce Wireless, Apr. 4, 2011, *available at* http://www.fiercewireless.com/europe/story/study-gps-enabled-handset-shipments-rocketed-100-2010/2011-04-22 (last visited July 9, 2011). . (noting that 97 percent of 2G and 3G handsets shipping in 2010 were GPS-enabled).

[65] *See* 47 C.F.R. 20.18(h)(1)(iv).

[66] *E911 Location Accuracy Second Report and Order*, 25 FCC Rcd at 18927 ¶ 47; *see also* 47 C.F.R. § 20.18(h)(1)(v).

carriers will need following the conclusion of the eight-year implementation period to come into compliance with the handset-based standard.

22. In addition, we conclude that all new CMRS network providers that meet the definition of covered CMRS providers in Section 20.18 must comply with the handset-based location accuracy standard. We concur with Verizon and Verizon Wireless that due to the broad migration toward use of A-GPS-capable handsets, it is reasonable to harmonize our location accuracy requirements with regard to new CMRS networks.[67] We define a "new CMRS network" as a CMRS network that is newly deployed subsequent to the effective date of this Report and Order and that is not associated with an existing CMRS network. In other words, our definition of "new CMRS network" excludes network changes or deployments that are part of an upgrade or expansion of an existing CMRS network. In adopting this definition, our intent is to require covered CMRS providers that are launching new stand-alone networks to meet the handset-based location accuracy standard from the start, rather than to accelerate the eight-year implementation period for existing covered CMRS providers that opt to upgrade their networks during the implementation period.

23. We find that requiring all new CMRS network providers to comply with our handset-based location accuracy standard is consistent with the regulatory principle of ensuring technological neutrality. Providers deploying new CMRS networks are free to use network-based location techniques, or to combine network and handset-based techniques, to provide 911 location information, provided that they meet the accuracy criteria applicable to handset-based providers.[68] Given the long-term goal of universal support for one location accuracy standard, we believe that such a mandate allows appropriate planning and ensures that new technology will comply with the most stringent location accuracy standard that applies to existing technology. Additionally, as A-GPS-capable handsets become more widely available, and as consumer demand increases for handsets that provide GPS-based navigation and location-based services,[69] new CMRS providers will have substantial incentive to provide such handsets to most if not all of their customers, thus minimizing the incremental cost to such carriers of complying with the Commission's handset-based location accuracy standard.

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[67] *See* Verizon and Verizon Wireless Comments at 2; *see also* T-Mobile Comments at 5. *See generally* Sprint Nextel Comments (commenting "that carriers are generally moving toward a device centric-GPS location technology."). We note that by one estimate, 97 percent of 2G and 3G handsets shipped by manufacturers in 2010 were enabled with GPS. *See* Paul Rasmussen, *Study: GPS Enabled Chipsets Rocketed by 100% in 2010*, Fierce Wireless, Apr. 4, 2011, *available at* http://www.fiercewireless.com/europe/story/study-gps-enabled-handset-shipments-rocketed-100-2010/2011-04-22 (last visited July 9, 2011).

[68] New CMRS networks that are deployed during the eight-year implementation period will be subject to the applicable handset-based location accuracy standard in effect at the time of the deployment. See 47 C.F.R. § 20.18(h)(2)(ii).

[69] *See*, *e.g.*, Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, WT Docket No. 10-133, *Fifteenth Report*, FCC 11-103 (rel. June 27, 2011), at 328, 356, ¶¶ 328, 356 (*Fifteenth CMRS Competition Report*) (noting the increasing use of GPS-based navigational applications and location-based services). *See also* Jenna Wortham, Sending GPS Devices the Way of the Tape Deck?, New York Times, July 7, 2009, *available at* http://www.nytimes.com/2009/07/08/technology/08gps.html; Mini Swamy, ABI Research: Smartphones to Trigger GPS Growth, LBS Mergers in the Offing, TMCNet, Apr. 21, 2011, at http://satellite.tmcnet.com/topics/satellite/articles/166793-abi-research-smartphones-trigger-gps-growth-lbs-mergers.htm (last visited July 9, 2011); Horace Dediu, Half of US Population to Use Smartphones by End of 2011, Asymco, Dec. 4, 2010, *available at* http://www.asymco.com/2010/12/04/half-of-us-population-to-use-smartphones-by-end-of-2011/ (last visited July 9, 2011).

1. Outdoor Location Accuracy Testing

24. In April 2000, the Commission's Office of Engineering and Technology (OET) issued Bulletin No. 71 (OET Bulletin 71) to provide assistance in determining whether wireless licensees are in compliance with the location accuracy standards set by the Commission.[70] The bulletin stated that compliance with the OET guidelines would establish "a strong presumption that appropriate means have been applied to ensure that an [automatic location identification] (ALI) system complies with the Commission's Rules."[71]

25. *Background.* In the *Location Accuracy FNPRM*, the Commission sought comment on whether it should make wireless location accuracy compliance testing mandatory and whether to establish a mandatory testing schedule.[72] The Commission also sought comment on whether OET Bulletin 71 should serve as the basis for a mandatory testing methodology, and the Commission sought to refresh the record on testing methodologies developed in response to the *Location Accuracy NPRM*.[73]

26. *Comments*. A number of commenters support mandatory periodic testing of CMRS providers' compliance with the Commission's location accuracy rules. NENA argues that "[s]uch testing is the PSAP's only real assurance that emergency services personnel will be able to locate callers in times of distress."[74] NENA, however, acknowledges "that compliance testing is an expensive and burdensome process for carriers" and therefore proposes that the "baseline compliance testing interval should be five years."[75] NENA also advocates that in PSAP service areas where Phase II service capabilities have been deployed, new or upgraded base stations should undergo compliance testing before entering service. NENA reasons that without such a requirement, current rules "could permit carriers to delay testing of location accuracy for newly-deployed base stations (or sectors in these areas) for up to six months" and that this risks "the creation of 'islands' where E9-1-1 Phase II level service is unavailable to consumers who have a reasonable expectation of service."[76] NENA also recommends that "[m]aterial changes to the wireless operational environment within a PSAP service area should trigger localized out-of-cycle testing."[77] Finally, NENA argues that carriers should be required to share test results with relevant PSAPs and State 9-1-1 offices, "subject to stringent confidentiality provisions," to foster collaboration between carriers and public safety agencies and to improve PSAPs' situational awareness.[78]

27. APCO also supports mandatory accuracy testing but does not propose a specific schedule or timeframe. APCO argues that "[c]ompliance testing must…be repeated within a reasonable time frame," as "wireless system updates such as 're-homing' a cellular network or modifying internal databases have been known to have a negative impact on location and 9-1-1 delivery."[79] APCO urges the

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[70] *See* OET Bulletin No. 71, Guidelines for Testing and Verifying the Accuracy of Wireless E911 Location Systems (Apr. 12, 2000) at 2, *available at* http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet71/oet71.pdf.

[71] *Id*.

[72] *Location Accuracy FNPRM* at ¶¶ 19-21.

[73] *Id*.

[74] NENA Comments at 9.

[75] *Id*.

[76] *Id.* at 10.

[77] *Id.* at 11.

[78] *Id.*.

[79] APCO Comments at 4.

Commission to "seriously consider mandating that compliance testing conforms to OET 71."[80] APCO also argues that test results should be shared with relevant PSAPs and presented in a standardized format.[81]

28. TruePosition also recommends periodic mandatory accuracy testing. TruePosition argues that "[t]o identify the impact of the numerous changes that occur over time…it is necessary to characterize system performance periodically."[82] TruePosition argues that "such testing often turns up hidden problems that can usually be rectified quickly once discovered" and that periodic testing "also has the benefit of identifying common issues such that procedures can be put in place to address them on an on-going basis."[83] Further, TruePosition argues that "test calls from a specific cell site should be weighted according to the percentage of 911 calls originating on that cell site" and that "[w]hile accuracy is the main criteria for compliance, it is meaningless unless yield is also taken into account."[84]

29. Texas 9-1-1 Agencies argue that "[w]ireless carriers must be required to do initial pre-deployment testing of Phase 2 service before turning up any new towers with live traffic or any new coverage areas with live traffic in 9-1-1 authority areas that have full Phase 2 service."[85] Texas 9-1-1 Agencies argue further that "[Section] 20.18 should not be interpreted to create an automatic loophole extension of up to six-months for wireless carriers to deploy Phase 2 service at a later date after they start handling live end user traffic."[86]

30. The Alliance for Telecommunications Industry Solutions' (ATIS) Emergency Services Forum (ESIF), an organization with wireless carriers as members, has developed and published several industry-accepted methodologies related to testing.[87] In particular, ATIS's ESIF has published a technical report (ATIS Report) that specifies events that should trigger maintenance testing.[88] These events include: (1) major network changes that may significantly impact location accuracy; (2) problems such as unexplained significant degradation of service, systematic failed delivery of service and catastrophic events; and (3) every two years, at a minimum, consistent with NRIC VII Focus Group 1A recommendations.[89] ATIS states that examples of major network changes that should trigger location accuracy testing include:

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[80] *Id*.

[81] *Id*.

[82] TruePosition Comments at 22.

[83] *Id*.

[84] *Id*.

[85] Texas 9-1-1 Agencies Comments at 15.

[86] *Id*.

[87] ATIS's membership includes key stakeholders from the information and communication technologies industry, including wireless and wireline service providers, equipment manufacturers, providers of commercial mobile radio services, broadband providers, consumer electronics companies, public safety agencies, and internet service providers. ATIS's ESIF serves as the primary forum for the telecommunications industry, public safety and other stakeholders to identify and resolve recognized technical and operational interconnection issues related to the delivery of E911 services. *See* ATIS Comments at 2.

[88] *See, e.g.,* ATIS Technical Report, "Approaches to Wireless E9-1-1 Indoor Location Performance Testing," ATIS-05000010; ATIS Technical Report, "Location Technology Performance Data: Define Topologies & Data Collection," ATIS-0500011. *See also* ATIS Comments at 10.

[89] *See* ATIS Comments at 10.

a) Changes to core location technology;

b) Major system software upgrades that impact location algorithms;

c) Changes in radio frequency (RF) configuration that would result in a significant impact to location accuracy in the area being considered; and

d) Natural disasters that alter the topology of a significant portion of the infrastructure in an area of consideration."[90]

According to AT&T, the ATIS report "should be the starting point for [an advisory group] evaluation."[91]

31. Carrier commenters generally oppose mandatory testing. T-Mobile argues that periodic testing is not necessary because "once initial data is collected indicating certain accuracy levels have been achieved, that data does not lose validity. In fact, performance generally tends to improve rather than degrade over time."[92] T-Mobile further contends that "[r]equiring periodic re-testing would…be unnecessary and impose a huge burden. At a minimum, the Commission is obligated by the Paperwork Reduction Act to evaluate the Second Report and Order mechanisms before imposing additional information collection requirements."[93] AT&T also opposes a testing requirement, arguing that "[t]he NPRM's discussion of these topics ignores the Commission's decision in the Second R&O to trend uncertainty data to validate accuracy in an ongoing manner."[94] T-Mobile similarly contends that "trending of confidence and uncertainty data…provides a way of better targeting areas where remedial measures may be needed,"[95] while "[n]etworkwide accuracy retesting is a costly and unnecessary burden absent any clear evidence of need."[96]

32. However, according to NENA, confidence and uncertainty trends are not sufficient proxies for location accuracy testing[97] because "reported confidence and uncertainty data are themselves subject to systemic error."[98] NENA disputes T-Mobile's claim that network performance does not materially change with time, noting that "routine changes in deployed networks can adversely affect location accuracy."[99]

33. Commenters also urge caution regarding using OET Bulletin 71 as the basis for testing procedures, arguing that the bulletin is outdated and further work on testing criteria is required. Andrew Corporation supports mandatory testing but cautions that "in order to ensure that such testing is as meaningful as possible, the compliance verification methodology should be based on empirical test data collected at a statistically significant number of test points representative of calling patterns in the targeted compliance area."[100] Andrew Corporation also argues that "compliance testing parameters should account for the fact that performance among individual handset models may vary for handset-

[90] *Id*.

[91] AT&T Comments at 11.

[92] T-Mobile Comments at 23. *See also* Sprint Nextel Comments at 8.

[93] *Id*.

[94] AT&T Comments at 10. *See also* ATIS Comments at 7-8.

[95] T-Mobile Ex Parte at 1.

[96] *Id*. at 2.

[97] *See* NENA Ex Parte at 1.

[98] *Id.* at 2.

[99] *Id.* at. 4.

[100] Andrew Corporation Comments at 3.

based location methods and can strongly influence measured results for GPS-based location technology."[101]

34. *Discussion.* We conclude that requiring CMRS providers to periodically test their outdoor location accuracy results and to share these results with PSAPs within their service areas, state 911 offices in the states or territories in which they operate, and the Commission, subject to confidentiality safeguards, is important to ensure that our location accuracy requirements are being met. Indeed, as NENA, APCO, and TruePosition note, the current lack of available data on location accuracy results has made it difficult for public safety entities, the Commission, and the public to assess whether the Commission's rules are effectively ensuring that CMRS providers are providing meaningful location information to PSAPs. The lack of available data has also made it difficult to assess the effects of emerging technologies on location accuracy results and has negatively affected the ability of public safety personnel to have confidence in the location information they do receive.[102]

35. As noted, there is disagreement in the record regarding the need for periodic testing of carriers' networks. T-Mobile contends that only initial test data on accuracy levels is necessary and that periodic retesting yields no public safety benefit. Other commenters, including NENA and TruePosition, cite examples of common environmental and network changes that can affect the reliability of previous test results, such as new construction or development, new Phase II capabilities, re-homing of cellular networks, and rectifying problems discovered in previous testing.[103] They argue that in the absence of periodic retesting, these changes can result in degradation of location accuracy performance that would not be identifiable based on initial test results.

36. We find that periodic testing is important to ensure that test data does not become obsolete as a result of environmental changes and network reconfiguration. Indeed, even ATIS, which is comprised of wireless carriers, notes that "major network change…could significantly impact location accuracy and trigger accuracy maintenance testing."[104] In addition, carrier disclosure to PSAPs and 911 offices will enable them to better gauge whether they are receiving accurate location information from CMRS providers and thus base their responses to emergencies accordingly. Disclosure of the information to the Commission will enable the Commission to monitor trends in location accuracy and thereby ensure that its regulations are appropriately tailored to enhance location accuracy without imposing unnecessary costs or administrative burdens. We also recognize that test results subject to disclosure may contain proprietary information. Therefore, before the Commission implements any disclosure requirements, we will seek comment on safeguards that should be implemented to ensure the protection of confidential information in the test results.

37. No entity has suggested a means other than periodic testing to ensure the accuracy of location information. However, further work is needed to develop approaches to testing criteria,

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[101] *Id*. at 4. *See also* Verizon Comments at 13 (explaining that the Commission "should promulgate any test regime parameters as an update to OET Bulletin No. 71 or as policy guidance, not codify them as rules"); Sprint Nextel Comments at 7 ("Any testing guidelines the Commission issues…should continue to be voluntary for carriers."); AT&T Comments at 9; TCS Comments at 5; St. Louis County Comments at 2.

[102] *See, e.g.*, Association of Public Safety Communications Officials-International, *An Assessment of the Value of Location Data Delivered to PSAPs with Enhanced Wireless 911 Calls (Project LOCATE)*, Final Report at 12, April 2007, CC Docket No. 94-102 (filed Apr. 10, 2007)("The entire public safety community and those served each day by them are potentially affected by the effort to improve the consistency and accuracy of wireless location data at the PSAP. Project LOCATE [an APCO organization] recognizes the need to manage current expectations among all users and responders. The success of such efforts can be measured in part by the improvements in understanding of current system capabilities.").

[103] *See, e.g.,* TruePosition Comments at 22; NENA Ex Parte at 4.

[104] ATIS Comments at 10.

procedures, and timeframes that are reasonable and cost-effective. We also agree with commenters that basing testing criteria and procedures on the current OET Bulletin 71, developed eleven years ago, would be inappropriate at this time. Rather, we conclude that development of these issues should be referred to the newly re-chartered CSRIC.[105] More specifically, the CSRIC should be tasked with making recommendations to the Commission within six months regarding cost-effective and specific approaches to testing requirements, methodologies, and implementation timeframes that will substantially meet the goals articulated above, including appropriate updates to OET Bulletin 71.[106] The Commission will then subject these recommendations to further notice and comment prior to implementing specific testing requirements and procedures.

38. We encourage the CSRIC to consider the feasibility of flexible testing criteria and methodologies. To the extent that any stakeholders have concerns about the potential expense of periodic testing, we expect them to substantiate such concerns by providing the CSRIC with detailed cost data relating to particular testing methodologies. Overall, the CSRIC's recommendations should attempt to find cost-effective testing solutions.

2. Legal Authority

39. We act pursuant to well-established legal authority. Since 1996, the Commission has required CMRS providers to implement basic 911 and E911 services.[107] As the Commission has explained before, sections 301 and 303(r) of the Act give us the authority to require CMRS providers to implement these services.[108] E911 requirements also further the Commission's mandate to "promot[e] safety of life and property through the use of wire and radio communication."[109] Our actions in this item enhance E911 service to "promote safety of life and property" and fall within this authority.

IV. SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

A. Applying E911 Rules to Outbound-Only Interconnected VoIP Service providers

40. *Background.* In 2005, the Commission first asserted regulatory authority over interconnected VoIP service providers for 911 purposes. In the *VoIP 911 Order*, the Commission defined interconnected VoIP service as a service that (1) enables real-time, two-way voice communications; (2) requires a broadband connection from the user's location; (3) requires Internet protocol-compatible customer premises equipment (CPE); and (4) permits users generally to receive calls that originate on the PSTN and to terminate calls to the PSTN.[110] The Commission established requirements for these providers to provide 911 services to their customers.[111] Since the Commission's adoption of these requirements, Congress has codified them and has also given the Commission the discretion to modify them "from time to time."[112]

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[105] *See* CSRIC Renewal PN.

[106] CSRIC Working Group 4C Final Report at 6.

[107] *See Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, 11 FCC Rcd 18676, 18679 ¶ 5 (1996).

[108] 47 U.S.C. §§ 301, 303(r); *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Fourth Memorandum Opinion and Order, 15 FCC Rcd 17442, 17445 ¶ 6 (2000).

[109] 47 U.S.C. § 151.

[110] *See VoIP 911 Order*, 20 FCC Rcd at 10257-58 ¶ 24; 47 C.F.R. § 9.3.

[111] *VoIP 911 Order*, 20 FCC Rcd at 10266-73, ¶¶ 36-51; 47 C.F.R. § 9.5.

[112] 47 U.S.C. § 615a-1(a); *see supra* note 7.

41. In the *Location Accuracy NOI*, the Commission noted that the Commission's VoIP 911 rules have thus far been limited to providers of interconnected VoIP services as defined above. The Commission also noted, however, that since these rules were adopted, there has been a significant increase in the availability and use of portable VoIP services and applications that do not meet one or more prongs of the interconnected VoIP service definition. In light of the increase in use of these services, the Commission sought comment on several alternatives for expanding the scope of the VoIP 911 rules, including whether 911/E911 obligations should apply to (1) VoIP services that enable users to place outbound calls that terminate on the PSTN but not to receive inbound calls from the PSTN, and (2) VoIP services that enable users to receive inbound calls from the PSTN but not to make outbound calls to the PSTN.[113]

42. *Comments.* In response to the *Location Accuracy NOI*, a number of public safety entities argue that the Commission should impose 911 obligations on VoIP services that do not meet the current definition of interconnected VoIP service.[114] NENA contends that consumers expect that they will be able to reach 911 from a VoIP telephone.[115] NENA submits that it is "reasonable for consumers to expect that services which allow outbound calling to the PSTN will properly route calls to 9-1-1."[116] Further, Texas 9-1-1 Agencies contends that "vendors of these services should be required to provide public education materials related to 9-1-1 limitations and work diligently with public safety and access network provider[s]…to minimize confusion and potential adverse consequences to their end users."[117]

43. Some commercial commenters also support the view that changing consumer expectations support extending 911 requirements beyond the scope of VoIP providers covered by the existing rules. AT&T highlights that "the record suggests that consumers expect that outbound, residential VoIP services that provide local calling capability will support E911."[118] Sprint Nextel notes that "[m]any…new services can be viewed as a form of mobile phone service and, as such, should be treated in a similar way for purposes of 911."[119] TCS states that "[s]ome VoIP services that otherwise fully comply with [the interconnected VoIP service] definition are configured so as to offer only "one-way" (i.e., either in-bound or out-bound calling, but not both) voice services to the PSTN." TCS characterizes this as a "loophole" that encourages "product definition arbitrage" and urges "either Congressional action…or clarification from the FCC that such services are included in Section 9.3."[120] MobileTREC states that "since a consumer's expectation is that all devices that have dial tone would have 911 service, then any device with dial tone should have a 911 solution, including nomadic or mobile VoIP services such as MagicJack, Skype, Vonage, and Google Voice."[121] DASH believes that "the primary criteria the Commission should apply in determining whether to impose 9-1-1 requirements on new products and services is the reasonable expectations of the subscriber."[122]

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[113] *Location Accuracy FNPRM*, 25 FCC Rcd at 18969-70 ¶ 31.

[114] *See* Adams County Comments at 2; Colorado E-911 Authorities Comments at 3; NENA Comments at 13 (stating that E911 requirements should be extended "to all VoIP providers that enable users to terminate calls to the PSTN").

[115] *See* NENA Comments at 13. *See also* Texas 9-1-1 Agencies Comments at 18.

[116] NENA Comments at 13 (asserting that this expectation is "held by the overwhelming majority of VoIP users.").

[117] Texas 9-1-1 Agencies Comments at 17.

[118] AT&T Comments at 16.

[119] Sprint Nextel Comments at 10.

[120] TCS Comments at 6-7.

[121] MobileTREC Comments at 4.

[122] DASH Comments at 9 ("A subscriber using a device that has a keypad with 12 buttons and is capable of establishing two-way voice communications to another party has a reasonable expectation that if he dials 9-1-1, help (continued….)

44. The VON Coalition, on the other hand, argues that "there is a real risk to innovation if the Commission begins to blur the previously established clear lines and expectations created in the definition of interconnected VoIP… to trigger 911 obligations on these innovative applications, products and services."[123] The VON Coalition also notes that "certain IP-enabled services and devices, including non-interconnected VoIP services, may not be technically capable of providing E911, because of the difficulties in identifying the locations of users."[124] In addition, the VON Coalition argues that "to the extent E911 or next generation 911 obligations are extended, it should be considered only for those voice applications or offerings that are designed to provide the essential qualities of a telephone service which is the ability to call anyone and receive a call from anyone in the world."[125]

45. *Discussion.* When the Commission adopted VoIP 911 requirements in 2005, it recognized that the definition of interconnected VoIP service might "need to expand as new VoIP services increasingly substitute for traditional phone service."[126] Since 2005, there has been a dramatic increase in the number and popularity of VoIP services.[127] For example, Skype reported to the Securities and Exchange Commission in 2010 that it had 20 million users in the United States.[128] Skype also stated that it had over 8 million paying users worldwide for its SkypeIn and SkypeOut services and had domestic revenues of over $100 million in 2009.[129] A number of companies, such as Skype and Google Voice offer a variety of "one-way" interconnected VoIP services that enable inbound calls from the PSTN or outbound calls to the PSTN, but not both.

46. There are now well over 4.2 million subscribers to one-way interconnected VoIP services, which was the number of two-way interconnected VoIP subscribers in 2005 when the FCC adopted the original interconnected VoIP 911 rules. Moreover, since 2005, a number of hardware products have been introduced that support outbound-only interconnected VoIP service and are indistinguishable from traditional landline or cordless phones in their ability to place outbound calls.[130]

47. Outbound-only interconnected VoIP service providers have also been marketing their services to businesses, which generally require a higher grade of quality and reliability than residential-based voice services. For example, since late 2008, Skype has been marketing several versions of its

(Continued from previous page)
will arrive, wherever he may be located. The underlying communications technology is irrelevant to the subscriber who just wants the call to go through and wants first responders to arrive at his location. Of course, as the paradigm changes and devices very different from a phone become more prevalent, subscriber expectations may change.").

[123] VON Coalition Comments at 13.

[124] VON Coalition March 29, 2011 Ex Parte.

[125] *Id.*

[126] *See VoIP 911NPRM*, 20 FCC Rcd 10245, 10277 ¶ 58.

[127] A recent research poll found that 24% of American adult Internet users have placed calls online, amounting to 19% of all U.S. adults. Also, on any given day, 5% of Internet users are going online to place phone calls. In a 2007 poll using different wording, 8% of Internet users (6% of all American adults) said that they had placed a call online; and on any given day, 2% of Internet users were placing a call. *See* Pew Research Center's Internet & American Life Project, http://pewresearch.org/pubs/2006/internet-online-phone-call-skype-vonage (last visited June 7, 2011).

[128] Skype S.à.r.l., Registration Statement at 138 (filed Aug. 9, 2010), *available at* http://www.sec.gov/Archives/edgar/data/1498209/000119312510182561/ds1.htm (last visited June 6, 2011).

[129] Skype S.a. r.l., Amendment No. 1 to Form S-1 Registration Statement at 98 (filed Nov. 2, 2010). *See also* http://blogs.wsj.com/digits/2010/01/19/skypes-growth-outpaces-phone-companies/ (last visited June 6, 2011) and http://gigaom.com/2010/04/20/skype-q4-2009-number/ (last visited June 6, 2011).

[130] *See e.g.*, http://shop.skype.com/phones/ (for currently offered Skype phones with outbound-only configuration) (last visited June 6, 2011).

service to small, medium, and large businesses that use Session Initiation Protocol-based PBX systems.[131] In addition to offering low cost rates for outbound calls, the service allows customers to purchase online numbers to receive inbound calls.[132]

48. *Outbound-Only Interconnected VoIP Service.* In light of increased consumer access to and use of outbound-only interconnected VoIP services, we seek comment on whether to extend our 911 obligations to outbound-only interconnected VoIP service providers to further the achievement of long-established regulatory goals to promote the safety of life and property.[133] We invite comment regarding consumers' expectations for being able to contact emergency personnel when using outbound-only interconnected VoIP services. What is the likelihood that a consumer who needs to place an emergency call and is unfamiliar with an outbound-only interconnected VoIP phone would expect it to have the ability to transmit a 911 call? Are warnings at the point of sale regarding a consumer's inability to reach 911 using a particular outbound-only interconnected VoIP service effective? Is there a consumer expectation with respect to being able to contact emergency personnel when using an inbound-only interconnected VoIP service?

49. If we were to extend 911 obligations to outbound-only interconnected VoIP service providers, should we also revise our definition of interconnected VoIP service?[134] As an initial matter, we seek comment on two potential technical modifications to the definition of interconnected VoIP service. First, we seek comment on whether we should modify the second prong of the existing definition, which requires a broadband voice connection from the user's location. Some interconnected VoIP service providers have asserted that VoIP services that are capable of functioning over a dial-up connection as well as a broadband connection fall outside this definition. Since these services provide virtually the same user experience, regardless of the fact that they are in dial-up mode, we seek comment on whether the second prong should specify an "Internet connection," rather than a broadband connection, as the defining feature.[135]

50. Second, we seek comment on whether we should modify the fourth prong of the existing definition to define connectivity in terms of the ability to connect calls to United States E.164 telephone numbers rather than the PSTN.[136] Such a change could reflect the fact that interconnected VoIP service providers are not limited to using the circuit-switched PSTN to connect or receive telephone calls.

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[131] *See* Skype, Skype Connect, available at http://www.skype.com/intl/en/business/; s*ee also* Tim Green, Network World, *Skype Opens Up SIP Business Service to Everyone*, Dec. 2, 2009, *available at* http://www.macworld.com/article/144694/2009/12/skypebiz.html; Jonathan Blum, *Review: Skype Manager for Small-Business Call Services*, Entrepreneur.com, Apr. 9, 2011, *available at* http://www.entrepreneur.com/article/219431.

[132] *See* Skype Connect, *available at* http://www.skype.com/intl/en-us/business/skype-connect?intcmp=CS-Upsell-FA10915#t_support.

[133] VoIP 911 Order at ¶ 29.

[134] In Section IV.B., *infra*, we seek comment on developing automatic location accuracy requirements for interconnected VoIP, which would apply to outbound-only, as well as to two-way, VoIP providers if we modify the interconnected VoIP definition as proposed in this section.

[135] *See* http://skypetips.internetvisitation.org/web_pages/faq.html#Q:__Can_I_use_Skype_over_a_modem (last visited June 6, 2011).

[136] E.164 is an International Telecommunications Union recommendation that defines the international public telecommunications numbering plan. *See*, *e.g.*, S. Hollenbeck, Network Working Group, *E.164 Number Mapping for the Extensible Provisioning Protocol (EPP)*, *Standards Track*, June 2005 (specifying "an Internet standards track protocol for the Internet community" and requesting discussion), *available at* http://www.ietf.org/rfc/rfc4114.txt (last visited June 30, 2011). In prescribing E.164 telephone numbers, our intent is to exclude non-United States numbers.

Indeed, as networks evolve away from circuit-switched technology, VoIP users are increasingly likely to place and receive telephone calls in which the end-to-end transmission is entirely over IP-based networks. By referencing E.164 telephone numbers and eliminating reference to the PSTN, the definition of interconnected VoIP service might be technically more accurate and avoid potential technical obsolescence.

51. Thus, we seek comment on whether to extend 911 requirements to any service that (1) enables real-time, two-way voice communications; (2) requires an Internet connection from the user's location; (3) requires Internet protocol-compatible customer premises equipment; and (4) permits users to terminate calls to all or substantially all United States E.164 telephone numbers. Would such a new definition accurately reflect current and evolving consumer expectations and the needs of PSAPs and first responders? In the companion Notice of Proposed Rulemaking, we seek comment on whether a new definition, were we to adopt one, should be used for any regulatory purpose other than 911and on issues related to the changing the definition for 911 purposes only.[137]

52. We also seek comment on the cost and technical feasibility of extending the Commission's existing 911 requirements to outbound-only interconnected VoIP service providers. In this regard, we seek comment on the ability of an outbound-only interconnected VoIP service provider to support callback capability. Does the fact that outbound-only interconnected VoIP service providers have already implemented call-back mechanisms for non-emergency purposes mean that it would be feasible for an outbound-only interconnected VoIP service provider to support callback capability for emergency purposes as well?[138] If the Commission were to extend existing 911 requirements to outbound-only interconnected VoIP service providers, what would be an appropriate timeframe for doing so?

53. Would the costs for outbound-only interconnected VoIP service providers to come into compliance with these requirements be no greater, and potentially be lower, than the costs that two-way interconnected VoIP service providers incurred when the Commission adopted its original VoIP 911 requirements in 2005? Has the development since 2005 of mechanisms to support VoIP 911 and the provision of registered location information led to efficiencies that could reduce the cost for outbound-only interconnected VoIP service providers to come into compliance? Conversely, do outbound-only interconnected VoIP services face any additional costs due to technical challenges in transmitting 911 calls, providing call-back information, or using customer-generated location information when compared to bidirectional services?[139]

54. To establish the baseline from which to calculate benefits and costs of extending 911 service requirements to outbound-only interconnected VoIP service providers, we seek comment on the number of firms and subscribers that would be affected; the number of firms that currently provide 911 service for outbound-only interconnected VoIP calls; the number of households and businesses that use outbound-only interconnected VoIP services, including the number that use outbound-only interconnected VoIP services to the exclusion of two-way voice calling services; the projected growth in use of outbound-only interconnected VoIP services, including any growth in the use of such services to the exclusion of two-way voice calling services; and the number of outbound-only interconnected VoIP 911 calls placed annually to PSAPs.

55. We seek comment on the appropriate manner to calculate the benefits that would result from extending 911 service requirements to outbound-only interconnected VoIP services. These benefits

[137] *See* infra Part V.

[138] For example, Skype has a feature that permits its customers to associate their wireless phone number with their SkypeOut account for callback and other purposes. *See* Skype, Caller Identification, *available at* http://www.skype.com/intl/en-us/features/allfeatures/caller-identification (last visited June 16, 2011).

[139] For traditional E911 services, there may be a need to allocate a pseudo-ANI for such calls, since the caller may not have a ten-digit phone number. Even this requirement would disappear in the context of next-generation 911.

may include decreased response times for emergencies; reductions in property damage, the severity of injuries and loss of life; and the increase in the probability of apprehending criminal suspects. We recognize that these benefits will be tempered when consumers have access to other telecommunications services that already provide 911 service and may increase when outbound-only interconnected VoIP service use grows in the future. Potential benefits may also include less tangible and quantifiable factors, such as an increased sense of security. We seek comment on how these intangibles should be accounted for in any analysis.

56. We seek comment on the costs and technical issues associated with providing 911 services. These costs may include hardware upgrades, software updates, customer service costs, the cost of sending additional 911 calls, decreased innovation and investment in services, market exit, liability concerns, as well as other potential costs not enumerated here. We seek comment on any changes to the proposed rules that could mitigate these cost factors while maintaining the goals of extending access to emergency services to users of outbound-only interconnected VoIP services. We seek comment on how any two-way or outbound-only interconnected VoIP service providers that currently offer 911 service provision these services and ask for a precise quantification of the initial and ongoing costs associated with establishing 911 calling, as well as the number of subscribers that have utilized this feature.

57. We seek further comment on any potential costs that public safety personnel may incur if the Commission were to impose 911 obligations upon outbound-only interconnected VoIP service providers. For instance, assuming that that most PSAPs are already capable of receiving 911 calls from two-way VoIP providers, would they incur additional costs were they also to receive 911 calls from outbound-only interconnected VoIP providers? For example, could there be potential costs if emergency response personnel are sent to the wrong location or if PSAPs are forced to deal with an increase in the number of fraudulent 911 calls?

58. Finally, with the introduction of advanced consumer equipment and applications for use on desktop computers and mobile devices, we expect significant innovation to continue in the provision of voice services over IP networks. Thus, we also seek comment on whether there are voice services that are presently being offered that would fall outside the scope of the proposed new definition for outbound-only interconnected VoIP service for which consumers may have a reasonable expectation of being able to contact 911.

B. Automatic Location Requirements for Interconnected VoIP Services

59. *Background.* The Commission's rules currently do not require providers of portable interconnected VoIP service to automatically provide location information to PSAPs without the customer's active cooperation. In the *Location Accuracy NPRM*, the Commission tentatively concluded that "to the extent that an interconnected VoIP service may be used in more than one location, providers must employ an automatic location technology that meets the same accuracy standards that apply to those CMRS services."[140] The *Location Accuracy NOI* sought to refresh the record on this tentative conclusion.

60. Specifically, in the *Location Accuracy NOI*, the Commission sought comment on a range of questions related to automatic provision of location information for interconnected VoIP services.[141] The Commission sought information on what advanced technologies, if any, permit portable interconnected VoIP service providers to provide ALI, whether portable interconnected VoIP service providers had implemented any practices or methods to provide ALI, and if not, what the Commission could do to facilitate the development of techniques for automatically identifying the geographic location

[140] *See Location Accuracy NPRM*, 22 FCC Rcd at 10615-16 ¶ 18 (tentatively concluding that "to the extent that an interconnected VoIP service may be used in more than one location, providers must employ an automatic location technology that meets the same accuracy standards that apply to those CMRS services").

[141] *Location Accuracy NOI*, 25 FCC Rcd at 18969 ¶¶ 29-30.

of users of this service.[142] Further, the Commission sought comment on whether interconnected VoIP service providers should incorporate the ability to automatically detect a user's Internet connectivity, identify a user's location, and prompt a user to confirm his/her location, prior to enabling calling features. The Commission also sought comment on whether CMRS operators that provide interconnected VoIP services can deliver location information to a PSAP in the same manner as for CMRS, specifically, delivering longitude and latitude coordinates to the PSAP in lieu of a street address.

61. *Comments.* Several commenters argue that the dramatic growth of interconnected VoIP services has created a market segment too large to remain exempt from E911 location accuracy and that interconnected VoIP service providers as well as broadband providers should work together to address technical solutions for providing automatic location information for VoIP subscribers (including wireless VoIP callers), with the goal of recommending a standard.[143] APCO maintains that "[c]allers using IP devices expect and should receive the same E9-1-1 service as callers using other types of devices" and that "automatic location requirements should therefore be imposed on all devices that the public uses in the same . . . manner as interconnected telephones."[144] NENA argues that "[i]t is entirely reasonable for consumers to expect that services which allow outbound calling to the PSTN will properly route calls to 9-1-1, [and] that this is indeed the expectation held by the overwhelming majority of VoIP users."[145] St. Louis County believes these services must provide location and routing information similar to that provided by wireline voice providers.[146]

62. NENA has two primary concerns about the inability of interconnected VoIP service providers to provide ALI for 911 calls. First, although NENA lacks quantitative figures, it has received a "wealth of anecdotal evidence that PSAPs frequently receive calls routed incorrectly due to a failure of nomadic VoIP systems to update user locations."[147] Second, according to NENA, there is evidence that callers sometimes intentionally falsify location information, which is "impossible to detect and can negatively impact . . . safety and security . . . by diverting resources away from legitimate emergency calls or directing attention away from [a crime] scene [and] when fraudulent calls are detected, it is technically . . . difficult to locate the perpetrator.[148] St. Louis County states that "while improvements to location accuracy have been [made], there remain inaccuracies and other limiting factors requiring additional time and effort at the point of call taking to adequately determine the location of the reporting party," a problem compounded by nomadic callers who "seldom [are] aware of their geographic location and can offer only observed landmarks thus delaying initial response."[149]

63. A number of commenters argue that the existing Registered Location requirement, whereby VoIP subscribers register their physical location with their provider, has worked well and should continue to serve as the basis for routing 911 calls.[150] Vonage states that it has worked with public safety

[142] *Id*. at ¶ 29.

[143] *See* TCS Comments at 4.

[144] APCO Comments at 6.

[145] NENA Comments at 13.

[146] St. Louis County Comments at 2.

[147] NENA Comments at 14. NENA cited one example of a local, United States PSAP that received a VoIP call from a U.S. military installation in South Korea that was routed on the basis of the caller's pre-deployment address, thus illustrating the "impact on response time and effectiveness when a user's registered location is in a different PSAP jurisdiction." *Id*.

[148] *Id.*

[149] St. Louis County Comments at 2.

[150] *See, e.g.*, Comments of Vonage at 6-7; Sprint Nextel Comments at 10 ("User input [as opposed to automatic location identification] will invariably provide more useful information to first responders that are looking for (continued….)

to adapt Vonage's 911 service to the equipment or infrastructure on which PSAPs rely, resulting in the delivery of more information to the PSAP than is provided by CMRS carriers. Vonage also asserts that "public safety has not requested ALI data from Vonage."[151]

64. While commenters differ on whether ALI requirements for interconnected VoIP service are needed, commenters generally agree that at this time there is no technological or cost-effective means to provide ALI for interconnected VoIP service providers.[152] Commenters also state that there are no industry standards to support ALI for interconnected VoIP calls[153] and that "the static ALI database in use today is ill-suited to provide location information for any mobile or nomadic communications service."[154] According to AT&T, the services encompassed within the Commission's definition of interconnected VoIP service "operate over a myriad of portable devices and technologies that permit portability, including commercial mobile smartphones running VoIP applications, Wi-Fi enabled VoIP handsets, portable terminal adapters, USB dongles, PC-based softphones [and] VoIP users might access the Internet through traditional wired broadband connections, public or private wireless access points, or commercial mobile broadband networks [such that] each permutation of device and network access may have unique technical and logistical challenges, which makes it infeasible today to rely on a single standard or technology for determining and relaying accurate ALI to PSAPs."[155] Likewise, Qwest states that "[w]ireline networks, *e.g.*, the architecture defining VoIP 911, have no ability to read each other's end-user locations [and] no existing technology, let alone applicable industry-agreed standards, support the automatic delivery of user address information from a VoIP piece of equipment to a database capable of manipulating it and getting it delivered to a PSAP."[156] Vonage argues that "it is particularly critical that the Commission recognize the distinction between fixed, nomadic, and mobile interconnected VoIP service [because] "[f]or fixed and nomadic services, moving to CMRS location requirements would degrade, rather than improve, the accuracy and reliability of emergency caller location information [and] [f]or VoIP mobile products, moving to CMRS location requirements will introduce duplication, inefficiency and confusion."[157]

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apartment numbers and office suites."); Intrado Comments at 5-6 ("[T]o ensure that the most current address of the user is available, the Commission should encourage providers to implement procedures which will detect that a user is using the service from a new address and prompt them to update with their current address"). *But see* Dash Comments at 7 ("[M]anual entry [Registered Location] by VoIP subscribers is not sufficient. Subscribers often forget to update their location or enter inaccurate or invalid information. Often, these issues are not identified until the subscriber places a 9-1-1 call and accurate information is required, but not available").

[151] Vonage Comments at 8.

[152] *See, e.g.*, Verizon Comments at 15; Vonage Comments at 9 ("[T]here is not yet any technically feasible way to automatically and reliably derive the location of an [Interconnected VoIP Service Provider] caller.); ATIS Comments at 9.

[153] Qwest Comments at 3-4 ("[N]o on-point industry standards exist to support VoIP's automatic delivery of location information (or updates), standards that would be necessary predicates to any successful deployment of such functionality.").

[154] Dash Comments at 7.

[155] AT&T Comments at 18-19; *see also* NENA Comments at 2 ("VoIP services present unique issues across the pantheon of contexts (static, nomadic/portable, mobile) in which they can be used"; "[i]n today's mobile environment, consumers are capable of downloading VoIP apps that offer no 9-1-1 capabilities"; and "some VoIP providers reside outside the United States or its territories, further complicating the imposition of regulatory requirements.").

[156] Qwest Comments at 5.

[157] Vonage Comments at 9-10.

65. Motorola states that "[i]mplementation of this functionality . . . would require substantial standards development, investment, and infrastructure upgrades by both VoIP service providers and PSAPs."[158] Vonage argues that "existing and proposed automatic location identification technology is significantly less reliable than network end-point location information . . . especially . . . in dense urban environments" and therefore "the Commission should not prematurely impose technological requirements and risk likely decreases in public safety and IVS autolocation."[159]

66. A number of commenters recommend that the Commission encourage industry and public safety entities to work together to develop automatic location identification solutions for VoIP.[160] NENA states that "[i]n the future, some form of Automatic Location Determination should be mandatory for all portable or nomadic VoIP devices and applications" and recommends that "the Commission consult closely with industry to begin fashioning workable 9-1-1 and E9-1-1 rules for PSTN-terminating VoIP providers."[161]

67. According to AT&T, one possible technological solution that warrants further consideration would be "to include integrated ALI capabilities in the design of terminal adapters or other user devices employed in the provision of portable VoIP services."[162] AT&T states that "these devices could include A-GPS, passive CMRS wireless receivers, or both, for use in trilateration and identification of the user's location."[163] Nevertheless, AT&T cautions that GPS-based automatic location information poses technical limitations, as many interconnected VoIP subscribers use their service indoors or in urban environments, making GPS less effective if satellite transmissions are reflected off buildings and other obstructions or satellite connectivity is lost when VoIP users are deeper indoors.[164] Dash argues that a key element in an ALI solution for interconnected VoIP service is a Location Information Server (LIS)[165] hosted by the service and/or broadband provider and therefore capable of determining, storing, updating, validating and providing location information to first responders.[166] Motorola supports the provision of a validated Master Street Address Guide (MSAG)[167] "where an interconnected VoIP service connects to a

[158] Motorola Comments at 11.

[159] Vonage Comments at 5.

[160] NENA Comments at 15; Dash Comments at 7; TIA Comments at 9; ATIS Comments at 9, 11.

[161] NENA Comments at 13.

[162] AT&T Comments at 19.

[163] AT&T Comments at 19.

[164] *See, e.g.*, AT&T Comments at 20.

[165] NENA defines LIS as "a functional entity that provides locations of endpoints. A LIS can provide Location-by-Reference, or Location-by-Value, and, if the latter, in geo or civic forms. A LIS can be queried by an endpoint for its own location, or by another entity for the location of an endpoint. In either case, the LIS receives a unique identifier that represents the endpoint, for example an IP address, circuit-ID or MAC address, and returns the location (value or reference) associated with that identifier. The LIS is also the entity that provides the dereferencing service, exchanging a location reference for a location value." *See* NENA Master Glossary of 9-1-1 Terminology at p. 66, *available at* http://www.nena.org/sites/default/files/NENA%2000-001_V15.pdf (last visited June 7, 2011).

[166] Dash Comments at 7.

[167] The MSAG is a database of street addresses and corresponding Emergency Service Numbers (ESNs). ESNs are typically three to five digit numbers that represent a unique combination of emergency service agencies (law enforcement, fire, and Emergency Medical Service) designated to serve a specific range of addresses within a particular geographic area, called an Emergency Service Zone.

PSAP through an IP/wireline technology, but interconnected VoIP services that connect over wireless networks should not be held to the same location accuracy standard as CMRS networks at this time."[168]

68. Some commenters believe that the costs associated with the deployment of VoIP automatic location capability would be very high. In addition, commenters point out that there is no mechanism for cost recovery. Qwest states that "it is unclear whether cost recovery would come from the federal government, or whether VoIP service providers would need to look to the states (and their funding mechanisms, such as 911 surcharges and state funds) for recovery of their significant costs . . . [a]nd it is even less clear where non-regulated entities would go for their cost recovery."[169] AT&T argues that any solution will require "substantial up-front investment well before any appreciable results would be seen" and "necessitate significant reengineering" as well as replacement of existing devices with "significant consumer outreach efforts and additional expense for subscribers and service providers."[170]

69. *Discussion.* We agree with commenters that, given the increasing popularity and adoption of interconnected VoIP services, the provision of accurate location information to PSAPs is becoming essential information to facilitate prompt emergency response and protect life, health and property. Although some commenters point out that the current Registered Location requirement can provide the necessary detailed location of callers, the current regime remains dependent upon subscribers manually and accurately entering their location information and updating it in a timely manner. NENA indicates that a number of VoIP 911 calls have provided erroneous or fraudulent location information to PSAPs, leading to the waste of scarce emergency resources and squandering time that could have been spent responding to other emergencies.[171] We note that proposals related to NG911 would allow the transmission of multiple location objects for a call and thus permit the PSAP to receive the benefit of both the additional information contained in a civic address provided by a user (*e.g.*, an apartment number or street address) and the automatically determined location information that is less subject to data entry errors, lack of timely updates, and possible misrepresentations.[172]

70. In light of the increasing prevalence of VoIP calling, the evolution of consumer expectations, and the limitations of the Registered Location method, we believe it is imperative to continue working towards an automatic location solution for interconnected VoIP calls to 911. At the same time, given the lack of presently available solutions, we are not proposing to adopt specific ALI requirements for interconnected VoIP services at this time but instead seek comment on a potential framework for developing solutions that would enable us to consider implementing ALI for interconnected VoIP service at a later date.

71. We agree with commenters that the provision of ALI in the interconnected VoIP context is particularly challenging because of the increasing prevalence of "over-the-top" VoIP service, where the over-the-top VoIP service provider[173] that offers interconnected VoIP service to consumers is a different

[168] Motorola Comments at 11.

[169] Qwest Comments at 9-10.

[170] AT&T Comments at 20-21.

[171] *See* NENA Comments at 14.

[172] *See* J. Polk, et al., Network Working Group, Internet Draft, *Location Conveyance for the Session Initiation Protocol*, Section 4.2.1 (May 18, 2011), *available at* http://tools.ietf.org/html/draft-ietf-sipcore-location-conveyance-08 (last visited June 17, 2011). *See also* RFC 5491 Section 3.4. *See* J. Winterbottom, et al., Network Working Group, *GEOPRIV Presence Information Data Format Location Object (PIDF-LO) Usage Clarification, Considerations, and Recommendations*, RFC 5491 (Mar. 2009), *available at* http://tools.ietf.org/html/rfc5491 (last visited June 17, 2011).

[173] The Commission's rules define interconnected VoIP as "a service that: (1) enables real-time, two-way voice communications; (2) requires a broadband connection from the user's location; (3) requires Internet protocol-
(continued….)

entity from the broadband provider that provides the underlying Internet connectivity. In this scenario, there will frequently be circumstances where the over-the-top VoIP service provider has a direct connection to the consumer but does not have information about the user's location, while the broadband provider may be aware of the consumer's location based on the access point he or she is using but is not aware of when the consumer is placing an emergency call. In these situations, the most efficient and accurate ALI solution may require that both the broadband provider and the over-the-top VoIP service provider play a part.

72. Given the increasing use of interconnected VoIP services, we seek comment whether the Commission should adopt proposed general location accuracy governing principles that could be applied to interconnected VoIP service providers and over-the-top VoIP service providers but that would allow both types of providers the flexibility to develop technologically efficient and cost-effective solutions. The IETF GEOPRIV working group has defined a suite of protocols that allow broadband providers to provide location information to subscribers' devices through standard protocol interfaces. One governing principle might be that when an interconnected VoIP user accesses the Internet to place an emergency call, the underlying broadband provider must be capable of providing location information regarding the access point being used by the device or application, using industry-standard protocols[174] on commercially reasonable and non-discriminatory terms. For example, a broadband provider might be able to satisfy its obligation by providing the access point location information to: (1) the end user, (2) the over-the-top VoIP service provider, and/or (3) the PSAP. Another general principle might be that when an interconnected VoIP user places an emergency call, the over-the-top VoIP service provider must either provide ALI directly (*e.g*., using geo-location information generated by the device or application) or must support the provision of access point location information by the broadband provider as described above.

73. We seek comment on whether we should adopt these or any other governing principles. We ask for comment on the appropriate timeframes for their implementation should the Commission decide to adopt them, considering the technological, cost, and operational aspects of the services and devices that the Commission proposes to subject to the new requirements. We also seek comment on the potential costs and benefits of this proposal. We seek comment on the most cost effective solution for providing reasonably accurate location information for interconnected VoIP services. These comments should address both currently available solutions and solutions under development. We seek detailed comment on the relative merits of any potential solutions, including the degree of location accuracy, the cost of implementing the location solution, the degree of coordination required to implement the solution, to which types of VoIP service providers the location systems would apply (e.g. interconnected VoIP, outbound-only interconnected VoIP, "over-the-top" VoIP, etc.) and any other limitations that may be relevant.

74. We seek comment on the potential benefits of extending location accuracy requirements to interconnected VoIP services. Are they similar to those described above for extending 911 requirements to outbound-only interconnected VoIP service, including decreased response time to emergencies; reductions in property damage, the severity of injuries, and loss of life; and an increase in the probability of apprehending criminal suspects? We recognize that the extent of any benefits will be in part a function of the degree to which current location methodologies provide incorrect or imprecise

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compatible customer premises equipment (CPE); and (4) permits users generally to receive calls that originate on the public switched telephone network and to terminate calls to the public switched telephone network." 47 C.F.R. § 9.3. Over-the-top VoIP services require the end user to obtain broadband transmission from a third-party provider, and providers of over-the-top VoIP can vary in terms of the extent to which they rely on their own facilities. *See SBC Commc'ns Inc. and AT&T Corp. Applications for Approval of Transfer of Control*, WC Docket No. 05-65, Memorandum Opinion and Order, 20 FCC Rcd 8290, 18337-38, para. 86 (2005).

[174] These protocols have been designed for use by any endpoint (stationary, nomadic, or mobile), in any IP network, including both wired networks (*e.g.*, cable, DSL, Ethernet, and fiber-optic) and wireless networks (*e.g.*, WiFi, WiMAX, 3G, and 4G).

location information and thereby delay emergency personnel from arriving at the scene. To aid in the estimation of these benefits, we seek comment on the extent to which the receipt of imprecise or incorrect location information from interconnected VoIP service providers has resulted in problems for first responders. We seek precise quantification of the extent to which emergency personnel are deployed to incorrect locations and the difference in response times for calls initiated from interconnected VoIP service providers versus wireline and wireless service providers.

75. We invite comment on the costs associated with various VoIP location accuracy technologies and how these costs and solutions vary by type of VoIP service. These costs may include hardware upgrades, software updates, liability concerns, and any transaction costs. With respect to the last component, we understand that an interconnected VoIP service provider has a relationship with the user but does not have information about the user's location, while the network provider may be aware of the device or application's location based on the access point being used but is not aware of when an emergency call is being placed. We seek comment on how a solution to this problem can be found and how transaction costs between interconnected VoIP service providers and network providers can be reduced in order to provide the most cost effective and accurate location information. Finally, to the extent that there are any other costs and benefits that we should consider, we seek comment on the nature and quantification of their magnitude.

76. *Privacy Concerns.* We note that section 222 of the Communications Act requires carriers (including CMRS providers) to safeguard the privacy of customer proprietary network information (CPNI), including location information.[175] Section 222 generally permits carriers to disclose CPNI "with the approval of the customer."[176] The statute provides heightened protection for location information: a customer shall not be considered to have given approval with regard to "call location information concerning the user of a commercial mobile service . . . or the user of an IP-enabled voice [interconnected VoIP] service" without "express prior authorization,"[177] except that a carrier or interconnected VoIP service provider may provide such information "to providers of emergency services, and providers of emergency support services, solely for purposes of delivering or assisting in the delivery of emergency services."[178] How would section 222 apply to broadband providers if we were to amend our rules to require them to assist interconnected VoIP service providers in providing ALI? Could the Commission use authority ancillary to sections 222 and 615a-1 to require broadband providers to maintain the confidentiality of location information except as consistent with section 222?[179] Could we extend the exception to the prior authorization rule for providers of emergency services to broadband providers? Are there other sources of authority that would enable the Commission to address privacy concerns in this area?

77. *Liability Protection.* In the larger context of our effort to transition to NG911, we have asked whether some type of liability protection might be necessary or appropriate for those involved in the provision of emergency services.[180] Today we revisit this question in the context of interconnected VoIP service providers and our proposal to extend ALI requirements to them and to broadband providers. Would a broadband provider be considered an "other emergency communications provider" subject to the

[175] 47 U.S.C. § 222(a).

[176] *Id.* § 222(c)(1).

[177] *Id.* § 222(f).

[178] *Id.* § 2229g).

[179] *See infra* ¶ 98 (seeking comment on the Commission's use of ancillary authority).

[180] *See NG911 NOI, supra*, at ¶¶ 71-73. Among the questions we asked was, "Should liability protection extend beyond the PSAP to all entities appropriately involved in the emergency response?" *Id.* at ¶ 73.

liability protections of section 615a(a)?[181] We also seek comment on the extent to which the Commission can address the liability of device manufacturers that include software capable of supporting ALI for interconnected VoIP service. Are there other sources of authority pursuant to which the Commission could address liability issues for service and equipment providers?

C. Location-Capable Broadband Voice Technologies

78. In the *Location Accuracy NOI*, we observed that "many new forms of IP-based voice communications are being offered to consumers via a variety of wireless services, devices, and applications for use on a wide range of new devices."[182] These IP-based communications are being carried over CMRS circuit-switched and data networks, as well as on Wi-Fi and other types of wireless connectivity and these communications may not be subject to our existing interconnected VoIP service or CMRS rules and therefore would not be included within the scope of our proposed revision to the interconnected VoIP service definition for 911 purposes. The record indicates that most smartphones, and many other new broadband-enabled mobile devices, now offer one or more location capabilities, such as A-GPS, network-based location determination, and Wi-Fi based positioning.[183] Often, these capabilities work in combination to provide fairly accurate location determination.[184] St. Louis County reports that "with the advent of the 'smart phone', it has been observed that the location reported by the device is enormously more accurate than that currently provided by Phase II wireless technologies" and such phones should use their "inherent geo-based accuracy for reporting the location of the calling party."[185] Some commenters argue that an industry advisory group would be able to provide an orderly and standards driven approach to leveraging commercial location-based service for use in providing location information for emergency calls.[186]

79. The introduction of more sophisticated mobile devices has allowed service providers to offer their customers a wide range of commercial location–based services. Such services allow users to navigate by car or on foot, find nearby points of interest such as restaurants or gas stations, tag photos, share their location information with friends, track jogging mileage, obtain coupons from nearby merchants, receive reminders of errands, or play location-based games. The location-based capabilities inherent in the design of these devices and applications could perhaps be leveraged when consumers contact 911 using non-CMRS-based voice services. These location-based services could potentially permit service providers and applications developers to provide PSAPs with more accurate 911 location information. Exploiting commercially available location determination technologies already in devices may offer a more cost efficient method by which to provide critical life saving information to PSAPs. We seek comment on whether we should encourage mobile service providers to enable the use of commercial location-based services for emergency purposes. We also seek comment on developing operational

[181] *Id.* § 615a(a). An "other emergency communications provider" is defined as "an entity other than a local exchange carrier, wireless carrier, or an IP-enabled voice service provider that is required by the Federal Communications Commission consistent with the Commission's authority under the Communications Act of 1934 to provide other emergency communications services." *Id.* § 615b(9)(A). "Other emergency communications services," in turn, is defined as "the provision of emergency information to a public safety answering point via wire or radio communications, and may include 9-1-1 and enhanced 9-1-1 service." *Id.* § 615b(8).

[182] *Location Accuracy NOI*, 25 FCC Rcd at 18971 ¶ 34.

[183] *See* AT&T Comments at 18-19; Andrew Corporation Comments at 8; Verizon and Verizon Wireless Comments at 1-2.

[184] *See* AT&T Comments at 19; Andrew Corporation Comments at 6; CommLabs Comments at 4-5; Polaris Reply Comments at 3.

[185] St. Louis County Comments at 2.

[186] AT&T Comments at 4-5; CTIA Reply Comments at 4-7; T-Mobile Reply Comments at 17; Motorola Mobility Reply Comments at 4-7.

benchmarks to assist consumers in evaluating the ability of carriers to provide precise location information for emergency purposes based on the location-based capabilities of devices. Should the Commission develop such benchmarks, and if so, what should they be? In addition, the CSRIC should be directed to explore and make recommendations on methodologies for leveraging commercial location-based services for 911 location determination. CSRIC should also suggest whether it is feasible or appropriate for the Commission to adopt operational benchmarks that will allow consumers to evaluate carriers' ability to provide accurate location information. We seek comment on whether the adoption of such benchmarks would be effective in enabling consumers to be better informed about the ability of wireless devices and technologies to provide a PSAP with accurate location information.

80. We also seek comment on the costs and benefits of the approaches described above. As in our discussion above regarding location accuracy in the interconnected VoIP service context, we seek to encourage the development of cost-effective solutions for location-capable broadband voice technologies to support the provision of accurate location information to PSAPs and first responders. We seek comment on both currently available solutions and solutions under development, including the degree of location accuracy provided, the cost of implementing the solution, the degree of coordination required to implement the solution, the types of service, application, and network providers that would be affected, and any other limitations that may be relevant. We also seek comment on the potential benefits for the public and for public safety in terms of improved access to 911 services, reducing response time to emergencies, and enhancing the protection of life, safety, and property.

D. Improving Indoor Location Accuracy

1. Indoor Location Accuracy Testing

81. *Background.* In the *Location Accuracy FNPRM*, the Commission sought comment on whether it should extend location accuracy testing to indoor environments. Noting the growing number of wireless 911 calls, the Commission asked whether the Commission should update OET Bulletin 71 to include measurements in indoor environments.[187]

82. *Comments*. Some commenters support the Commission's imposing an indoor testing requirement. Polaris "strongly advocates that the Commission establish testing and reporting requirements for in-building location accuracy and yield. With better information regarding the scope and impact of the challenges associated with indoor E911 location information, the Commission will be able to properly assess the best way to improve indoor performance (and the appropriate metrics that need to be put in place)."[188] Polaris argues that "the Commission should hold workshops and other events to get input from industry members and advisory groups regarding indoor testing. Based on this input, the Commission should also consider requiring indoor testing and establishing a testing schedule."[189]

83. NENA argues that the growing number of "wireless-only households…may prompt a need for new indoor/outdoor testing to more accurately reflect consumer trends in the use of mobile devices." However, NENA states that it "lacks sufficient quantitative information to recommend a particular fraction of testing that should be conducted indoors."[190] Finally, TruePosition argues that the testing structure "should encompass those environments from which most calls are made, including indoors. [Testing] must keep pace with consumer expectations and emergency response requirements."[191]

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[187] *Location Accuracy FNPRM and NOI*, 25 FCC Rcd at 18964 ¶ 20.

[188] Polaris Comments at 7.

[189] *Id.* at 7.

[190] NENA Comments at 8.

[191] TruePosition Comments at 23. *See also* Letter from John C. Logan, Attorney for TruePosition, to Marlene Dortch, Secretary, Federal Communications Commission (Jul. 5, 2011).

84. Carriers generally oppose expanding testing to indoor environments. T-Mobile argues that unlike outdoor data collection, "which can be performed by drive testing, there is no feasible way to perform indoor testing on any large scale."[192] However, if indoor testing is required, "T-Mobile agrees with the ESIF recommendation that testing representative indoor environments would be far preferable to repetitive application of indoor testing at the local level."[193] Sprint Nextel also opposes an indoor testing standard, stating that "the proportion of calls placed to 911 from indoors varies from PSAP to PSAP, from town to town, from county to county and from state to state" and that because of these variations, "adopting a specified level of indoor testing is not reasonable without further data."[194] Sprint Nextel further argues that "technology for performing indoor testing is still in the process of being developed," and therefore, "[i]t would be premature to impose specific indoor testing requirements on the carriers at this time."[195]

85. AT&T also argues against an indoor testing requirement because, "[p]ractically speaking, AT&T already finds it difficult to conduct outdoor testing on private property," and it anticipates that "gaining indoor building access for testing purposes will be even more difficult."[196] AT&T contends that "obtaining access to the number of indoor sites required to meet a 30% standard may be impossible."[197] Finally, Qualcomm argues that "[t]he FCC has no basis to use OET Bulletin No. 71 as the starting point for indoor compliance testing, and definitely should not make its 'guidelines' mandatory or define a level of indoor versus outdoor testing."[198] Qualcomm states that "the level of 911 wireless calls made indoors versus outdoors is not only presently unquantified, but it is effectively irrelevant to the Commission's ultimate goal of improving the location accuracy of calls made from inside of buildings."[199]

86. *Discussion.* Publicly available reports, such as a March 2011 study from J. D. Power and Associates,[200] indicate that indoor wireless calls have increased dramatically in the past few years, to an average of 56 percent of all calls, up from 40 percent in 2003.[201] Indoor locations pose particular challenges for first responders, as the location of an emergency may not be as obvious as emergencies that occur outdoors. For example, since indoor incidents are often not visible to the first responder without entering the building, a location accuracy of 100/300 meters or cell-tower only would only identify the city block in which a building is located, which in urban environments could potentially contain thousands of apartments. Thus, we consider indoor location accuracy to be a significant public safety concern that requires development of indoor technical solutions and testing methodologies to verify the effectiveness of such solutions.

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[192] T-Mobile Comments at 22.

[193] *Id.* at 23.

[194] Sprint Nextel Comments at 7.

[195] *Id.* at 8.

[196] AT&T Comments at 9.

[197] *Id.* at 10.

[198] Qualcomm Comments at 13.

[199] *Id.* at 13.

[200] J.D. Power and Associates, *Overall Wireless Call Quality Momentum Halts Due to Shifts in Wireless Call and Data Usage Pattern* (Mar. 3, 2011), *available at* http://businesscenter.jdpower.com/JDPAContent/CorpComm/News/content/Releases/pdf/2011023-wcq2.pdf (last visited July 8, 2011).

[201] The NRIC VII FG1A report indicates that indoor calls should be weighted at 5% of samples.

87. While we recognize the importance of indoor testing, we believe that further work is needed in this area and seek comment on whether the Commission should require indoor location accuracy testing and, if so, using what standards. Can outdoor testing methodologies be used in indoor environments, or should the standards for outdoor and indoor location accuracy testing be different? Are traditional sampling and drive testing methods used for outdoor testing appropriate for indoor testing, or do we need new testing methodologies tailored to indoor environments? What indoor location accuracy testing methodologies are available today, and what are the costs and benefits associated with each? We also seek comment on the percentage of emergency calls that are placed indoors today and a quantification of how much an indoor location accuracy testing standard could improve the ability of emergency responders to locate someone in an emergency.

88. We also refer the indoor testing issue to the CSRIC for further development of technical recommendations. We direct that the CSRIC provide initial findings and recommendations to the Commission, taking into account the cost effectiveness of any recommendations, within nine months of the referral of this issue to the CSRIC.

2. Wi-Fi Positioning and Network Access Devices

89. *Wi-Fi Positioning.* In the *Location Accuracy NOI*, the Commission sought comment on the potential use of Wi-Fi connections to support location accuracy determination in indoor environments, including both residential environments and public hotspots, such as coffee shops, airports, or bookstores.[202] In the last several years, many more homes, offices, shops, and public spaces have installed Wi-Fi access points, and a growing number of mobile devices (*e.g.*, smartphones, laptops, and tablet PCs) use Wi-Fi positioning capability as one means of determining the device user's location.[203] To locate a mobile device using Wi-Fi positioning, a technology vendor must first create a database of Wi-Fi access point information (a Wi-Fi Database). The caller's device must then measure information from visible Wi-Fi access points and send that information to a Wi-Fi Location Server that has access to the Wi-Fi Database. The device's location is then determined by the Wi-Fi Location Server. Since the radii for Wi-Fi access points are typically small, Wi-Fi positioning can produce reasonably accurate location information.

90. While some consumer location-based services rely on Wi-Fi positioning, Wi-Fi positioning is not currently used for emergency calls.[204] According to the CSRIC 4C Report, Wi-Fi positioning is not being used to deliver emergency calls because: (1) current deployments for Wi-Fi positioning are based on proprietary implementations; (2) support for transporting Wi-Fi measurements to the Wi-Fi Location Server are not available in the E911 control plane interface standards; (3) only a small fraction of mobile phones in the marketplace have Wi-Fi capability, although the penetration rate is growing rapidly with the increasing adoption of smartphones; and (4) use of Wi-Fi positioning reduces a portable device's battery life.[205] Despite the fact that Wi-Fi positioning is not currently being used for emergency calls, the CSRIC Report states that the use of Wi-Fi positioning for emergency purposes warrants more detailed study.[206]

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[202] *See Location Accuracy NOI*, 25 FCC Rcd at 18972-73 ¶38.

[203] F. Alizadeh, "WiFi Positioning Made LBS a Reality," Skyhook Wireless, *2nd Opportunistic RF Localization for Next Generation Wireless Devices*, June 13-14, 2010, Worcester Polytechnic Institute, *available at* http://www.cwins.wpi.edu/workshop10/pres/tech_4.pdf .

[204] *See* CSRIC 4C Report.

[205] *Id.*

[206] *Id.*

91. T-Mobile has concerns about using Wi-Fi positioning for emergency calls and states that "WiFi Proximity only works in urban and dense suburban areas, and only with phones that have Wi-Fi receive capability. WiFi Proximity methods also share common weaknesses with A-GPS in many indoor environments (where access points cannot readily be located and documented) and in heavily forested rural areas (where access point densities are low)."[207] T-Mobile also notes that "current E911 control plane interface standards do not support the use of WiFi Proximity location estimates for E911 purposes, and developing and maintaining the required database to support this method is operationally intensive and costly."[208] T-Mobile concludes by noting that "the WiFi Proximity method has considerable shortcomings: limited areas of applicability, potentially low reliability, only a subset of handsets that can be located, no standards support for E911, limited accuracy, and high cost. For these reasons, though the approach has found some success as a medium accuracy location method for some commercial-location-based smartphone applications, at present no vendors have even proposed using this method for E911."[209]

92. *Network Access Devices.* Many fixed broadband Internet access devices, particularly those provided to the consumer by the broadband service provider, are permanently located at a civic (street) address, which is known to the network provider.[210] Indeed, in some access network architectures, the device is designed to cease functioning when it has been moved to a different network attachment point. Thus, when a caller uses a wireless phone that is communicating with a Wi-Fi access point or femtocell, the wireless carrier may be able to use the civic address to better locate the caller. For example, in a high- rise building, access to the civic address of the network access device could alleviate the need for vertical location information, since the civic address would include information that is capable of locating the source of the call, such as a floor or apartment number.

93. *Discussion.* We would not expect Wi-Fi positioning to serve as a replacement for other location technologies such as A-GPS or triangulation-based techniques, but could it complement these technologies, particularly in indoor or urban canyon settings where alternative location technologies such as A-GPS may not work reliably? Given the potential public safety benefits of using Wi-Fi positioning to locate emergency callers, we seek comment on whether, and if so, how, the Commission could encourage the use of location information that has been derived using Wi-Fi positioning for 911 purposes. How might location information derived from Wi-Fi positioning be conveyed to the PSAP, VoIP service provider, or broadband Internet access provider in both E911 and NG911 settings? Can network devices now or will they in the future be capable of providing Internet connectivity (*e.g.*, home gateways, hot spots, and set-top boxes)? If so, will they be able to self-locate using Wi-Fi positioning? What are the potential costs of including this capability in devices and how much time would be needed to implement it? The Commission seeks comment on the merits of these proposals.

94. We also seek comment on whether fixed broadband Internet access service providers could provision their network access devices to be capable of providing location information (civic or geospatial) to network hosts that attach to these network access devices. Further, we seek comment on the methods and technologies that would most effectively enable the provision of location information to network access devices. Because we recognize that it may be highly inefficient and burdensome for manufacturers of consumer equipment and software applications to make individual arrangements with every broadband provider to provide location information using network access devices, we seek comment on whether network access devices could provide location information using one or more

[207] T-Mobile Comments at 15.

[208] *Id.*

[209] T-Mobile Comments at 16.

[210] Examples of such devices include DSL modems, cable modems, wireless Internet service provider modems, and femtocells.

recognized industry standards.[211]

95. As in prior sections, we seek comment on the costs and benefits of the potential indoor accuracy solutions described above, including both currently available solutions and solutions under development. We recognize that the efficacy of any particular indoor solution may vary depending on the nature of the indoor environment, the broadband networks available within the environment, and the particular device, service, or application being used by the consumer to place an emergency call. We seek comment on the relative costs and benefits of each such solution and the costs and benefits of developing multiple solutions that can provide more accurate location information when combined.

E. Legal Authority

96. We seek comment on our analysis that we have legal authority to adopt the proposals described herein. First, we believe that modifying the definition of interconnected VoIP service as proposed flows from the Commission's authority to regulate interconnected VoIP 911 service, which was ratified by the NET 911 Improvement Act. The NET 911 Improvement Act defines "IP-enabled voice service" as having "the meaning given the term 'interconnected VoIP service' by section 9.3 of the Federal Communications Commission's regulations."[212] The legislative history of the NET 911 Improvement Act indicates that Congress did not intend to lock in the then-existing definition of interconnected VoIP service as a permanent definition for NET 911 Improvement Act purposes.[213]

97. We also believe that we have authority to modify the 911 obligations of interconnected VoIP service providers. The NET 911 Improvement Act requires interconnected VoIP service providers to provide 911 service "in accordance with the requirements of the Federal Communications Commission, as in effect on July 23, 2008 and as such requirements may be modified by the Commission from time to time."[214] Thus, our authority to modify the manner in which interconnected VoIP service providers provide E911 service falls under Congress's explicit delegation to us to modify the requirements applying to interconnected VoIP service "from time to time."

98. To the extent the regulation of network operators or others is reasonably ancillary to the effective performance of the Commission's statutory responsibilities to oversee the activities of interconnected VoIP service providers, and such regulation lies within our subject matter jurisdiction, as specified in Title I of the Communications Act, the Commission has authority, under Section 4(i) of the Communications Act and judicial precedent regarding the Commission's ancillary jurisdiction to adopt requirements applicable to these other entities.[215] Broadband, Internet access, and other network service

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[211] Examples of these standards include IEEE LLDP-MED, IETF DHCP, and IETF HELD.

[212] 47 U.S.C. § 615b(8).

[213] The House Report to the NET 911 Improvement Act states: "New section 7, as redesignated by H.R. 3403, would add a definition of 'IP-enabled voice service' that is tied to the Commission's definition of 'interconnected VoIP service' at 47 C.F.R. 9.3. The Committee recognizes that new technologies or successor protocols may enter the marketplace. As these new technologies or successor protocols become widely accepted and fungible substitutes for telephony, the Committee recognizes that the Commission may need to modify its definition from time to time." H.R. Rep. 110-442, 110th Cong., 1st Sess. 16 (2007).

[214] 47 U.S.C. § 615a-1(a).

[215] *See, e.g.*, 47 U.S.C. § 154(i) (authorizing the Commission to "perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this Act, as may be necessary in the execution of its functions"); *United States v. Southwestern Cable Co.*, 392 U.S. 157, 178 (1968) (recognizing that Commission may exercise authority that is "reasonably ancillary to the effective performance of [its] various responsibilities"); *United States v. Midwest Video Corp.*, 406 U.S. 649 (1972) (upholding FCC regulation of cable television under the agency's ancillary jurisdictional authority, where regulations promoted long-established statutory goals of broadcast regulation and cable was enmeshed in field of television broadcasting); *American Library Association v. FCC*, 406 F.3d 689 (D.C. Cir. 2005) (stating that the Commission's ancillary jurisdiction "is limited to circumstances where: (continued….)

providers fall within our general jurisdictional grant as providers of "interstate and foreign communication by wire or radio."[216] In addition, many VoIP 911 calls are carried over such networks. Accordingly, if a network used by the interconnected VoIP service provider does not accommodate the provider's efforts to comply with the 911 obligations that we establish for such provider pursuant to our express statutory obligations under the NET 911 Improvement Act,[217] the element required for exercising ancillary jurisdiction over such networks – *i.e.*, that the regulation is reasonably ancillary to the effective performance of our statutory duties – appears to be met, since the requirements we would impose on the network would be designed to enable the provider's compliance with the 911 obligations that we had promulgated under our express statutory mandate. To the extent the record that develops supports a conclusion that the regulation of other entities will enable interconnected VoIP service providers to fulfill their statutory duties as described herein, then we conclude that the Commission may exercise its ancillary authority to promulgate such regulations. We seek comment on this analysis.

99. We also ask commenters to address other potentially relevant sources of authority. For example, as to wireless broadband providers, does the Commission have authority, pursuant to Title III provisions, to impose license conditions in the public interest[218] and adopt the proposals discussed herein to support the provision of 911/E911 services by interconnected VoIP service providers? How would the statutory goals of sections 1302(a) and (b) be furthered by the rules we propose?

V. NOTICE OF PROPOSED RULEMAKING ON AMENDING THE DEFINITION OF INTERCONNECTED VOIP SERVICE IN SECTION 9.3 OF THE COMMISSION'S RULES

100. In the Second Further Notice above, we seek comment on whether to include outbound-only interconnected VoIP service within the definition of interconnected VoIP service solely for purposes of our 911 rules and not for any other purpose. We note that since enactment of the NET 911 Improvement Act, Congress has passed two other statutes that refer to the definition of interconnected VoIP service in section 9.3 of the Commission's rules. In October 2010, the Twenty-First Century Communications and Video Accessibility Act (CVAA) become law.[219] It requires, among other things, that the Commission promulgate regulations to "ensure the accessibility, usability, and compatibility of advanced communications services and the equipment used for advanced communications services by individuals with disabilities"[220] and to do what is necessary to "achieve reliable, interoperable

(Continued from previous page)

(1) the Commission's general jurisdictional grant under Title I covers the subject of the regulations and (2) the regulations are reasonably ancillary to the Commission's effective performance of its statutorily mandated responsibilities") .

[216] 47 U.S.C. § 152(a).

[217] The NET 911 Improvement Act, *inter alia*, places a duty on "each IP-enabled voice service provider to provide 9-1-1 service and enhanced 9-1-1 service to its subscribers in accordance with the requirements of the Federal Communications Commission," 47 U.S.C. § 615a-1(a), requires the Commission to issue regulations that "ensure that IP-enabled voice service providers have the ability to exercise their rights under subsection [615a-1(b)]" to access capabilities for providing 9-1-1 service that stand in parity with the access rights of CMS providers, 47 U.S.C. § 615a-1(c)(1)(A), and authorizes the Commission to "modify such regulations from time to time, as necessitated by changes in the market or technology, to ensure the ability of an IP-enabled voice service provider to comply with its obligations under subsection [615a-1](a) and to exercise its rights under subsection [615a-1](b)," 47 U.S.C. § 615a-1(c)(3). We also note that these provisions of the NET 911 Improvement Act were codified as part of the Communications Act.

[218] *See, e.g.,* 47 U.S.C. §§ 307(a), 309(j)(3), and 316(a)(1).

[219] Twenty-First Century Communications and Video Accessibility Act of 2010, Pub. L. No. 111-260, 124 Stat. 2751 (amending sections 3, 255, 303, 330, 710, and 713 of the Communications Act, and adding sections 615c and 715-19, codified at 47 U.S.C. §§ 153, 225, 303, 330, 610, 613, 615c, 616-20).

[220] 47 U.S.C. § 617(e)(1)(A).

communication that ensures access by individuals with disabilities to an Internet protocol-enabled emergency network, where achievable and technically feasible."[221] The CVAA defines "advanced communications services" to include interconnected VoIP service as defined in section 9.3 of our rules "as such section may be amended from time to time," as well as "non-interconnected VoIP" service, which is service other than interconnected VoIP service "that . . . enabled real-time voice communications that originate from or terminate to the user's location using Internet protocol or any success protocol; and . . . requires Internet protocol compatible customer premises equipment."[222] In December 2010, the Truth in Caller ID Act became law.[223] It amends section 227 of the Communications Act to prohibit any person from engaging in caller ID spoofing in connection with "any telecommunications service or IP-enabled voice service." That Act defines "IP-enabled voice service" to have "the meaning given that term by section 9.3 of the Commission's regulations (47 C.F.R. 9.3), as those regulations may be amended by the Commission from time to time."[224]

101. We seek comment on whether, if we decide to amend the definition of interconnected VoIP service in section 9.3, we should amend it for 911 purposes only. Would an amendment for 911 purposes only necessarily require the Commission to use the same definition when implementing the CVAA or the Truth in Caller ID Act?[225] Would there be any necessary effect on the Commission's other rules that cross-reference section 9.3?[226]

VI. PROCEDURAL MATTERS

A. *Ex Parte* Presentations

102. The proceedings initiated by this Second Further Notice of Proposed Rulemaking and this Notice of Proposed Rulemaking shall be treated as a "permit-but-disclose" proceedings in accordance with the Commission's *ex parte* rules.[227] Persons making *ex parte* presentations must file a copy of any

[221] *Id.* § 615c(g).

[222] *Id.* § 3(1), (25), (36).

[223] Truth in Caller ID Act of 2009, Pub. L. No. 111-331, 124 Stat. 3572 (2010).

[224] 47 U.S.C. § 227(e)(8)(C). The Commission has recently interpreted Congress to have referred to the definition of interconnected VoIP in section 9.3. *See* Rules and Regulations Implementing the Truth in Caller ID Act of 2009, WC Docket. No. 11-39, *Report and Order*, FCC 11-100, at ¶¶ 27-28 (rel. June 22, 2011) (using the term "interconnected VoIP services" to be consistent with the Commission's existing rules and the Truth in Caller ID Act in reference to Congress's use of the term "IP-enabled voice services.").

[225] We note that the Commission has previously interpreted the same term in different contexts to have different meanings. *See, e.g.*, *Communications Assistance for Law Enforcement Act and Broadband Access and Services*, First Report and Order and Further Notice of Proposed Rulemaking, 20 FCC Rcd 14989, 14998-15001, ¶¶ 16-23 (2005) (interpreting the defined term "information services" in the Communications Assistance for Law Enforcement Act differently from the interpretation of the similarly defined term in the Communications Act), *aff'd sub nom. Am. Council on Educ. v. FCC*, 451 F.3d 226, 232 (D.C. Cir. 2006) (noting that the Commission's "interpretation of CALEA reasonably differs from its interpretation of the 1996 Act, given the differences between the two statutes"); *see also Bright House Networks, LLC v. Verizon Cal. Inc.*, 23 FCC Rcd 10704, 10919-20, ¶ 41 (2008) (holding that two entities were "telecommunications carriers for purposes of section 222(b) of the Act" but leaving open the possibility that they are not telecommunications carriers "for purpose of all other provisions of the Act"), *aff'd sub nom. Verizon Cal., Inc. v. FCC*, 555 F.3d 270, 276 (D.C. Cir. 2009) (noting that agencies can interpret imprecise terms differently in separate sections of a statute that have different purposes); *U S West Communications, Inc. v. FCC*, 177 F.3d 1058, 1059-60 (D.C. Cir. 1999) (noting that the term "provide" used in different places in the Communications Act can be subject to different meanings depending on context).

[226] *See* 47 C.F.R. §§ 1.47, 6.1, 6.3(e), 12.3, 43.11, 52.12, 52.13, 52.17, 52.21(h), 52.32, 52.33, 52.34, 52.35(e)(1), 52.36(d), 54.5, 54.706, 54.708, 63.60, 64.2003, 64.2005.

[227] 47 C.F.R. §§ 1.1200 *et seq.*

written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must: (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made; and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda, or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (*e.g.*, .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's *ex parte* rules.

B. Comment Filing Procedures

103. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments in response to this Second Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://fjallfoss.fcc.gov/ecfs2/.

- Paper Filers: Parties that choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

  Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

  - All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.

  - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

  - U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

C. Accessible Formats

104. To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

D. Regulatory Flexibility Analyses

105. 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) of the possible significant economic impact on small entities of the policies and rules addressed in this document. The FRFA is set forth in Appendix B.

106. As required by the Regulatory Flexibility Act of 1980, *see* 5 U.S.C. § 604, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and rules addressed in this document. The IRFA is set forth in Appendix C. Written public comments are requested in the IRFA. These comments must be filed in accordance with the same filing deadlines as comments filed in response to this Second Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking as set forth on the first page of this document, and have a separate and distinct heading designating them as responses to the IRFA.

E. Paperwork Reduction Act Analysis

107. The Report and Order 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.

108. The Second Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking contain proposed new information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and OMB to comment on the information collection requirements contained in this document, as required by PRA. In addition, pursuant to the Small Business Paperwork Relief Act of 2002,[228] we seek specific comment on how we might "further reduce the information collection burden for small business concerns with fewer than 25 employees."[229]

109. 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."[230] 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.

F. Congressional Review Act

110. The Commission will send a copy of this Report and Order 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).

VII. ORDERING CLAUSES

111. Accordingly, IT IS ORDERED, pursuant to Sections 1, 4(i), 301, 303(r), and 332 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 301, 303(r), and 332, that the Third Report and Order in PS Docket No. 07-114 IS ADOPTED and that Parts 20 and 9 of the Commission's Rules, 47 C.F.R. Part 20 and 47 C.F.R. Part 9, are amended as set forth in Appendix C. The Third Report and Order shall become effective 60 days after publication in the Federal Register, subject to OMB approval for new information collection requirements.

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[228] Pub. L. No. 107-198.

[229] 44 U.S.C. § 3506(c)(4).

[230] *Location Accuracy FNPRM and NOI* at Appendix.

112. IT IS FURTHER ORDERED, pursuant to Sections 1, 2, 4(i), 7, 10, 201, 214, 222, 251(e), 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333, 615a, 615a-1, 615b of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 154(i), 157, 160, 201, 214, 222, 251(e), 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333, 615a, 615a-1, 615b, that this Second Further Notice of Proposed Rulemaking is hereby ADOPTED.

113. IT IS FURTHER ORDERED, pursuant to Sections 1, 2, 4(i), 7, 227, 301, 302, 303, 615a-1, 615b, 615c, and 716 of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 154(i), 157, 227, 301, 302, 303, 615a-1, 615b, 615c, and 617, that this Notice of Proposed Rulemaking is hereby ADOPTED.

114. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Third Report and Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

115. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

List of Commenters to *Location Accuracy FNPRM and NOI*

Comments	Abbreviation
Adams, Arapahoe and Jefferson County E-911 Emergency Service Authorities	Colorado E-911 Authorities
Alliance for Telecommunications Industry Solutions	ATIS
Andrew LLC, a CommScope Company	Andrew Corporation
Association of Public-Safety Communications Officials	APCO
AT&T, Inc.	AT&T
City of Ferguson	Ferguson
Commlabs, Inc.	Commlabs
CTIA – The Wireless Association	CTIA
Dash Carrier Services, LLC	Dash
Francois Menard	Menard
Generic Conferencing, LLC	Generic
Intrado, Inc.	Intrado
James J. Beck, Mayor, City of Richmond Heights, MI	Richmond Heights
Lehman Walker, City Manager, University City, Missouri	University City
Linda Goldstein, Mayor, Clayton, Missouri	Clayton Missouri
Mark Levin, City Administrator, Maryland Heights, Missouri	Maryland Heights
MobileTREC Corporation	MobileTREC
Motorola Mobility, Inc. & Motorola Solutions, Inc.	Motorola
National Emergency Number Association	NENA
Polaris Wireless, Inc.	Polaris
Qualcomm Incorporated	QUALCOMM
Qwest Communications International, Inc.	Qwest
Sprint Nextel Corporation	Sprint Nextel
Saint Louis County Emergency Communications Commission	Saint Louis County
Telecommunications Industry Association	TIA
Telecommunication Systems, Inc.	Telecommunications Systems
Texas Commission on State Emergency Communications & The Texas 9-1-1 Alliance	Texas 9-1-1 Agencies
Tim Fischesser, Executive Director, St. Louis County Municipal League	St. Louis County Municipal League
T-Mobile USA, Inc.	T-Mobile
TruePosition, Inc.	TruePosition
Verizon and Verizon Wireless	Verizon and Verizon Wireless
Voice on the Net Coalition	VON Coalition
Vonage Holdings Corp.	Vonage
Wilson Electronics, Inc.	Wilson
YMax Corporation	YMax

Reply Comments

Replies	Abbreviation
AT&T, Inc	AT&T
Andrea Forte, Henning Schulzrinne and Yi Zhang,	Forte

Motorola	Motorola
Cisco Systems	Cisco
CTIA-The Wireless Association	CTIA
Dumont Wireless, Inc.	Dumont
Francois Menard	Menard
Motorola Mobility, Inc.	Motorola
National Cable & Telecommunications Association	NCTA
Polaris Wireless, Inc.	Polaris
South Slope Cooperative Communications Co.	South Slope
SouthernLINC Wireless	SouthernLINC
Sprint	Sprint
T-Mobile USA, Inc.	T-Mobile
TruePosition, Inc.	TruePosition

Ex Parte Comments

Ex Partes	**Abbreviation**
AT&T	AT&T
Cisco Systems	Cisco
Microsoft Corp.	Microsoft
National Cable & Telecommunications Association	NCTA
Polaris Wireless, Inc.	Polaris
T-Mobile USA, Inc.	T-Mobile
TruePosition, Inc.	TruePosition
Verizon	Verizon
Voice on the Net Coalition	Voice on the Net
Rural Cellular Association	RCA

APPENDIX B

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] an Initial Regulatory Flexibility Analysis (IRFA) was included in the *Further Notice of Proposed Rulemaking and Notice of Inquiry* in PS Docket No. 07-114 (*FNPRM*).[2] The Commission sought written public comment on the proposals in these dockets, including comment on the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.[3]

A. Need for, and Objectives of, the Proposed Rules

2. In the Second Report and Order, we continue to strengthen our existing Enhanced 911 (E911) location accuracy regime[4] for wireless carriers by providing for phasing out the network-based standard over time while retaining the existing handset-based and network-based location accuracy standards and the eight-year implementation period established in our September 2010 E911 Location Accuracy Second Report and Order.[5]

3. We also require new Commercial Mobile Radio Service (CMRS) networks to comply with the handset-based location criteria, regardless of the location technology they actually use. In addition, we require wireless carriers to test their E911 location accuracy results and to share the results with Public Safety Answering Points (PSAPs), state 911 offices, and the Commission, subject to confidentiality safeguards.

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

4. T-Mobile argues that "[r]equiring periodic re-testing would…be unnecessary and impose a huge burden. At a minimum, the Commission is obligated by the Paperwork Reduction Act to evaluate the Second Report and Order mechanisms before imposing additional information collection requirements."[6]

5. No commenter provided a quantification of the cost of meeting the requirements adopted in this Order. In response to the issues raised in public comments, we concluded that the proposed testing regime provided carriers, including small businesses, with a sufficient measure of flexibility to account for technical and cost-related concerns. Requiring carriers to periodically test their location accuracy results and to share their results with PSAPs within their service areas and state 911 offices in the states or territories in which they operate and the Commission, subject to confidentiality safeguards, strikes the appropriate balance between ensuring system performance and reducing the burden on carriers. In the event that small entities face unique circumstances that restrict their ability to comply with the Commission's rules, the Commission can address them through the waiver process. We have determined that the final rules adopt the best alternatives for promoting accurate location accuracy data.

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[1] *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).

[2] *See* Wireless E911 Location Accuracy Requirements, PS Docket 07-114, *Further Notice of Proposed Rulemaking and Notice of Inquiry*, 25 FCC Rcd 18957 (Sep. 23, 2010) (*FNPRM*).

[3] *See* 5 U.S.C. § 604.

[4] *See* 47 C.F.R. § 20.18(h).

[5] In the Matter of Wireless E911 Location Accuracy Requirements, PS Docket No. 07-114, *Second Report and Order*, 25 FCC Rcd 18909 (2010) (*E911 Location Accuracy Second Report and Order*).

[6] *Id*.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Would Apply

6. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules.[7] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[8] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[9] 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 Small Business Administration (SBA).[10]

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 comprehensive, statutory small entity size standards.[11] First, nationwide, there are a total of approximately 27.5 million small businesses, according to the SBA.[12] In addition, a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[13] Nationwide, as of 2007, there were approximately 1,621,315 small organizations.[14] Finally, the term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[15] Census Bureau data for 2011 indicate that there were 89,476 local governmental jurisdictions in the United States.[16] We estimate that, of this total, as many as 88, 506 entities may qualify as "small governmental jurisdictions."[17] Thus, we estimate that most governmental jurisdictions are small.

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[7] 5 U.S.C. §§ 603(b)(3), 604(a)(3).

[8] 5 U.S.C. § 601(6).

[9] 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 terms which are appropriate to the activities of the agency and publishes such definitions(s) in the Federal Register."

[10] 15 U.S.C. § 632.

[11] *See* 5 U.S.C. §§ 601(3)–(6).

[12] *See* SBA, Office of Advocacy, "Frequently Asked Questions," web.sba.gov/faqs (last visited May 6,2011; figures are from 2009).

[13] 5 U.S.C. § 601(4).

[14] INDEPENDENT SECTOR, THE NEW NONPROFIT ALMANAC & DESK REFERENCE (2010).

[15] 5 U.S.C. § 601(5).

[16] U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2011, Table 427 (2007)

[17] The 2007 U.S Census data for small governmental organizations are not presented based on the size of the population in each such organization. There were 89, 476 small governmental organizations in 2007. If we assume that county, municipal, township and school district organizations are more likely than larger governmental organizations to have populations of 50,000 or less, , the total of these organizations is 52,125. If we make the same assumption about special districts, and also assume that special districts are different from county, municipal, township, and school districts, in 2007 there were 37,381 special districts. Therefore, of the 89,476 small governmental organizations documented in 2007, as many as 89,506 may be considered small under the applicable standard. This data may overestimate the number of such organizations that has a population of 50,000 or less. U.S. (continued….)

1. Telecommunications Service Entities

a. Wireless Telecommunications Service Providers

8. Pursuant to 47 C.F.R. § 20.18(a), the Commission's 911 service requirements are only applicable to Commercial Mobile Radio Service (CMRS) "[providers], excluding mobile satellite service operators, to the extent that they: (1) Offer real-time, two way switched voice service that is interconnected with the public switched network; and (2) Utilize an in-network switching facility that enables the provider to reuse frequencies and accomplish seamless hand-offs of subscriber calls. These requirements are applicable to entities that offer voice service to consumers by purchasing airtime or capacity at wholesale rates from CMRS licensees."

9. Below, for those services subject to auctions, we note that, as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Also, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated.

10. *Wireless Telecommunications Carriers (except Satellite)*. Since 2007, the Census Bureau has placed wireless firms within this new, broad, economic census category.[18] Prior to that time, such firms were within the now-superseded categories of "Paging" and "Cellular and Other Wireless Telecommunications."[19] Under the present and prior categories, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.[20] For the category of Wireless Telecommunications Carriers (except Satellite), Census data for 2007, which supersede data contained in the 2002 Census, show that there were 1,383 firms that operated that year.[21] Of those 1,383, 1,368 had fewer than 100 employees, and 15 firms had more than 100 employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small.

11. *Incumbent Local Exchange Carriers* (*Incumbent LECs*). Neither the Commission nor the SBA has developed a small business size standard specifically for incumbent local exchange services. The appropriate size standard under SBA rules is for the category Wired Telecommunications Carriers. Under that size standard, such a business is small if it has 1,500 or fewer employees.[22] Census Bureau data for 2007, which now supersede data from the 2002 Census, show that there were 3,188 firms in this category that operated for the entire year. Of this total, 3,144 had employment of 999 or fewer, and 44 firms had had employment of 1000 or more. According to Commission data, 1,307 carriers reported that they were incumbent local exchange service providers.[23] Of these 1,307 carriers, an estimated 1,006 have

(Continued from previous page)

CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 2011, Tables 427, 426 (Data cited therein are from 2007).

[18] U.S. Census Bureau, 2007 NAICS Definitions, "517210 Wireless Telecommunications Categories (Except Satellite)"; http://www.census.gov/naics/2007/def/ND517210.HTM#N517210.

[19] U.S. Census Bureau, 2002 NAICS Definitions, "517211 Paging"; http://www.census.gov/epcd/naics02/def/NDEF517.HTM.; U.S. Census Bureau, 2002 NAICS Definitions, "517212 Cellular and Other Wireless Telecommunications"; http://www.census.gov/epcd/naics02/def/NDEF517.HTM.

[20] 13 C.F.R. § 121.201, NAICS code 517210 (2007 NAICS). The now-superseded, pre-2007 C.F.R. citations were 13 C.F.R. § 121.201, NAICS codes 517211 and 517212 (referring to the 2002 NAICS).

[21] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS code 517210 (rel. Oct. 20, 2009), http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.

[22] 13 C.F.R. § 121.201, NAICS code 517110.

[23] *See Trends in Telephone Service*, Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division at Table 5.3 (Sept. 2010) (*Trends in Telephone Service*).

1,500 or fewer employees and 301 have more than 1,500 employees.[24] Consequently, the Commission estimates that most providers of local exchange service are small entities that may be affected by the rules and policies proposed in the Notice. Thus under this category and the associated small business size standard, the majority of these incumbent local exchange service providers can be considered small.[25]

12. *Competitive Local Exchange Carriers (Competitive LECs), Competitive Access Providers (CAPs), Shared-Tenant Service Providers, and Other Local Service Providers.* Neither the Commission nor the SBA has developed a small business size standard specifically for these service providers. The appropriate size standard under SBA rules is for the category Wired Telecommunications Carriers. Under that size standard, such a business is small if it has 1,500 or fewer employees.[26] . Census Bureau data for 2007, which now supersede data from the 2002 Census, show that there were 3,188 firms in this category that operated for the entire year. Of this total, 3,144 had employment of 999 or fewer, and 44 firms had had employment of 1,000 employees or more. Thus under this category and the associated small business size standard, the majority of these Competitive LECs, CAPs, Shared-Tenant Service Providers, and Other Local Service Providers can be considered small entities.[27] According to Commission data, 1,442 carriers reported that they were engaged in the provision of either competitive local exchange services or competitive access provider services.[28] Of these 1,442 carriers, an estimated 1,256 have 1,500 or fewer employees and 186 have more than 1,500 employees.[29] In addition, 17 carriers have reported that they are Shared-Tenant Service Providers, and all 17 are estimated to have 1,500 or fewer employees.[30] In addition, 72 carriers have reported that they are Other Local Service Providers.[31] Of the 72, seventy have 1,500 or fewer employees and two have more than 1,500 employees.[32] Consequently, the Commission estimates that most providers of competitive local exchange service, competitive access providers, Shared-Tenant Service Providers, and Other Local Service Providers are small entities that may be affected by rules adopted pursuant to the Notice.

13. *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.[33] 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

[24] *See id*.

[25] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=600&-ds_name=EC0751SSSZ5&-_lang=en.

[26] 13 C.F.R. § 121.201, NAICS code 517110.

[27] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=600&-ds_name=EC0751SSSZ5&-_lang=en

[28] *See Trends in Telephone Service* at Table 5.3.

[29] *See id.*

[30] *See id*.

[31] *See id*.

[32] *See id*.

[33] *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 C.F.R. § 24.720(b).

revenues of not more than $15 million for the preceding three calendar years.[34] These small business size standards, in the context of broadband PCS auctions, have been approved by the SBA.[35] 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.[36] On April 15, 1999, the Commission completed the reauction of 347 C-, D-, E-, and F-Block licenses in Auction No. 22.[37] Of the 57 winning bidders in that auction, 48 claimed small business status and won 277 licenses.

14. On January 26, 2001, the Commission completed the auction of 422 C and F Block Broadband PCS licenses in Auction No. 35. Of the 35 winning bidders in that auction, 29 claimed small business status.[38] 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.[39] On May 21, 2007, the Commission completed an auction of 33 licenses in the A, C, and F Blocks in Auction No. 71.40 Of the 12 winning bidders in that auction, five claimed small business status and won 18 licenses.41 On August 20, 2008, the Commission completed the auction of 20 C-, D-, E-, and F-Block Broadband PCS licenses in Auction No. 78.[42] Of the eight winning bidders for Broadband PCS licenses in that auction, six claimed small business status and won 14 licenses.[43]

15. *Narrowband Personal Communications Services*. 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

[34] *See PCS Report and Order*, 11 FCC Rcd at 7852, para. 60.

[35] *See Alvarez Letter 1998*.

[36] *See Broadband PCS, D, E and F Block Auction Closes*, Public Notice, Doc. No. 89838 (rel. Jan. 14, 1997).

[37] *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).

[38] *See C and F Block Broadband PCS Auction Closes; Winning Bidders Announced*, Public Notice, 16 FCC Rcd 2339 (2001).

[39] *See Broadband PCS Spectrum Auction Closes; Winning Bidders Announced for Auction No. 58*, Public Notice, 20 FCC Rcd 3703 (2005).

[40] *See Auction of Broadband PCS Spectrum Licenses Closes; Winning Bidders Announced for Auction No. 71*, Public Notice, 22 FCC Rcd 9247 (2007).

[41] *Id*.

[42] *See Auction of AWS-1 and Broadband PCS Licenses Closes; Winning Bidders Announced for Auction 78*, Public Notice, 23 FCC Rcd 12749 (WTB 2008).

[43] *Id.*

standard in the Narrowband PCS Second Report and Order.[44] 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.[45]

16. *Specialized Mobile Radio.* The Commission awards "small entity" bidding credits in auctions for Specialized Mobile Radio (SMR) geographic area licenses in the 800 MHz and 900 MHz bands to firms that had revenues of no more than $15 million in each of the three previous calendar years.[46] The Commission awards "very small entity" bidding credits to firms that had revenues of no more than $3 million in each of the three previous calendar years.[47] The SBA has approved these small business size standards for the 900 MHz Service.[48] The Commission has held auctions for geographic area licenses in the 800 MHz and 900 MHz bands. The 900 MHz SMR was completed in 1996. Sixty bidders claiming that they qualified as small businesses under the $15 million size standard won 263 geographic area licenses in the 900 MHz SMR band. The 800 MHz SMR auction for the upper 200 channels was conducted in 1997. Ten bidders claiming that they qualified as small businesses under the $15 million size standard won 38 geographic area licenses for the upper 200 channels in the 800 MHz SMR band.[49] A second auction for the 800 MHz band was conducted in 2002 and included 23 BEA licenses. One bidder claiming small business status won five licenses.[50]

17. The auction of the 1,050 800 MHz SMR geographic area licenses for the General Category channels was conducted in 2000. Eleven bidders won 108 geographic area licenses for the General Category channels in the 800 MHz SMR band qualified as small businesses under the $15 million size standard.[51] In an auction completed in 2000, a total of 2,800 Economic Area licenses in the lower 80 channels of the 800 MHz SMR service were awarded.[52] Of the 22 winning bidders, 19 claimed "small business" status and won 129 licenses. Thus, combining all three auctions, 40 winning bidders for geographic licenses in the 800 MHz SMR band claimed status as small business. In addition, there are numerous incumbent site-by-site SMR licensees and licensees with extended implementation authorizations in the 800 and 900 MHz bands. We do not know how many firms provide 800 MHz or 900 MHz geographic area SMR pursuant to extended implementation authorizations nor how many of these providers have annual revenues of no more than $15 million. One firm has over $15 million in revenues. In addition, we do not know how many of these firms have 1,500 or fewer employees. We

[44] *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).

[45] *See* Letter to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC, from Aida Alvarez, Administrator, SBA (Dec. 2, 1998).

[46] 47 C.F.R. § 90.814(b)(1).

[47] *Id*.

[48] *See* Letter to Thomas Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated August 10, 1999.

[49] *See* "Correction to Public Notice DA 96-586 'FCC Announces Winning Bidders in the Auction of 1020 Licenses to Provide 900 MHz SMR in Major Trading Areas,'" *Public Notice*, 18 FCC Rcd 18367 (WTB 1996).

[50] *See* "Multi-Radio Service Auction Closes," *Public Notice*, 17 FCC Rcd 1446 (WTB 2002).

[51] *See* "800 MHz Specialized Mobile Radio (SMR) Service General Category (851-854 MHz) and Upper Band (861-865 MHz) Auction Closes; Winning Bidders Announced," *Public Notice*, 15 FCC Rcd 17162 (2000).

[52] *See*, "800 MHz SMR Service Lower 80 Channels Auction Closes; Winning Bidders Announced," *Public Notice*, 16 FCC Rcd 1736 (2000).

assume, for purposes of this analysis, that all of the remaining existing extended implementation authorizations are held by small entities, as that small business size standard is approved by the SBA.

18. In addition, there are numerous incumbent site-by-site SMR licensees and licensees with extended implementation authorizations in the 800 and 900 MHz bands. We do not know how many firms provide 800 MHz or 900 MHz geographic area SMR pursuant to extended implementation authorizations, nor how many of these providers have annual revenues of no more than $15 million. One firm has over $15 million in revenues. In addition, we do not know how many of these firms have 1500 or fewer employees.[53] We assume, for purposes of this analysis, that all of the remaining existing extended implementation authorizations are held by small entities, as that small business size standard is approved by the SBA.

19. *AWS Services (1710–1755 MHz and 2110–2155 MHz bands (AWS-1); 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz bands (AWS-2); 2155–2175 MHz band (AWS-3))*. For the AWS-1 bands, 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.[54] In 2006, the Commission conducted its first auction of AWS-1 licenses.[55] In that initial AWS-1 auction, 31 winning bidders identified themselves as very small businesses.[56] Twenty-six of the winning bidders identified themselves as small businesses.[57] In a subsequent 2008 auction, the Commission offered 35 AWS-1 licenses.[58] Four winning bidders identified themselves as very small businesses, and three of the winning bidders identified themselves as a small business.[59]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 has proposed to treat both AWS-2 and AWS-3 similarly to broadband PCS service and AWS-1 service due to the comparable capital requirements and other factors, such as issues involved in relocating incumbents and developing markets, technologies, and services.[60]

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[53] *See generally* 13 C.F.R. § 121.201, NAICS code 517210.

[54] *See* Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, *Report and Order*, 18 FCC Rcd 25,162, App. B (2003), *modified by* Service Rules for Advanced Wireless Services In the 1.7 GHz and 2.1 GHz Bands, *Order on Reconsideration*, 20 FCC Rcd 14,058, App. C (2005).

[55] *See* "Auction of Advanced Wireless Services Licenses Scheduled for June 29, 2006; Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Procedures for Auction No. 66," AU Docket No. 06-30, *Public Notice*, 21 FCC Rcd 4562 (2006) ("*Auction 66 Procedures Public Notice*").

[56] *See* "Auction of Advanced Wireless Services Licenses Closes; Winning Bidders Announced for Auction No. 66," *Public Notice*, 21 FCC Rcd 10,521 (2006) ("*Auction 66 Closing Public Notice*").

[57] *See id.*

[58] *See AWS-1 and Broadband PCS Procedures Public Notice*, 23 FCC Rcd at 7499. Auction 78 also included an auction of broadband PCS licenses.

[59] *See* "Auction of AWS-1 and Broadband PCS Licenses Closes, Winning Bidders Announced for Auction 78, Down Payments Due September 9, 2008, FCC Forms 601 and 602 Due September 9, 2008, Final Payments Due September 23, 2008, Ten-Day Petition to Deny Period," *Public Notice*, 23 FCC Rcd 12,749 (2008).

[60] Service Rules for Advanced Wireless Services in the 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz Bands et al., *Notice of Proposed Rulemaking*, 19 FCC Rcd 19,263, App. B (2005); Service Rules for Advanced Wireless Services in the 2155–2175 MHz Band, *Notice of Proposed Rulemaking*, 22 FCC Rcd 17,035, App. (2007); Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band, *Further Notice of Proposed Rulemaking*, 23 FCC Rcd 9859, App. B (2008).

20. *Rural Radiotelephone Service*. The Commission has not adopted a size standard for small businesses specific to the Rural Radiotelephone Service. A significant subset of the Rural Radiotelephone Service is the Basic Exchange Telephone Radio System ("BETRS"). In the present context, we will use the SBA's small business size standard applicable to Wireless Telecommunications Carriers (except Satellite), i.e., an entity employing no more than 1,500 persons.[61] There are approximately 1,000 licensees in the Rural Radiotelephone Service, and the Commission estimates that there are 1,000 or fewer small entity licensees in the Rural Radiotelephone Service that may be affected by the rules and policies adopted herein.

21. *Wireless Communications Services.* This service can be used for fixed, mobile, radiolocation, and digital audio broadcasting satellite uses in the 2305-2320 MHz and 2345-2360 MHz bands. 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.[62] The SBA has approved these definitions.[63] The Commission auctioned geographic area licenses in the WCS service. In the auction, which commenced on April 15, 1997 and closed on April 25, 1997, there were seven bidders that won 31 licenses that qualified as very small business entities, and one bidder that won one license that qualified as a small business entity.

22. *220 MHz Radio Service – Phase I Licensees*. The 220 MHz service has both Phase I and Phase II licenses. Phase I licensing was conducted by lotteries in 1992 and 1993. There are approximately 1,515 such non-nationwide licensees and four nationwide licensees currently authorized to operate in the 220 MHz band. The Commission has not developed a small business size standard for small entities specifically applicable to such incumbent 220 MHz Phase I licensees. To estimate the number of such licensees that are small businesses, the Commission applies the small business size standard under the SBA rules applicable. The SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.[64] For this service, the SBA uses the category of Wireless Telecommunications Carriers (except Satellite). Census data for 2007, which supersede data contained in the 2002 Census, show that there were 1,383 firms that operated that year.[65] Of those 1,383, 1,368 had fewer than 100 employees, and 15 firms had more than 100 employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small.

23. *220 MHz Radio Service – Phase II Licensees.* The 220 MHz service has both Phase I and Phase II licenses. The Phase II 220 MHz service is a new service, and is subject to spectrum auctions. In the *220 MHz Third Report and Order*, the Commission adopted a small business size standard for defining "small" and "very small" businesses for purposes of determining their eligibility for special provisions such as bidding credits and installment payments.[66] This small business standard indicates that

[61] NAICS Code 51210.

[62] Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (WCS), *Report and Order*, 12 FCC Rcd 10785, 10879 ¶ 194 (1997).

[63] *See* Letter to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated December 2, 1998.

[64] 13 C.F.R. § 121.201, NAICS code 517210 (2007 NAICS). The now-superseded, pre-2007 C.F.R. citations were 13 C.F.R. § 121.201, NAICS codes 517211 and 517212 (referring to the 2002 NAICS).

[65] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS code 517210 (rel. Oct. 20, 2009), http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.

[66] Amendment of Part 90 of the Commission's Rules to Provide For the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service, *Third Report and Order*, 12 FCC Rcd 10943, 11068-70 ¶¶ 291-295 (1997).

a "small business" is an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding $15 million for the preceding three years.[67] A "very small business" is defined as an entity that, together with its affiliates and controlling principals, has average gross revenues that do not exceed $3 million for the preceding three years.[68] The SBA has approved these small size standards.[69] Auctions of Phase II licenses commenced on and closed in 1998.[70] In the first auction, 908 licenses were auctioned in three different-sized geographic areas: three nationwide licenses, 30 Regional Economic Area Group (EAG) Licenses, and 875 Economic Area (EA) Licenses. Of the 908 licenses auctioned, 693 were sold.[71] Thirty-nine small businesses won 373 licenses in the first 220 MHz auction. A second auction included 225 licenses: 216 EA licenses and 9 EAG licenses. Fourteen companies claiming small business status won 158 licenses.[72] A third auction included four licenses: 2 BEA licenses and 2 EAG licenses in the 220 MHz Service. No small or very small business won any of these licenses.[73] In 2007, the Commission conducted a fourth auction of the 220 MHz licenses.[74] Bidding credits were offered to small businesses. A bidder with attributed average annual gross revenues that exceeded $3 million and did not exceed $15 million for the preceding three years ("small business") received a 25 percent discount on its winning bid. A bidder with attributed average annual gross revenues that did not exceed $3 million for the preceding three years received a 35 percent discount on its winning bid ("very small business"). Auction 72, which offered 94 Phase II 220 MHz Service licenses, concluded in 2007.[75] In this auction, five winning bidders won a total of 76 licenses. Two winning bidders identified themselves as very small businesses won 56 of the 76 licenses. One of the winning bidders that identified themselves as a small business won 5 of the 76 licenses won.

24. *700 MHz Guard Band Licenses.* 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.[76] A small

[67] *Id.* at 11068 ¶ 291.

[68] *Id.*

[69] *See* Letter to Daniel Phythyon, Chief, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated January 6, 1998 (*Alvarez to Phythyon Letter 1998*).

[70] *See generally* "220 MHz Service Auction Closes," *Public Notice*, 14 FCC Rcd 605 (WTB 1998).

[71] *See* "FCC Announces It is Prepared to Grant 654 Phase II 220 MHz Licenses After Final Payment is Made," *Public Notice*, 14 FCC Rcd 1085 (WTB 1999).

[72] *See* "Phase II 220 MHz Service Spectrum Auction Closes," *Public Notice*, 14 FCC Rcd 11218 (WTB 1999).

[73] *See* "Multi-Radio Service Auction Closes," *Public Notice*, 17 FCC Rcd 1446 (WTB 2002).

[74] *See* "Auction of Phase II 220 MHz Service Spectrum Scheduled for June 20, 2007, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Procedures for Auction 72, *Public Notice,* 22 FCC Rcd 3404 (2007).

[75] *See* "Auction of Phase II 220 MHz Service Spectrum Licenses Closes, Winning Bidders Announced for Auction 72, Down Payments due July 18, 2007, FCC Forms 601 and 602 due July 18, 2007, Final Payments due August 1, 2007, Ten-Day Petition to Deny Period, *Public Notice,* 22 FCC Rcd 11573 (2007).

[76] Service Rules for the 746-764 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *Second Report and Order*, 15 FCC Rcd 5299 (2000). Service rules were amended in 2007, but no changes were made to small business size categories. *See* Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones, WT Docket No. 01-309, Biennial Regulatory Review – Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services, WT Docket 03-264, Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission's Rules, (continued….)

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.[77] 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.[78] SBA approval of these definitions is not required.[79] In 2000, the Commission conducted an auction of 52 Major Economic Area ("MEA") licenses.[80] 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 and closed in 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.[81]

25. *Upper 700 MHz Band Licenses*. In the *700 MHz Second Report and Order*, the Commission revised its rules regarding Upper 700 MHz licenses.[82] 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.[83] 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.

26. *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.[84] 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.[85] 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.[86] 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.[87] The SBA approved these small size

(Continued from previous page)

WT Docket No. 06-169, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, WT Docket No. 96-86, *Report and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd 8064 (2007).

[77] *Id*. at 5343 ¶ 108.

[78] *Id*.

[79] *Id*. at 5343 ¶ 108 n.246 (for the 746-764 MHz and 776-704 MHz bands, the Commission is exempt from 15 U.S.C. § 632, which requires Federal agencies to obtain Small Business Administration approval before adopting small business size standards).

[80] *See* "700 MHz Guard Bands Auction Closes: Winning Bidders Announced," *Public Notice*, 15 FCC Rcd 18026 (2000).

[81] *See* "700 MHz Guard Bands Auction Closes: Winning Bidders Announced," *Public Notice*, 16 FCC Rcd 4590 (WTB 2001).

[82] *700 MHz Second Report and Order*, 22 FCC Rcd 15289.

[83] *See* Auction of 700 MHz Band Licenses Closes, *Public Notice*, 23 FCC Rcd 4572 (WTB 2008).

[84] *See* Reallocation and Service Rules for the 698–746 MHz Spectrum Band (Television Channels 52–59), *Report and Order*, 17 FCC Rcd 1022 (2002) ("*Channels 52–59 Report and Order*").

[85] *See id.*, 17 FCC Rcd at 1087–88 ¶ 172.

[86] *See id*.

[87] *See id.*, 17 FCC Rcd at 1088 ¶ 173.

standards.[88] 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)) was conducted in 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 licenses.[89] A second auction commenced on May 28, 2003, closed on June 13, 2003, and included 256 licenses.[90] Seventeen winning bidders claimed small or very small business status, and nine winning bidders claimed entrepreneur status.[91] In 2005, the Commission completed an auction of 5 licenses in the Lower 700 MHz band. All three winning bidders claimed small business status.

27. In 2007, the Commission reexamined its rules governing the 700 MHz band in the *700 MHz Second Report and Order*.[92] An auction of A, B and E block 700 MHz licenses was held in 2008.[93] Twenty winning bidders claimed 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). Thirty-three winning bidders claimed very small business status (those with attributable average annual gross revenues that do not exceed $15 million for the preceding three years).

28. *Offshore Radiotelephone Service.* This service operates on several UHF television broadcast channels that are not used for television broadcasting in the coastal areas of states bordering the Gulf of Mexico.[94] There are presently approximately 55 licensees in this service. The Commission is unable to estimate at this time the number of licensees that would qualify as small under the SBA's small business size standard for the category of Wireless Telecommunications Carriers (except Satellite). Under that SBA small business size standard,[95] a business is small if it has 1,500 or fewer employees.[96] Census data for 2007, which supersede data contained in the 2002 Census, show that there were 1,383 firms that operated that year.[97] Of those 1,383, 1,368 had fewer than 100 employees, and 15 firms had more than 100 employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small.

29. *Wireless Telephony*. Wireless telephony includes cellular, personal communications services, and specialized mobile radio telephony carriers. As noted, the SBA has developed a small business size standard for Wireless Telecommunications Carriers (except Satellite).[98] Under the SBA small business size standard, a business is small if it has 1,500 or fewer employees.[99] According to *Trends in Telephone Service* data, 413 carriers reported that they were engaged in wireless telephony.[100]

[88] *See Alvarez Letter 1998*.

[89] *See* Lower 700 MHz Band Auction Closes, *Public Notice*, 17 FCC Rcd 17,272 (2002).

[90] *See* Lower 700 MHz Band Auction Closes, *Public Notice*, 18 FCC Rcd 11,873 (2003).

[91] *See id.*

[92] 700 MHz Second Report and Order, *Second Report and Order*, 22 FCC Rcd 15,289, 15,359 n.434 (2007).

[93] *See* Auction of 700 MHz Band Licenses Closes, *Public Notice*, 23 FCC Rcd 4572 (2008).

[94] This service is governed by Subpart I of Part 22 of the Commission's Rules. *See* 47 C.F.R. §§ 22.1001-22.1037.

[95] 13 C.F.R. § 121.201, NAICS code 517210.

[96] *Id*.

[97] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS code 517210 (rel. Oct. 20, 2009), http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.

[98] 13 C.F.R. § 121.201, NAICS code 517210.

[99] *Id*.

[100] TRENDS IN TELEPHONE SERVICE, tbl. 5.3.

Of these, an estimated 261 have 1,500 or fewer employees and 152 have more than 1,500 employees.[101] Therefore, more than half of these entities can be considered small.

30. *Satellite Telecommunications Providers.* Two economic census categories address the satellite industry. The first category has a small business size standard of $15 million or less in average annual receipts, under SBA rules.[102] The second has a size standard of $25 million or less in annual receipts.[103]

31. The category of Satellite Telecommunications "comprises establishments primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications."[104] Census Bureau data for 2007 show that 512 Satellite Telecommunications firms that operated for that entire year.[105] Of this total, 464 firms had annual receipts of under $10 million, and 18 firms had receipts of $10 million to $24,999,999.[106] Consequently, the Commission estimates that the majority of Satellite Telecommunications firms are small entities that might be affected by our action.

32. The second category, i.e. "All Other Telecommunications" comprises "establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or Voice over Internet Protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry."[107] For this category, Census Bureau data for 2007 show that there were a total of 2,383 firms that operated for the entire year.[108] Of this total, 2,346 firms had annual receipts of under $25 million and 37 firms had annual receipts of $25 million to $49, 999,999.[109] Consequently, the Commission estimates that the majority of All Other Telecommunications firms are small entities that might be affected by our action.

b. Equipment Manufacturers

33. *Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.* The Census Bureau defines this category as follows: "This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and

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[101] *Id.*

[102] 13 C.F.R. § 121.201, NAICS code 517410.

[103] 13 C.F.R. § 121.201, NAICS code 517919.

[104] U.S. Census Bureau, 2007 NAICS Definitions, "517410 Satellite Telecommunications,".

[105] See http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

[106] http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

[107] *http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517919&search=2007%20NAICS%20Search*.

[108] U.S. Censhttp://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

[109]http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment." The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees. According to Census Bureau data for 2007, there were a total of 939 establishments in this category that operated for part or all of the entire year. Of this total, 784 had less than 500 employees and 155 had more than 100 employees.[110] Thus, under this size standard, the majority of firms can be considered small.

34. *Semiconductor and Related Device Manufacturing.* These establishments manufacture "computer storage devices that allow the storage and retrieval of data from a phase change, magnetic, optical, or magnetic/optical media. The SBA has developed a small business size standard for this category of manufacturing; that size standard is 500 or fewer employees storage and retrieval of data from a phase change, magnetic, optical, or magnetic/optical media."[111] According to data from the 2007 U.S. Census, in 2007, there were 954 establishments engaged in this business. Of these, 545 had from 1 to 19 employees; 219 had from 20 to 99 employees; and 190 had 100 or more employees.[112] Based on this data, the Commission concludes that the majority of the businesses engaged in this industry are small.

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

35. The Third Report and Order requires all new CMRS network providers that meet the definition of covered CMRS providers in Section 20.18 of the Commission's rules to comply with the handset-based location accuracy standard by the end of the implementation period to meet that standard. The Third Report and Order defines a "new CMRS network" as a CMRS network that is newly deployed as specified in the rule adopted and that is not associated with an existing CMRS network. Additionally, the Third Report and Order requires that carriers share test results with PSAPs, State 911 offices and the Commission.

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

36. The RFA requires an agency to describe any significant, specifically small business 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 than design, standards; and (4) and exemption from coverage of the rule, or any part thereof, for small entities."[113]

37. With respect to requiring new CMRS providers to comply with the existing handset-based location accuracy standard, the Commission intends for covered CMRS providers that are launching new stand-alone networks to meet the handset-based location accuracy standard from the start, rather than to stagger the eight-year implementation period for existing covered CMRS providers that opt to upgrade their networks during the implementation period.

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[110] The NAICS Code for this service 334220. See 13 C.F.R 121/201. See also http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=300&-ds_name=EC0731SG2&-_lang=en.

[111] U.S. Census Bureau, 2007 Economic Census, Industry Series: Manufacturing, "Semiconductor and Related Device Manufacturing ," NAICS code 334413.

[112] http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=300&-ds_name=EC0731I1&-_lang=en.

[113] 5 U.S.C. §§ 603(c)(1)-(c)(4).

38. The following steps taken by the Third Report and Order, however, will minimize any significant economic impact on small entities providing service on new CMRS networks. The Commission has determined that, because any next-generation handsets that might be used by a covered CMRS provider typically would be capable of providing precise location information for commercial purposes, the incremental cost for carriers to use that location information to comply with the Commission's handset-based location accuracy standard will be minimal.

39. Further, the Third Report and Order clarifies that providers deploying new CMRS networks are free to use network-based location techniques, or to combine network and handset-based techniques, to provide 911 location information, provided that they meet the accuracy criteria applicable to handset-based providers. Allowing carriers to blend location accuracy technologies further reduces the burdens on CMRS providers by allowing them flexibility in meeting the Commission's standards and allowing them to adapt the rules to their particular network infrastructure.

40. Concerning compliance testing, the Commission has determined that the benefits of requiring all CMRS carriers to test their E911 location accuracy results, and to share the results with PSAPs, state 911 offices and the Commission, subject to confidentiality safeguards, far outweighs any cost of conducting the testing and sharing the results. E911 represents a significant and valuable investment that enables emergency responders to reach the site of an emergency as quickly as possible.

41. Moreover, the testing requirement does not become effective until after the Commission seeks comment and adopts an order implementing CSRIC recommendations for testing requirements. The Order specifically directs CSRIC to consider the feasibility of flexible testing criteria and methodologies, and to attempt to find cost-effective testing solutions.

42. Finally, in the event that small entities face unique circumstances with respect to these rules, such entities may request waiver relief from the Commission. Accordingly, we find that we have discharged our duty to consider the burdens imposed on small entities.

F. Legal Basis

45. The legal basis for any action that may be taken pursuant to this Third Report and Order is contained in Sections 1, 4(i), 301, 303(r), and 332 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 301, 303(r), and 332.

APPENDIX C

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact of the proposal described in the attached Second Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking on small entities. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments in the Second Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking. The Commission will send a copy of the Second Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).[2] In addition, the Second Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking and IRFA (or summaries thereof) will be published in the Federal Register.[3]

A. Need for, and Objectives of, the Proposed Rules

2. In the Second Further Notice of Proposed Rulemaking, we seek comment on measures to improve 911 availability and location determination for users of interconnected Voice over Internet Protocol (VoIP) services. First, we seek comment on whether to expand the current definition of "interconnected VoIP service" for 911 purposes to include "outbound-only" interconnected VoIP services (i.e., services that support outbound but not inbound voice calling). These services, which allow consumers to place IP-based outbound calls to any telephone number, have grown increasingly popular in recent years and may be increasingly likely to generate consumer expectations that they will support 911 calling. Therefore, we seek comment on whether to extend to outbound-only VoIP service providers similar 911 requirements that have applied to other interconnected VoIP service providers since 2005.

3. We also seek comment on whether we should develop a framework for ensuring that all interconnected VoIP service providers can provide automatic location information for VoIP 911 calls. Currently, interconnected VoIP customers must provide their location information manually by registering the location of the phone. While the registered location approach has yielded benefits, in light of the increasing popularity of VoIP calling, the enhanced mobility of VoIP devices, and the evolution of consumer expectations, we believe it is beneficial to continue working towards automatic location solutions for interconnected VoIP calls to 911. Because this work is ongoing, we do not propose specific location accuracy requirements for interconnected VoIP service at this time but instead seek comment on whether we should adopt a set of general governing principles for the development of location accuracy solutions. To ensure that automatic location information can be generated and transmitted in the most technologically efficient and cost-effective manner possible, some of these solutions may require participation by both "over the top" interconnected VoIP service providers that offer service to customers and broadband providers that provide underlying network connectivity for VoIP calls. Governing principles might apply to both types of providers but would afford flexibility to VoIP service providers and broadband providers to develop alternative solutions appropriate to specific VoIP 911 scenarios.

4. Finally, we seek comment on an array of issues associated with extending 911 calling and location accuracy requirements to broadband-based voice services other than interconnected VoIP service. We seek comment on whether it may be possible to support 911 location determination through

[1] *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).

[2] *See* 5 U.S.C. § 603(a).

[3] *See* 5 U.S.C. § 603(a).

leveraging of location technologies that are already being developed for commercial broadband applications. Finally, we seek comment on technological approaches to improve location accuracy for 911 communications originating from indoor environments.

5. In the Notice of Proposed Rulemaking, we seek comment on whether, if we were to amend the definition of interconnected VoIP service contained in section 9.3 of our rules, such changes would have any legal implications with regard to other statutes or regulations that refer to that same definition.

B. Legal Basis

6. The legal basis for any action that may be taken pursuant to this Second Further Notice of Proposed Rulemaking is contained in Sections 1, 2, 4(i), 7, 10, 201, 214, 222, 251(e), 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333, 615a, 615a-1, 615b of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 154(i), 157, 160, 201, 214, 222, 251(e), 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333, 615a, 615a-1.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Would Apply

7. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules.[4] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[5] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[6] 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 Small Business Administration (SBA).[7]

8. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions*. Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards.[8] First, nationwide, there are a total of approximately 27.5 million small businesses, according to the SBA.[9] In addition, a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[10] Nationwide, as of 2007, there were approximately 1,,621,315 small organizations.[11] Finally, the term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population

[4] 5 U.S.C. §§ 603(b)(3), 604(a)(3).

[5] 5 U.S.C. § 601(6).

[6] 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 terms which are appropriate to the activities of the agency and publishes such definitions(s) in the Federal Register."

[7] 15 U.S.C. § 632.

[8] *See* 5 U.S.C. §§ 601(3)–(6).

[9] *See* SBA, Office of Advocacy, "Frequently Asked Questions," web.sba.gov/faqs (last visited May 6,2011; figures are from 2009).

[10] 5 U.S.C. § 601(4).

[11] INDEPENDENT SECTOR, THE NEW NONPROFIT ALMANAC & DESK REFERENCE (2010).

of less than fifty thousand."[12] Census Bureau data for 2011 indicate that there were 89,476 local governmental jurisdictions in the United States.[13] We estimate that, of this total, as many as 88, 506 entities may qualify as "small governmental jurisdictions."[14] Thus, we estimate that most governmental jurisdictions are small.

1. Telecommunications Service Entities

c. Wireless Telecommunications Service Providers

9. Pursuant to 47 C.F.R. § 20.18(a), the Commission's 911 service requirements are only applicable to Commercial Mobile Radio Service (CMRS) "[providers], excluding mobile satellite service operators, to the extent that they: (1) Offer real-time, two way switched voice service that is interconnected with the public switched network; and (2) Utilize an in-network switching facility that enables the provider to reuse frequencies and accomplish seamless hand-offs of subscriber calls. These requirements are applicable to entities that offer voice service to consumers by purchasing airtime or capacity at wholesale rates from CMRS licensees."

10. Below, for those services subject to auctions, we note that, as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Also, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated.

11. *Wireless Telecommunications Carriers (except Satellite)*. Since 2007, the Census Bureau has placed wireless firms within this new, broad, economic census category.[15] Prior to that time, such firms were within the now-superseded categories of "Paging" and "Cellular and Other Wireless Telecommunications."[16] Under the present and prior categories, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.[17] For the category of Wireless Telecommunications Carriers (except Satellite), Census data for 2007, which supersede data contained in the 2002 Census, show that there were 1,383 firms that operated that year.[18] Of those 1,383, 1,368 had fewer than 100

[12] 5 U.S.C. § 601(5).

[13] U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2011, Table 427 (2007).

[14] The 2007 U.S Census data for small governmental organizations are not presented based on the size of the population in each such organization. There were 89, 476 small governmental organizations in 2007. If we assume that county, municipal, township and school district organizations are more likely than larger governmental organizations to have populations of 50,000 or less, , the total of these organizations is 52,125. If we make the same assumption about special districts, and also assume that special districts are different from county, municipal, township, and school districts, in 2007 there were 37,381 special districts. Therefore, of the 89,476 small governmental organizations documented in 2007, as many as 89,506 may be considered small under the applicable standard. This data may overestimate the number of such organizations that has a population of 50,000 or less. U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 2011, Tables 427, 426 (Data cited therein are from 2007).

[15] U.S. Census Bureau, 2007 NAICS Definitions, "517210 Wireless Telecommunications Categories (Except Satellite)"; http://www.census.gov/naics/2007/def/ND517210.HTM#N517210.

[16] U.S. Census Bureau, 2002 NAICS Definitions, "517211 Paging"; http://www.census.gov/epcd/naics02/def/NDEF517.HTM.; U.S. Census Bureau, 2002 NAICS Definitions, "517212 Cellular and Other Wireless Telecommunications"; http://www.census.gov/epcd/naics02/def/NDEF517.HTM.

[17] 13 C.F.R. § 121.201, NAICS code 517210 (2007 NAICS). The now-superseded, pre-2007 C.F.R. citations were 13 C.F.R. § 121.201, NAICS codes 517211 and 517212 (referring to the 2002 NAICS).

[18] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS code 517210 (rel. Oct. 20, 2009), http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.
(continued….)

employees, and 15 firms had more than 100 employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small.

12. *Wireless Service Providers*. The SBA has developed a small business size standard for wireless firms within the two broad economic census categories of "Paging" and "Cellular and Other Wireless Telecommunications." Under both categories, the SBA deems a wireless business to be small if it has 1,500 or fewer employees. For the census category of Paging, Census Bureau data for 2002 show that there were 807 firms in this category that operated for the entire year. Of this total, 804 firms had employment of 999 or fewer employees, and three firms had employment of 1,000 employees or more. Thus, under this category and associated small business size standard, the majority of firms can be considered small. For the census category of Cellular and Other Wireless Telecommunications, Census Bureau data for 2002 show that there were 1,397 firms in this category that operated for the entire year. Of this total, 1,378 firms had employment of 999 or fewer employees, and 19 firms had employment of 1,000 employees or more. Thus, under this second category and size standard, the majority of firms can, again, be considered small.

13. *Incumbent Local Exchange Carriers* (*Incumbent LECs*). Neither the Commission nor the SBA has developed a small business size standard specifically for incumbent local exchange services. The appropriate size standard under SBA rules is for the category Wired Telecommunications Carriers. Under that size standard, such a business is small if it has 1,500 or fewer employees.[19] Census Bureau data for 2007, which now supersede data from the 2002 Census, show that there were 3,188 firms in this category that operated for the entire year. Of this total, 3,144 had employment of 999 or fewer, and 44 firms had had employment of 1000 or more. According to Commission data, 1,307 carriers reported that they were incumbent local exchange service providers.[20] Of these 1,307 carriers, an estimated 1,006 have 1,500 or fewer employees and 301 have more than 1,500 employees.[21] Consequently, the Commission estimates that most providers of local exchange service are small entities that may be affected by the rules and policies proposed in the Notice. Thus under this category and the associated small business size standard, the majority of these incumbent local exchange service providers can be considered small.[22]

14. A *Competitive Local Exchange Carriers (Competitive LECs), Competitive Access Providers (CAPs), Shared-Tenant Service Providers, and Other Local Service Providers.* Neither the Commission nor the SBA has developed a small business size standard specifically for these service providers. The appropriate size standard under SBA rules is for the category Wired Telecommunications Carriers. Under that size standard, such a business is small if it has 1,500 or fewer employees.[23] . Census Bureau data for 2007, which now supersede data from the 2002 Census, show that there were 3,188 firms in this category that operated for the entire year. Of this total, 3,144 had employment of 999 or fewer, and 44 firms had had employment of 1,000 employees or more. Thus under this category and the associated small business size standard, the majority of these Competitive LECs, CAPs, Shared-Tenant Service Providers, and Other Local Service Providers can be considered small entities.[24]. According to Commission data, 1,442 carriers reported that they were engaged in the provision of either competitive

(Continued from previous page)

[19] 13 C.F.R. § 121.201, NAICS code 517110.

[20] *See Trends in Telephone Service*, Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division at Table 5.3 (Sept. 2010) (*Trends in Telephone Service*).

[21] *See id*.

[22] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=600&-ds_name=EC0751SSSZ5&-_lang=en.

[23] 13 C.F.R. § 121.201, NAICS code 517110.

[24] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=600&-ds_name=EC0751SSSZ5&-_lang=en.

local exchange services or competitive access provider services.[25] Of these 1,442 carriers, an estimated 1,256 have 1,500 or fewer employees and 186 have more than 1,500 employees.[26] In addition, 17 carriers have reported that they are Shared-Tenant Service Providers, and all 17 are estimated to have 1,500 or fewer employees.[27] In addition, 72 carriers have reported that they are Other Local Service Providers.[28] Of the 72, seventy have 1,500 or fewer employees and two have more than 1,500 employees.[29] Consequently, the Commission estimates that most providers of competitive local exchange service, competitive access providers, Shared-Tenant Service Providers, and Other Local Service Providers are small entities that may be affected by rules adopted pursuant to the Notice.

15. *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.[30] 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.[31] These small business size standards, in the context of broadband PCS auctions, have been approved by the SBA.[32] 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.[33] On April 15, 1999, the Commission completed the reauction of 347 C-, D-, E-, and F-Block licenses in Auction No. 22.[34] Of the 57 winning bidders in that auction, 48 claimed small business status and won 277 licenses.

16. On January 26, 2001, the Commission completed the auction of 422 C and F Block Broadband PCS licenses in Auction No. 35. Of the 35 winning bidders in that auction, 29 claimed small business status.[35] 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

[25] *See Trends in Telephone Service* at Table 5.3.

[26] *See id.*

[27] *See id*.

[28] *See id*.

[29] *See id*.

[30] *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 C.F.R. § 24.720(b).

[31] *See PCS Report and Order*, 11 FCC Rcd at 7852, para. 60.

[32] *See Alvarez Letter 1998*.

[33] *See Broadband PCS, D, E and F Block Auction Closes*, Public Notice, Doc. No. 89838 (rel. Jan. 14, 1997).

[34] *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).

[35] *See C and F Block Broadband PCS Auction Closes; Winning Bidders Announced*, Public Notice, 16 FCC Rcd 2339 (2001).

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.[36] On May 21, 2007, the Commission completed an auction of 33 licenses in the A, C, and F Blocks in Auction No. 71.37 Of the 12 winning bidders in that auction, five claimed small business status and won 18 licenses.38 On August 20, 2008, the Commission completed the auction of 20 C-, D-, E-, and F-Block Broadband PCS licenses in Auction No. 78.[39] Of the eight winning bidders for Broadband PCS licenses in that auction, six claimed small business status and won 14 licenses.[40]

17. *Narrowband Personal Communications Services*. 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.[41] 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.[42]

18. *Specialized Mobile Radio.* The Commission awards "small entity" bidding credits in auctions for Specialized Mobile Radio (SMR) geographic area licenses in the 800 MHz and 900 MHz bands to firms that had revenues of no more than $15 million in each of the three previous calendar years.[43] The Commission awards "very small entity" bidding credits to firms that had revenues of no more than $3 million in each of the three previous calendar years.[44] The SBA has approved these small business size standards for the 900 MHz Service.[45] The Commission has held auctions for geographic area licenses in the 800 MHz and 900 MHz bands. The 900 MHz SMR was completed in 1996. Sixty bidders claiming that they qualified as small businesses under the $15 million size standard won 263 geographic area licenses in the 900 MHz SMR band. The 800 MHz SMR auction for the upper 200 channels was conducted in 1997. Ten bidders claiming that they qualified as small businesses under the $15 million size standard won 38 geographic area licenses for the upper 200 channels in the 800 MHz

[36] *See Broadband PCS Spectrum Auction Closes; Winning Bidders Announced for Auction No. 58*, Public Notice, 20 FCC Rcd 3703 (2005).

[37] *See Auction of Broadband PCS Spectrum Licenses Closes; Winning Bidders Announced for Auction No. 71*, Public Notice, 22 FCC Rcd 9247 (2007).

[38] *Id*.

[39] *See Auction of AWS-1 and Broadband PCS Licenses Closes; Winning Bidders Announced for Auction 78*, Public Notice, 23 FCC Rcd 12749 (WTB 2008).

[40] *Id.*

[41] *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).

[42] *See* Letter to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC, from Aida Alvarez, Administrator, SBA (Dec. 2, 1998).

[43] 47 C.F.R. § 90.814(b)(1).

[44] *Id*.

[45] *See* Letter to Thomas Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated August 10, 1999.

SMR band.[46] A second auction for the 800 MHz band was conducted in 2002 and included 23 BEA licenses. One bidder claiming small business status won five licenses.[47]

19. The auction of the 1,050 800 MHz SMR geographic area licenses for the General Category channels was conducted in 2000. Eleven bidders won 108 geographic area licenses for the General Category channels in the 800 MHz SMR band qualified as small businesses under the $15 million size standard.[48] In an auction completed in 2000, a total of 2,800 Economic Area licenses in the lower 80 channels of the 800 MHz SMR service were awarded[49]. Of the 22 winning bidders, 19 claimed "small business" status and won 129 licenses. Thus, combining all three auctions, 40 winning bidders for geographic licenses in the 800 MHz SMR band claimed status as small business.

20. In addition, there are numerous incumbent site-by-site SMR licensees and licensees with extended implementation authorizations in the 800 and 900 MHz bands. We do not know how many firms provide 800 MHz or 900 MHz geographic area SMR pursuant to extended implementation authorizations, nor how many of these providers have annual revenues of no more than $15 million. One firm has over $15 million in revenues. In addition, we do not know how many of these firms have 1500 or fewer employees.[50] We assume, for purposes of this analysis, that all of the remaining existing extended implementation authorizations are held by small entities, as that small business size standard is approved by the SBA.

21. *AWS Services (1710–1755 MHz and 2110–2155 MHz bands (AWS-1); 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz bands (AWS-2); 2155–2175 MHz band (AWS-3))*. For the AWS-1 bands, 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.[51] In 2006, the Commission conducted its first auction of AWS-1 licenses.[52] In that initial AWS-1 auction, 31 winning bidders identified themselves as very small businesses.[53] Twenty-six of the winning bidders identified themselves as small businesses.[54] In a subsequent 2008 auction, the Commission offered 35 AWS-1 licenses.[55] Four winning bidders identified themselves as very small

[46] *See* "Correction to Public Notice DA 96-586 'FCC Announces Winning Bidders in the Auction of 1020 Licenses to Provide 900 MHz SMR in Major Trading Areas,'" *Public Notice*, 18 FCC Rcd 18367 (WTB 1996).

[47] *See* "Multi-Radio Service Auction Closes," *Public Notice*, 17 FCC Rcd 1446 (WTB 2002).

[48] *See* "800 MHz Specialized Mobile Radio (SMR) Service General Category (851-854 MHz) and Upper Band (861-865 MHz) Auction Closes; Winning Bidders Announced," *Public Notice*, 15 FCC Rcd 17162 (2000).

[49] *See*, "800 MHz SMR Service Lower 80 Channels Auction Closes; Winning Bidders Announced," *Public Notice*, 16 FCC Rcd 1736 (2000).

[50] *See generally* 13 C.F.R. § 121.201, NAICS code 517210.

[51] *See* Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, *Report and Order*, 18 FCC Rcd 25,162, App. B (2003), *modified by* Service Rules for Advanced Wireless Services In the 1.7 GHz and 2.1 GHz Bands, *Order on Reconsideration*, 20 FCC Rcd 14,058, App. C (2005).

[52] *See* "Auction of Advanced Wireless Services Licenses Scheduled for June 29, 2006; Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Procedures for Auction No. 66," AU Docket No. 06-30, *Public Notice*, 21 FCC Rcd 4562 (2006) ("*Auction 66 Procedures Public Notice*").

[53] *See* "Auction of Advanced Wireless Services Licenses Closes; Winning Bidders Announced for Auction No. 66," *Public Notice*, 21 FCC Rcd 10,521 (2006) ("*Auction 66 Closing Public Notice*").

[54] *See id.*

[55] *See AWS-1 and Broadband PCS Procedures Public Notice*, 23 FCC Rcd at 7499. Auction 78 also included an auction of broadband PCS licenses.

businesses, and three of the winning bidders identified themselves as a small business.[56]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 has proposed to treat both AWS-2 and AWS-3 similarly to broadband PCS service and AWS-1 service due to the comparable capital requirements and other factors, such as issues involved in relocating incumbents and developing markets, technologies, and services.[57]

22. *Rural Radiotelephone Service*. The Commission has not adopted a size standard for small businesses specific to the Rural Radiotelephone Service. A significant subset of the Rural Radiotelephone Service is the Basic Exchange Telephone Radio System ("BETRS"). In the present context, we will use the SBA's small business size standard applicable to Wireless Telecommunications Carriers (except Satellite), i.e., an entity employing no more than 1,500 persons.[58] There are approximately 1,000 licensees in the Rural Radiotelephone Service, and the Commission estimates that there are 1,000 or fewer small entity licensees in the Rural Radiotelephone Service that may be affected by the rules and policies adopted herein.

23. *Wireless Communications Services.* This service can be used for fixed, mobile, radiolocation, and digital audio broadcasting satellite uses in the 2305-2320 MHz and 2345-2360 MHz bands. 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.[59] The SBA has approved these definitions.[60] The Commission auctioned geographic area licenses in the WCS service. In the auction, which commenced on April 15, 1997 and closed on April 25, 1997, there were seven bidders that won 31 licenses that qualified as very small business entities, and one bidder that won one license that qualified as a small business entity.

24. *220 MHz Radio Service – Phase I Licensees*. The 220 MHz service has both Phase I and Phase II licenses. Phase I licensing was conducted by lotteries in 1992 and 1993. There are approximately 1,515 such non-nationwide licensees and four nationwide licensees currently authorized to operate in the 220 MHz band. The Commission has not developed a small business size standard for small entities specifically applicable to such incumbent 220 MHz Phase I licensees. To estimate the number of such licensees that are small businesses, the Commission applies the small business size standard under the SBA rules applicable. The SBA has deemed a wireless business to be small if it has

[56] *See* "Auction of AWS-1 and Broadband PCS Licenses Closes, Winning Bidders Announced for Auction 78, Down Payments Due September 9, 2008, FCC Forms 601 and 602 Due September 9, 2008, Final Payments Due September 23, 2008, Ten-Day Petition to Deny Period," *Public Notice*, 23 FCC Rcd 12,749 (2008).

[57] Service Rules for Advanced Wireless Services in the 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz Bands et al., *Notice of Proposed Rulemaking*, 19 FCC Rcd 19,263, App. B (2005); Service Rules for Advanced Wireless Services in the 2155–2175 MHz Band, *Notice of Proposed Rulemaking*, 22 FCC Rcd 17,035, App. (2007); Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band, *Further Notice of Proposed Rulemaking*, 23 FCC Rcd 9859, App. B (2008).

[58] NAICS Code 51210.

[59] Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (WCS), *Report and Order*, 12 FCC Rcd 10785, 10879 ¶ 194 (1997).

[60] *See* Letter to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated December 2, 1998.

1,500 or fewer employees.[61] For this service, the SBA uses the category of Wireless Telecommunications Carriers (except Satellite). Census data for 2007, which supersede data contained in the 2002 Census, show that there were 1,383 firms that operated that year.[62] Of those 1,383, 1,368 had fewer than 100 employees, and 15 firms had more than 100 employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small.

25. *220 MHz Radio Service – Phase II Licensees.* The 220 MHz service has both Phase I and Phase II licenses. The Phase II 220 MHz service is a new service, and is subject to spectrum auctions. In the *220 MHz Third Report and Order*, the Commission adopted a small business size standard for defining "small" and "very small" businesses for purposes of determining their eligibility for special provisions such as bidding credits and installment payments.[63] This small business standard indicates that a "small business" is an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding $15 million for the preceding three years.[64] A "very small business" is defined as an entity that, together with its affiliates and controlling principals, has average gross revenues that do not exceed $3 million for the preceding three years.[65] The SBA has approved these small size standards.[66] Auctions of Phase II licenses commenced on and closed in 1998.[67] In the first auction, 908 licenses were auctioned in three different-sized geographic areas: three nationwide licenses, 30 Regional Economic Area Group (EAG) Licenses, and 875 Economic Area (EA) Licenses. Of the 908 licenses auctioned, 693 were sold.[68] Thirty-nine small businesses won 373 licenses in the first 220 MHz auction. A second auction included 225 licenses: 216 EA licenses and 9 EAG licenses. Fourteen companies claiming small business status won 158 licenses.[69] A third auction included four licenses: 2 BEA licenses and 2 EAG licenses in the 220 MHz Service. No small or very small business won any of these licenses.[70] In 2007, the Commission conducted a fourth auction of the 220 MHz licenses.[71] Bidding credits were offered to small businesses. A bidder with attributed average annual gross revenues that exceeded $3 million and did not exceed $15 million for the preceding three years ("small business") received a 25 percent discount on its winning bid. A bidder with attributed average annual gross revenues

[61] 13 C.F.R. § 121.201, NAICS code 517210 (2007 NAICS). The now-superseded, pre-2007 C.F.R. citations were 13 C.F.R. § 121.201, NAICS codes 517211 and 517212 (referring to the 2002 NAICS).

[62] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS code 517210 (rel. Oct. 20, 2009), http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.

[63] Amendment of Part 90 of the Commission's Rules to Provide For the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service, *Third Report and Order*, 12 FCC Rcd 10943, 11068-70 ¶¶ 291-295 (1997).

[64] *Id.* at 11068 ¶ 291.

[65] *Id.*

[66] *See* Letter to Daniel Phythyon, Chief, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated January 6, 1998 (*Alvarez to Phythyon Letter 1998*).

[67] *See generally* "220 MHz Service Auction Closes," *Public Notice*, 14 FCC Rcd 605 (WTB 1998).

[68] *See* "FCC Announces It is Prepared to Grant 654 Phase II 220 MHz Licenses After Final Payment is Made," *Public Notice*, 14 FCC Rcd 1085 (WTB 1999).

[69] *See* "Phase II 220 MHz Service Spectrum Auction Closes," *Public Notice*, 14 FCC Rcd 11218 (WTB 1999).

[70] *See* "Multi-Radio Service Auction Closes," *Public Notice*, 17 FCC Rcd 1446 (WTB 2002).

[71] *See* "Auction of Phase II 220 MHz Service Spectrum Scheduled for June 20, 2007, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Procedures for Auction 72, *Public Notice,* 22 FCC Rcd 3404 (2007).

that did not exceed $3 million for the preceding three years received a 35 percent discount on its winning bid ("very small business"). Auction 72, which offered 94 Phase II 220 MHz Service licenses, concluded in 2007.[72] In this auction, five winning bidders won a total of 76 licenses. Two winning bidders identified themselves as very small businesses won 56 of the 76 licenses. One of the winning bidders that identified themselves as a small business won 5 of the 76 licenses won.

26. *700 MHz Guard Band Licenses.* 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.[73] 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.[74] 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.[75] SBA approval of these definitions is not required.[76] In 2000, the Commission conducted an auction of 52 Major Economic Area ("MEA") licenses.[77] 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 and closed in 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.[78]

27. *Upper 700 MHz Band Licenses*. In the *700 MHz Second Report and Order*, the Commission revised its rules regarding Upper 700 MHz licenses.[79] 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

[72] *See* "Auction of Phase II 220 MHz Service Spectrum Licenses Closes, Winning Bidders Announced for Auction 72, Down Payments due July 18, 2007, FCC Forms 601 and 602 due July 18, 2007, Final Payments due August 1, 2007, Ten-Day Petition to Deny Period, *Public Notice,* 22 FCC Rcd 11573 (2007).

[73] Service Rules for the 746-764 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *Second Report and Order*, 15 FCC Rcd 5299 (2000). Service rules were amended in 2007, but no changes were made to small business size categories. *See* Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones, WT Docket No. 01-309, Biennial Regulatory Review – Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services, WT Docket 03-264, Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission's Rules, WT Docket No. 06-169, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, WT Docket No. 96-86, *Report and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd 8064 (2007).

[74] *Id*. at 5343 ¶ 108.

[75] *Id*.

[76] *Id*. at 5343 ¶ 108 n.246 (for the 746-764 MHz and 776-704 MHz bands, the Commission is exempt from 15 U.S.C. § 632, which requires Federal agencies to obtain Small Business Administration approval before adopting small business size standards).

[77] *See* "700 MHz Guard Bands Auction Closes: Winning Bidders Announced," *Public Notice*, 15 FCC Rcd 18026 (2000).

[78] *See* "700 MHz Guard Bands Auction Closes: Winning Bidders Announced," *Public Notice*, 16 FCC Rcd 4590 (WTB 2001).

[79] *700 MHz Second Report and Order*, 22 FCC Rcd 15289.

nationwide license in the D Block.[80] 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.

28. *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.[81] 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.[82] 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.[83] 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.[84] The SBA approved these small size standards.[85] 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)) was conducted in 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 licenses.[86] A second auction commenced on May 28, 2003, closed on June 13, 2003, and included 256 licenses.[87] Seventeen winning bidders claimed small or very small business status, and nine winning bidders claimed entrepreneur status.[88] In 2005, the Commission completed an auction of 5 licenses in the Lower 700 MHz band. All three winning bidders claimed small business status.

29. In 2007, the Commission reexamined its rules governing the 700 MHz band in the *700 MHz Second Report and Order*.[89] An auction of A, B and E block 700 MHz licenses was held in 2008.[90] Twenty winning bidders claimed 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). Thirty three winning bidders claimed very small business status (those with attributable average annual gross revenues that do not exceed $15 million for the preceding three years).

30. *Offshore Radiotelephone Service.* This service operates on several UHF television broadcast channels that are not used for television broadcasting in the coastal areas of states bordering the Gulf of Mexico.[91] There are presently approximately 55 licensees in this service. The Commission is unable to estimate at this time the number of licensees that would qualify as small under the SBA's small

[80] *See* Auction of 700 MHz Band Licenses Closes, *Public Notice*, 23 FCC Rcd 4572 (WTB 2008).

[81] *See* Reallocation and Service Rules for the 698–746 MHz Spectrum Band (Television Channels 52–59), *Report and Order*, 17 FCC Rcd 1022 (2002) ("*Channels 52–59 Report and Order*").

[82] *See id.*, 17 FCC Rcd at 1087–88 ¶ 172.

[83] *See id*.

[84] *See id.*, 17 FCC Rcd at 1088 ¶ 173.

[85] *See Alvarez Letter 1998*.

[86] *See* Lower 700 MHz Band Auction Closes, *Public Notice*, 17 FCC Rcd 17,272 (2002).

[87] *See* Lower 700 MHz Band Auction Closes, *Public Notice*, 18 FCC Rcd 11,873 (2003).

[88] *See id.*

[89] 700 MHz Second Report and Order, *Second Report and Order*, 22 FCC Rcd 15,289, 15,359 n.434 (2007).

[90] *See* Auction of 700 MHz Band Licenses Closes, *Public Notice*, 23 FCC Rcd 4572 (2008).

[91] This service is governed by Subpart I of Part 22 of the Commission's Rules. *See* 47 C.F.R. §§ 22.1001-22.1037.

business size standard for the category of Wireless Telecommunications Carriers (except Satellite). Under that standard.[92] Under that SBA small business size standard, a business is small if it has 1,500 or fewer employees.[93] Census data for 2007, which supersede data contained in the 2002 Census, show that there were 1,383 firms that operated that year.[94] Of those 1,383, 1,368 had fewer than 100 employees, and 15 firms had more than 100 employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small.

31. *Wireless Telephony*. Wireless telephony includes cellular, personal communications services, and specialized mobile radio telephony carriers. As noted, the SBA has developed a small business size standard for Wireless Telecommunications Carriers (except Satellite).[95] Under the SBA small business size standard, a business is small if it has 1,500 or fewer employees.[96] According to *Trends in Telephone Service* data, 413 carriers reported that they were engaged in wireless telephony.[97] Of these, an estimated 261 have 1,500 or fewer employees and 152 have more than 1,500 employees.[98] Therefore, more than half of these entities can be considered small.

32. *Satellite Telecommunications Providers.* Two economic census categories address the satellite industry. The first category has a small business size standard of $15 million or less in average annual receipts, under SBA rules.[99] The second has a size standard of $25 million or less in annual receipts.[100]

33. The category of Satellite Telecommunications "comprises establishments primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications."[101] Census Bureau data for 2007 show that 512 Satellite Telecommunications firms that operated for that entire year.[102] Of this total, 464 firms had annual receipts of under $10 million, and 18 firms had receipts of $10 million to $24,999,999.[103] Consequently, the Commission estimates that the majority of Satellite Telecommunications firms are small entities that might be affected by our action.

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[92] 13 C.F.R. § 121.201, NAICS code 517210.

[93] *Id*.

[94] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS code 517210 (rel. Oct. 20, 2009), http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.

[95] 13 C.F.R. § 121.201, NAICS code 517210.

[96] *Id*.

[97] TRENDS IN TELEPHONE SERVICE, tbl. 5.3.

[98] *Id.*

[99] 13 C.F.R. § 121.201, NAICS code 517410.

[100] 13 C.F.R. § 121.201, NAICS code 517919.

[101] U.S. Census Bureau, 2007 NAICS Definitions, "517410 Satellite Telecommunications."

[102] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

[103] http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

34. The second category, i.e. "All Other Telecommunications" comprises "establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or Voice over Internet Protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry."[104] For this category, Census Bureau data for 2007 show that there were a total of 2,383 firms that operated for the entire year.[105] Of this total, 2,346 firms had annual receipts of under $25 million and 37 firms had annual receipts of $25 million to $49, 999,999.[106] Consequently, the Commission estimates that the majority of All Other Telecommunications firms are small entities that might be affected by our action.

a. Equipment Manufacturers

35. *Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.* The Census Bureau defines this category as follows: "This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment." The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing which is: all such firms having 750 or fewer employees. According to Census Bureau data for 2007, there were a total of 939 establishments in this category that operated for part or all of the entire year. Of this total, 784 had less than 500 employees and 155 had more than 100 employees.[107] Thus, under this size standard, the majority of firms can be considered small.

36. *Semiconductor and Related Device Manufacturing.* These establishments manufacture "computer storage devices that allow the storage and retrieval of data from a phase change, magnetic, optical, or magnetic/optical media. *The* SBA has developed a small business size standard for this category of manufacturing; that size standard is 500 or fewer employees storage and retrieval of data from a phase change, magnetic, optical, or magnetic/optical media."[108] According to data from the 2007 U.S. Census, in 2007, there were 954 establishments engaged in this business. Of these, 545 had from 1 to 19 employees; 219 had from 20 to 99 employees; and 190 had 100 or more employees.[109] Based on this data, the Commission concludes that the majority of the businesses engaged in this industry are small.

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[104] *http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517919&search=2007%20NAICS%20Search*.

[105] U.S. Census, http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

[106] http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

[107] The NAICS Code for this service 334220. See 13 C.F.R 121/201. See also http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=300&-ds_name=EC0731SG2&-_lang=en.

[108] U.S. Census Bureau, 2007 Economic Census, Industry Series: Manufacturing, "Semiconductor and Related Device Manufacturing ," NAICS code 334413.

[109] http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=300&-ds_name=EC0731I1&-_lang=en.

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

37. The Second Further Notice of Proposed Rulemaking and the Notice of Proposed Rulemaking do not adopt any recordkeeping or reporting requirements.

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

38. The RFA requires an agency to describe any significant, specifically small business 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 than design, standards; and (4) and exemption from coverage of the rule, or any part thereof, for small entities."[110]

39. The Second Further Notice of Proposed Rulemaking seeks comment on ways we might amend our location accuracy standards. To assist in the analysis, commenters are requested to provide information regarding how small entities would be affected if the Commission were to adopt any changes.

40. We seek comment on whether to expand our 911 rules to include "outbound-only" interconnected VoIP services (i.e., services that support outbound but not inbound voice calling) and request that commenters provide any information regarding how small entities would be affected by such an expansion. Additionally, we seek comment on any alternative proposals to ensure that we continue to further the achievement of long-established regulatory goals to promote the safety of life and property.[111]

41. We also seek comment on whether to modify the fourth prong of the existing definition of interconnected VoIP service to define connectivity in terms of the ability to connect calls to United States E.164 telephone numbers rather than the PSTN. This potential change would reflect the fact that VoIP service providers are not limited to using the circuit-switched PSTN to connect or receive telephone calls. Indeed, as networks evolve away from circuit-switched technology, VoIP users are increasingly likely to place and receive telephone calls where the end-to-end transmission is entirely over IP-based networks. By referencing E.164 telephone numbers and eliminating reference to the PSTN, the proposed definition is technically more accurate and avoids potential technical obsolescence. We seek comment on this proposal.

42. We also seek comment on whether we should adopt a set of proposed general location accuracy governing principles that could be applied to interconnected VoIP broadband providers and over-the-top VoIP service providers, but that would allow both types of providers flexibility to develop technologically efficient and cost-effective solutions. One governing principle might be that when an interconnected VoIP user accesses the Internet to place an emergency call, the underlying broadband provider must be capable of providing location information regarding the access point being used by the device or application, using industry-standard protocols on commercially reasonable and non-discriminatory terms. Under this proposal, the broadband provider would be able to satisfy its obligation by providing the access point location information to: (1) the end user, (2) the over the top VoIP service provider, and/or (3) the PSAP. A second general principle might be that when an interconnected VoIP user places an emergency call, the VoIP service provider must either provide ALI directly (e.g., using geo-location information generated by the device or application) or must support the provision of access point location information by the broadband provider as described above. How would any governing

[110] 5 U.S.C. §§ 603(c)(1)-(c)(4).

[111] VoIP 911 Order at ¶ 29.

standards affect small entities? Are there alternative governing standards that might better accommodate the needs of small entities?

43. Finally, we seek comment on developing operational benchmarks for evaluating carriers' ability to provide precise location information for emergency purposes based on device capabilities. We further invite commenters to address whether the Commission should develop such benchmarks, and if so, what they should be.

44. We also seek comment on whether, if we were to extend 911 rules to outbound-only interconnected VoIP service, such a change would have any legal effect on our use of the term "interconnected VoIP service" in other contexts.

D. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

45. <None.>

APPENDIX D

Final Rules

Part 20 of the Code of Federal Regulations is amended as follows:

PART 20 – COMMERCIAL MOBILE RADIO SERVICES

1. The authority for Part 20 remains unchanged.

2. Section 20.18(h)(2)(iv) is added to read:

Providers of new CMRS networks that meet the definition of covered CMRS providers under paragraph (a) of this section must comply with the requirements of paragraphs (h)(2)(i)-(iii) of this section. For this purpose, a "new CMRS network" is a CMRS network that is newly deployed subsequent to the effective date of the Third Report and Order in PS Docket No. 07-114 and that is not an expansion or upgrade of an existing CMRS network.

STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI

Re: *Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission's Rules*, Notice of Proposed Rulemaking, GN Docket No. 11-117; *Wireless E911 Location Accuracy Requirements*, Third Report and Order, PS Docket No. 07-114; *E911 Requirements for IP-Enabled Service Providers,* Second Further Notice of Proposed Rulemaking, WC Docket No. 05-196

The Communications Act assigns this Commission important responsibilities with respect to public safety communications, none more significant than ensuring that our first responders are able to find and provide assistance to Americans in harm's way.

We are at a time of great opportunity and serious challenge when it comes to harnessing communications technologies to help first responders and save lives.

A nationwide, interoperable mobile broadband network would put the communications tools consumers take for granted in the hands of police, firefighters, and other first responders. It would implement an important recommendation of the 9/11 Commission. I applaud the Senate Commerce Committee for recently passing legislation to build a broadband public safety network; the House Energy and Commerce Committee is working on similar legislation. And we will continue to work with Congress to make that vision a reality.

On emergency alerts, modern communications give us the opportunity to alert people to disasters anytime, anywhere. But until recently, this was just a theory.

I was pleased to announce at Ground Zero the accelerated deployment of a new national mobile alerting system – PLAN – which will allow people to receive emergency alerts directly on their mobile phones. This is complementary to the broadcast emergency alert system. A similar system saved lives during the recent earthquake and tsunami in Japan, and it will make a real difference here in the U.S. during, for example, disasters like the recent tornadoes in the Southeast, where every second of warning counts.

With respect to 9-1-1, there are also big opportunities and challenges – opportunities to connect people and 9-1-1 responders through all forms of communications. But today's 9-1-1 system does not empower the means of communication consumers take for granted. It does not provide for sending texts to 9-1-1, or photos or video.

Today, the average American sends about 20 texts a day, and the average teenager sends over 100. Yet we know of instances like the tragedy at Virginia Tech where texts to 9-1-1 went unanswered. Who knows how many other times this has happened, but even once is too many.

Today only about one-quarter of Public Safety Answering Points use broadband to process 9-1-1 calls. And that's only the first step to achieving next generation 9-1-1. We are hard at work developing a game plan to accelerate next-generation 9-1-1, and I will continue to make this an agency priority.

Today's action addresses another major opportunity and challenge – that of ensuring that *mobile* 9-1-1 works as it should. For both the current 9-1-1 system and next generation 9-1-1 to work, we have to be sure that callers can be located, wherever they are, whatever technology they're using to communicate.

Mobile phones allow people to call 9-1-1 from anywhere, including places where traditional

phones aren't available. And the percentage of 9-1-1 calls from mobile has increased dramatically – from about 25% in 2001 to over 65% today.

When Americans call 9-1-1 from their landlines, first responders receive accurate location information more than 98 percent of the time. But one quarter of all households have now "cut the cord" and given up their landlines for wireless phones. Others are turning to alternative voice services that may not enable a PSAP to locate a caller or may not support 9-1-1 at all. When Americans call 9-1-1 from their mobile phones, first responders are about 50 percent less likely to receive precise information about the caller's location. One half as likely. And this affects both rural and urban areas. The inaccuracy can be up to one or two miles, or fail to pinpoint the caller's location inside a building, particularly a tall building, or the PSAP may get no location information at all. We must do better.

A consumer who has come to expect an alert on her cell phone that a nearby restaurant is offering a discounted meal should also be able to expect that when she contacts 9-1-1, first responders will know where she is.

Today's Order sets us on the path to improving the delivery of accurate location information when the public calls for help. The *Third Report and Order* continues the process we began last September of strengthening our existing Enhanced 9-1-1 (or E9-1-1) location accuracy rules, by requiring all wireless carriers to meet the more stringent metrics of the handset-based location accuracy standard. The item has a necessary transition plan to come into compliance. I encourage commercial mobile carriers to beat the deadlines, as many mobile carriers have committed to accelerate implementation of the new PLAN emergency mobile alerts.

We also are initiating periodic testing of the ability of wireless networks to provide accurate location information to ensure that first responders can rely on the location information they receive. And we extend that challenge to finding and developing cost effective solutions to the problem of indoor location accuracy, which poses difficulties when callers are deep inside buildings without a strong signal.

In that same vein, I encourage VoIP providers to work with us to ensure that VoIP consumers can call 9-1-1 in an emergency with first responders getting the location information that can save lives.

Today's *Second Further Notice* also explores ways to ensure that newer communications technologies like VoIP service leverage existing technology to provide 9-1-1 centers with critical and potentially life-saving automatic location information.

I thank the staff of our Public Safety and Homeland Security Bureau, and my Special Counsel and Legal Advisor, Amy Levine, for their considerable and ongoing work in this area. I look forward to working closely with the CSRIC, the public safety community, communications providers, and other stakeholders to continue to harness technology to improve our nation's 9-1-1 service.

STATEMENT OF
COMMISSIONER MICHAEL J. COPPS

Re: *Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission's Rules*, Notice of Proposed Rulemaking, GN Docket No. 11-117; *Wireless E911 Location Accuracy Requirements*, Third Report and Order, PS Docket No. 07-114; *E911 Requirements for IP-Enabled Service Providers,* Second Further Notice of Proposed Rulemaking, WC Docket No. 05-196

I was pleased to receive this item. E911 is a matter of ongoing and high priority attention for the Commission and today's proceeding is another step in the right direction. I don't need to dwell on the importance of E911 saving lives, protecting property, and preventing and discouraging crime. Location accuracy has gotten measurably better and certainly we have seen welcome increases in GPS-capable handsets and in network upgrades. That's good news for citizens. But even as we applaud that, we know our job is far from being done and we are still pushed by our public interest duty to move things along with all deliberate speed. This is another step in the right direction.

In light of the dynamic changes in technology, I support maintaining separate standards for both network and handset based location systems. I am particularly pleased that we are now requiring carriers to test and report to us, as well as to state 911 centers and PSAPs, whether or not carriers are hitting the mark for outdoor calls. This kind of real-world data can only make our diagnosis and our decisions better. And it will provide our Communications Security, Reliability, and Interoperability Council (CSRIC) important information that it needs as it considers its next steps and recommendations. I am hopeful CSRIC will provide the guidance we need toward the development of effective standards as a top priority matter. As I have stated many times before, vitally-necessary E911 infrastructure will best be built by the private and public sectors discussing together, planning together, working together and coming up with solutions together. It's not something either sector can accomplish alone.

I also want to reemphasize the priority of keeping clear focus on the matter of indoor testing. As more consumers cut the cord, their cell phones become the one and often only 911-capable device in their homes. Today we ask the right questions about indoor testing. I welcome that because it is just absolutely critical that we do not let this issue stall. The record clearly shows that my requests for reports and studies on in-building coverage go back many years in the E911 Location Accuracy docket.

I am also encouraged that we propose to expand E911 requirements to a greater set of VoIP users. It makes complete sense to me that VoIP users who can make calls to anyone would expect to be able to reach 911 in an emergency. I look forward to what I hope is a thorough record that tells us what consumers of this and other one-way services expect. So I appreciate the Notice's questions about our authority to extend E911 requirements to VoIP services for which callers can only call out.

But it should not stop there. To me public safety communication means ***two-way*** communications. Two-way communications become really important if an emergency call gets disconnected, goes dead for any reason, or if other emergency responders need to contact the caller. So I am pleased that we will also inform ourselves about what consumers need in the way of receiving calls ***back*** from emergency call centers. I understand that the Net 911 Improvement Act bolsters our legal authority in this area. Nevertheless, as I have said before, I believe the Commission should look comprehensively at the proper classification of VoIP. At the risk of sounding like a broken record, our charge to protect the safety of the American people is clear and should never have to hinge on semantics or distinctions without a real difference.

The item also moves the ball forward for VoIP users by asking how we can ensure that location information is automatically updated. Today, that updating is a manual process. The issues are

technically challenging, I understand that. But we live in a digital world and we here at the FCC must demand digital solutions to these critical problems. So here, too, I look forward to reviewing the record and to taking appropriate steps to move this critical issue expeditiously forward.

I want to thank the Public Safety bureau for bringing us this important item and helping us work through its many technical aspects. I commend the Chairman for his leadership in making these issues a priority and I thank him and my colleagues for working together to enhance the item as it made its way around the Eighth Floor.

STATEMENT OF
COMMISSIONER ROBERT M. McDOWELL

Re: *Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission's Rules*, Notice of Proposed Rulemaking, GN Docket No. 11-117; *Wireless E911 Location Accuracy Requirements*, Third Report and Order, PS Docket No. 07-114; *E911 Requirements for IP-Enabled Service Providers,* Second Further Notice of Proposed Rulemaking, WC Docket No. 05-196

I am voting to approve today's actions on improving consumers' ability to make emergency calls using mobile and Internet Protocol (IP) technologies. Given the extraordinary growth of mobile and IP services, not to mention that some consumers may not care to understand the complexities of the technologies, how the systems operate or their regulatory treatment, I am pleased that the Commission is continuing its efforts in this important area. For example, in cases of heart attack or stroke, time is of the essence. A mobile device may be the only means to get help. It is crucial that we do all we can to improve emergency responders' ability to locate victims quickly.

I thank all of the interested parties for sharing their insights and marketplace experiences on this topic in response to the notice of inquiry initiated last September. And, I am grateful to the Chairman for his willingness to accept edits that allow for additional comment on indoor location accuracy testing. It is sensible for the Commission to undertake further study in this area given that the number of indoor wireless calls has increased dramatically in recent years.

Many thanks are also due to the Chairman for his support of improvements to our questions regarding the Commission's authority with regard to non-interconnected VoIP services. Given the unique context present here, I support the narrowly-tailored questions set forth in the notices of proposed rulemaking. Just last year, Congress passed legislation indicating that the Commission's definition of "interconnected VoIP" may include "non-interconnected VoIP" service,[112] thereby contemplating a greater level of authority for the Commission over these voice services. Moreover, as set forth in Section 151 of the Act, Congress long ago charged the Commission with promoting safety of life and property through the use of wire and radio communications. There is a longstanding recognition that ensuring clear and effective communications in times of emergency is a key aspect of the Commission's mission. Under these circumstances, I support our inquiry regarding the Commission's level of jurisdiction over the use of non-interconnected VoIP services for making emergency voice calls, but only in this narrow context.

Finally, in this instance, I support our decision to refrain from including draft rules at this time. Normally, I am a proponent of including draft rules. As we remain at a preliminary stage, however, final proposals have yet to be developed. For example, many of our questions are open-ended and seek input from the Communications Security, Reliability and Interoperability Council, a team of experts that provides recommendations to ensure, among other things, optimal reliability and functionality of our nation's communications systems. We also need a strong record illustrating the costs and technical feasibility of implementing these ideas. Thus, I approve of this prudent approach to develop the record further before drafting proposed rules.

Assisting consumers in times of emergency is one of the Commission's core responsibilities and

[112] *See* Twenty-First Century Communications and Video Accessibility Act of 2010, Pub. L. No. 111-260, 124 Stat. 2751 (2010) (amending sections 3, 255, 303, 330, 710, and 713 of the Communications Act, and adding sections 615c and 715-19, codified at 47 U.S.C. §§ 153, 225, 303, 330, 610, 613, 615c, 616-20); Truth in Caller ID Act of 2009, Pub. L. No. 111-331, 124 Stat. 3572 (2010).

is among the highest of callings of public servants. I look forward to learning more as a result of today's proceedings. As always, I thank our talented staff for their hard work and diligence.

STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN

Re: *Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission's Rules*, Notice of Proposed Rulemaking, GN Docket No. 11-117; *Wireless E911 Location Accuracy Requirements*, Third Report and Order, PS Docket No. 07-114; *E911 Requirements for IP-Enabled Service Providers,* Second Further Notice of Proposed Rulemaking, WC Docket No. 05-196

As our Fifteenth Mobile Services Report points out, the number of Americans who subscribe to wireless phone services has been increasing each year for the past nine years and, as of 2009, that figure exceeds 274 million. Therefore, it is important that the Commission's public safety policies keep pace with the Nation's growing dependence on these technologies. With regard to mobile wireless E-9-1-1 services, we must adopt rules that continue to improve the ability of public safety personnel to obtain accurate information, when a person uses a mobile phone to make an emergency call. Our regulatory approach should be comprehensive and adapt to the technological advances in the mobile wireless industry. But, our approach should also be reasonable and flexible enough to permit carriers to find the path to more accurate wireless E-9-1-1 services that is most cost effective for them.

This item, I believe, strikes the right balance. The Report and Order recognizes that the industry should be working towards the more stringent standard we set for handset based location technologies. It requires all new wireless providers, which meet the definition of covered CMRS providers in our Rules, to satisfy that standard. It also explains that the Commission intends to sunset the less stringent network based location standard. But it appropriately declines to impose a unitary standard for all providers. The record makes clear that providers who are currently using network-based E-9-1-1 solutions, are migrating to handset based solutions. Accordingly, the more accurate handset based standard should, as a practical matter and without a regulatory mandate, become the industry standard.

The two Notices we also adopt today, properly seek comment about expanding 9-1-1 location service requirements to cover more VoIP services. The item explains that, as the use of location based services on smart phones becomes more prevalent, Americans are beginning to expect that their service providers know their current location whenever they are using that device. It is therefore reasonable for them to also expect that, when they make a 9-1-1 call, their current location information should be provided to public safety agencies, whether they make the call using a traditional commercial wireless services or whether they are using VoIP services. Technical experts at the Internet Engineering Task Force have proposed standards that should allow that type of location communication to occur whenever a person chooses to make the 9-1-1 call using VoIP services. I hope that all relevant parties will contribute additional technical expertise that will move us closer to that goal.

I commend Admiral Jamie Barnett and his team at the Public Safety Homeland Security Bureau for presenting us with an excellent item.