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

In the Matter of	)	
	)	
Establishing the Digital Opportunity Data Collection	)	WC Docket No. 19-195
	)	
	)	
Modernizing the FCC Form 477 Data Program	)	WC Docket No. 11-10
	)	

SECOND REPORT AND ORDER AND THIRD FURTHER NOTICE OF PROPOSED RULEMAKING

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By the Commission: Chairman Pai and Commissioners O'Rielly and Carr issuing separate statements; Commissioner Rosenworcel approving in part, dissenting in part, and issuing a statement; Commissioner Starks concurring and issuing a statement.

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I. INTRODUCTION

1. Closing the digital divide and connecting every American to broadband no matter where he or she lives is the Commission's highest priority. But to bring broadband to every unserved part of the country means knowing where broadband is available, and where it is not. The Commission has made significant advances in bringing broadband to areas that the Commission's current data show are wholly unserved. To maintain that momentum, the Commission needs more granular, precise maps that will allow it to target support to Americans living in those areas where some, but not all, have access. Accurate and precise broadband maps are of enormous importance not only to the Commission, but also other federal policy makers, state policy makers, and consumers alike. Today's actions follow the pivotal step we took in 2019 when we adopted the Digital Opportunity Data Collection, laying out a three-pronged approach to developing a nationwide broadband map that will have unprecedented detail: Internet service providers, who have the most intimate knowledge of where their networks reach, provide granular and detailed coverage data; that coverage data is compared against a fabric of locations that are, or could be, serviced by a broadband connection; and consumers, plus state, local, and Tribal government entities, provide feedback on the accuracy of the broadband coverage data directly to the Commission.

2. Congress has likewise recognized that accurate and granular maps are essential to closing the digital divide. Congress passed the Broadband DATA Act in March 2020, largely codifying the Commission's overall approach to the Digital Opportunity Data Collection. The Broadband DATA Act requires the Commission, among other things, to issue final rules for collecting granular data from providers on the availability and quality of broadband Internet access service, to create publicly available coverage maps, to establish processes for members of the public and other entities to challenge and verify the coverage maps, and to create a common dataset of all locations where fixed broadband Internet access service can be installed.

3. This *Second Report and Order and Third Further Notice of Proposed Rulemaking* takes the next step in developing the new broadband coverage maps by adopting specific coverage reporting and disclosure requirements for fixed and mobile broadband providers, filing and certification requirements, measures for determining the accuracy of broadband availability data (including audits and collecting crowdsourced data), standards for collecting and incorporating verified data for use in the coverage maps from governmental entities and certain third parties, and establishing the Broadband Serviceable Location Fabric (Fabric). We also seek comment on several narrow issues relating to implementing the challenge and verification processes for coverage data, implementing the Fabric, and certain other specific requirements of the Broadband DATA Act outside the scope of the *Digital Opportunity Data Collection Order and Further Notice*.

II. BACKGROUND

4. The Commission's prior work collecting information about broadband availability has a lengthy history beginning in 2000 with FCC Form 477, originally a collection of subscription and connection data for local telephone and broadband services.[1] The Commission's broadband data collection efforts evolved over time, and in 2013 the Commission adopted the current Form 477 requirement that fixed service providers report a list of census blocks in which they provide access to broadband.[2] That block-level reporting, while imperfect, was a valuable data source that allowed the Commission to identify the least-served parts of the country and was incorporated into many Commission proceedings and actions, including reporting to Congress and the public about the availability of broadband services, informing transaction reviews, and supporting our universal service policies.[3] However, in 2017, the Commission recognized the need to collect and develop better quality, more useful, and more granular broadband deployment data to inform our policymaking.[4]

5. In August 2019, the Commission recognized "a compelling and immediate need" for better broadband deployment data, and adopted the *Digital Opportunity Data Collection Order and Further Notice* that: (1) established the Digital Opportunity Data Collection in order to obtain geospatial broadband coverage maps from fixed broadband providers; (2) adopted a process to collect public input, commonly known as "crowdsourcing," on the accuracy of fixed providers' broadband maps; and (3) made targeted changes to the existing Form 477 data collection to reduce reporting burdens for all filers and to incorporate new technologies.[5] The Commission also indicated that it would pursue the development of a uniform national locations dataset on which provider deployment data could be overlaid

[1] *Local Competition and Broadband Reporting*, CC Docket No. 99-301, Report and Order, 15 FCC Rcd 7717, 7719-20, para. 3 (2000); *see also* 47 U.S.C. § 1302(b) (Section 706 of the Telecommunications Act of 1996 requires the Commission to determine and report annually on "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion").

[2] *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order, 28 FCC Rcd 9887, 9902, para. 32 (2013).

[3] *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order, 28 FCC Rcd 9887, 9895, para. 16 (2013); *Local Telephone Competition and Broadband Reporting*, WC Docket No. 04-141, Report and Order, 19 FCC Rcd 22340, 22341, paras. 1-2 (2004); *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol Subscribership*, WC Docket No. 07-38, Report and Order and Further Notice of Proposed Rulemaking, 23 FCC Rcd 9691, 9692, paras. 1-2 (2008).

[4] *See Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Further Notice of Proposed Rulemaking, 32 FCC Rcd 6329, 6331, para. 6 (2017) (*2017 Data Collection Improvement FNPRM*).

[5] *Establishing the Digital Opportunity Data Collection; Modernizing the FCC Form 477 Data Program*, WC Docket Nos. 19-195, 11-10, Report and Order and Second Further Notice of Proposed Rulemaking, 34 FCC Rcd 7505, 7506, 7521, paras. 2, 3, 35 (2019) (*Digital Opportunity Data Collection Order and Further Notice*).

to produce a highly accurate and precise picture of broadband deployment.[6] The *Digital Opportunity Data Collection Order and Further Notice* directed the Universal Service Administrative Company—the Administrator of the Commission's Universal Service Fund—under the oversight of the Commission's Office of Economics and Analytics (OEA), the Wireline Competition Bureau (WCB), the Wireless Telecommunications Bureau (WTB), and the International Bureau (IB), to develop the portal for collecting the broadband coverage maps from fixed providers as well as public input on the accuracy of the maps.[7]

6. At that time, we also sought comment on: (1) the additional technical standards for fixed broadband providers that could ensure greater precision for the Digital Opportunity Data Collection deployment reporting; (2) the ways in which the Commission could incorporate crowdsourced and location-specific fixed broadband deployment data into the Digital Opportunity Data Collection; and (3) how the Commission could incorporate the collection of accurate, reliable mobile voice and broadband coverage data into the Digital Opportunity Data Collection.[8]

7. Following adoption of the *Digital Opportunity Data Collection Order and Further Notice*, Congress passed the Broadband DATA Act,[9] which requires the Commission to take steps to improve our broadband deployment data collection and the related maps documenting broadband availability in the United States.[10] The Broadband DATA Act requires the Commission, within 180 days of its enactment, to issue final rules to: (1) require the biannual collection and dissemination of granular data relating to the availability and quality of service of fixed and mobile broadband Internet access service for the Commission to use in conjunction with creating broadband coverage maps;[11] (2) establish processes for the Commission to verify and protect the data collected;[12] (3) establish a process for collecting verified data for use in the coverage maps from State, local, and Tribal governmental entities, from other federal agencies, and, if the Commission deems it in the public interest, from third parties;[13] (4) establish the Fabric to serve as a foundation on which fixed broadband availability is overlaid;[14] (5) establish a user-friendly challenge process through which the public and State, local, and Tribal governmental entities can challenge the accuracy of the coverage maps, provider availability data, or information in the Fabric;[15] and (6) develop a process through which entities or individuals in the United States may submit specific information about the deployment and availability of broadband Internet access service in the United States on an ongoing basis.[16] The Broadband DATA Act also requires that

[6] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7519, para. 31.

[7] *Id.* at 7509, para. 11.

[8] *Id.* at 7506, para. 4.

[9] Broadband Deployment Accuracy and Technology Availability Act, Pub. L. No. 116-130, 134 Stat. 228 (2020) (codified at 47 U.S.C. §§ 641-646) (Broadband DATA Act).

[10] S. Rep. No. 116-174, at 1 (2019).

[11] 47 U.S.C. § 642(a)(1)(A).

[12] 47 U.S.C. § 642(a)(1)(B)(i).

[13] 47 U.S.C. §§ 642(a)(2)(A)-(C).

[14] 47 U.S.C. § 642(b)(1)(B).

[15] 47 U.S.C. §§ 642(a)(1)(B)(iii), (b)(5)(A).

[16] 47 U.S.C. §§ 642(a)(1)(B)(iv), 644(b). The Broadband DATA Act generally refers to this submission of data as a "crowdsourcing" process, 47 U.S.C. § 644(b), but does not define "crowdsourced data." For the purposes of this item (and unless expressly stated otherwise), "crowdsourced data" includes any data generated by consumer mobile broadband users who voluntarily download speed test apps on their mobile devices, whether submitted by consumers through the portal or by State, local, or Tribal governmental entities.

the Commission adopt rules that include uniform standards for reporting mobile and fixed broadband service availability data.[17]

8. Within 180 days of the effective date of those rules, the Commission also must reform the Form 477 broadband deployment collection in a manner that achieves the purposes of the Broadband DATA Act and that allows for the comparison of data produced before and after the implementation of the Broadband DATA Act's requirements.[18] The Commission, after consulting with the Federal Geographic Data Committee, must create a map that depicts the extent and availability of broadband Internet access service in the United States, without regard to whether the service is fixed or mobile, as well as the areas of the United States that remain unserved (the Broadband Map).[19] The Commission also must create, in consultation with the Federal Geographic Data Committee, certain other coverage maps, which must depict the extent of availability of fixed and mobile broadband Internet access services and the areas that remain unserved.[20] The Commission must update the maps at least biannually and make them available to the public at an appropriate level of granularity[21] and to other federal agencies upon request.[22]

III. SECOND REPORT AND ORDER

9. Based on the record before us and consistent with the requirements of the Broadband DATA Act, in this *Second Report and Order* we take steps to implement collection and verification requirements for fixed and mobile broadband service availability and quality of service data. We largely build on the filing requirements we previously adopted or proposed for broadband service providers, and comments submitted in response to the *Digital Opportunity Data Collection Order and Further Notice*. Many of the requirements and proposals are encompassed in the structure of the Broadband DATA Act. Indeed, Congress recognized the value of the Commission's earlier work on the Digital Opportunity Data Collection and provided that "[i]f the Commission, before the date of enactment of this title, has taken an action that, in whole or in part, implements this title, the Commission shall not be required to revisit such action to the extent that such action is consistent with this title."[23]

10. However, certain requirements adopted in the *Digital Opportunity Data Collection Order and Further Notice* are inconsistent with the terms of the statute. For example, it established a role for USAC to develop and maintain the infrastructure for accepting and managing submissions from service providers, along with challenges and crowdsourced data from consumers, government entities, and other third parties, which the Broadband DATA Act prohibits.[24] In addition, although we lack necessary funding to currently implement the Digital Opportunity Data Collection maps under the Broadband DATA Act, we take steps to complete the rulemaking required within the statutory deadline and in anticipation of receiving necessary funding in the future so that we can begin developing these granular, precise broadband service availability maps as quickly as possible.

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[17] 47 U.S.C. § 642(b)(2).

[18] 47 U.S.C. § 642(b)(6)(A).

[19] Pursuant to the Broadband DATA Act, the Broadband Map must depict the extent of broadband Internet access service availability in the United States, which must be based on data collected by the Commission from all broadband providers, as well as the areas of the United States that remain unserved. 47 U.S.C. § 642(c)(1)(A).

[20] 47 U.S.C. §§ 642(c)(1)(A)-(C).

[21] 47 U.S.C. § 642(c)(4).

[22] 47 U.S.C. § 642(c)(5).

[23] 47 U.S.C. § 646(e).

[24] 47 U.S.C § 646(c)(2).

11. In light of these and other minor inconsistencies, we will not seek Paperwork Reduction Act approval for the Part 54 rules adopted in the *Digital Opportunity Data Collection Order and Further Notice*. Instead, we adopt certain measures to implement aspects of the Broadband DATA Act for which we have no discretion or that are consistent with the Broadband DATA Act and for which we have a sufficient record in this proceeding. We also seek comment in the *Third Notice* on how best to implement the remaining requirements in the Broadband DATA Act through a new set of rules in accordance with the 180-day timetable contemplated in the Act. We intend to implement the remaining requirements of the Act in light of further comments received in response to our *Third Notice.* We note that the Act exempts this rulemaking from review of its information collection requirements under the Paperwork Reduction Act.[25]

A. Requirements for the Submission of Fixed Broadband Internet Access Service Availability and Quality of Service Data

12. We require providers of terrestrial fixed, fixed wireless, and satellite broadband Internet access service to report availability and quality of service data that document the areas (1) where they have actually built out their broadband network infrastructure, such that they are able to provide service, and (2) where they could perform a standard broadband installation. In establishing these requirements, we adopt and incorporate the Broadband DATA Act's definitions of "broadband Internet access service,"[26] "propagation model,"[27] "provider,"[28] "quality of service,"[29] "shapefile,"[30] and "standard broadband installation,"[31] which shall apply to the submission of the required data. All terrestrial fixed and satellite service providers must report either polygon shapefiles or lists of addresses or locations that constitute their service areas. We further require terrestrial fixed wireless providers to report either their shapefiles in the form of propagation maps and propagation model details that reflect the speeds and latency of their service, or a list of addresses or locations that reflect their service areas. All fixed providers must disclose the details of how they generated their coverage polygons or lists of addresses or locations when they submit them. In particular, we require providers to submit an explanation of the methodology or combination of methodologies used and how they implemented those methodologies, including the distances from aggregation points, to the extent relevant. We will make such information publicly available, subject to individual requests for confidential treatment of this information.[32]

13. In the *Digital Opportunity Data Collection Order and Further Notice,* the Commission required all fixed broadband service providers to submit "granular coverage maps (polygons)" of the areas where they have broadband-capable networks and can make service available to end-user locations.[33] The Commission explained that "broadband coverage polygons," "coverage polygons," and

[25] 47 U.S.C. § 646(b).

[26] Broadband Internet access service is defined as "a mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all Internet endpoints, including any capabilities that are incidental to and enable the operation of the communications service, but excluding dial-up Internet access service. This term also encompasses any service that the Commission finds to be providing a functional equivalent of the service described in the previous sentence or that is used to evade the protections set forth in this part." 47 U.S.C. § 641(1); 47 CFR § 8.1(b).

[27] 47 U.S.C. § 641(10).

[28] 47 U.S.C. § 641(11).

[29] 47 U.S.C. § 641(12).

[30] 47 U.S.C. § 641(13).

[31] 47 U.S.C. § 641(14).

[32] *See infra* Section III.I.

[33] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7510-11, paras. 12-13.

"polygons" as used in the *Digital Opportunity Data Collection Order and Further Notice* refer to "broadband areas or footprints—captured in GIS-compatible formats—delineating the areas in which a provider's network meets the requirements detailed in [the *Digital Opportunity Data Collection Order and Further Notice*] and as defined by the Commission."[34] The *Digital Opportunity Data Collection Order and Further Notice* further required all fixed providers to submit broadband coverage polygons that reflect the maximum download and upload speeds available in each area, the technology used to provide the service, and a differentiation among residential-only, business-only, or residential-and-business broadband services.[35] Service would be considered "actually available" in an area in which a provider had a current broadband connection or could provide such a connection within ten business days of a request, without an extraordinary commitment of resources and without construction charges or fees exceeding an ordinary service activation fee.[36]

14. The Broadband DATA Act takes a similar approach to fixed broadband service reporting, requiring the Commission's rules to provide uniform standards for the reporting of broadband Internet access service data,[37] including "information regarding download and upload speeds, at various thresholds established by the Commission, and, if applicable, latency with respect to broadband Internet access service that the provider makes available," and that "can be georeferenced to the GIS data in the Fabric . . . ."[38] Also, with regard to fixed broadband services, the data collected must document where the provider "has actually built out network infrastructure . . . such that the provider is able to provide service; and [where it] could provide that service, as determined by where the provider is capable of performing a standard broadband installation . . . ."[39] The Broadband DATA Act defines a "standard broadband installation" as "the initiation of service in an area in which the provider has not previously offered that service, with no charges or delays attributable to the extension of the network of the provider,"[40] as well as "the initiation of fixed broadband Internet access service through routine installation that can be completed not later than ten business days after the date on which the service request is submitted."[41]

15. The Commission must further allow providers of terrestrial fixed and satellite service to report availability data in the form of polygon shapefiles,[42] defined as "a digital storage format containing geospatial or location-based data and attribute information regarding the availability of broadband Internet access service[,] and that can be viewed, edited, and mapped in GIS software."[43] With regard to data collected from terrestrial fixed wireless providers, the rules must provide for reporting propagation maps and propagation model details that satisfy standards similar to those applicable to mobile services, taking into account differences between the two types of services.[44] The maps and model data reported for fixed wireless service must also reflect the speed and latency of the services they depict.[45] For all fixed services, the Broadband DATA Act provides that the Commission also may permit, but not require, providers to report fixed broadband service availability using a "list of addresses or locations" in lieu of

[34] *Id.* at 7509 & n.22.

[35] *Id.* at 7510, para. 12.

[36] *Id.* at 7510, para. 13.

[37] 47 U.S.C. § 642(b)(2).

[38] 47 U.S.C. §§ 642(b)(2)(A)(ii), (iii).

[39] 47 U.S.C. § 642(b)(2)(a)(i).

[40] 47 U.S.C. § 641(14)(A).

[41] 47 U.S.C. § 641(14)(B).

[42] 47 U.S.C. § 642(b)(2)(A)(iv)(II)(aa).

[43] 47 U.S.C. § 641(13).

[44] 47 U.S.C. § 642(b)(2)((A)(iv)(I)(aa)(AA).

[45] 47 U.S.C. § 642(b)(2)((A)(iv)(I)(aa)(BB).

shapefiles or propagation maps and model details, but requires the Commission to provide a method for providers to use such address or location-based reporting in Tribal areas.[46]

1. Maximum Buffers for Wireline Broadband Service Reporting

16. The *Digital Opportunity Data Collection Order and Further Notice* sought comment on whether to adopt additional reporting requirements for similarly-situated fixed wired providers in order to provide consistently reliable results.[47] The Commission asked whether fixed "buffers," or a specified distance around network facilities such as the location of distribution or coaxial plant, should be established to define coverage for specific fixed technologies.

17. We adopt requirements for the use of specific maximum buffers around aggregation points for wired technologies.[48] Specifically, for providers using Digital Subscriber Line (DSL) technologies to offer speeds at 25/3 Mbps or greater, we adopt a maximum distance of 6,600 route feet from the DSLAM to the covered premises. For providers using Hybrid-Fiber Coax (HFC or cable) technology, we adopt a maximum buffer of 12,000 route feet from the aggregation point to the customer premises.[49] For providers using Fiber to the Premises (FTTP or fiber) technologies, we adopt a maximum buffer of 196,000 route feet[50] from the OLT to the Optical Network Termination (ONT).[51] For all fixed wired technologies, the buffer distance from the aggregation point shall include the drop distance,[52] up to a maximum distance of 500 feet from a deployed line or distribution network infrastructure to the parcel boundary of a served location.[53] Providers that make fixed DSL service available at a maximum speed less than 25/3 Mbps in an area will not be subject to a maximum buffer requirement for such areas. However, these providers are still subject to the requirement of the Broadband DATA Act and this *Second Report and Order* that their coverage areas include only the areas where they have actually built out their broadband network infrastructure, such that they are able to provide service, and where they could perform a standard broadband installation. In addition, the buffer distances from the aggregation point are measured in route distance and therefore must reflect where providers have deployed their last-mile distribution networks. Providers may not simply create and submit a coverage area in the Digital Opportunity Data Collection that is an airline-mile radius around an aggregation point of the maximum

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[46] 47 U.S.C. §§ 642(b)(2)(A)(iv)(I)(bb), (II)(bb).

[47] *Digital Opportunity Data Collection Order and Further Notice,* 34 FCC Rcd at 7538, para. 79.

[48] The aggregation point would be the point in the network at which traffic is aggregated and disbursed from a central location, such as an optical node or cable model termination system (in an HFC network), Digital Subscriber Line Access Multiplexer (DSLAM) (in a DSL network), or Optical Line Termination (OLT), which is typically in the central office (in fiber networks).

[49] *See* Letter from Jennifer K. McKee, V.P. and Assoc. General Counsel, NCTA, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 19-195, at 3 (filed July 8, 2020) (NCTA July 8, 2020 *Ex Parte* Letter).

[50] 196,000 feet is approximately 37.1 miles or 60 kilometers.

[51] *See* Letter from Brian J. Ford, Director of Industry Affairs, NTCA, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 19-195, at 2-6 (filed July 6, 2020) (NTCA July 6, 2020 *Ex Parte* Letter). *See also* Letter from Brett Kilbourne, Utilities Technology Council, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 19-195, 11-10, at 1-2 (filed July 9, 2020) (UTC July 9, 2020 *Ex Parte* Letter); Letter from Brian M. O'Hara, Sr. Director Regulatory Issues, NRECA, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 19-195, 11-10, at 1-2 (filed July 9, 2020) (NRECA July 9, 2020 *Ex Parte* Letter); Letter from Thomas Cohen *et al.*, Counsel to ACA Connects, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 19-195, 11-10, at 3 & n.15 (filed July 9, 2020) (ACA Connects July 9, 2020 *Ex Parte* Letter).

[52] The drop distance is the distance from the provider's in-ground or above-ground last-mile distribution network, consisting of fiber-optic cable, hybrid-fiber coaxial cable, and/or copper, to the customer's premises.

[53] NTCA July 6, 2020 Ex Parte Letter at 5; *see, e.g., Digital Opportunity Data Collection Order and Further Notice,* 34 FCC Rcd at 7538, para. 79.

buffer value. We direct OEA, in coordination with WCB and OET, to update these values via notice and comment rulemaking in the future as necessary to ensure accuracy and to account for technological and other developments.

18. The maximum buffers we adopt here are, as the name implies, *maximums*. Wireline fixed broadband providers reporting service availability should not consider these maximum buffers safe harbors; rather, service providers may only report those areas they know to be serviceable by their networks. That is, if the locations that a provider can *actually* serve fall within a smaller distance from the aggregation point, either within a particular geographic area or throughout its network, then the provider should report only those smaller areas or set of locations. Providers must ensure that their polygons, the outer edges of which represent the outer perimeter of a service area, encompass only locations that meet the standards for service provision established in the Broadband DATA Act. We expect that in many areas and under many varying conditions, a provider's actual maximum distance from the aggregation point to a served location would be lower than the maximum buffer. In such circumstances, the provider's coverage polygon must reflect the *actual* buffer size or other methodology used to generate the polygon that accurately depicts the area it serves. Providers may also use a different methodology than buffering around network plant to determine and depict their coverage areas. However, subject to the specific exceptions set forth below, locations included in a provider's coverage polygon may not be outside of the maximum buffers established by the Commission, irrespective of the methodology used by the provider.

19. The approach we adopt is consistent with those commenters that opposed a one-size-fits-all approach to buffers.[54] Service providers may only report serving areas up to the maximum buffer distance to the extent that they have existing line or distribution network infrastructure located within 500 feet of the parcel boundary of the served location and where the provider can perform a standard broadband installation. In particular, we agree with Verizon that where service providers' business practices call for a smaller buffer than the maximum we adopt for a given technology, the provider should use the smaller of the two.[55] For those reasons, we disagree with the Broadband Mapping Coalition's proposal to establish "safe harbors" based on an appropriate buffer zone related to the density of a geographic area.[56] Providing such safe harbors could permit some service providers to overstate the availability of their services and report areas served where they cannot actually provide service. We believe that the use of maximum buffers will provide important guardrails and result in more accurate, standardized, and cohesive data on broadband availability by wired providers using fiber, cable, and DSL technologies, and therefore adopt the use of maximum buffers specific to each to account for the particular attributes of each technology.[57]

20. Further, several parties have expressed support for the approach we adopt today for maximum buffers. With respect to buffer values for fiber, NTCA, USTelecom, NRECA, ACA Connects, and UTC argue that common provider deployment practices and industry technical standards provide the

[54] Verizon and NCTA opposed a one-size-fits-all approach and proposed allowing providers to use distances that are already used internally for commercial purposes and which accurately reflect business practices. NCTA Comments at 6; Verizon Comments at 3. Verizon additionally proposed setting a range of acceptable buffers up to several hundred meters and requiring the narrower of the provider's own buffer or the outside end of the range. Verizon Comments at 3.

[55] *See* Verizon Comments at 3.

[56] Broadband Mapping Coalition Comments at 21-22.

[57] For this reason, we disagree with Alexicon's argument that "requiring polygon-based broadband availability reporting based on a buffer zone or on homes passed may present additional difficulties (burden) on small carriers." Alexicon Comments at 4-5. To the contrary, we conclude that the use of maximum buffers will provide greater flexibility to wired broadband providers and result in more accurate, standardized, and cohesive broadband availability data for all wired providers.

basis for a much larger maximum distance from the aggregation point for FTTP than for HFC or DSL.[58] NTCA, NRECA, and UTC claim that ITU standards for Gigabit-capable passive optical network (GPON) technologies, as well Active Ethernet (AE) technology, allow for a maximum buffer of up to 60 km and that real-world fiber deployments in rural areas are often at or above 45 km from the OLT to the ONT at the customer premises.[59] The three parties support a maximum buffer, or distance from the aggregation point, of 60 km for fiber.[60] USTelecom does not recommend a specific distance, but notes that several of its members have reported deploying FTTP to upwards of 65,000 feet (or 20 km).[61] We agree that industry technical standards and deployment practices, as explained in the record, provide a basis for adopting a significantly larger maximum buffer for fiber than for HFC or DSL, and we therefore adopt a maximum distance of 60 route km from the aggregation point at the central office for fiber reporting. To ensure that coverage areas reflect where providers have actually deployed fiber plant that can be accessed by nearby locations, NTCA proposes that the boundary of each location shown to be served or within a provider's polygon coverage area be within 500 feet of a deployed fiber line or distribution network infrastructure.[62] We agree with this proposal and adopt an equivalent requirement for all wireline technologies in the Digital Opportunity Data Collection. In addition, each location shown to be served or within a provider's polygon coverage area, if not already connected to the network, must be able to be connected within ten business days of a request.

21. With respect to HFC networks, NCTA and ACA Connects encouraged the Commission not to adopt maximum buffers at this time.[63] However, NCTA stated that if the Commission were to adopt a maximum buffer, it should be at least 12,000 route feet from the aggregation point in order to accurately reflect the construction and operation of HFC networks.[64] NCTA argues that smaller buffers would lead to locations that are actually served to be shown as unserved, a concern shared by ACA Connects.[65] For the reasons stated above, we are adopting maximum buffers for HFC and other wired technologies. We support NCTA's proposed buffer distances and adopt a maximum distance of 12,000

[58] NTCA July 6, 2020 *Ex Parte* Letter at 2-6; Letter from B. Lynn Follansbee, Vice Pres.—Policy & Advocacy, USTelecom, to Marlene Dortch, Secretary, FCC, WC Docket No. 19-195, at 1-2 (filed July 9, 2020) (USTelecom July 9, 2020 *Ex Parte* Letter); NRECA July 9, 2020 *Ex Parte* Letter at 1-2; UTC July 9, 2020 *Ex Parte* Letter at 1-2; ACA Connects July 9, 2020 *Ex Parte* Letter at 3.

[59] NTCA July 6, 2020 *Ex Parte* Letter at 3, 5; NRECA July 9, 2020 *Ex Parte* Letter at 1; UTC July 9, 2020 *Ex Parte* Letter at 1.

[60] NTCA July 6, 2020 *Ex Parte* Letter at 5; NRECA July 9, 2020 *Ex Parte* Letter at 1-2; UTC July 9, 2020 *Ex Parte* Letter at 2. UTC also argues that the maximum buffer should be increased to 80 km in cases where providers have deployed AE fiber technology, which it claims can serve customers at that distance. UTC July 9, 2020 *Ex Parte* Letter at 2. NRECA also acknowledges that deployments of up to 80 route km are possible with AE, but suggests the reporting of such deployments could be addressed via waiver, and NTCA claims AE can support distances up to 40 km. NRECA July 9, 2020 *Ex Parte* Letter at 2; NTCA July 6, 2020 *Ex Parte* Letter at 3. Given the lack of consistency in the record and the recommendation by NRECA, we decline to adopt a larger maximum buffer for AE fiber technology at this time. OEA, in conjunction with WCB and OET, can consider whether technological advancements and industry developments warrant such a change in the future.

[61] USTelecom July 9, 2020 *Ex Parte* Letter at 1.

[62] NTCA July 6, 2020 *Ex Parte* Letter at 5-6.

[63] NCTA July 8, 2020 *Ex Parte* Letter at 2; ACA Connects July 9, 2020 *Ex Parte* Letter at 3.

[64] NCTA July 8, 2020 *Ex Parte* Letter at 3.

[65] *Id.* at 2. NCTA shared the results of analyses done by Cox and Comcast, which found that buffers of 6,840 airline feet and 10,000 airline feet, respectively, did not include locations that the providers actually serve. *Id*. While airline feet were used in these analyses, we specify route feet in our maximum buffer requirements to ensure that coverage areas or locations submitted for the Digital Opportunity Data Collection reflect where a provider has deployed its in-ground or above-ground distribution network, rather than a simple radius around an aggregation point location. ACA Connects July 9, 2020 *Ex Parte* Letter at 2.

route feet from the aggregation point for HFC networks, along with a maximum distance of 500 feet from a deployed line or distribution network infrastructure and the parcel boundary.

22. With respect to DSL, the Commission's 2010 National Broadband Plan reported that DSL speeds exceeding 25/3 Mbps could be attained in a lab environment at a distance of 5,000 feet from the DSLAM using pair-bonded, vectored VDSL2/2+ on a heavy gauge wire.[66] In addition, USTelecom claims that speeds of 25/3 Mbps are offered at 4,000 feet from the aggregation point using pair-bonded DSL technology.[67] We adopt a higher maximum buffer size of 6,600 route feet from the DSLAM for DSL providers to allow for variance between the actual practices of providers and those examples, along with a maximum of distance of 500 feet from a deployed line or distribution network infrastructure and the parcel property. In addition, the 6,600-foot buffer for DSL is supported by NTCA.[68] The maximum buffer requirement will not apply to reporting of DSL service at a maximum speed of less than 25/3 Mbps. Given that DSL speeds are highly dependent on the distance from the aggregation point and on the type of copper deployed in a way that the other technologies are not, lower-speed DSL services can be offered at greater distances along a large continuum.[69] Adopting discrete buffer distances to account for different speeds levels for DSL services below 25/3 Mbps would introduce complexity and burden for providers of those services. Given that services offered at speeds below 25/3 Mbps are increasingly less common in the marketplace and are not the focus of the Commission's assessment of broadband availability for universal service funding and annual Broadband Progress Reports, we find that this additional burden would not be warranted and therefore exempt DSL services offered below 25/3 Mbps from buffers.[70] All fixed providers, including DSL providers offering maximum speeds below 25/3 Mbps, are still subject to the requirement of the Broadband DATA Act and this *Second Report and Order* that their coverage areas include only the areas where they have actually built out their broadband network infrastructure, such that they are able to provide service, and where they could perform a standard broadband installation.

23. We also adopt several limited exceptions to the use of these maximum buffers to promote greater accuracy in the map. First, if a provider has a current subscriber at a location beyond the bounds of the applicable maximum buffer, then that location must be included in its coverage polygon or list of addresses or locations, as applicable. Second, if a provider previously had a broadband subscriber, using the same technology, at a location beyond the bounds of the maximum buffer, then the location must be included in the provider's coverage polygon or list of addresses or locations.[71] Third, if a provider is receiving or has received universal service support to provide broadband service in a particular geographic area—or has other federal, state, or local obligations to make service available in the area—and the provider has begun to make service available in that area, then the provider must include all of the deployed locations in that area in its polygon or list of addresses or locations, regardless of whether they are within or beyond the bounds of the maximum buffer. Finally, in cases where a provider asserts that it could serve a location beyond the bounds of the applicable maximum buffer for a reason not already

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[66] FCC, *The Broadband Availability Gap, OBI Technical Paper No. 1*, at 100 (April 2010) (*OBI Technical Paper No. 1*), https://transition.fcc.gov/national-broadband-plan/broadband-availability-gap-paper.pdf. Real-world results can be smaller. *Id.* at 98-99.

[67] USTelecom July 9, 2020 *Ex Parte* Letter at 1-2.

[68] NTCA July 6, 2020 *Ex Parte* Letter at 5.

[69] USTelecom July 9, 2020 *Ex Parte* Letter at 1-2; *OBI Technical Paper No. 1*, at 99-100.

[70] *Rural Digital Opportunity Fund*, *Connect America Fund*, WC Docket Nos. 19-126, 10-90, Report and Order, 35 FCC Rcd 686, 690, paras. 9-10 (2020); *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 19-285, 2020 Broadband Deployment Report, FCC 20-50 (rel. Apr. 24, 2020) (*2020 Broadband Deployment Report*).

[71] The fact that such a location previously had a subscription provides evidence that the provider has built out its broadband network infrastructure to, and is capable of providing a standard broadband installation at, that location.

addressed under the exceptions described herein, then the provider must submit a waiver request explaining where and how it provides service to such areas or locations.

2. Fixed Wireless Broadband Service Availability Reporting Standards

24. We also adopt standards for fixed wireless providers that report availability using propagation maps and propagation model details, as required by the Broadband DATA Act.[72] The Broadband DATA Act requires that propagation maps and model details reported by fixed wireless providers: (1) satisfy standards similar to those set for mobile broadband service, taking into account "material differences" between fixed and mobile services; and (2) reflect the speeds and latency of the service.[73] In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission sought comment on a variety of issues associated with reporting coverage polygons for terrestrial fixed wireless broadband service. In particular, we asked whether there are "fundamental differences between fixed wireless and mobile technologies that would caution against using mobile wireless standards for fixed wireless deployment reporting (e.g., fixed wireless use of fixed, high-powered antennas that could result in a different link budget than for mobile service, or the use of unlicensed spectrum by some fixed wireless providers)."[74] The Commission further sought comment on whether, based on differences between mobile and terrestrial fixed services, it would be appropriate to adopt different standards or parameters for reporting, for example, a different probability of cell-edge throughput or utilization rate for unlicensed spectrum.[75] The Commission also sought comment on factors it should use to validate the fixed wireless mapping methodology, identifying as possible examples "cell-site and receive site engineering and technical details and locations, RF propagation characteristics, [and] signal strength."[76]

25. In response to the *Digital Opportunity Data Collection Order and Further Notice*, commenters argued that different standards should be used for fixed wireless given the technological, operational, and usage differences between the services.[77] In addition, two parties, AT&T and WISPA, proposed frameworks for reporting fixed wireless coverage.[78] Following passage of the Broadband DATA Act, USTelecom and WISPA submitted a joint proposal modifying earlier proposals.[79] Specifically, USTelecom and WISPA urged the Commission to adopt a 50% loading factor for fixed broadband service coverage reporting, consistent with the loading factor established for mobile service by the Broadband DATA Act.[80] USTelecom and WISPA, however, argued for the adoption of a 75% cell edge probability for fixed services, rather than the 90% cell edge probability established in the Broadband DATA Act for mobile broadband services.[81] USTelecom and WISPA explained that "[a] fixed wireless provider often controls the base station and receiver and thus can often customize an installation or adjust a radio to enable successful signal reception even when a model predicts only a 75% probability of success."[82] USTelecom and WISPA contrast this with mobile wireless providers, who "have no control

[72] The Broadband DATA Act permits us to allow submission of fixed broadband service availability data using list of addresses or locations (*see* 47 U.S.C. §§ 642(b)(2)(A)(iv)(I)(bb)), and we have determined to adopt this method in all areas (*see supra* para. 12).

[73] 47 U.S.C. § 642(b)(2)(A)(iv)(I)(aa).

[74] *Digital Opportunity Data Collection Order and Further Notice,* 34 FCC Rcd at 7539, para. 80.

[75] *Id.*

[76] *Id.*

[77] AT&T Comments at 2-3; WISPA Comments at Attach. 1-2 (WISPA citation to specific parameters).

[78] AT&T Comments at 6-8; WISPA Comments at Attach. 1-2 (WISPA citation to specific parameters).

[79] Letter from B. Lynn Follansbee, Vice Pres.—Policy & Advocacy, USTelecom to Marlene Dortch, Secretary, FCC, WC Docket No. 19-195, at 1-3 (filed May 14, 2020) (USTelecom/WISPA May 14, 2020 *Ex Parte* Letter).

[80] *Id.* at 2.

[81] *Id.* at 2-3.

over the location or movement of a user's phone and thus a higher probability is necessary to predict a consistent connection."[83]

26. We agree with USTelecom and WISPA that there are fundamental similarities between mobile and fixed wireless service that warrant collecting common elements in the coverage reporting for each technology, but that certain differences warrant collecting different information, as contemplated by the Broadband DATA Act. Accordingly, given the material differences between the two types of service, as set out in the record, we adopt some of the standards for fixed wireless broadband service reporting by propagation maps and models proposed by USTelecom and WISPA, including a 75% cell edge probability, a 50% cell loading factor, and a receiver height of four to seven meters.[84] We agree with USTelecom and WISPA that given the stationary nature of fixed wireless customer installations and the ability to manage the base stations and receivers to maximize coverage at fixed locations, it is appropriate to adopt a lower cell edge probability than we otherwise require for mobile broadband coverage. In addition, fixed wireless propagation modeling appears to use the cell edge probability parameter in a different way than mobile, often having it reflect existing locations in a point-to-point network configuration.[85] Given these material differences and the inaccuracies that could potentially result from a higher cell edge probability for fixed wireless, we adopt the 75% cell edge parameter for the reporting of fixed wireless broadband availability using propagation maps and model details. In addition, we adopt the use of a 50% cell loading factor, given that it is the value specified in the Broadband DATA Act for mobile and that there is no basis in the record for using a different standard for fixed wireless services. Finally, we require fixed wireless providers to use a receiver height value ranging from four to seven meters in their propagation modeling. USTelecom and WISPA claimed this range is reasonable for fixed wireless receiver heights and suggested that the Commission establish it.[86] We decline to adopt higher values for these elements of terrestrial fixed wireless reporting, as suggested by NTCA and Vantage Point.[87] USTelecom and WISPA have demonstrated that fixed wireless broadband service providers' control over both the base stations and receivers in their networks affords them more opportunity to make adjustments and take other steps that will increase the likelihood of consistent connections as compared with mobile providers.[88] NTCA and Vantage Point have not meaningfully challenged USTelecom and WISPA's position in their comments, nor have they provided a justification for imposing a higher loading factor on fixed service reporting.

27. Like in the case of wireline fixed broadband networks, we also provide for certain exceptions for serviceable locations outside the coverage area depicted by a provider's propagation

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[82] *Id.* at 2.

[83] *Id.*

[84] *Id*. at 1-2.

[85] *Id.* USTelecom and WISPA explained that fixed wireless providers often develop their coverage maps by first determining which locations in an area they serve or are seeking to serve, and then use a propagation model to create an area-based map that includes those point locations—a methodology that reflects their typical use of point-to-point and point-to-multipoint configurations in their network design. They further assert that, in developing an area-based map from a propagation model, WISPs often start with a 50% cell edge probability and then add a certain amount of path loss so that the contour eventually reflects the locations in their service area and network design. The amount of path loss added decreases the contour from the starting point such that it typically equates to a cell edge probability of 75%. The parties argue that adding additional path loss to produce a contour that reflects a 90% cell edge probability would remove locations that the provider serves (both existing and potential customers) with its network.

[86] USTelecom/WISPA May 14, 2020 *Ex Parte* Letter at n.3.

[87] NTCA July 6, 2020 *Ex Parte* Letter at 7.

[88] *See* USTelecom/WISPA May 14, 2020 *Ex Parte* Letter at 2.

model. Fixed wireless service providers must include locations with current and former subscribers. In the case of former subscribers, providers should not report those locations that they no longer believe to be serviceable due to subsequent changes in the network. Likewise, if a provider is receiving or has received universal service support to provide broadband service in a particular geographic area—or has other federal, state, or local obligations to make service available in the area—and the provider has begun to make service available in that area, then the provider must include all of the deployed locations, regardless of whether they are within or beyond the bounds of the maximum buffer. In adopting these standards, we confirm that the availability of fixed wireless service at a given location may ultimately be determined through the challenge process and other determinations based on facts on the ground. Therefore, we will require a fixed wireless provider to remove from its broadband availability data areas or locations that a successful challenge or Commission inquiry has shown to be unserved by that provider.

28. Although we could prescribe additional propagation modeling parameters for fixed wireless providers, we are concerned that doing so would risk making the maps less accurate. The specific parameters we adopt above will allow providers to use their internal modeling standards and practices in a way that will best reflect the service they are capable of providing, and the service providers are in the best position to determine where their service is available. However, to facilitate public feedback, a robust challenge process, and ease of analysis by Commission staff, we also adopt the USTelecom and WISPA proposal to require fixed wireless providers submitting propagation maps and propagation model details to disclose several of the parameters and details used to create their propagation maps and models.

29. *First*, service providers must identify the radio network planning tool(s) used, along with information including: (1) the name of the planning tool; (2) the version number of the planning tool; (3) the name of the planning tool's developer; (4) the granularity of the model (e.g., 3-arc-second square points); and (5) affirmation that the coverage model has been validated and calibrated at least one time using on-the-ground testing and/or other real-world measurements completed by the provider or its vendor. *Second*, service providers must submit base station information including: (1) frequency band(s) used to provide service being mapped; (2) carrier aggregation; (3) radio technologies used on each band (e.g., 802.11ac-derived OFDM, proprietary OFDM, LTE); and (4) elevation above ground for each base station. *Third*, service providers must submit information on the height and power values used for receivers/CPE antennas in their modeling (height must be within a range of four to seven meters). *Finally*, service providers must submit terrain and clutter information including the name and vintage of the dataset used, the resolution of clutter data, and a list of clutter categories used with a description of each, along with a description of the link budget and parameters including predicted signal strength.

30. We believe that this information will assist us in determining whether the fixed wireless broadband data that we collect is granular and accurate, consistent with the requirements and purpose of the Broadband DATA Act.[89] It will also promote participation from the public and from other government entities and third parties to ensure that the resulting maps are as accurate as possible. For example, interested parties may be able to use this information to identify poorly calibrated propagation models which will obviate the need for a lengthier case-by-case challenge process and give filers an opportunity to correct their coverage data more quickly. It similarly will provide Commission staff with an opportunity to identify possible concerns with filers' model parameters and most efficiently target the Commission's auditing and verification efforts. At the same time, it provides filers the greatest ability to ensure their coverage data best reflects the realities on the ground without being constrained to unnecessarily prescriptive modeling requirements that could increase cost and burden with little consequent benefit to the accuracy of broadband maps.

31. USTelecom and WISPA assert that certain categories of the information we are collecting from terrestrial fixed wireless providers may be commercially sensitive or raise security concerns.[90]

[89] *See* 47 U.S.C. § 642(b)(2)(A)(v).

Other information—such as the frequency bands used to provide service, carrier aggregation, radio technologies used, terrain and clutter information, base station elevation, and CPE height and power information—do not appear to raise confidentiality concerns. We will treat this information as presumptively public and will treat the remaining information as presumptively non-public. We believe there is a strong public interest in having as much access to this information as possible in order to facilitate public review and input on its accuracy, but we acknowledge the potential sensitivities and believe this approach best balances the two interests.

B. The Collection and Reporting of Data for Mobile Broadband Internet Access Service

32. We require mobile broadband providers to submit propagation maps and propagation model details based on minimum specified parameters. Service providers will be required to submit propagation maps reflecting technology-specific user download and upload speeds given prescribed minimum cell edge probabilities, cell loading factors, and modeling resolution. We otherwise allow service providers to choose other propagation modeling parameters that reflect each provider's particular network configurations, deployed infrastructure, and geographic characteristics of each area. Service providers must submit to the Commission modeling parameters they use in modeling the prescribed network performance standards which will be available for public review. Providing flexibility to select modeling parameters combined with public disclosure of those parameters will ensure that submitted propagation maps reflect on-the-ground performance while fostering transparency and confidence in modeled performance. As AT&T points out, "The answer is not to prescribe *how* providers should create their maps, but rather to clearly define *what the map must represent*, and then to require transparency."[91]

33. In addition to requiring mobile broadband providers to use propagation modeling to generate and to submit maps showing their 4G LTE coverage, we additionally require providers to submit information, data, and coverage maps for existing 3G networks and next-generation 5G-NR networks. By requiring technology-specific maps, this approach provides information about the availability of the three most widely deployed generations of mobile wireless technology and will make it easier to compare the services that different mobile broadband providers offer. Commenters previously have expressed support for this approach.[92]

34. Under current Form 477 reporting requirements, facilities-based mobile broadband providers must report on mobile broadband deployment by submitting, for each technology, polygons in

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[90] USTelecom/WISPA May 14, 2020 *Ex Parte* Letter at 3 ("Infrastructure location information, however, should not be required for security and competitive reasons. Providers should retain the ability to request confidential treatment for at least some of this information, such as calculations used in clutter datasets that may be protected under vendor proprietary arrangements.").

[91] AT&T Comments at 3.

[92] *See, e.g.*, AT&T Oct. 10, 2017 Comments at 5; AT&T Comments at 4 ("as a first step to obtaining more accurate propagation maps from mobile and fixed wireless providers, the FCC should define the level of service to be mapped" and noting that "the mobile map would be developed by different wireless technologies (e.g., 3G, 4G or 4G LTE, and 5G-NR)"); New York City Comments at 2 (expressing support for establishing technical standards for broadband reporting for "4G LTE and future generation mobile broadband technologies"); *but see* AT&T Reply at 5 (refining proposal to recommend that the Commission require "mobile providers to report on their broadband networks by speed capability rather than technology," and proposing that mobile providers report "their mobile voice and broadband coverage with coverage maps depicting two service levels: (1) voice and broadband service below 5 Mbps download and 1 Mbps upload, and (2) voice and broadband service at or above 5 Mbps download and 1 Mbps upload"); Letter from Mary L. Henze, Asst. Vice Pres., AT&T Services, Inc., to Marlene Dortch, Secretary, FCC, WC Docket No. 19-195, at 2 (filed May 15, 2020) (AT&T May 15, 2020 *Ex Parte* Letter) (recommending two-service level maps for demonstrating 4G LTE and 5G-NR coverage). While we require mobile providers to submit coverage maps showing their 3G, 4G LTE, and 5G-NR coverage, we also require that coverage maps reflect minimum speed thresholds associated with each technology.

GIS mapping files that digitally represent the geographic areas in which a customer should expect to receive the minimum upload and download speed the mobile provider advertises for that area or, if the provider does not advertise such speeds, the minimum upload and download speeds users should expect to receive within the polygon.[93]

35. In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission sought comment on incorporating mobile voice and broadband coverage into the Digital Opportunity Data Collection and on what additional steps the Commission should take to obtain more accurate and reliable mobile broadband deployment data.[94] The Commission asked commenters to refresh the record on the potential use of radio frequency (RF) signal prediction, including the mutual use (by the Commission and stakeholders) of a standardized RF propagation prediction model and standardized coverage maps for mobile services.[95] The Commission asked commenters to discuss their experience in the Mobility Fund Phase II proceeding, including the lessons the Commission should draw from the standardized parameters it established for propagation models in that proceeding and whether standardized RF signal strength prediction and technical parameters including download speed, cell loading, and cell edge coverage probability are sufficient to demonstrate coverage.[96] The Commission also asked whether any additional parameters are necessary and whether 5G technology requires different standardized parameters.[97] Providers, to varying degrees, supported the use of propagation models with standardized parameters, though all commenters who opined on the issue supported 4G LTE parameters defined by a cell edge probability of 90% and a cell loading factor of 50%.[98]

36. On December 4, 2019, the Rural Broadband Auctions Task Force released a report on the results of its investigation of purported inaccuracies in the mobile broadband coverage data submitted by mobile providers for the one-time collection of 4G LTE coverage data in the Mobility Fund Phase II proceeding (*Mobility Fund Phase II Investigation Staff Report* or *Report*).[99] The *Report* included recommendations on how the Commission could improve its collection of mobile broadband coverage data, including recommendations for standardizing many of the parameters carriers should use to generate propagation maps. In particular, the *Report* recommended that propagation models be based on standardized parameters for reference signal received power (RSRP) value and/or minimum downlink and uplink speeds, standard cell loading factors and cell edge coverage probabilities, and maximum terrain and clutter bin sizes, among other parameters.[100] The *Report* also recommended that the Commission

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[93] *See* FCC Form 477, Local Telephone Competition and Broadband Reporting Instructions, at 25 (*FCC Form 477 Instructions*), https://us-fcc.app.box.com/v/Form477Instructions.

[94] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7549, para. 112.

[95] *Id.* at 7550, para. 116.

[96] *Id*. In 2017, in the Mobility Fund Phase II proceeding, the Commission separately instituted a new, one-time collection of data to determine the deployment of 4G LTE for purposes of establishing the areas eligible for universal service support in the Mobility Fund Phase II auction. *Connect America Fund, Universal Service Reform—Mobility Fund*, WC Docket No. 10-90, WT Docket No. 10-208, Order on Reconsideration and Second Report and Order, 32 FCC Rcd 6282, 6296, para. 28 (2017) (*Mobility Fund II Order on Reconsideration and Second Report and Order*).

[97] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7550-51, para. 116.

[98] *See, e.g.,* CCA Comments at 5-6, CTIA Comments at 5, Verizon Comments at 9, Verizon Reply at 5, U.S. Cellular Comments at 15.

[99] Rural Broadband Auctions Task Force Staff Report, Mobility Fund Phase II Coverage Maps Investigation Staff Report (2019), https://docs.fcc.gov/public/attachments/DOC-361165A1.pdf (*Mobility Fund Phase II Investigation Staff Report*). In December 2018, the Commission suspended the Mobility Fund Phase II challenge process and launched an investigation into potential violations of challenge process rules by one or more major providers. News Release, FCC, FCC Launches Investigation Into Potential Violations of Mobility Fund Phase II Mapping Rules (Dec. 7, 2018), https://docs.fcc.gov/public/attachments/DOC-355447A1.pdf.

collect specific information used in propagation models, including the locations and characteristics of certain cell sites used for mobile wireless service, the modeling software used, the entire link budget, the sources of terrain and clutter data, and clutter values.[101] The Commission subsequently placed the *Report* into the record of this proceeding.

37. Several of the requirements of the Broadband DATA Act are similar to proposals and recommendations from the *Digital Opportunity Data Collection Order and Further Notice* and the *Mobility Fund Phase II Investigation Staff Report*. The Act requires the Commission to collect from each mobile broadband provider propagation maps and propagation model details that indicate a provider's current 4G LTE coverage based on certain minimum specified parameters.[102] The maps must "take into consideration the effect of clutter," and must reflect "a download speed of not less than 5 megabits per second and an upload speed of not less than 1 megabit per second with a cell edge probability of not less than 90%" and "cell loading of not less than 50%," as well as "any other parameter that the Commission determines to be necessary to create a map . . . that is more precise than the map produced" under the Mobility Fund Phase II data collection.[103]

1. Standardized Predictive Propagation Maps for Mobile Service

38. At the outset we prescribe the same cell edge probability, cell loading, and clutter factors for each of the mobile broadband technologies—3G, 4G, and 5G-NR—for providers' propagation model results. These parameters also will apply to the propagation models providers use to generate the shapefiles that depict the coverage of their voice services.[104] While commenters support consistent parameters in the context of 4G LTE, we conclude that certain uniform minimum parameter values are equally important for demonstrating 3G and 5G-NR coverage as well as voice coverage and that they will

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[100] *Mobility Fund Phase II Investigation Staff Report* at 3, para. 9. The *Report* also recommended that the Commission consider requiring that providers assume the minimum values for any additional parameters that would be necessary to accurately determine the area where a handset should achieve download and upload speeds no less than the minimum throughput requirement for any modeling that includes such a requirement. *Id.*

[101] *Mobility Fund Phase II Investigation Staff Report* at 3, para. 10.

[102] 47 U.S.C. § 642(b)(2)(B).

[103] *Id.*

[104] The Commission sought comment on incorporating mobile wireless voice into the Digital Opportunity Data Collection in the *Digital Opportunity Data Collection Order and Further Notice. Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7549, para. 112; *see also 2017 Data Collection Improvement FNPRM*, 32 FCC Rcd at 6333, paras. 12-13 (seeking comment on how standardization of minimum parameters could allow "more meaningful comparisons among service providers' mobile broadband deployment").

help the Commission assess and compare coverage maps among providers for each technology.[105]

39. *First,* as noted above, we require each coverage map to reflect coverage areas where users should expect to receive the minimum required download and upload speeds with not less than a 90% cell edge coverage probability and a cell loading of not less than 50%. The Broadband DATA Act set these requirements for 4G LTE data submissions, and we find that they are appropriate metrics to use for 3G and 5G-NR data submissions and voice submissions as well. We agree with commenters that by adopting the stricter coverage probability and network loading parameters that many providers themselves use to design their networks, we will help ensure that the coverage maps providers submit do not overestimate coverage and that they more closely match real consumer experience.[106] We adopt the Broadband DATA Act's definitions of the terms "cell edge probability" and "cell loading."[107]

40. *Second*, we require that mobile service providers generate coverage maps with a spatial resolution of 100 meters or better.[108] The Broadband DATA Act defines clutter as "a natural or man-

[105] *See, e.g.,* CTIA Comments at 4, 8 (recommending that the Commission adopt a standardized framework for coverage maps that reflects consumer experience but contending that it is premature to adopt standardized parameters for 5G); CTIA Reply at 4 (noting that "service-level parameters for estimating 4G LTE coverage" will "enable the Commission to aggregate and compare coverage maps across wireless providers"); Verizon Comments at 9 (noting that the Commission can address most of the concerns that have been expressed about the Form 477 mobile deployment data "simply by adopting standardized modeling parameters for 4G LTE propagation models (but not for 5G, for which the adoption of standardized parameters is premature)"). *See also* AT&T Oct. 10, 2017 Comments at 5 (recommending required parameters "with a standard cell edge probability of attaining specific download speeds for each technology (3G/4G, 4G LTE, and 5G) . . ."); Connected Nation Oct. 10, 2017 Comments at 10 ("[t]he Commission should require filers to use specified predictive propagation models to prepare their Form 477 deployment filings. . . . Each carrier should submit, in addition to a certified propagation model, a ReadMe.txt file that explains each of the variables that were used in the development of the model. As the Commission examines speeds available by platform, it is important to understand all services that are available. For rural America, this is especially important to understand since some areas may still only have access to 2G or 3G services.").

[106] *See, e.g.,* CCA Comments at 5-6 (". . . a map defined by at least 90 percent cell edge probability and 50 percent cell loading factor will prevent against an overstatement of network coverage and help ensure that rural communities are provided adequate mobile broadband service"); Verizon Comments at 9 (noting that 90% cell edge probability and 50% loading factor parameters ". . . are more robust than those adopted by the Commission in the Mobility Fund proceeding, and thus should make it less likely that actual user experience falls short of that predicted by the model"); U.S. Cellular comments at 15 (expressing support for 90% cell edge probability and 50% cell loading parameters). *See also* AT&T May 15, 2020 *Ex Parte* Letter at 2 (expressing support for applying same coverage probability and cell loading parameters to 5G services, "the first map would indicate where a provider has a 90% probability of delivering 7Mbps/1Mbps at the cell edge (as proposed for the 5G Fund) with 50% loading. The second map could display where 5G service provided a 90% probability of 1Mbps at the cell edge with 50% loading"). The California PUC opposed the use of propagation modeling based on concerns about the potential inaccuracy of results. California PUC Comments at 8. We expect that the coverage probability, cell loading, and clutter parameters we adopt today will help ensure reliability of the data we collect. 47 U.S.C. § 642(b)(2)(B).

[107] We adopt the Broadband DATA Act's definitions of "cell edge probability" and "cell loading" verbatim. Under the Broadband DATA Act "cell edge probability" is defined to mean "the likelihood that the minimum threshold download and upload speeds with respect to broadband Internet access service will be met or exceeded at a distance from a base station that is intended to indicate the ultimate edge of the coverage area of a cell." 47 U.S.C. § 641(3). "Cell loading" is defined to mean "the percentage of the available air interface resources of a base station that are used by consumers with respect to broadband Internet access service." 47 U.S.C. § 641(4). In response to CTIA's request for clarification, we clarify that we intend the term "cell loading" to refer to the percentage of available air interface resources for both the serving cell and neighboring cells. *See* Letter from Matthew Gerst, Vice Pres., Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 11-10, 19-195, at 2 (filed May 18, 2020) (CTIA May 18, 2020 *Ex Parte* Letter). To the extent providers estimate cell loading on neighboring cells to calculate an interference margin as part of their link budgets, we would expect providers to use a 50% cell loading factor for neighboring cells.

made surface feature that affects the propagation of a signal from a base station"[109] and requires that the Commission develop rules that require providers to account for the effect of clutter as part of the propagation models and coverage maps for 4G LTE service.[110] When predicting mobile coverage using a propagation model, it is standard practice to incorporate digital terrain information so that propagation models predict those instances when the radio signal will likely be blocked on the ground. Similarly, it is common practice to include location-specific data for clutter which can also attenuate and scatter radio waves as they propagate.[111]

41. For consistency between submissions, and to implement the Broadband DATA Act's requirement that providers account for the effect of clutter in producing their propagation models, we specify a baseline resolution requirement for the terrain and clutter data used for modeling and producing maps. We adopt the Broadband DATA Act's definition of the term clutter for purposes of the collection.[112] Without sufficient resolution for terrain and clutter data, natural obstructions to radio propagation can be missed and cause propagation models to misrepresent cellular coverage. The *Mobility Fund Phase II Investigation Staff Report* recommended that our data specifications include maximum terrain and clutter bin sizes and noted that failure to adequately model local clutter and terrain may have contributed to inaccuracies in carrier propagation models in the Mobility Fund Phase II proceeding.[113] Several commenters support requiring carriers to report the clutter factors they use across their coverage areas and requiring the use of terrain and clutter data with a resolution of 100 meters or better.[114] We find that establishing a baseline terrain and clutter bin value of 100 meters or better will help improve the overall accuracy and comparability of the data we collect.

42. Our decision to require reporting for 3G, 4G LTE, and 5G-NR networks is consistent with the requirements of the Broadband DATA Act and the streamlining measures the Commission adopted in the *Digital Opportunity Data Collection Order and Further Notice.* Such a requirement should serve the public interest by providing accurate, granular data on the availability of the most prevalent generations of mobile broadband service. We reject arguments that we lack legal authority to

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[108] "Spatial resolution of 100 meters or better" refers to the maximum spacing between calculated values which form a grid of 100 meters by 100 meters. Higher spatial resolution data (e.g., less than 100 meters grid sizes) are composed with a greater number of grids to yield more details than those of lower spatial resolutions (e.g., greater than 100 meters grid sizes).

[109] 47 U.S.C. § 641(5).

[110] 47 U.S.C. § 642(b)(2)(B).

[111] *See, e.g.*, AT&T Comments at 7 ("Different wireless carriers obtain terrain and clutter information from different sources . . . . The Commission should require filers to provide a complete list of the clutter categories used in their propagation model, along with a detailed description of each clutter category").

[112] Clutter and terrain bin size refers to a spatial resolution unit of the data.

[113] *Mobility Fund Phase II Investigation Staff Report* at 3, 53, paras. 9, 79.

[114] CCA Comments at 7 (expressing support for requiring carriers to report the clutter factors they use across their coverage areas, but noting that "[w]ith varied geographic features across the country, clutter factors should match local environments, and accordingly clutter factors cannot be standardized"); CTIA Comments at 5 & n.16; AT&T May 15, 2020 *Ex Parte* Letter at 2; Letter from Matthew Gerst, Vice Pres. Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 19-195, at 1 (filed May 29, 2020) (CTIA May 29, 2020 *Ex Parte* Letter); (supporting "use of appropriate clutter factors and terrain data with a resolution of 100 meters or better"); Letter from Alexi Maltas, CCA, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 19-195, at 3 (filed May 28, 2020) (CCA May 28, 2020 *Ex Parte* Letter) (noting that CCA supports "the disclosure of terrain and clutter factor at a resolution of 100 meters or less, but with the caveat that any requirement needs to account for what data is available in a particular location"). We agree. We are not requiring that carriers use a single clutter factor for their entire service area. We only specify that carriers (1) incorporate terrain and clutter factors into their propagation model, and (2) use terrain and clutter data with a resolution of 100 meters of better.

establish mapping parameters for 5G-NR services or that it would be premature do so.[115]

43. Our decision to adopt reporting parameters for 5G-NR services implements the Broadband DATA Act requirement that the Commission, if it determines that it is necessary to revise reporting standards to collect accurate propagation maps with respect to future generations of mobile broadband technologies, shall immediately commence a rulemaking to adopt new reporting standards for those technologies.[116] We require mobile providers to submit coverage maps reflecting 5G-NR deployment based on different speed thresholds than the Broadband DATA Act requires for 4G LTE services because we find that the 4G LTE speed thresholds specified in the Act are insufficient to accurately reflect 5G-NR coverage.[117] In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission specifically asked whether 5G technology would require different standardized parameters.[118] Moreover, and as noted above, nationwide providers have deployed 5G networks in different areas throughout the country and additional rollouts are planned.[119] The Commission needs reliable and accurate information about the scope of these 5G-NR deployments as they occur and the parameters we establish today are appropriate for assessing service quality and consumer experience for all mobile technologies, including 5G-NR. Because we do not prescribe extensive modeling parameters and provide flexibility to providers to select and disclose appropriate parameters that reflect the configuration of their networks, commenters' concerns here are largely mooted.

44. *Third*, we prescribe technology-specific user download and upload speeds that users should expect in light of the cell edge probabilities and cell loading factors described above. For 4G LTE, as specified in the Broadband DATA Act, we will require mobile broadband service providers to submit propagation maps and propagation model details that demonstrate where mobile wireless users should expect to receive minimum user speeds of 5/1 Mbps at the cell edge, with a cell edge probability of not less than 90% and a cell loading of not less than 50%.[120] The speed thresholds must represent the expected user experience, as measured at the application layer.

45. For 5G-NR networks, we will require service providers to submit maps that model 5G-

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[115] *See* CCA May 28, 2020 *Ex Parte* Letter at 3 ("the Commission is currently seeking comment on whether to adopt 7 Mbps/1 Mbps for 5G in the Establishing a 5G Fund for Rural America proceeding. CCA looks forward to offering its perspective on that question"); Verizon Comments at 9 ("The Commission can, however, address most of the concerns that have been expressed about the Form 477 mobile broadband deployment data simply by adopting standardized modeling parameters for 4G LTE propagation models (but not for 5G, for which the adoption of standardized parameters is premature . . ."); CTIA May 18, 2020 *Ex Parte* Letter at 3 (". . . the Broadband DATA Act requires the Commission to make a 'determin[ation]' that the specifications above are 'insufficient' to collect accurate propagation maps and propagation model details. And, after such finding, the Act requires the Commission to 'immediately commence a rule making to adopt new reporting standards with respect to those technologies.' Consistent with this directive, the Commission should seek further input on any specifications for mapping 5G that deviate from the Broadband DATA Act's standardized parameters").

[116] 47 U.S.C. § 642(b)(3).

[117] Accordingly, we reject CTIA's argument that it is premature to adopt any parameters for 5G-NR services that are different from those specified in the Act. *See* CTIA May 18, 2020 *Ex Parte* Letter at 3.

[118] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7550-51, para. 116.

[119] *See 2020 Broadband Deployment Report*, FCC 20-50, at 47, para. 91; *Establishing a 5G Fund for Rural America*, GN Docket No. 20-32, et al., Notice of Proposed Rulemaking and Order, 35 FCC Rcd 3994, 4000, para. 16 (2020) (*5G Fund NPRM*).

[120] 47 U.S.C. § 642(b)(2)(B). We clarify that Alaska Plan mobile participants may continue to file LTE at specific speeds, including speeds lower than 5/1 Mbps, to demonstrate that they have met their Alaska Plan commitments, in addition to filing the mobile coverage data required by this order, pursuant to the Broadband DATA Act. *See* Letter from Julie A. Veach, Counsel to GCI, to Marlene Dortch, Secretary, FCC, WC Docket No. 19-195, at 2 (filed July 10, 2020).

NR service using two distinct minimum speed thresholds, both of which must be modeled using a cell edge probability of 90% and cell loading of 50%. First, we require service providers to submit 5G-NR deployment data using a minimum speed threshold of 7/1 Mbps at the cell edge. We anticipate that a 7/1 Mbps speed metric is realistically attainable and will reflect the minimum desired typical user experience across broad 5G-NR coverage areas.[121] In particular, this speed threshold is likely to be attainable by mobile broadband service providers deploying 5G-NR service over smaller channel blocks of low-band spectrum[122] and finds support in the record.[123] Second, we require service providers to submit 5G-NR deployment data based on a higher, 35/3 Mbps minimum speed threshold (at the cell edge). The Commission previously adopted 35/3 Mbps for universal service supported 5G deployments in Puerto Rico and the U.S. Virgin Islands.[124] The two-tiered approach we adopt today for mapping 5G-NR service will provide the best information to end users on where they can expect to receive 5G-NR services capable of supporting a variety of potential use cases.

46. We find it appropriate to adopt requirements for reporting 5G-NR coverage at this time based on the current state of these commercial deployments. The Commission sought comment on reporting standards for 5G networks in the *Digital Opportunity Data Collection Order and Further Notice*, and several commenters expressed support for adopting reporting standards for 5G mobile service.[125] Major U.S. wireless carriers have deployed, or are deploying, commercial 5G networks throughout the country.[126] In view of the Commission's previous request for comment and the record it received on this issue, we disagree with those commenters that argue we should seek additional comment before adopting reporting standards for 5G-NR services.[127]

47. We adopt minimum expected user speeds of 200/50 kbps at the cell edge for 3G network deployments at the prescribed cell edge probability and cell loading.[128] These speeds are consistent with the speed thresholds for 3G service used by the Commission in the Mobility Fund I context,[129] and

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[121] *See 5G Fund NPRM,* 35 FCC Rcd at 4027, para. 98.

[122] The spectral efficiency gains afforded by 5G-NR technology could be expected to allow for deployment of mobile broadband service at speeds of 7/1 Mbps using the same amount of spectrum required by a 4G LTE network to deliver 5/1 Mbps service.

[123] AT&T May 15, 2020 *Ex Parte* Letter at 2 (outlining potential two service-level approach to map rollout of 5G NR services, where "the first map would indicate where a provider has a 90% probability of delivering 7Mbps/1Mbps at the cell edge (as proposed for the 5G Fund) with 50% loading.").

[124] *The Uniendo a Puerto Rico Fund and the Connect USVI Fund et al.*, WC Docket Nos. 18-143, 10-90, 14-58, Report and Order and Order on Reconsideration, 34 FCC Rcd 9109, 9172, para. 124 (2019) (*PR-USVI Fund Report and Order*). In the *PR-USVI Fund Report and Order*, the Commission required 35 Mbps download speed because "the minimum performance requirements of 5G technology, using a typical 10 MHz channel bandwidth, including other system efficiencies such as Multiple Input Multiple Output (MIMO) should permit service providers to meet this speed requirement." *PR-USVI Fund Report and Order*, 34 FCC Rcd at 9172, para. 124. *See also 5G Fund NPRM,* 35 FCC Rcd at 4027, para. 97.

[125] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7550, para. 116 (seeking comment on requiring providers to submit coverage maps using standardized parameters and asking whether 5G technology would require different parameters); New York City Comments at 2 (arguing " . . . a standardized propagation model for 4G LTE and future generation mobile broadband technology . . . is needed").

[126] *2020 Broadband Deployment Report*, FCC 20-50, at 47, para. 91; *5G Fund NPRM,* 35 FCC Rcd at 4000, para. 16.

[127] *See* CCA May 28, 2020 *Ex Parte* Letter at 2 (arguing that " . . . the record does not establish the appropriate speeds at the cell edge for other technologies, such as 5G").

[128] 3G network deployments include both CDMA and GSM deployments. *See Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7525, para. 46.

represent a useful baseline for mapping 3G mobile network coverage. In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission noted that commenters had previously expressed support for applying standardized parameters to coverage maps for each mobile broadband technology, including 3G, and it asked commenters to refresh the record on that issue.[130] Although the transition to networks capable of supporting 5G technology is underway nationwide, we recognize that many mobile broadband network service providers continue to operate 3G networks—particularly providers that serve customers in rural areas of the country.[131]

48. *Fourth*, we require providers to disclose to the Commission details of their propagation models and of the link budgets they use for modeling cell edge network throughput (both uplink and downlink). The *Mobility Fund Phase II Investigation Staff Report* recommended that the Commission require providers to include detailed information in their filing related to how they developed their coverage maps, such as the locations and specific characteristics of cell sites, the modeling software used, the entire link budget and values, and terrain source data.[132] Commenters expressed support for requiring providers to disclose similar information.[133] We agree that requiring providers to submit detailed data about their propagation models and link budgets will help the Commission verify the accuracy of their propagation models. Accordingly, we require providers to disclose the following information regarding their radio network planning tools: (1) the name of the planning tool; (2) the version number used to produce the map; (3) the name of the developer of the planning tool; (4) an affirmation that the coverage model has been validated and calibrated at least one time using drive test and/or other real-world measurements completed by the provider or its vendors (the affirmation should include a brief summary of the process used for calibration and date of calibration); (5) the propagation model or models used;[134] and (6) the granularity of the models used (e.g., 3-arc-second square points, bin sizes (subject to the baseline requirements adopted here), and other parameters).[135] We also require that propagation maps submitted by providers predict outdoor coverage, which should include both (1) on-street or pedestrian

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[129] *Connect America Fund et al.*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 11791-92, para. 361 (2011).

[130] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7550, para. 114 (citing AT&T Oct. 10, 2017 Comments at 5).

[131] *See generally* Form 477 data, https://www.fcc.gov/mobile-deployment-form-477-data.

[132] *Mobility Fund Phase II Investigation Staff Report* at 53, para. 81.

[133] AT&T May 15, 2020 *Ex Parte* Letter at 2 (proposing list of parameters that should be disclosed with every propagation map); AT&T Reply at 1 (arguing that "the Commission should adopt an approach based on mapping to Commission-defined service levels, with full transparency regarding the modeling parameters that filers use to generate their maps, including detailed link budgets"); AT&T Comments at 6 (recommending that "[a]long with each service level coverage map, the Commission should require filers to submit the specific parameters used in producing each coverage contour, including a detailed link budget …"); CCA Comments at 4-7 (recommending factors that should be included as part of "detailed Radio Frequency Link Budget submission"); CTIA May 18, 2020 *Ex Parte* Letter at 4 (arguing that "[w]hile the Commission should refrain from adopting standardized mapping parameters beyond the requirements of the Broadband DATA Act based on the current record, the Commission could gain valuable experience by adopting a framework under which mobile broadband providers would disclose to the Commission, with protections for confidentiality, other values").

[134] If multiple models are used, the provider should include a brief description of the circumstances under which each model is deployed (e.g., model X is used in urban areas, while model Y is used in rural areas) and include any sites where conditions deviate.

[135] *See* AT&T May 15, 2020 *Ex Parte* Letter at 2.

stationary usage and (2) in-vehicle mobile usage.[136]

49. In addition, we also require providers to submit: (1) all applicable link-budgets used to design their networks and provide service at the defined speeds, and all parameters and parameter values included in those link budgets; (2) a description of how the carrier developed its link budget(s) and the rationale for using specific values in the link budget(s); and (3) the name of the creator, developer or supplier, as well as the vintage of the terrain and clutter datasets used, the specific resolution of the data (subject to the minimum requirements adopted in this *Order*), a list of clutter categories used, a description of each clutter category, and a description of the propagation loss due to clutter for each.[137] For each of the categories of required data, we require providers to submit reasonable parameter values and propagation models consistent with how they model their services when designing their networks. In no case may any provider omit link budget parameters or otherwise fail to account for constraints on their coverage projections.[138] We also require the above-described information be made public subject to individual requests for confidential treatment, so that it is available to those who wish to challenge provider-submitted coverage maps.[139]

50. We require service providers to submit their coverage maps in vector format.[140] There are two predominant forms for storing and displaying map information digitally. Raster format provides a grid of individual points that, together, represent an image. Vector format produces an image by storing and displaying a set of connected lines in the form of the start and end points, rather than the individual pixels of the line as would be done with raster-format data. When taken together, the set of lines form the boundaries for different colors within a map or, more generally, an image. While raster format arguably provides for more detail, it involves significantly more data. There are differing views in the record about whether to require raster format. Some commenters argue that raster format would improve consistency and comparability of provider data.[141] Others argue that requiring raster format would be burdensome.[142] We find that requiring the submissions in vector format will facilitate efficient and effective collection of data while minimizing burdens for providers. We are not persuaded that the benefits of requiring raster format outweigh the potential added burdens for some providers.[143] Requiring submission of raster files

[136] *See* Letter from Alan Buzacott, Exec. Dir. Fed. Reg. and Legal Affairs, Verizon, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 19-195, at 1 (filed July 8, 2020) (arguing that "[t]o achieve the Commission's goal of standardizing propagation maps and to avoid subsequent apples to oranges comparisons, the Commission must specify before the initial filing deadline the type of coverage that should be depicted by the propagation maps").

[137] *See* AT&T May 15, 2020 *Ex Parte* Letter at 2-3.

[138] *Mobility Fund Phase II Investigation Staff Report* at 19-20, para. 50 & nn.98-99 (explaining that it is unreasonable for a provider to omit unspecified parameters when generating mobile coverage data).

[139] *See* AT&T May 15, 2020 *Ex Parte* Letter at 2 (proposing list of parameters that should be disclosed with every propagation map and recommending that providers be able to request confidentiality as needed). We reject CTIA's request that the Commission treat all link budget information as confidential. To the extent that a provider views such information as commercially sensitive, it may submit an individual request for confidential treatment. *See* Letter from Matthew Gerst, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 19-195, 11-10, at 6 (filed July 6, 2020) (CTIA July 6, 2020 *Ex Parte* Letter).

[140] In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission sought comment on whether providers should be required to submit standardized coverage maps in vector or raster format, on whether raster-formatted data would improve the Commission's ability to verify the accuracy of deployment data, and on which of the two formats is the least burdensome. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7551-52, para. 118.

[141] *See, e.g.,* NYC Comments at 2 (noting that raster format would allow consistency and ease of comparability among shapefiles); ACT—The App Association Comments at 5 (supporting raster format to provide visual representations of actual service areas).

[142] *See, e.g.,* U.S. Cellular Comments at 17 (claiming that a raster format would be burdensome because it currently relies on vector-formatted data to create its propagation maps).

would not only increase burdens on service providers, but also expend significant Commission resources needed to process the greater volume of data associated with raster-formatted submissions. In addition, we find that the evidence in the record fails to demonstrate that requiring providers to use raster format for their submissions is necessary for the Commission to be able to verify mobile broadband coverage. Instead, we anticipate that the other verification measures we propose in the *Third Notice* would be more useful for verifying provider submissions.

51. Taken together, we expect that the minimum parameter values we establish will improve the accuracy, comparability, and reliability of the mobile broadband data we collect. As discussed above, the Broadband DATA Act gives the Commission the authority to adopt any other parameters it determines are necessary to create a map that is "more precise than the map produced as a result of the submissions under the Mobility Fund Phase II information collection."[144] In accordance with this authority, we direct OEA and WTB to modify the speed, probability, and loading parameters as necessary to account for improvements in mobile broadband service over time.[145] This will continue to allow the Commission to ensure the collection of accurate, comparable, and granular broadband data maps in the future.

C. Establishment of the Fabric

52. The Broadband DATA Act requires the Commission to create "a common dataset of all locations in the United States where fixed broadband Internet access service can be installed, as determined by the Commission."[146] The Act also requires the Commission to establish the Fabric, which must contain "geocoded information" for all of the locations identified in the common dataset.[147] In addition, the Fabric must serve as the foundation on which all other fixed broadband Internet access service availability data collected under the Broadband DATA Act are layered,[148] it must be compatible with commonly used geographic information system (GIS) software,[149] and the Commission must update the Fabric at least every six months.[150] The Broadband DATA Act also prescribes constraints for the Commission in contracting for assistance in the creation of the Fabric.[151]

53. In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission stated its intention to develop a national, broadband-serviceable location database, to be maintained by the Administrator, that would be incorporated into the Digital Opportunity Data Collection database.[152] In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission sought comment on multiple issues associated with the development and implementation of such a database, including what kinds of locations should be included as being "broadband-serviceable,"[153] how locations should be

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[143] *See, e.g.,* U.S. Cellular Comments at 17 (noting that it "relies on vector-formatted data to create its propagation maps, and has therefore developed all of its mapping related processes based upon its utilization of this vector-formatted data" and that a requirement to use raster format would "would force upon U.S. Cellular the burdensome task of reprogramming all of the tools and processes it currently relies upon to produce its coverage maps").

[144] 47 U.S.C. § 642(b)(2)(B)(ii)(II).

[145] *See also* 47 U.S.C. § 642(b)(3).

[146] 47 U.S.C. § 642(b)(1)(A)(i).

[147] 47 U.S.C. § 642(b)(1)(B)(i).

[148] 47 U.S.C. § 642(b)(1)(B)(ii).

[149] 47 U.S.C. § 642(b)(1)(B)(iii).

[150] 47 U.S.C. § 642(b)(1)(B)(iv).

[151] 47 U.S.C. § 642(b)(1)(A)(ii).

[152] *Digital Opportunity Data Collection Order and Further Notice,* 34 FCC Rcd at 7518, para. 30.

[153] *Id.* at 7545-46, para. 101.

defined in the location database, and how it should manage and verify the quality of the data.[154]

54. Consistent with our stated intentions in the *Digital Opportunity Data Collection Order and Further Notice*, and the substantially overlapping requirements of the Broadband DATA Act, we adopt the Fabric, along with these basic elements as required by the Act. Specifically, we conclude that the Fabric will consist of a single, nationwide fabric that will contain geocoded locations for all locations where a broadband connection can be installed. However, we find that it is appropriate in the *Third Notice* to seek additional comment on certain aspects of developing the Fabric. We also note that the Broadband DATA Act specifically authorizes the Commission to contract with an entity with GIS expertise to create and maintain the Fabric,[155] but we have not yet been appropriated funding to implement the Fabric and other measures required by the Broadband DATA Act and therefore cannot begin to implement them. We find, however, that determining to establish the Fabric now will enable us to commence promptly the processes necessary to contract for its creation and operation once funding is available, subject to the provisions of the Federal Acquisition Regulation and other requirements established in the Broadband DATA Act.[156]

D. Timing of Collection Filings

55. As required by the Broadband DATA Act,[157] we establish a biannual schedule for collection of broadband Internet access service availability and quality of service data. For this purpose, we establish filing deadlines of March 1 and September 1 each year. The March filing would reflect data as of December 31 of the previous calendar year, while the September filing would reflect data as of June 30 of the then-current calendar year. We direct OEA to issue a public notice announcing the initial filing deadline at least six months prior to that deadline, and fixed and mobile service providers must file their initial reports by that initial filing deadline.[158] Finally, providers that become subject to the Digital Opportunity Data Collection filing requirements after the initial filing deadline must file data initially for the reporting period in which they become eligible.

E. Processes for Verifying Broadband Availability Data Submitted by Providers

56. Pursuant to the Broadband DATA Act, we adopt rules for processes through which the Commission will be able to "verify the accuracy and reliability" of the broadband Internet access service availability data submitted by providers.[159] In addition to the infrastructure data that fixed wireless providers must submit to verify their network coverage data,[160] we also adopt (1) a process that uses data contained in the Administrator's High Cost Universal Broadband (HUBB) portal[161] to cross-check fixed broadband coverage data; (2) the use of audits as a means of verifying coverage data accuracy; (3) a certification requirement for all biannual provider submissions, and (4) processes for collecting crowdsourced and verified third-party data. We seek comment in the *Third Notice* on other methods for

[154] *Id.* at 7546, para. 104.

[155] 47 U.S.C. § 642(b)(1)(A)(ii).

[156] 47 U.S.C. § 642(b)(1)(A)(ii).

[157] 47 U.S.C. § 642(a)(1)(A).

[158] *See, e.g., Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7512, para. 16 ("Fixed broadband service providers must file initial service availability reports within six months of the public notice announcing availability of the new collection platform.").

[159] 47 U.S.C. §§ 642(a)(1)(B)(i), (b)(4)(B).

[160] *See supra* Sections III.A.2.

[161] *See* USAC, *The HUBB Portal*, https://www.usac.org/high-cost/annual-requirements/submit-data-in-the-hubb/ (last visited May 1, 2020).

verifying the broadband availability and quality of service data submitted by providers, some of which are mandated by the Broadband DATA Act.

1. Verifying Fixed Broadband Data Using HUBB Data

57. We will independently verify fixed broadband coverage data submitted by providers by integrating the geolocation data contained in the HUBB portal with the submitted fixed broadband coverage polygons.[162] As part of its Universal Service Fund oversight responsibilities, USAC maintains the HUBB portal through which high-cost universal service support recipients report the coordinates, address, deployment date, speed, and number of units for every location where fixed broadband service is available.[163] The Commission found in the *Digital Opportunity Data Collection Order and Further Notice* that cross-checking broadband availability data with HUBB data "will benefit our overall understanding of how high-cost support dollars are used in conjunction with overall broadband deployment and will aid the data collection verification effort."[164] As a result, we will use HUBB data to verify provider-submitted data, but note that USAC will not have a role in this process. Since HUBB data include location coordinates, we will use the data to cross-check any location data submitted by fixed broadband providers or to determine whether any locations served according to the HUBB are outside any service polygons submitted. We will require filers whose data in the HUBB conflict with their availability data to submit conforming or corrective information after determining which information is in error.

2. Commission Audits

58. The Broadband DATA Act requires the Commission to "conduct regular audits of information submitted by providers . . . to ensure that the providers are complying with [the Act]."[165] For all fixed providers, this information includes (1) the availability of broadband Internet access service; (2) download and upload speeds and, if applicable, latency; and (3) location data that can be georeferenced in the Fabric.[166] For fixed wireless providers, such information includes any propagation maps and propagation model details, or lists of addresses or locations that constitute a provider's service area.[167] For terrestrial fixed and satellite providers, such information includes polygon shapefiles or a list of addresses or locations that constitute a provider's service area.[168] For mobile providers, such information includes propagation maps and propagation model details that indicate a provider's mobile 4G-LTE broadband Internet access service coverage.[169]

59. In the *Digital Opportunity Data Collection Order and Further Notice*, we sought comment on the use of such tools such as audits, field tests, and statistical analyses to confirm the accuracy of broadband availability data submitted by providers.[170] We agree with commenters such as Connected Nation that "the DODC would benefit significantly from having a mechanism for field validation in place at the outset of the first data collection so that there is a means of auditing the data and

[162] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7517-18, para. 28.

[163] *Id.*

[164] *Id.*

[165] 47 U.S.C. § 644(a).

[166] 47 U.S.C. § 642(b)(2).

[167] 47 U.S.C. § 642(b)(2)(A)(iv)(I).

[168] 47 U.S.C. § 642(b)(2)(A)(iv)(II).

[169] 47 U.S.C. § 642(b)(2)(B).

[170] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7540, para. 83.

investigating where evidence suggests the resulting maps may be incorrect."[171]

60. Accordingly, we will conduct audits involving information submitted by all types of providers of broadband Internet access service (e.g., terrestrial fixed, fixed and mobile wireless, satellite). Subject to our receipt of sufficient appropriations, audit tools will include field surveys, investigations, and annual random audits to verify data accuracy. In addition, audits may be initiated based on an unusual number of crowdsourced complaints.[172]

3. Certification of Filings

61. The Broadband DATA Act requires that each provider must include as part of its filing "a certification from a corporate officer of the provider that the officer has examined the information contained in the submission and that, to the best of the officer's actual knowledge, information, and belief, all statements of fact contained in the submission are true and correct."[173] The format of this certification is slightly different from the certification requirement adopted for fixed providers in the *Digital Opportunity Data Collection Order and Further Notice*,[174] but we conclude that the plain language of the Broadband DATA Act now requires us to adopt this new standard (for both fixed and mobile service providers) and we do so here.[175]

4. Process for Collecting Crowdsourced Data

62. The Broadband DATA Act requires that the Commission develop a crowdsourcing process "through which entities or individuals . . . may submit specific information about the deployment and availability of broadband Internet access service . . . on an ongoing basis so that the information may be used to verify and supplement information submitted by providers . . . for inclusion in the [broadband coverage] maps."[176] The Act further directs the Commission to "prioritize the consideration of data provided by data collection applications used by consumers that the Commission has determined: (i) are highly reliable; and (ii) have proven methodologies for determining network coverage and network performance."[177] In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission adopted a crowdsourcing process for fixed services to begin collecting public input on the accuracy of service providers' broadband deployment data.[178] We further stated, "Consistent with the public feedback mechanism we adopt for fixed providers in the Digital Opportunity Data Collection, we propose to collect similar crowdsourced data for purposes of improving the quality of mobile broadband deployment data and seek comment on how to incorporate such data into data quality analysis."[179] We noted that third-party crowdsourced data for mobile service can serve as an important supplement to the information we

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[171] *See* Letter from Brent Legg, V.P. Government Affairs, Connected Nation, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 19-195, 11-10, at 2 (filed July 25, 2019).

[172] *See infra* Section III.E.4.

[173] 47 U.S.C. § 642(b)(4).

[174] There, we required an appropriate official of each filer to include a certification that the filer's service availability data is true and accurate to the best of the certifying official's knowledge. *Digital Opportunity Data Collection Order and Further Notice,* 34 FCC Rcd at 7512, para. 16.

[175] Because certifications are such an important part of verifying broadband availability filings, we decline to adopt USTelecom's request not to require certifications for any updates or corrections made in between biannual filings. *See* USTelecom July 9, 2020 *Ex Parte* Letter at 2. Moreover, as noted below, because filers may bundle multiple updates and corrections into a single submission, we do not expect requiring certifications for these filings to be especially burdensome.

[176] 47 U.S.C. §§ 642(a)(1)(B)(iv), 644(b)(1).

[177] 47 U.S.C. § 644(b)(2)(A).

[178] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7506, 7513, paras. 3, 18.

[179] *Id.* at 7553-54, para. 123.

collect from service providers by independently measuring mobile broadband speed and availability.[180] In addition to our proposal to collect such data, we sought comment on how to treat crowdsourced data and the procedures that we should follow.[181] In this *Second Report and Order*, we adopt the requirements from the Broadband DATA Act and our proposals from the *Digital Opportunity Data Collection Order and Further Notice* to collect crowdsourced data.

63. As an initial matter, consistent with comments received in response to the *Digital Opportunity Data Collection Order and Further Notice*[182] and the differences spelled out in the Broadband DATA Act,[183] we determine that the crowdsourcing process should be administered as separate and distinct from the challenge process. As a result, as set forth herein, we adopt distinct processes for collecting data for crowdsourcing and challenges. In addition, in connection with crowdsourced data on mobile service availability, we distinguish between mobile crowdsourced data collected by app developers, such as Ookla,[184] and information (including individual speed test results) submitted by consumers through the online portal for crowdsourced filings, as described below.

a. Scope of Crowdsourced Data Filings

64. The Broadband DATA Act requires the Commission to establish a process that allows individuals and entities to submit specific information about the "deployment and availability" of broadband Internet access service in the United States on an ongoing basis.[185] We adopt a process that will allow for submission of information falling within this defined scope.

65. In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission noted that it has used mobile crowdsourced data, such as speed test data generated by mobile consumer speed test apps, to inform various Commission reports.[186] We recognized, however, that such data have

[180] *Id.*

[181] *Id.* at 7553-54, paras. 123-24.

[182] Many providers supported a two-pronged approach to disputing the Digital Opportunity Data Collection filings of providers: "challenges" (requiring a provider response) versus crowdsource "complaints" (no response required unless an investigation uncovers pattern of misreporting). *See, e.g.,* NTCA Reply at 5-6 (crowdsourced data can and should be used as part of an ongoing process to help identify and evaluate trends in coverage reports, as a complement to a challenge process); GeoLinks Reply at 9-10 (use crowdsourced data for informational purposes only and consider crowdsourcing "a complement to, and [not] a substitute for, robust and meaningful evidentiary challenge processes"); Broadband Mapping Coalition Comments at 27-28; Verizon Comments at 6-7; WTA Comments at 12-13; Alaska Communications Comments at 12; NCTA Reply at 9; AT&T Reply at 7-8; GVNW Consulting Reply at 2-3, 5.

[183] While the challenge process allows individuals and entities to formally challenge the accuracy of coverage maps, Fabric information, and broadband Internet access service availability data submitted by providers (47 U.S.C. § 642(b)(5)(A)), the crowdsource process allows for individual and entities to submit specific information about the deployment and availability of broadband Internet access service so that the information may be used to verify and supplement information submitted by providers for inclusion in the coverage maps (47 U.S.C. § 644(b)(1)).

[184] Ookla gathers crowdsourced mobile speed data through its Speedtest mobile app. Speedtest, *Speedtest Apps for Mobile*, http://www.speedtest.net/mobile/ (last visited June 4, 2020).

[185] 47 U.S.C. § 644(b)(1).

[186] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7553-54, para. 123. *See also, e.g.*, *Communications Marketplace Report et al.*, GN Docket No. 18-231 et al., Report, 33 FCC Rcd 12558, 12579, para. 25 (2018); *Implementation of Section 6002(B) of the Omnibus Budget Reconciliation Act of 1993,* WT Docket No. 17-69, Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services, 32 FCC Rcd 8968, 9034-37, paras. 90-92 (2017)*; 2020 Broadband Deployment Report*, FCC 20-50, at 8-9, paras. 16-17.

certain limitations.[187] For example, bias is often introduced into speed test data because tests are performed only at specific times and places, potentially providing a less accurate snapshot of mobile broadband performance. We also noted that the methods by which different speed test apps collect data can vary and may not use techniques that control for certain variables.[188] Although we recognize the potential limitations of crowdsourced data, we nonetheless believe that third-party crowdsourced data can serve as an important supplement to the information we collect from service providers by independently measuring mobile broadband speed and availability.

66. We direct OET, OEA, WCB, and WTB to develop and refine a process for entities and individuals to submit third-party fixed and mobile crowdsourced data consistent with the Broadband DATA Act's requirements and the Commission's policies. In accordance with the Act's requirements, these Bureaus and Offices will develop the process by which we will prioritize the consideration of crowdsourced data submitted through data collection applications used by consumers, and other entities, that are determined to be "highly reliable" and that "have proven methodologies for determining network coverage and network performance."[189] In applying this standard, these Bureaus and Offices may consider: (1) whether the application uses metrics and methods that comply with current Bureau and Office requirements for submitting network coverage and speed data in the ordinary course; (2) whether the speed application has enough users that it produces a dataset to provide statistically significant results for a particular provider in a given area; and (3) whether the application is designed so as not to introduce bias into test results. The Bureaus and Offices will issue specific rules by which we will prioritize the consideration of crowdsourced data in advance of the time that the online portal is available. This will allow filers to take these rules into account in submitting crowdsourced data. As noted above, the Commission has used mobile crowdsourced data to inform various Commission reports, such as in the 2020 Broadband Deployment Report where the Commission supplemented Form 477 data with Ookla crowdsourced speed test data in assessing access to advanced telecommunications capability for mobile services.[190] The Commission currently receives some crowdsourced data through its Measuring Mobile Broadband in America (MMBA) program; we do not, however, intend to restrict crowdsourcing broadband data collection efforts to the product of any one specific entity. Further, the industry or commenter may identify a number of alternative applications that satisfy the aims of crowdsourcing in this context.

67. We also direct OET, OEA, WCB, and WTB to modify the process for the collection of fixed and mobile crowdsourced data over time in the event that these Bureaus and Offices determine it is necessary. We recognize that there may be changes in technology, different types of crowdsourced data, or other considerations that may require revaluation and possible modifications of the Bureaus' and Offices' initial determinations in order that they may satisfy the Act's provisions for submitting crowdsourced data on an ongoing basis. We find that directing these Bureaus and Offices to implement the collection of fixed and mobile crowdsourced data will provide greater flexibility to adjust and improve our data collection process over time.

b. Establishment of an Online Portal for Crowdsourced Data Filings

68. Consistent with the requirements in the Broadband DATA Act[191] and similar to the

[187] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7553-54, para. 123.

[188] *Id.* There also could be a small sample size problem, particularly in rural areas where there may be very few speed tests. *Id.* Additionally, speed test apps report failed tests differently, thus potentially decreasing the reliability of speed test data in unserved areas where no signal is available and speed tests are more likely to fail.

[189] 47 U.S.C. § 644(b)(2)(A).

[190] *See supra* para. 63 & n.209.

[191] 47 U.S.C. § 644(b)(1).

requirement in the *Digital Opportunity Data Collection Order and Further Notice*,[192] we will establish and use an online portal for crowdsourced data filings and will use that same portal for challenge filings.[193] We find that a single platform would be the most beneficial approach for the public, challengers, and providers to use for crowdsourced data and challenge filings. We direct the Offices and Bureaus to implement the crowdsourced data collection and to create a portal for the receipt of crowdsourced data.

c. Information Included in Crowdsourced Data Filings

69. Similar to our proposal in the *Digital Opportunity Data Collection Order and Further Notice*,[194] we require that crowdsourced data filings contain the contact information of the filer (e.g., name, address, phone number, and e-mail), the location that is the subject of the filing (including the street address and/or GPS coordinates of the location), the name of the provider, and any relevant details about the deployment and availability of broadband Internet access service at the location.[195] With regard to crowdsourced input from existing speed-test applications, we currently collect the location and identifying information that is part of the normal operation of the application, and the Commission will only accept tests that use the device's location services to determine latitude and longitude to ensure precise location data.

70. In addition, crowdsourced data filers must certify that, to the best of the filer's actual knowledge, information, and belief, all statements in the filing are true and correct.[196] This is similar to the certification required under the Broadband DATA Act for providers when making their biannual filings,[197] as well as the proposed certification for parties when submitting data in the challenge process. We believe that such a requirement will discourage frivolous or malicious crowdsourced data filings.[198]

d. Treatment of Crowdsourced Data Filings

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[192] We note the similar requirement from the *Digital Opportunity Data Collection Order and Further Notice* directing OEA to work with USAC to create an online portal for State, local, and Tribal governmental entities and members of the public to review and dispute the broadband coverage polygons filed by fixed providers under the new collection. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 18.

[193] We also sought comment on this issue in the *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7542, para. 89 (proposing a system to track complaints about the accuracy of fixed broadband coverage polygons—such a system could be similar to the Commission's existing consumer-complaints database). As described above, we requested comment on our proposal to collect mobile crowdsourced data in the *Digital Opportunity Data Collection Order and Further Notice,* consistent with the public feedback mechanism we adopted for fixed service providers in the Digital Opportunity Data Collection. We received comments regarding the creation of an online portal for fixed and mobile crowdsourced data filings. *See, e.g.,* Verizon Comments at 5-7.

[194] Following our proposal to collect mobile crowdsourced data, we sought comment on the steps the Commission should take to ensure that the crowdsourced data it uses are statistically valid and provide accurate information. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7553-54, paras. 123-24.

[195] *Id.* at 7542, para. 91 ("We propose to have USAC collect the following data from entities disputing coverage: the address of the location at which coverage is disputed and/or its coordinates (latitude and longitude); the fixed provider whose service coverage is in dispute; the download and upload speeds available for subscription; the technology reported at that location by the provider; and contact information from the submitting party (e-mail address and/or phone number."); *see also* Alaska Communications Comments at 13.

[196] In response to our proposed collection of both fixed and mobile crowdsourced data in the *Digital Opportunity Data Collection Order and Further Notice*, Verizon asserted that crowdsourced data filers should certify certain information to authenticate customers as part of the Commission's measures to protect the integrity of its process for collecting such data. Verizon Comments at 6.

[197] 47 U.S.C. § 642(b)(4).

[198] *See Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 20 (directing USAC to develop mechanisms in the new platform to prevent malicious or unreliable crowdsourced filings).

71. As an initial matter, the crowdsourced data portal will alert providers when crowdsourced filings are made concerning their data, and providers may, but will generally not be required, absent a Commission inquiry, to respond to crowdsourced data filings.[199] In response to the *Digital Opportunity Data Collection Order and Further Notice*, many providers objected to a proposed requirement that they respond to all crowdsourced data filings.[200] We note that a crowdsourced data filer can file a challenge if it seeks a more formal response to a dispute pursuant to a challenge process, on which we seek comment in the *Third Notice.*

72. We will use crowdsourced data to inform, but not decide, a provider's claimed deployment and availability of broadband Internet access service—and as an important part of verification options that include Commission audits, cross-checking with HUBB data, a challenge process, and data from government entities and third parties.[201] When we sought comment in the *Digital Opportunity Data Collection Order and Further Notice* on the use of crowdsourced data,[202] many providers argued that such data should be used only when there is a systematic problem with a provider's reporting in a given area.[203] We adopt an approach similar to that advocated by commenters and limit the use of crowdsourced data to identifying trends and trouble-spotting, rather than addressing every individual claim.[204] Specifically, Commission staff will use crowdsourced data to identify individual instances or patterns of potentially inaccurate or incomplete deployment or availability data that warrant further investigation or review.

73. In response to our requests for comment on mobile crowdsourced data, parties generally agree that service providers represent the best source of mobile broadband deployment and availability data and that crowdsourced data should only be used as a supplement to the information that the Commission collects from providers.[205] Some commenters assert that public feedback from actual

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[199] *See, e.g.,* ACA Connects Reply at 13-15 (arguing that providers be sent validated crowdsource filings and providers should have the option of responding to individual filings).

[200] Broadband Mapping Coalition Comments at 28 (arguing that crowdsource reports do not require the provider's response in all cases); NCTA Reply at 9 (stating that, given the less credible and precise nature of the data submitted, providers should not be obligated to respond to every complaint); AT&T Reply at 7-8 (arguing that providers should not be expected to respond to each and every filing submitted via crowdsourcing); *see also* Connected Nation Comments at 6-7 (arguing that it would be unreasonable and impractical for providers to be required to respond to every complaint that is filed); WTA Comments at 13 (agreeing that crowdsource reports should not require a provider response in all cases).

[201] *See, e.g.,* NTCA Comments at 11; GeoLinks Reply at 9-10 (agreeing with WTA that crowdsource data should be used for informational purposes only).

[202] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7544, para. 95.

[203] NTCA Reply at 5-6 (arguing that crowdsourced data can serve to provide the Commission with "heat maps" highlighting where a confluence of reports indicates persistent broadband gaps notwithstanding reporting on a more granular basis pursuant to common technical standards); NCTA Reply at 9 (agreeing that data submitted as part of the crowdsource process should "be used to detect trends with respect to coverage claims"); AT&T Reply at 7-8 (arguing that provider responses only should be required where the trends in crowdsourced data identify a problem); Connected Nation Comments at 6-7 (requesting that crowdsourcing complaints be tracked in the aggregate for the purpose of identifying areas on the resulting maps that warrant further refinement or investigation).

[204] Verizon Comments at 6-7; WTA Comments at 12-13 (arguing that crowdsourced data should only be used to identify areas for further investigation purposes); ACA Connects Reply at 13-15 ("If the WCB finds that there is a critical mass of valid filings over a limited time about a particular provider on a specific issue, it should investigate further."); State of Colorado Comments at 8 ("Crowdsourced data would be collected and utilized proactively by the FCC and compared to provider reported data as a validation mechanism, as opposed to solely using a complaint-based, reactive process for a specific area in question.").

[205] *See, e.g.,* AT&T Reply at 2, 7-8; Verizon Comments at 5-7, 11-12; Verizon Reply at 6; U.S. Cellular Comments at 4-5; CTIA Comments 8-9; CTIA Reply at 5.

broadband consumers and entities can improve the accuracy and granularity of the coverage maps or identify inadvertent errors, while also emphasizing that caution is necessary in relying on crowdsourced data. They maintain that such data must be carefully calibrated both to promote greater accuracy and to protect providers from unnecessary burdens.[206] Several commenters urge the Commission not to require providers to respond to each individual crowdsourced data submission; they argue that it would be an unnecessary burden and may not materially improve the development of accurate coverage maps.[207] Some commenters point out that crowdsourced data are not collected under controlled conditions or in a statistically significant manner.[208] In particular, CTIA proposes a limited pilot program to evaluate the utility of tools such as crowdsourced data for verifying mobile broadband coverage before the Commission takes more steps to expand the use of such data.[209]

74. In response to the *Digital Opportunity Data Collection Order and Further Notice*, commenters suggested a range of thresholds above which the Commission should investigate crowdsourced data complaints—from "one half of one percent of the number of premises covered," as suggested by Next Century Cities, to at least 75% of submitted results in an area suggesting that coverage is overstated, as requested by WTA—Advocates for Rural Broadband (WTA).[210] We decline to establish specific thresholds to use when deciding whether to evaluate providers' filings where crowdsourced data suggest that a certain percentage of the locations reported in a census block, or a certain percentage of the provider's total locations, are inaccurate. Instead, we agree with commenters such as ACA Connects that Commission staff should initiate inquiries when a "critical mass of" crowdsourced filings suggest that a provider has submitted inaccurate or incomplete data.[211] We direct our Bureaus and Offices to provide guidance to providers when inquiries based on crowdsourced filings could be initiated. We also reserve the right to investigate filings in instances that do not meet the thresholds if warranted by the specific circumstances of a crowdsourced data filing.

e. Remedies for Inaccurate Data Identified by Crowdsourced Data Filings

75. Similar to our proposal in the *Digital Opportunity Data Collection Order and Further Notice*,[212] once staff have evaluated a particular crowdsourced data submission and established the need to

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[206] *See, e.g.,* Verizon Comments at 5, 11-12; CTIA Comments at 8-9; U.S. Cellular Comments at 4; *see also* City of New York Comments at 4 (supporting Commission's efforts to elicit voluntary speed testing by consumers and local governments, but discourages overreliance on verification via crowdsourcing alone); GVNW Consulting Comments at 5 (contending that input from consumers or government entities could be a "double-edged sword" given that crowdsourcing has the potential for inaccurate or bad-faith disputes).

[207] *See, e.g.,* Verizon Comments at 5-7; AT&T Reply at 7-8; CTIA Reply at 6; *see also* U.S. Cellular Comments at 4 (crowdsourced data is important because it can identify outliers that merit further investigation).

[208] *See, e.g.,* Verizon Comments at 8-9, 12; Verizon Reply at 6; CTIA Comments at 9.

[209] CTIA Comments at 3, 8-11; CTIA Reply at 2, 5-8; *see also* Verizon Reply at 6; AT&T Reply at 7-8.

[210] *See, e.g.,* Next Century Cities Comments at 5-6; WTA Comments at 13-14; *see also* Alexicon Comments at 7 (a "statistically significant" number of complaints about a provider's specific area).

[211] ACA Connects Comments at 12-14 (arguing that action should be required when "there is a critical mass of complaints indicating a material and immediate problem exists about a distinct and similar issue in the reported data from a provider"); *see also* NCTA Comments at 15-16 ("if USAC or the FCC saw an exceptional level of feedback in a particular area or for a particular provider, they could investigate to determine whether there is a reporting problem that the provider should correct").

[212] Regarding the collection of mobile crowdsourced data, we requested comment on the actions that the Commission should take as part of its process to ensure accurate crowdsourced data, and in particular, how the Commission should handle cases in which crowdsourced data show that service is unavailable in an area where a provider claims broadband availability. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7554, para. 124. Several commenters suggested certain processes to evaluate whether the mobile

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take a closer look at a provider's data, staff will contact the provider and offer it an opportunity to explain any discrepancies between its data and the Commission's analysis.[213] If the provider agrees with staff analysis, then it will be required to refile updated and corrected data within 30 days of agreeing with that determination, although providers will be allowed to bundle multiple crowdsourced corrections into one filing during a 30-day period.[214] If the provider disputes the staff analysis, staff will review the provider's response and consider whether further inquiry is necessary to resolve the discrepancy.[215] This could include, for example, beginning a formal audit of the provider's data or engaging in informal dispute resolution.[216] If staff ultimately conclude that the provider's filing is not reliable with respect to the areas covered by the crowdsourced filing, staff will require the provider to refile its fixed or mobile coverage data excluding the locations or areas in question.

f. Public Availability of Information Filed in the Crowdsourcing Process

76. We will make public all information submitted as part of the crowdsourcing process, with the exception of personally identifiable information and any data required to be confidential under section 0.457 of our rules.[217] We note that the information that we adopt for crowdsourced data filers to provide is the same information that we required be made publicly available in the *Digital Opportunity Data Collection Order and Further Notice*.[218] We find that this information will be sufficient to inform the public about the nature of a crowdsourced data filing, while protecting legitimate privacy or other interests. Similar to the requirement we adopted in the *Digital Opportunity Data Collection Order and Further Notice*, we direct OEA to make crowdsourced data publicly available as soon as is practicable after submission and to establish an appropriate method for doing so.[219] While we do not establish a specific timeline for making such data publicly available, we expect that there will be regular releases of crowdsourced data.[220]

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crowdsourced data would merit further analysis and under what circumstances generally providers should be expected to respond. *See, e.g.,* AT&T Reply at 7-8; Verizon Comments at 5-7; U.S. Cellular Comments at 4.

[213] In the *Digital Opportunity Data Collection Order and Further Notice*, we proposed that "USAC track coverage disputes, follow-up with providers to ascertain whether there is agreement that there is a problem with the data and ensure that providers refile updated and corrected data in a timely fashion." *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7542, para. 89.

[214] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7542-43, paras. 89, 93 ("In instances where the provider agrees that its original filing was in error, USAC could track the error and ensure that the provider corrects its data."); NCTA July 8, 2020 *Ex Parte* Letter at 3 ("If there are many crowdsourcing data inquiries occurring at the same time, it could be possible that a provider would need to resubmit its data on a rolling basis. To minimize the need to constantly update the map and to minimize the potential burden on reporting entities and Commission staff, we asked the Commission to limit the number of times data would need to be resubmitted to once in a 30-day period.").

[215] *See, e.g.,* ACA Connects Comments at 12-14 ("Where a provider disputes the complaints, the WCB (and not USAC) can decide whether to investigate further.").

[216] *See, e.g.,* Connected2Fiber Comments at 5 (arguing that a specific review process, and/or a third-party quality auditor inspecting routes, locations and coverage should be initiated if the crowdsourced data identify any anomalies).

[217] 47 CFR § 0.457; *see also Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 20 (directing USAC not to make publicly available private information pursuant to 47 CFR § 0.457(f)).

[218] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 19.

[219] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 20 (directing USAC, working with OEA, to establish procedures for the release of crowdsourced data).

[220] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 20.

F. Enforcement

77. Under the Broadband DATA Act, it is unlawful to willfully and knowingly, or recklessly, submit information or data that is materially inaccurate or incomplete with respect to the availability or the quality of broadband Internet access service.[221] We adopt this requirement, but seek comment in the *Third Notice* on several aspects of the Broadband DATA Act's enforcement requirement.

G. Creation of Coverage Maps Depicting Availability of Broadband Internet Access Service and Sharing Mapping Data

78. Pursuant to the Broadband DATA Act, the Commission must issue final rules that require the dissemination of granular data that the Commission must use to compile coverage maps that depict the availability of broadband Internet access service and be made publicly available.[222] This requirement is different from the process we adopted in the *Digital Opportunity Data Collection Order and Further Notice*, which required broadband service providers to submit granular maps of the areas where they have broadband-capable networks and make service available.[223] Pursuant to the Broadband DATA Act, it is now the Commission's responsibility to take the granular availability data for broadband Internet access service submitted by providers and others and create, after consultation with the Federal Geographic Data Committee: (1) the Broadband Map, which must depict areas of the country that remain unserved by providers and depict the extent of availability of fixed and mobile broadband Internet access service; (2) a map that depicts the availability of fixed broadband Internet access service; and (3) a map that depicts the availability of mobile broadband Internet access service.[224]

79. We will establish the Broadband Map as a map that depicts the extent of the availability of broadband Internet access service, as well as areas that are unserved, overlaid onto the fixed service Fabric data.[225] The Broadband DATA Act provides that this Broadband Map must depict the availability of broadband "without regard to whether that service is fixed or mobile."[226] Pursuant to the Act, we also will create separate maps depicting fixed coverage and mobile coverage.[227] Coverage depicted on the Broadband Map and the fixed and mobile coverage maps will be defined by providers' reported availability data, as revised by the outcome of successful challenges under the challenge process and the outcomes of Commission investigations and inquiries, which may be informed by crowdsourced data.[228]

80. Further, the Broadband DATA Act requires that we update the coverage maps at least biannually using the most recent data collected from providers.[229] In concert with our adoption herein of the biannual collection of broadband Internet access service data, we will update our coverage maps with new provider availability data at least biannually with data submitted by providers, as well as with any updates or corrections. Doing so will meet the Broadband DATA Act's requirement that we use the most recent data collected from providers.[230] We direct OEA to update the coverage maps as quickly as possible after the biannual submission deadlines and to update the maps on a continuing basis based on the outcomes of challenges and Commission investigations and inquiries, including those informed by

[221] 47 U.S.C. § 643.

[222] 47 U.S.C. § 642(a)(1)(A)(ii).

[223] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7506, para. 2.

[224] 47 U.S.C. § 642(c)(1).

[225] 47 U.S.C. § 642(c)(1)(A).

[226] 47 U.S.C. § 642(c)(1)(A).

[227] 47 U.S.C. §§ 642(c)(1)(B), (C).

[228] 47 U.S.C. §§ 642(c)(1), (b)(5)(C)(ii), 644(b)(1).

[229] 47 U.S.C. § 642(c)(3).

[230] *Id.*

verified data and crowdsourced data as that information becomes available.[231]

81. Finally, the Act requires the Commission to consult with various federal agencies in connection with creating and providing access to the coverage maps.[232] First, the Broadband DATA Act requires the Commission to consult with the Federal Geographic Data Committee before creating the three coverage maps.[233] Second, the Broadband DATA Act requires the Commission to consult with the Secretary of Agriculture and with NTIA to enable those entities to consult the coverage maps when considering the awarding of funds for the deployment of broadband Internet access service under any program administered by the Administrator of the Rural Utilities Service or the Administration, respectively.[234] In addition, the Commission must establish a process to make the data collected from providers pursuant to the Digital Opportunity Data Collection available to NTIA.[235] We direct OEA, WTB, IB, and WCB to carry out these requirements.

H. Collection of Verified Broadband Data from Government Entities and Third Parties for Use in the Coverage Maps.

82. The Broadband DATA Act requires the Commission to develop a process to collect verified data for use in the coverage maps from: (1) State, local, and Tribal governmental entities primarily responsible for mapping or tracking broadband Internet access service coverage in their areas; (2) third parties, if the Commission determines it is in the public interest to use their data in the development of the coverage maps or in the verification of data submitted by providers; and (3) other federal agencies.[236] We adopt this requirement and direct the Bureaus and Offices to implement the details of the process. We will treat such data as "primary" availability data "for use in the coverage maps" on par with the availability data submitted by providers in their biannual Digital Opportunity Data Collection filings. We seek comment in the *Third Notice* on other details associated with the process, including such issues as the meaning of "verified" data, how to reconcile this data with data submitted by providers in their biannual filings, collecting verified data for mobile service, and the parameters of the Commission's public interest determination to use third-party data.

I. Data Confidentiality and Privacy

83. The Broadband DATA Act requires that the rules we adopt establish "processes and procedures through which the Commission and, as necessary, other entities or individuals submitting non-public or competitively sensitive information, can protect the security, privacy, and confidentiality of such information," including: (1) information contained in the Fabric, (2) the dataset supporting the Fabric, and (3) availability data submitted pursuant to section 802(b)(2) of the Broadband DATA Act.[237] In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission determined that all fixed

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[231] 47 U.S.C. §§ 642(c)(1), (b)(5)(C)(ii), 644(b)(1).

[232] 47 U.S.C. §§ 642(c)(1), (4).

[233] 47 U.S.C. § 642(c)(1).

[234] 47 U.S.C. § 642(c)(4).

[235] 47 U.S.C. § 642(b)(7).

[236] 47 U.S.C. § 642(a)(2). Section 801(8) of the Broadband DATA Act states: "The term 'Indian Tribe' has the meaning given the term 'Indian tribe' in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 5304)." 47 U.S.C. § 642(a)(8). Section 5304(3) of The Indian Self-Determination Act, in turn, defines "Indian Tribe" as "any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 688) [43 U.S.C. §§ 1601 et seq.], which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians." 25 U.S.C. § 5304(e).

[237] 47 U.S.C. § 642(a)(1)(B)(ii). We discuss the confidential treatment of mobile propagation map data in section III.B.1, *supra*.

broadband service provider information, comprising shapefiles depicting areas covered at each offered speed, would be presumed to be non-confidential unless the Commission specifically directed that it be withheld.[238] We required all filers seeking confidential treatment of data submitted as part of the Digital Opportunity Data Collection to submit a request at the time of the filing that the data be treated as confidential, along with the reasons for withholding the information from the public.[239] The Commission noted that it would make decisions on requests for confidential treatment on a case-by-case basis.[240] The Commission similarly determined that mobile broadband service provider coverage maps would presumptively be treated as non-confidential.[241] Specifically, we decided that the Commission will release the following information in Digital Opportunity Data Collection filings to the public, and providers may not request confidential treatment of such information: (1) provider-specific mobile deployment data; (2) data regarding minimum advertised or expected speed for mobile broadband Internet access services; and (3) location information that is necessary to permit accurate broadband mapping, including as part of the crowdsourcing or challenge processes.[242]

84. We found in the *Digital Opportunity Data Collection Order and Further Notice* that to better allow for crowdsourcing, mapping, and other uses of fixed broadband deployment data, all fixed service provider information filed as part of the Digital Opportunity Data Collection will be presumed to be non-confidential unless the Commission specifically directs that it be withheld.[243] We also found that this approach "strikes an appropriate balance between the protection of confidential information and the need for public disclosure of fixed broadband deployment data to help with crucial crowdsourcing functionality and mapping capabilities."[244] We find these rationales continue to apply[245] and accordingly adopt the requirements from the *Digital Opportunity Data Collection Order and Further Notice* to the treatment of both fixed and mobile availability data and expand the requirements to include information contained in the Fabric and the dataset supporting the Fabric.[246]

85. We expect the Fabric will include at least some proprietary information that we will acquire commercially, which will be subject to licensing or other agreements that limit the extent to which it can be made available.[247] We also anticipate that we will receive information from individuals or entities concerning the accuracy of availability data and information in the Fabric. Accordingly, we will withhold from routine public inspection all data required to be kept confidential pursuant to section 0.457

[238] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7517, para. 27.

[239] *Id*.

[240] *Id.*

[241] Digital Opportunity Data Collection Order and Further Notice, 34 FCC Rcd at 7521-22, paras. 36-40.

[242] *Id.*

[243] *Id.* at 7517, para. 27.

[244] *Id.*

[245] We note that no party has filed for reconsideration of this issue in the *Digital Opportunity Data Collection Order and Further Notice*.

[246] See, e.g., Broadband Mapping Coalition Comments at 11-12 (noting that the BMC contemplated that the information concerning broadband serviceable locations would be viewable by the public, "so that crowdsourcing or look-up capabilities would be available to consumers seeking to determine which providers serve their home or business. Because the FCC has stated that it wants to include crowdsourcing as part of this effort, it is hard to imagine how crowdsourcing could possibly be effective without some public disclosure of the BSLF and reported data.").

[247] *See* Broadband Mapping Coalition Comments at 12 (noting that creating the Fabric using proprietary data would result in a "superior product at a lower estimated cost and would allow for public viewing with the following caveat—while information on the location of broadband serviceable locations would be viewable, *the entire dataset* would *not* be available for download by the public." (emphasis in original)).

of our rules and all personally identifiable information, including names, email addresses, and telephone numbers submitted in connection with availability data and the data in the Fabric.[248] However, we will entertain requests for disclosure if the public interest in disclosure outweighs the interests listed in section 0.457 of our rules.[249] Subject to contractual or license restrictions, we will make public all other information received about the status of broadband Internet access service availability at specific locations, including geographic coordinates and street addresses, whether a provider has reported availability at a location, and whether the owner or occupant has disputed a report of broadband Internet access service availability at such location.[250] We also will make publicly available all shapefiles, propagation maps, lists of addresses or locations for both fixed and mobile service, and on-the-ground mobile data, including data submitted by mobile providers to verify their coverage maps, subject to individual requests for confidential treatment.

J. Updating the Data Collection

86. Consistent with the requirement in the Broadband DATA Act,[251] and similar to the requirement that we adopted (but have not implemented) in the *Digital Opportunity Data Collection Order and Further Notice*,[252] we direct IB, WTB, WCB, and OEA to (1) update the specific format of data to be submitted pursuant to the Digital Opportunity Data Collection to reflect changes over time in GIS and other data storage and processing functionalities; and (2) implement any technical improvements or other clarifications to the filing mechanism and forms.

IV. THIRD FURTHER NOTICE OF PROPOSED RULEMAKING

87. In this *Third Notice*, we seek comment on what steps are necessary to implement certain other provisions of the Broadband DATA Act. In doing so, we note that section 806(e) of the Broadband DATA Act provides that "[i]f the Commission, before the date of enactment of this title, has taken an action that, in whole or in part, implements this title, the Commission shall not be required to revisit such action to the extent that such action is consistent with this title."[253] Accordingly, we ask that commenters address the extent to which measures already adopted by the Commission meet the requirements of the Broadband DATA Act, as well as what new measures may be necessary.

A. Service Providers Subject to the Collection of Broadband Internet Access Service Data

88. Under the Broadband DATA Act, the Commission must issue rules for the collection of broadband Internet access service data from each "provider" of broadband Internet access service, with "provider" being defined as "a provider of fixed or mobile broadband Internet access service."[254] We propose that the providers subject to the requirements adopted in the *Second Report and Order* be limited to "facilities-based providers," as defined in 47 CFR § 1.7001(a)(2).[255] We believe this definition is consistent with the Broadband DATA Act because the Act requires each provider to report where it "has

[248] 47 CFR § 0.457.

[249] *Id.*

[250] *See* California PUC Comments at 3-4 ("Public access to the Fabric's underlying location data would allow public feedback to correct any errors, increasing accuracy of the data.").

[251] 47 U.S.C. § 642(a)(3).

[252] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7565, Appx. A, Final Rules (47 CFR § 54.1403).

[253] 47 U.S.C. § 646(e).

[254] 47 U.S.C. § 641(11).

[255] *See* 47 CFR § 1.7001(a)(2). The definition is further clarified in the Form 477 Instructions. *See FCC Form 477 Instructions* at 6-7.

actually built out the broadband network infrastructure,"[256] and a facilities-based provider, rather than a reseller of the facilities-based provider's services or capacity, is in the best position to know and report such information. If resellers were to report information on broadband availability, it is likely that such information would be less accurate than the data reported by facilities-based providers. In addition, the availability footprints of resold service would overlap those reported by facilities-based providers, given that resellers, by definition, provide service in all or a portion of the same footprint as the facilities-based providers. Further, the definition of facilities-based provider that we propose to use is the same as that adopted for fixed providers in the *Digital Opportunity Data Collection Order and Further Notice*,[257] and it currently applies to providers required to file Form 477 fixed and mobile broadband deployment data.[258] As such, defining "provider" in the same way in the Digital Opportunity Data Collection will enable "the comparison of data and maps" produced under Form 477 with those produced under the Broadband DATA Act, which the Act requires the Commission to do.[259]

B. Standards for Reporting Availability and Quality of Service Data for Fixed Broadband Internet Access Service

89. The Broadband DATA Act requires that rules issued by the Commission provide for uniform standards for the reporting of broadband Internet access service data.[260] We believe that, except as noted below, the reporting requirements previously adopted in the *Digital Opportunity Data Collection Order and Further Notice* for fixed broadband service data are consistent with the Broadband DATA Act's requirements for reporting on the availability of such services. In particular, we believe that it is consistent with the Broadband DATA Act to require providers of broadband Internet access service at advertised speeds exceeding 200 kbps in at least one direction to report broadband availability data under the rules established for the Digital Opportunity Data Collection. The 200 kbps speed threshold is the same as that adopted in the *Digital Opportunity Data Collection Order and Further Notice* and currently required for Form 477.[261]

90. *Business-Only Service.* The *Digital Opportunity Data Collection Order and Further Notice* required fixed providers to differentiate in their coverage polygons among service that was residential-only, business-only, or business-and-residential.[262] While we recognize that there may be drawbacks to requiring fixed providers to report business-only broadband polygons due to the competitively sensitive nature of such data, we recognize that there may be benefits to collecting and consulting business-only data, for example, in awarding funding for broadband services in other Universal Service Fund programs. As such, we seek comment on excluding from the Digital Opportunity Data Collection business-only service and instead requiring only a distinction between "residential-only" and "business-and-residential" services by fixed providers.[263] We seek comment on this approach. In the alternative, should the Commission require the collection of business-only services, including non-mass-market business data services, though not specifically required by the Broadband DATA Act? Would

[256] 47 U.S.C. § 642(b)(2)(A)(i)(I).

[257] *Digital Opportunity Data Collection Order and Further Notice,* 34 FCC Rcd at 7510, para. 12 & n.23.

[258] *See* 47 CFR § 1.7001(a)(2).

[259] 47 U.S.C. § 642(b)(6)(A)(i)(II)(aa).

[260] 47 U.S.C. § 642(b)(2).

[261] *Digital Opportunity Data Collection Order and Further Notice,* 34 FCC Rcd at 7510, para. 12 & n.23; 47 CFR § 1.7001(a)(1).

[262] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7510, para 12.

[263] Adoption of this approach also would effectively render moot the Petition for Reconsideration filed by INCOMPAS in this proceeding wherein it argued that business data competitors using the last-mile facilities of wholesale providers should not file broadband coverage polygons. *See* INCOMPAS, Petition for Reconsideration, WC Docket Nos. 19-195, 11-10, at 9 (filed Sep. 23, 2019).

there be a benefit to the Commission having data about the availability of broadband service for businesses and organizations that do not buy mass-market services, including healthcare organizations, schools, libraries, and other government entities? Would business-only availability data be particularly helpful for informing, for example, E-rate or universal service programs that support health care? Since the Broadband DATA Act focuses on restricting subsidies to unserved areas and avoiding wasteful subsidized overbuilding, could the availability of business-only deployment data for consultation in the E-Rate or Rural Health Care programs, for example, help advance the goals and principles of the statute?

91. *Speed Information for Fixed Services*. As a component of their availability reporting under the Broadband DATA Act, fixed broadband providers must submit "information regarding download and upload speeds, at various thresholds."[264] The *Digital Opportunity Data Collection Order and Further Notice* required all fixed providers to submit broadband coverage polygons that reflect the maximum download and upload speeds available in each area, as well as the technology used to provide the service and a differentiation among residential-only, business-only, or residential-and-business broadband services.[265] We propose that all fixed broadband providers be required to report the maximum advertised download and upload speeds associated with the broadband Internet access service that a provider offers in an area. However, for service offered at speeds below 25/3 Mbps, we propose the use of two speed tiers: one for speeds greater than 200 kbps in at least one direction and less than 10/1 Mbps, and another for speeds greater than or equal to 10/1 Mbps and less than 25/3. For speeds greater than or equal to 25/3 Mbps, we propose that providers report the maximum advertised download and upload speeds associated with the broadband Internet access service provided in an area. We seek comment on these proposals.

92. *Latency Information for Fixed Services*. We also seek comment on whether and how to collect latency information for fixed broadband services. Latency refers to the time it takes for a data packet to travel from one point to another in a network, whereas a round-trip latency refers to the time it takes for a data packet to travel from one point to another and then back again.[266] The *Digital Opportunity Data Collection Order and Further Notice* sought comment on whether fixed providers should be required to report latency levels along with other parameters in their coverage polygons.[267] The Broadband DATA Act provides that latency information shall be collected from fixed broadband providers "if applicable,"[268] and specifically requires that propagation model-based coverage maps submitted by fixed wireless providers reflect the "speeds and latency" of the service offered by the provider.[269] We propose to require all fixed broadband service providers to report latency data by indicating whether the network round-trip latency associated with the service offered by each technology and each maximum speed combination in a particular geographic area is less than or equal to a particular threshold. We propose to use 100 milliseconds (ms)—based on the 95th percentile of measurements—as that threshold, since that is the latency benchmark that recipients of Connect America Fund Phase II model-based support, as well as Connect America Fund Phase II auction support recipients in the Low

[264] 47 U.S.C. § 642(b)(2)(A)(ii).

[265] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7510, para. 12.

[266] *See* FCC, Office of Engineering and Technology, *Eighth Measuring Broadband America Fixed Broadband Report* (Dec. 14, 2018), https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-eighth-report (*Eighth Measuring Broadband America Fixed Broadband Report*).

[267] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7510, para. 12.

[268] 47 U.S.C. § 642(b)(2)(A)(ii).

[269] 47 U.S.C. § 642(b)(2)(A)(iv)(I)(aa)(BB).

Latency tier, are required to meet.[270] We propose to update that benchmark for the Digital Opportunity Data Collection if and when the benchmark is updated in the universal service context. We seek comment on this proposal and ask whether a lower value should be used as a latency threshold independent of any changes made in the universal service context.

93. As an alternative to having all fixed providers submit latency information, should we determine that the collection of latency data is only applicable to providers of certain types of fixed service?[271] Further, should a more limited set of providers be required to submit more granular data on latency? Would such requirements be consistent with the Broadband DATA Act? For instance, should we require only fixed wireless providers submitting propagation maps to file data indicating the 95th percentile latency values for the services they offer? Should we extend this requirement to satellite providers, given the notable differences in latency values between satellite providers and other fixed providers?[272] Should any latency requirements of satellite providers be limited to non-geostationary-orbit satellites and should such providers report latency values specifically for the apogee of satellites' orbits or for the greatest path distance between a satellite and ground station? We propose to direct OEA, in consultation with WCB, IB, and OET, to issue specific guidance to providers on how to measure their network latency for purposes of reporting such information in the Digital Opportunity Data Collection. We seek comment on these proposals regarding the collection of latency information and ask commenters to provide detailed explanations for any alternative recommendations, including any alternative latency benchmarks.

94. *Satellite Availability Reporting.* In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission sought comment on how, for the purposes of the Digital Opportunity Data Collection, we could improve upon the existing satellite broadband data collection to reflect more accurately current satellite broadband service availability.[273] The Commission sought comment on whether satellite broadband deployment data reporting near nationwide deployment[274] could be improved by requiring additional information, including the number and location of satellite beams, the capacity used to provide service by an individual satellite to consumers at various speeds, and the number of subscribers served at those speed levels.[275] The Satellite Industry Association and Hughes oppose such reporting and argue that neither beam location nor capacity would provide additional granular information about the reach of the networks or where satellite broadband providers make service available.[276] We continue to seek comment on how we could improve upon the existing satellite broadband data collection. Assuming *arguendo* that requiring the reporting of such supply side data is not useful or practical, should the Commission require additional reporting on the demand side by requiring any satellite provider submitting nationwide broadband coverage also to identify the census tracts with at least one reported

[270] *See Connect America Fund*, WC Docket No. 10-90, Report and Order, 28 FCC Rcd 15060, 15070, paras. 22-23 (WCB 2013); *Connect America Fund et al*., WC Docket Nos. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 5949, 5960, para. 29 (2016).

[271] *See* 47 U.S.C. § 642(b)(2)(A)(ii).

[272] *See Eighth Measuring Broadband America Fixed Broadband Report*.

[273] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7540-42, paras. 85-87.

[274] For instance, according to currently reported data, satellite service offering 25 Mbps/3 Mbps speeds is available to all but 0.03% of the U.S. population. *Id.* at 7540-41, para. 85.

[275] *Id.*

[276] See Letter from Tom Stroup, Satellite Industry Association, to Marlene Dortch, Secretary, FCC, WC Docket No. 19-195, at 1 (filed Feb. 25, 2020). See also Hughes Network Systems, LLC Comments at 4 (Hughes) ("In designing their networks to reflect reasonable assumptions about network loading, satellite broadband providers are no different from other types of network providers who are not required to report on network capacity for this purpose."); Hughes Reply at 4-7 (arguing the record does not support special reporting requirements by satellite providers but not other technologies).

subscriber? Should we require reporting of where the satellite operator is actively marketing its broadband services?[277] If concrete proposals are not provided to more reasonably represent satellite broadband deployment, we would rely on other mechanisms outlined in this *Second Report and Order* and *Third Notice* including standards for availability reporting, crowdsourced data checks, certifications, audits, and enforcement, potentially as well as currently reported subscriber data,[278] in assessing the accuracy of satellite provider claims of broadband deployment.

C. Additional Standards for Collection and Reporting of Data for Mobile Broadband Internet Access Service

95. In the *Second Report and Order*, we require that a mobile provider's propagation model results for 3G, 4G and 5G-NR mobile broadband technologies be based on standardized parameter values for cell edge probability, cell loading, and clutter that meet or exceed certain specified minimum values. We also require mobile providers to disclose propagation model details and link budget parameters. In this *Third Notice*, we seek comment on whether we should require providers to submit infrastructure information, make additional disclosures concerning the input data, assumptions, and parameter values underlying their propagation models and on whether any additional parameters are necessary to ensure that we collect accurate mobile broadband deployment data.

96. First, we seek comment on requiring providers to disclose to the Commission additional details of their propagation models and of the link budgets they use for modeling cell edge network throughput (both uplink and downlink). Specifically, we seek comment on requiring providers to submit a description of sites or areas in their network where drive testing or other verification mechanisms demonstrate measured deviations from the input parameter values or output values included in the link budget(s) submitted to the Commission, and a description of each deviation and its purpose. We seek comment on whether requiring providers to include this additional information will help the Commission more fully understand and assess propagation model coverage predictions.

97. We also seek comment on whether we should prescribe propagation modeling standards, such as a minimum value for Reference Signal Received Power (RSRP)[279] or Received Signal Strength Indicator (RSSI).[280] A map showing where the RSRP or RSSI meets or exceeds a minimum value could assist with the verification of expected user speeds. The *Mobility Fund Phase II Investigation Staff Report* discussed the role of signal strength in measuring mobile broadband performance and found "a strong positive relationship between the RSRP signal strength recorded and the percentage of 4G LTE speed tests that achieved a download speed of at least 5 Mbps . . . ."[281] Several parties discussed signal strength in their comments in response to the *Digital Opportunity Data Collection Order and Further Notice* and expressed differing views on whether a standardized or minimum signal strength parameter

[277] *See* Free Press Comments at 16.

[278] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7541, para. 86.

[279] RSRP is a standard measure of reference or synchronization signal power for 4G LTE and 5G-NR technologies. Providers must use this metric instead of RSSI for 4G LTE and 5G-NR.

[280] RSSI is a measure of total power within the signal operating bandwidth for all technologies.

[281] *Mobility Fund Phase II Investigation Staff Report* at 47, para. 65.

value is necessary.[282] We seek additional comment to inform our determination of whether a minimum signal strength parameter value is appropriate. We recognize that RSRP or RSSI values may vary based on factors such as spectrum band, network design, or device operating capabilities, but seek comment on whether we can establish a minimum signal strength parameter value that accommodates such variation. For example, should we adopt CCA's suggestion that we define a minimum signal strength parameter by technology (e.g., LTE or 5G), spectrum band, and channel size?[283] If so, we seek comment on what values would be appropriate. Alternatively, in view of the variety of factors that affect signal strength, would it be preferable to adopt an approach that uses a range of signal strength data to verify propagation model coverage predictions? Under such an approach, the Commission could require, for each of the propagation maps submitted, a second set of maps showing RSSI or RSRP signal levels, measured at 1.5 meters above ground level (AGL), from each active cell site. These maps could form color coded "heat maps" showing RSSI or RSRP gradient levels in 10 dB increments from -40 dBm to -120 dBm. We seek comment on this approach and whether it would be an effective method for verifying coverage predictions.

98. We also seek comment on whether we should adopt any other minimum values for particular model parameters not otherwise specified above. For example, the *Mobility Fund Phase II Investigation Staff Report* concluded that the Commission "should be able to obtain more accurate mobile coverage data by specifying additional technical parameters,"[284] and it recommended that the Commission adopt standard fading statistics as one parameter for standardized mobile broadband coverage data specifications.[285] Based on this finding, should we require carriers to report the fading standard deviation they use to set a fade margin or otherwise incorporate into their link budgets or propagation models? Should we set minimum values or standardize values for any of the additional parameters we would require carriers to submit? Commenters advocating for the Commission to require reporting (or standardization) of a particular parameter should provide detailed technical justifications for why the parameter or value is necessary or important for the Commission to verify carriers' propagation models and coverage maps.

99. Finally, we ask whether we should require mobile providers to submit additional coverage maps based on different speed, cell edge probability, or cell loading values. Are there particular use cases or categories of subscribers, such as Machine-to-Machine or Internet-of-Things users, that might benefit from information on 4G LTE or 5G-NR service availability at speeds below the thresholds set forth in the Broadband DATA Act and adopted in the *Second Report and Order*; or are there use cases for which higher thresholds for broadband speed or utilization might make sense? For example, should providers report coverage with cell loading values set to 30% and 70%, in addition to 50%, where all other values were held constant? Having different maps (or map layers) based on these different assumptions could show how the likelihood of establishing or maintaining a mobile broadband

[282] *Cf*, Deere & Co. Comments at 9 (expressing support for a -85 dBm RSSI parameter); CCA Comments at 5 (recommending that the Commission require carriers to "report a standard RSRP level controlled for individual carriers' varied spectrum portfolio and use" and that "a -120 dBm level per 5 megahertz channel could register that a consumers' [*sic*] device is connected to LTE service, but nevertheless provide for a poor connection that fails to support many applications or functions"); CCA May 28, 2020 *Ex Parte* Letter at 2 ("CCA has long maintained that the Commission should define minimum reference signal received power ('RSRP'), standardized by technology (e.g., LTE, 5G), spectrum band, and channel size") *with* Verizon Comments at 9-10 (arguing that the Commission should not standardize a specific signal strength level); CTIA Reply at 7 (urging the Commission not to prescribe RSRP value and stating that "a cell edge speed and probability factor, not signal strength will better reflect consumer experience"); CTIA May 29, 2020 *Ex Parte* Letter at 2 (contending that "[a] strong RSRP, for example, does not ensure high through-put and thus is of little value to a user on the ground").

[283] CCA May 28, 2020 *Ex Parte* Letter at 2.

[284] *Mobility Fund Phase II Investigation Staff Report* at 53, para. 80.

[285] *Id.* at 3, 53, paras. 9, 80.

connection may change when the network is experiencing different utilization rates. Rather than setting uniform cell-loading values, should we instead require carriers to submit, on a per-cell basis, propagation maps that incorporate a cell-loading value based on busy-hour utilization? We note that this requirement would be in addition to the requirements we adopt in the *Second Report and Order* that carriers submit maps based on minimum speed, cell-edge probability, and cell loading metrics. Assuming the Commission requires mobile providers to submit additional coverage maps, how should the Commission incorporate this information into the maps it creates pursuant to the Broadband DATA Act? Are there any steps the Commission would need to take to avoid confusing consumers and help ensure that they are able to make reasonable comparisons between mobile broadband providers' coverage areas?

1. Collecting Infrastructure Information

100. In the *Digital Opportunity Data Collection Order and Further Notice*, we proposed to collect certain types of network infrastructure information to be submitted by mobile service providers upon Commission request, and we sought comment on whether the Commission should require mobile providers to submit infrastructure information to verify providers' broadband network coverage.[286] We seek to refresh the record and seek further comment on collecting infrastructure information as part of the Digital Opportunity Data Collection.

101. We believe such information could help Commission staff independently verify the accuracy of provider coverage propagation models and maps submitted by mobile wireless service providers. The *Mobility Fund Phase II Investigation Staff Report* concluded that collecting such infrastructure data could help accurately verify mobile broadband coverage.[287] We also believe that infrastructure data could advance the Broadband DATA Act's requirement that we verify the accuracy and reliability of submitted coverage data.[288] At the same time we recognize that this is not data we ordinarily collect, and further acknowledge that the collection of infrastructure information could raise commercial sensitivity and national security concerns,[289] as well as impose additional burdens on filers.[290] We seek additional comment on these views and how best to strike a balance between competing concerns.

102. If we opt to collect this information as part of the Digital Opportunity Data Collection, we seek comment on what information we should collect, how often we should collect it, and whether filers should regularly submit infrastructure information to the Commission or submit information only on

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[286] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7552, paras. 119-20.

[287] *Mobility Fund Phase II Investigation Staff Report* at 3, para. 10 (determining that "detailed information on propagation model parameters and deployed infrastructure is necessary to fully verify the engineering assumptions inherent in mobile coverage data").

[288] 47 U.S.C. § 642(b)(4)(B).

[289] *See, e.g.*, AT&T Comments at 8-9; AT&T Reply at 2 & n.5; Verizon Comments at 11; CTIA Comments at 13-14; CTIA Reply at 8-9; Letter from Matthew Gerst, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 19-195, 11-10, at 1-4 (filed July 6, 2020) (CTIA July 6, 2020 *Ex Parte* Letter); *see also* AT&T May 15, 2020 *Ex Parte* Letter at 2-3; USTelecom/WISPA May 14, 2020 *Ex Parte* Letter at 3.

[290] AT&T contends that it could significantly burden providers to produce infrastructure location information (particularly larger providers with thousands of sites) and may require more than the 30 days response time. AT&T Comments at 8-9; *see also* Verizon Comments at 11. CTIA similarly maintains that it would burden providers to compile the proposed types of detailed infrastructure, such as the "height (above ground and sea level), type, and directional orientation of all transmit antennas at each cell site" nationwide. CTIA Comments at 13; CTIA Reply at 8-9; *see also* CTIA July 6, 2020 *Ex Parte* Letter at 3-5. U.S. Cellular suggests that in response to a Commission request, the Commission should follow a three-step process, which narrows the submission of information to that which the provider believes will demonstrate the accuracy of its data and to give at least 60 days for the submission. U.S. Cellular Comments at 15-16.

staff request, such as when the need for staff to verify part or all of a filer's network arises. In the *Digital Opportunity Data Collection Report and Order*, we proposed collecting nine categories of infrastructure information from filers.[291] We note that some parties, including CTIA and AT&T, support requiring mobile providers to require regular submission of certain infrastructure information relating to the geographic locations of cell sites, while making other more detailed information available upon Commission staff request.[292] We seek comment on these proposals and other alternatives we should consider, including whether such a rule is necessary in the first instance and whether the benefits of regular reporting would outweigh the costs. Commenters should discuss both the value of collecting this information for ensuring the accuracy of mobile broadband coverage maps and the potential impact on filers.

D. Processes for Verifying Broadband Availability Data Submitted by Providers

103. Pursuant to the Broadband DATA Act, the Commission must issue final rules that establish processes through which we can "verify the accuracy and reliability" of the broadband Internet access service availability data submitted by providers.[293] These requirements are set out in distinct provisions of the Broadband DATA Act, separate from other requirements to establish processes for improving data accuracy and reliability, such as processes for receiving verified data from third parties and governmental mapping entities,[294] crowdsourcing,[295] and a challenge process.[296] Accordingly, we find that these verification processes are intended to be in addition to other requirements, though there may be overlap and interrelationships between them. We note, for example, that information received through the crowdsourcing required under section 804(b) of the Broadband DATA Act is to be used to "verify and supplement" availability data collected under section 802(b)(2)(B) of the Act.[297] We seek comment on this finding.

1. Verifying Mobile Data

104. In this section, we propose requiring mobile providers to submit a statistically valid sample of on-the-ground data (i.e., both mobile and stationary drive-test[298] data) as an additional method to verify mobile providers' coverage maps. We seek comment on ways to develop a statistically valid methodology for the submission and collection of such data as well as how to implement such a requirement in a way that is not cost prohibitive for providers, particularly for small service providers. Further, we request comment on directing OEA and WTB to determine whether to develop a statistically valid methodology that will be used for determining the locations and frequency for on-the-ground testing as well as the technical parameters for standardizing on-the-ground data, and we seek comment on potential considerations for developing such a methodology. Finally, we request comment on whether and how the Commission should use signal strength information submitted by carriers to verify providers' coverage maps.

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[291] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7552, paras. 119-20.

[292] *See, e.g.*, CTIA July 6, 2020 *Ex Parte* Letter at 4-5; Letter from Mary L. Henze, Assistant Vice President, Federal Regulatory, AT&T, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 19-195, 11-10, at 1-3 (filed July 9, 2020); *see also* AT&T May 15, 2020 *Ex Parte* Letter at 2; USTelecom/WISPA May 14, 2020 *Ex Parte* Letter at 3.

[293] 47 U.S.C. §§ 642(a)(1)(B)(i), (b)(4)(B).

[294] 47 U.S.C. §§ 642(a)(2)(A)-(C).

[295] 47 U.S.C. § 644(b).

[296] 47 U.S.C. § 642(b)(5).

[297] 47 U.S.C. §§ 644(b), 642(b)(2)(B).

[298] As we have previously explained, "[d]rive tests refer to tests analyzing network coverage for mobile services in a given area, i.e., measurements taken from vehicles traveling on roads in the area." *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7555, para. 125 & n.310.

105. *On-the-Ground Service Provider Data*. The *2017 Data Collection Improvement FNPRM* sought comment on requiring mobile broadband providers to submit speed test data to supplement their model-based data.[299] In the *Digital Opportunity Data Collection Order and Further Notice*, we sought further comment on this issue and asked whether providers already collect such data in the ordinary course of business.[300] In response to the *2017 Data Collection Improvement FNPRM* and the *Digital Opportunity Data Collection Order and Further Notice*, some commenters supported using drive-test data as a means of verifying broadband coverage.[301] Providers, on the other hand, argued that collecting such data over their entire network would be unduly burdensome and unnecessary.[302] The *Mobility Fund Phase II Investigation Staff Report*, however, found that drive testing can play an important role in auditing, verifying, and investigating the accuracy of mobile broadband coverage maps submitted to the Commission.[303] The *Mobility Fund Phase II Investigation Staff Report* recommended that the Commission require providers to "submit sufficient actual speed test data sampling that verifies the accuracy of the propagation model used to generate the coverage maps. Actual speed test data is critical to validating the models used to generate the maps."[304]

106. We propose requiring mobile service providers to submit on-the-ground test data—from a combination of mobile and stationary tests—as a tool to help the Commission verify their voice and broadband coverage submissions. The Broadband DATA Act requires the Commission to verify the accuracy and reliability of mobile broadband coverage data that mobile providers submit to the Commission,[305] and we believe that on-the-ground test data from mobile providers could be a critical component of our verification process.[306] We anticipate, however, that requiring providers to test their entire network would be prohibitively expensive; accordingly, we propose to require mobile providers to collect a statistically valid, unbiased sample of on-the-ground test data to verify their coverage maps. Industry commenters have indicated either that providers do not collect on-the-ground test data in the

[299] *2017 Data Collection Improvement FNPRM*, 32 FCC Rcd at 6333-34, para. 14.

[300] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7553, para. 122.

[301] *See, e.g.*, City of New York Comments at 4; CPUC Comments at 6, 8; Comments of Connected Nation, Inc., WC Docket No. 11-10, at 11 (filed Sept. 14, 2017). These commenters diverged on who should perform the drive testing; Connected Nation and the City of New York recommended that carriers perform the drive testing, while the California PUC argued that the FCC or an independent third party should conduct the testing.

[302] *See, e.g.*, CTIA Comments at 12 (noting that these data are readily available through third parties); Verizon Comments at 8-9, 11 (arguing that it would be prohibitively expensive for providers to drive test their entire network and that such testing is impractical because statistically significant results can be obtained only by performing a very large number of measurements under controlled conditions).

[303] *Mobility Fund Phase II Investigation Staff Report* at 52, para. 77 (recommending that the Commission seek appropriations from Congress to carry out drive testing as part of its efforts to audit, verify, and investigate the accuracy of mobile broadband coverage maps submitted to the Commission).

[304] *Mobility Fund Phase II Investigation Staff Report* at 53, para. 81.

[305] 47 U.S.C. § 642(b)(4)(B).

[306] City of New York, California PUC, and Connected Nation have asserted that on-the-ground data, such as drive-test data, are critical to verifying service providers' coverage data. *See* City of New York Comments at 4; CPUC Comments at 6, 8; Comments of Connected Nation, Inc., WC Docket No. 11-10, at 11 (filed Sept. 14, 2017). California PUC asserted that "drive tests [are] the most effective measure of actual mobile broadband service speeds." CPUC Comments at 6 (internal quotations omitted). As part of its comments on the *Digital Opportunity Data Collection Order and Further Notice*, California PUC submitted results from twelve statewide drive tests measuring actual mobile broadband service speed and quality user experience for the four nationwide carriers, interpolated statewide, to show that providers' shapefiles may have overstated actual coverage. CPUC Comments at 6-8. CTIA, which opposed the mandatory submission of on-the-ground data, nonetheless acknowledged that these data "may be a useful resource to help validate propagation data . . . ." CTIA Comments at 12.

ordinary course of business or that they do so only to calibrate their propagation models.[307] Accordingly, we expect that collecting a sample would be more effective in verifying coverage than on-the-ground test data already collected in the ordinary course of business.

107. In order to help verify the accuracy of mobile providers' submitted coverage maps, we propose that carriers submit evidence of network performance based on a sample of on-the-ground tests that is statistically appropriate for the area tested. We propose at a minimum that the speed tests include downlink, uplink, latency, and signal strength measurements and that they be performed using an end-user application that measures performance between the mobile device and specified test servers. We propose that speed tests must be taken outdoors. We propose requiring a combination of mobile and stationary tests to accurately verify the coverage speed maps. We also seek comment on how we should compare the two types of tests. We request comment on the parameters that should be specified, such as the time of day within which the tests should be performed and whether we should set limits on the height at which the tests must be conducted. In the case of mobile speed tests, we request comment on whether we should set limits on vehicle speed and whether we should accept unmanned aircraft system tests. We also seek comment on how we ensure that providers submit a statistically valid and unbiased sample of tests. For example, how should the tests be distributed between urban and rural areas? How can we ensure that the speed test measurements represent the typical user case for the area covered? How, for example, can we prevent providers from performing their tests close to their towers where signal strength is greatest? In developing our methodology, should we specify the types of equipment that providers can use, including the handsets and any other special equipment necessary for the testing? Should we specify where to place such equipment during the testing? Although we eliminated the requirement to report network coverage on Form 477 by spectrum band in the *Digital Opportunity Data Collection Order and Further Notice*,[308] we propose, for verification purposes, to require providers to indicate spectrum bands and bandwidths in submitted mobile and stationary test data.[309]

108. We seek comment on the costs of requiring mobile providers to submit a statistically valid sample of on-the-ground data to verify their network coverage. We recognize both that it may be difficult to develop a statistically valid methodology governing mobile and stationary tests that eliminates or minimizes selection bias and that on-the-ground testing may prove burdensome and expensive. We request comment on the potential costs of developing a statistically valid methodology for on-the-ground testing. In addition, we seek comment on the potential costs for providers to implement such methodology, particularly in light of our proposal to require only a sample of a mobile provider's network. What are the costs of requiring providers to submit both mobile stationary test data? To what extent should we modify our requirements for small providers, if at all?

109. We request comment on the type of confidentiality protections that we should apply to any on-the-ground data that mobile providers submit. The Broadband DATA Act's privacy provision does not clearly apply to the collection of data submitted to verify the accuracy of coverage data.[310] Should these data be subject to disclosure pursuant to the private-public balancing test in sections 0.457

[307] *See, e.g.*, CTIA Comments at 12; Verizon Comments at 11.

[308] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7523, para. 41.

[309] In the context of eliminating the requirement to submit separate Form 477 coverage maps by spectrum band, the Commission acknowledged that it had not yet used such data to analyze deployment in different spectrum bands and that such data were unnecessary to confirm buildout requirements or to determine deployment speeds, as such information was typically provided by mobile providers through other means. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7523-24, paras. 42-43. For on-the-ground test data, however, spectrum band data are essential to be able to understand and analyze mobile providers' on-the-ground submissions and to use them as a tool to verify mobile coverage maps.

[310] *See* 47 U.S.C. § 642(a)(1)(B)(ii).

and 0.461 of our rules? Should these data be available to the public during the challenge process?[311]

2. Engineering Certification of Biannual Filings

110. While the Broadband DATA Act requires that each provider must include as part of its filing a certification from a corporate officer,[312] the *Mobility Fund Phase II Investigation Staff Report* included a similar recommendation that the Commission require service providers to include an engineering certification with all data submissions.[313]

111. In the *Second Report and Order*, as required by the Broadband DATA Act, we require providers to submit a certification from a corporate officer that the statements of fact contained in its biannual submissions are true and correct.[314] We propose requiring mobile providers in addition to submit a certification of the accuracy of their submissions from a qualified engineer. We also propose to require public filing of these certifications. The *Mobility Fund Phase II Investigation Staff Report* recommended that the Commission require providers to include an engineering certification. It found that requiring an engineering certification would help improve the accuracy of submissions by ensuring that providers take into account network performance data showing actual service availability in different areas across the country.[315] We seek comment on the *Report*'s recommendation and on whether requiring both an engineering certification and a certification from a corporate officer would help improve accuracy of provider submissions. To the extent a corporate officer (e.g., a Chief Technology Officer) is both an engineer and has the requisite knowledge required under the Broadband DATA Act, we propose to require the mobile filer to submit a single certification, which would also attest to the corporate officer's engineering qualifications. We propose requiring that this certification state that the certified professional engineer or a corporate engineering officer that is employed by the service provider has direct knowledge of, or responsibility for, the generation of the service provider's Commission-filed coverage maps. We propose requiring that the certified professional engineer or corporate engineering officer certify that he or she has examined the information contained in the submission and that, to the best of the engineer's actual knowledge, information, and belief, all statements of fact contained in the submission are true and correct, and in accordance with the service provider's ordinary course of network design and engineering.

112. We also seek comment on whether we should require an engineering certification for biannual filings for fixed broadband service providers, as we propose to do with certifications for mobile service providers. We believe that this step would improve the accuracy of data on availability of fixed services by requiring providers to focus on network performance in certifying the accuracy of their filings, but seek comment on whether the same considerations would apply to fixed services so as to warrant this step. We also seek comment on any potential penalties for violating the certification.

3. Collection and Use of Verified Data

113. We seek comment on how best to implement the Broadband DATA Act's requirement to collect and use "verified" data from third parties and government entities. As an initial matter, we seek comment on what constitutes "verified" data. If the data are produced by the entity submitting them, should the entity be required to explain the methodology for collecting and producing the data? If the entity gathers the data from providers or other third parties, should the entity be required to attest to the reliability of the data? Also, how should these verified data be "used" in the coverage maps to provide a

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[311] Section 642(b)(5) of the Broadband DATA Act indicates that entities may challenge the accuracy of "any information submitted by a provider regarding the availability of broadband Internet access service," which could include verification information. *See* 47 U.S.C. § 642(b)(5).

[312] 47 U.S.C. § 642(b)(4).

[313] *Mobility Fund Phase II Investigation Staff Report* at 53, para. 80.

[314] *See supra* section III.E.3.

[315] *Mobility Fund Phase II Investigation Staff Report* at 3, 53, paras. 10, 80 & n.126.

useful resource? If the provider agrees with the data submitted by the government entity or third party, then we propose to "use" such data by including the data in the coverage maps. We seek comment on a process for getting the provider's assessment of this data. We also seek comment on these proposals and seek ideas on other approaches to verifying and using such data.

114. We propose requiring third party and governmental entities to attempt to resolve any inconsistent data with the providers. If the third party or governmental provider successfully reconciles its data with the provider, then we would allow those data to be used in the coverage maps. If the third-party or governmental data cannot be reconciled with the provider after a period of 60 days, then the data would be made publicly available and its status noted, but the data would not be included as part of the official coverage maps. We seek comment on this approach and whether it is consistent with the Broadband DATA Act's mandate that such data be used in the coverage maps. We seek comment on any other methods for resolving inconsistencies between a provider's data and data submitted by third parties and government entities.

115. In addition, we seek comment on how we should handle instances in which an external data format used by the third party is incompatible with the data submitted by providers—for example, if a state provides data based on geocoded addresses, but the provider submits availability data using shapefiles. We propose to make publicly available, and note the status of, such incompatible data from governments and third parties, but not to include them in producing the coverage maps. Is this a viable proposal and consistent with the Broadband DATA Act? What else could we do to resolve the incompatibility in formats so that the data can be useful for the coverage maps?

116. We seek comment on the flexibility in the Broadband DATA Act to collect third-party availability data when the Commission determines that it is in the public interest to use such data in the development of the coverage maps or the verification of data submitted by providers. We propose to accept broadband Internet access service availability data from any third party that is able to demonstrate that it has employed a sound and reliable methodology in collecting, organizing, and verifying coverage data or location data, but we propose to use such data only if the Commission in its discretion determines that the data would make the coverage maps (or the data underlying the coverage maps) more accurate. We seek comment on this proposal and on any alternatives where collecting and using third-party data would improve the coverage maps or the underlying provider-submitted data. For example, should we use third-party data only to verify the availability data submitted by providers? Also, what factors should drive our public interest determination to accept and use the third-party data? We propose to use factors such as whether the third party specializes in gathering and/or analyzing broadband availability data, the format and type of data submitted (are they compatible and comparable with the providers' data), and the extent to which the entity demonstrates that its collection, organization, and verification methodologies are sound and would appreciably improve the accuracy and reliability of the coverage maps. Finally, we propose to require third parties submitting verified data to certify that the information it is submitting is true and accurate to the best of their actual knowledge, information, and belief, consistent with the certification requirements we propose to apply to providers in connection with their availability data.

4. Additional Options for Collecting Verified Data on Mobile Service

117. As discussed above, we propose to require mobile providers to submit on-the-ground test data to assist the Commission in verifying their data submissions. In this section, we propose to collect voluntarily-submitted "verified" on-the-ground data on mobile service from "[s]tate, local, and Tribal governmental entities that are primarily responsible for mapping or tracking broadband Internet access service" and from Federal agencies for use in the mobile coverage maps the Commission creates.[316] We also seek comment on whether to collect voluntarily-submitted "verified" on-the-ground data from other third parties, including other non-federal government entities and mobile providers that submit data unrelated to their own networks, for use in the coverage maps. In addition, to meet the Broadband DATA

[316] 47 U.S.C. § 642(a)(2)(A).

Act's mandate to conclude a process that tests the feasibility of partnering with one or more Federal agencies to collect information to verify and supplement broadband information submitted by providers,[317] we propose to launch a pilot program with a Federal agency with a delivery fleet, such as the United States Postal Service (USPS). We seek comment on how to implement this pilot program.

118. *On-the-Ground Data from Government Entities and Third Parties.* We seek to refresh the record on accepting on-the-ground data from certain state, local, and Tribal governmental entities as well as from other third parties. The *Digital Opportunity Data Collection Order and Further Notice* sought comment on whether to contract with third parties to deliver speed test data.[318] In response to the *Digital Opportunity Data Collection Order and Further Notice*, the California PUC argued that the Commission or third parties not affiliated with providers should conduct nationwide drive-testing and that the Commission should accept data collected through tests conducted by states or their contractors.[319] The City of New York also supported submission of voluntary speed-test data produced by local governments.[320] Verizon maintained that, if the Commission were to obtain third-party sources of test data, including structured sample data, it would be reasonable to *supplement* providers' submissions but unreasonable to use such data to *validate* providers' submissions, given inherent *variability* in such data.[321]

119. We seek comment on whether we should adopt standards or requirements that these data must satisfy. We also seek comment on whether the Commission has discretion, under the Act, not to use such data if it determines that such data is not reliable or helpful for creation of the coverage maps. We also seek comment on whether, and under what conditions, the Commission should accept verified on-the-ground data from other third parties. We propose to define "other third parties" to include all entities not mentioned in section 642(a)(2)(A) and (C) of the Act,[322] including non-federal governmental entities that are not primarily responsible for mapping or tracking broadband Internet access service, service providers that submit data on other providers' network coverage and performance, and other entities, such as third-party entities that routinely collect on-the-ground data. We seek comment on this proposed definition. Would data from other third parties help the Commission develop more accurate mobile coverage maps and verify providers' submitted data?[323] If we collect data from other third parties, should we specify the procedures and parameters for on-the-ground testing that the Commission will accept, as discussed in more detail above? Should the third-party be required to certify the methods by which the data were collected? We seek comment on whether establishing required procedures and standards will ensure the accuracy of these data. Will third parties be able to manipulate the procedures to generate inaccurate coverage data?

120. We seek comment on whether we can set technical standards for on-the-ground data that we collect from government and third parties, and if so, what standards we should require for such data. In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission sought comment

[317] 47 U.S.C. §§ 644(b)(1)-(2).

[318] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7555, para. 126.

[319] California PUC Comments at 8; *see also* California PUC Comments, WC Docket No. 11-10, at 6 (filed Sept. 14, 2017) (arguing that state level drive test data provides "the most effective measure of actual mobile broadband service speeds").

[320] City of New York Comments at 4.

[321] Verizon Comments at 11-12. Verizon's comments were in the context of crowdsourced data generally, and not specific to drive test data from government entities or third parties that typically conduct drive test data. *Id.*

[322] 47 U.S.C. §§ 642(a)(2)(A), (C).

[323] *See, e.g.*, 47 U.S.C. § 642(a)(2).

on ways to define a drive-testing process that would yield a useful dataset to verify provider data.[324] We note that the data speed that users experience depends on both the deployed network and the performance capabilities of the device. We believe that adopting standardized methodologies, testing parameters, and minimum device performance capabilities that apply equally to on-the-ground data submitted by providers to verify their network (as discussed in section IV.D.1., above) and to on-the-ground data voluntarily submitted by state, local, and Tribal governmental entities, other third parties, and Federal agencies (including through a pilot program) will assist the Commission in collecting verified data. Accordingly, we propose that any standardized requirements should be the same as those we adopt for service providers submitting on-the-ground data to verify their coverage data, as discussed above. For government and third-party on-the-ground test data, should we set parameters and methodologies such as equipment standards, requirements for placement of equipment, and time-of-day testing requirements? Should we require a combination of mobile and stationary test data? To the extent we adopt methodologies and parameters, can parties still manipulate such tests to generate inaccurate results? What, if anything, can the Commission do to prevent such manipulation?

121. Should the Commission consider accepting any other forms of verified on-the-ground data besides mobile and/or stationary test data? In the *Digital Opportunity Data Collection Order and Further Notice*, we sought comment on the use of aerial drone testing and other technologies to verify data accuracy, with a particular emphasis on using such technologies to conduct sample audits of provider-submitted mobile deployment data, but few commenters addressed this issue.[325] We seek to refresh the record on the extent to which the Commission could verify and use such data in the creation of its mobile broadband maps. Are such data sufficiently reliable for use in the mobile broadband coverage maps? Would third parties have an interest in submitting such data for use in the Commission's coverage maps?

122. *Federal Agency Delivery Fleet Pilot Program.* Section 644(b)(2)(B) of the Broadband DATA Act requires the Commission, within one year of the Act's enactment, to "conclude a process that tests the feasibility of partnering with Federal agencies that operate delivery fleet vehicles, including the United States Postal Service, to facilitate the collection and submission" of data that can be used to verify and supplement broadband coverage information.[326] After the feasibility testing, the Commission must publish a report determining "whether the partnerships with Federal agencies . . . are able to facilitate the collection and submission of information" to verify and supplement mobile broadband data submitted by providers.[327] We seek comment on how best to comply with these mandates.

123. We believe that we should study the feasibility of partnering with Federal agencies by seeking to develop a pilot program that would install drive-test hardware on last-mile federal delivery fleet vehicles in certain sample markets to perform drive tests during a typical delivery route. How can we develop a cost-effective pilot program with USPS or another Federal agency that would yield useful data? What steps could the Commission take to address concerns about the validity of drive-test data

[324] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7555, para. 126. We considered designating a defined set of points nationwide for drive testing that we could use as part of a structured sampling method. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7555, para. 126. We also sought comment on steps the Commission could take to address concerns about the meaningfulness and statistical validity of any provider-submitted on-the-ground data. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7555, para. 122. We inquired whether the Commission should specify the methodology and parameters that providers must use to collect on-the-ground data. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7555, para. 122. We also asked whether the Commission should require providers to use specific measurement equipment or software applications to measure mobile broadband speeds. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7555, para. 126.

[325] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7555-57, paras. 127-30.

[326] 47 U.S.C. § 644(b)(2)(B).

[327] 47 U.S.C. § 644(b)(2)(C)(i).

more generally?[328] For example, should the Commission focus its pilot program on rural areas, where there are greater concerns with mobile coverage, or on markets where coverage is disputed? We seek comment on whether the pilot program should also incorporate stationary testing.

124. What other considerations should guide the Commission's decisions in establishing a pilot program with a federal agency that operates delivery fleet vehicles, such as USPS? For instance, in a Government Accountability Office (GAO) Report that considered the feasibility of USPS delivery vehicles collecting mobile wireless coverage and performance data, GAO identified two potential limitations: large up-front costs and complex technical specifications.[329] We seek comment on the likely costs of a pilot program. What procedures could the Commission implement to address concerns with requiring delivery workers to perform technically complex tasks?[330] Can drive-testing be automated so that delivery vehicles can collect data passively? We seek comment on possible best practices for obtaining reliable drive-test data, including whether technicians would be required to install and calibrate test equipment; whether drivers would have to be trained to perform tests; and whether, in order to ensure a statistically valid sample, multiple drive-tests would be required on the same route. Would there be any legal or other constraints inherent in partnering with USPS for such a pilot program?[331] For example, USPS Rural Carrier Associates "serv[e] thousands of families and businesses in rural and suburban areas while traveling millions of miles daily" but typically use their own vehicles for mail delivery.[332] Are there challenges to deploying drive testing equipment in vehicles not owned by the USPS? Are there other Federal agencies "that operate delivery fleet vehicles," as the Broadband DATA Act states?[333]

125. Finally, should we also consider exploring a pilot program with a private entity that operates a large fleet of delivery vehicles, such as UPS or Federal Express? Are private entities better equipped than Federal agencies to operate such a program? Are there other private entities that routinely cover a high enough percentage of the roads?

E. Challenge Process

126. In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission explained that "input from the people who live and work in the areas that a service provider purports to serve also plays a vital role in ensuring the quality of these maps, helping to identify areas where the data submitted do not align with the reality on the ground."[334] We seek comment on how best to implement a user-friendly challenge process consistent with the Broadband DATA Act.

127. Pursuant to the Broadband DATA Act, the Commission must establish a user-friendly

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[328] 47 U.S.C. § 644(b)(2)(C); *see also, e.g.*, CTIA Comments at 12.

[329] Government Accountability Office, Report to Ranking Member, Committee on Homeland Security and Governmental Affairs, S. Senate, "U.S. Postal Service, Offering Nonpostal Services through Its Delivery Network Would Likely Present Benefits and Limitations," GAO-20-190, at 31-32 (Dec. 2019), available at https://www.gao.gov/assets/710/703324.pdf (GAO USPS Report).

[330] GAO USPS Report at 31 (noting that several technical factors must be controlled for when collecting data, which could pose a challenge to USPS implementation). The GAO Report considered collecting mobile wireless coverage as a potential revenue stream for USPS; as such, the report considered USPS collecting data that it could offer to providers, rather than collecting data through a Commission partnership. *See, e.g.*, *Id.* at 32.

[331] GAO USPS Report at 1 ("USPS noted legal and other constraints to offering new non-postal services that leverage USPS's last mile network").

[332] *See* USPS, Publication 181—Join Our Team! Rural Carrier Associate at 1, 2 (Oct. 2007), https://about.usps.com/publications/pub181.pdf (last visited Apr. 29, 2020).

[333] 47 U.S.C. § 644(b)(2)(B).

[334] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 18 (quoting Letter from Steven F. Morris, Vice President & Deputy General Counsel, NCTA, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 11-10, at 4 (filed Apr. 10, 2019)).

challenge process through which consumers, State, local, and Tribal governmental entities, and other entities or individuals may submit coverage data to challenge the accuracy of the coverage maps, broadband availability information submitted by providers, or information included in the Fabric.[335] In establishing the rules for the challenge process, the Commission must take into consideration a number of factors, including: (1) the types and granularity of information to be provided in a challenge; (2) the need to mitigate time and expense in submitting or responding to a challenge; (3) the costs to consumers and providers from misallocating funds based on outdated or inaccurate information in coverage maps; (4) lessons learned from comments submitted in the Mobility Fund Phase II challenge process; and (5) the need for user-friendly submission formats to promote participation in the process.[336] The process also must include the verification of data submitted through the challenge process and allow providers to respond to challenges to their data.[337] The Commission must develop an online mechanism for submitting challenges: (1) that is integrated into the coverage maps, (2) that allows an eligible entity or individual to submit a challenge, (3) that makes challenge data available in both GIS and non-GIS formats, and (4) that clearly identifies broadband availability and speeds as reported by providers.[338] The rules establishing the challenge process also must include processes for the speedy resolution of challenges and for updating the Commission's coverage maps and data as challenges are resolved.[339]

1. Online Tracking System

128. In the *Digital Opportunity Data Collection Order and Further Notice*, we directed OEA to work with the Administrator to create an online portal for State, local, and Tribal governmental entities and members of the public to review and dispute the broadband coverage data filed by fixed providers under the new Digital Opportunity Data Collection.[340] The Broadband DATA Act does not permit USAC to develop the new portal, however, and, as described above, the portal must be flexible enough to handle broadband Internet access service mapping, availability, and location challenges for both fixed and mobile providers. We propose that the online mechanism for receiving and tracking challenges be accessible through the same portal that we propose to use for crowdsourced submissions, and that it provide easy, direct access to the challenge data as well as broadband availability data we collect from providers, including speed and latency data.[341] We seek comment on this proposal and on any alternatives for tracking challenges. For example, in the *Digital Opportunity Data Collection Order and Further Notice*, we asked whether the tracking portal could be similar to the Commission's existing consumer complaints database.[342] We also seek comment on the best user-friendly format for filing, responding to, and tracking challenges,[343] as well as on what other steps may be required to ensure that the challenge portal complies with the requirements of the Broadband DATA Act.

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[335] 47 U.S.C. §§ 642(a)(1)(B)(iii), (b)(5).

[336] 47 U.S.C. §§ 642(b)(5)(B)(i)(V)-(VI).

[337] 47 U.S.C. §§ 642(b)(5)(B)(ii), (iii).

[338] 47 U.S.C. §§ 642(b)(5)(B)(ii)-(iv).

[339] 47 U.S.C. § 642(b)(5)(C).

[340] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, 7542, paras. 18, 89 ("This input would identify locations where a member of the public or a governmental entity indicates that the fixed provider is not able to provision broadband service despite the location being within a broadband coverage polygon."); *see also id.* at 7542, para. 89.

[341] *See supra* section III.E.4.

[342] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7542, para. 89.

[343] In establishing a challenge process, the Broadband DATA Act specifically requires the Commission to consider the need for user-friendly challenge submission formats that will promote participation in the challenge process. *See* 47 U.S.C. § 642(b)(5)(B)(i)(VI).

2. Consumer Challenge Process

129. The challenge process must be available for consumers, as well as for State, local, and Tribal governmental entities and other entities. We anticipate that the issues raised in individual consumer challenges may differ from those raised by entities, so we propose to establish separate sets of requirements and procedures for consumer challengers.

a. Consumer Challenges of Fixed Data

130. *Service Availability and Coverage Map Data.* We propose to collect the following information from consumers seeking to challenging coverage map data or the availability of service at a particular location:[344] (1) the name and contact information of the challenger (e.g., address, phone number, and/or e-mail); (2) the street address and geographic coordinates (latitude/longitude) of the location(s) at which the consumer is disputing the availability of broadband Internet access service; (3) a representation that the challenger owns or resides at the location or is authorized to request and receive service there; (4) the name of the provider whose coverage is being disputed; (5) a category of availability dispute, selected from pre-established options on the portal (e.g., no actual service offering at location; provider failed to install within ten business days of valid order for service; provider denied request for service; installation attempted but unsuccessful; reported speed not available); and (6) text and documentary evidence and details of a request for service (or attempted request for service), including the date, method, and content of the request and details of the response from the provider. As required by the Broadband DATA Act, the platform for this submission would be integrated with the coverage maps so that the challenger would have ready access to broadband availability information reported at the location that is subject to the challenge.

131. We conclude that collecting this information would appropriately balance the burden on the challenger and provider, would facilitate challenge participation, and would adequately verify the information collected, as required by the Broadband DATA Act. We seek comment on this conclusion.

132. We also seek comment on the information that we propose to collect for challenges to fixed service availability and coverage data. Is there additional information that we should collect or are any of the proposed types of information not needed to present a clear picture of a challenge? Is the information we propose to collect comprehensive enough to cover all challenges considered by the Broadband DATA Act? We also believe that requiring detailed information to support a challenge will inhibit the submission of frivolous or malicious filings.[345] We seek comment on this assumption.

133. Regarding the information requested from a consumer challenger, we seek comment on the specificity we should require for contact information and whether there are any privacy concerns with requesting this information (e.g., whether we should require both telephone numbers and email addresses). With regard to geographic coordinates, we propose to require that challenges be brought only on a location-specific basis, whether the challenge be for coverage maps, availability, or the Fabric. We seek comment on this proposal and on any better alternatives.

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[344] The challenge process proposed for fixed service availability and coverage map data is designed to allow consumers and other parties to challenge whether coverage maps accurately reflect the *availability* of broadband service from a particular provider using the technology and at the maximum advertised speeds reported by the provider. This challenge process is not meant to address disputes that subscribers have with their broadband provider about quality of service issues, such as actual speeds and latencies received at a particular location.

[345] We note that in the Digital Opportunity Data Collection Order and Further Notice, we directed USAC to develop mechanisms in the Digital Opportunity Data Collection to prevent malicious or unreliable filings. Digital Opportunity Data Collection Order and Further Notice, 34 FCC Rcd at 7513, para. 20 ("[w]e want to avoid bad-faith or malicious challenges to coverage data, such as a dispute to every address in a fixed provider's footprint via an automated tool or bot. In order for this tool to be effective, it is essential that we safeguard the integrity of the data submitted through it.").

134. Also, in order to ensure the reliability of the data submitted, we propose that an individual, or an authorized officer or signatory of an entity, certify that the person examined the information contained in the challenge and that, to the best of the person's actual knowledge, information, and belief, all statements of fact contained in the submission are true and correct. Because providers must certify in a similar fashion with regard to their availability filings,[346] we believe it is appropriate that a challenge to the substance of such filings be supported with certification that have comparable terms.[347] We also propose that, if allowed to challenge multiple locations at once, the challenger must certify that this is true for each of the locations. We seek comment on these proposals.

135. Once a challenge is submitted to the online portal, the Broadband DATA Act requires the Commission to allow providers to respond.[348] As an initial matter, we propose that the Commission's online portal should automatically notify a provider that a challenge has been filed against it.[349] We believe that sending an automatic notification to providers is appropriate as it should promote active engagement, awareness, and responsiveness by providers.[350] We seek comment on this proposal and on any alternatives to alerting providers to the filing of a challenge in the portal.

136. We propose requiring providers to submit a reply to a challenge in the online portal within 30 days of being notified of the challenge. We further propose that a provider's failure to submit a reply within the required period, or its acceptance of the assertions in the challenge, result in removal of the location from the Commission's official coverage map. We seek comment on this approach and on alternative time periods and alternative approaches. For example, NTCA has proposed a 60-day reply period for providers.[351] Any timetable for a provider response must balance the burdens on the provider versus the public's interest in rapid resolution of disputes so that the Commission has the best broadband Internet access service deployment data available for funding decisions and reporting. We also want to assess the burdens on providers (especially small providers) in responding to challenges.

137. We propose that a provider disputing a challenge must provide evidence in its reply to the challenger that it has either verified the existence of service or evaluated its capability of provisioning service at the location of the dispute and that it is currently providing service or is willing and able to provide service to the challenger at that location. Once a provider submits its objection to the challenge, the location will be identified on the public coverage maps as "in dispute/pending resolution." The challenger and provider would then have 60 days from the provider's reply to resolve the dispute. If the parties are unable to reach consensus within those 60 days, then the Commission will review the evidence and make a determination (based on a preponderance of the evidence, with the burden on the provider to

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[346] *See* 47 U.S.C. § 642(b)(4).

[347] *See* Broadband Mapping Coalition Comments at 34; NCTA Comments at 12-13 (arguing that "a challenging party should be required to certify to the accuracy of the data they are submitting just as providers certify to the accuracy of the data they must report"). We are requesting comment in this *Third Notice* on whether to require an engineering certification from providers of fixed and mobile broadband Internet access services regarding the availability and quality of their services. *See supra* section IV.D.2. We do not propose to require engineering showings or certifications as part of consumer challenges, but we will accept and consider them as part of resolving challenges should a challenger wish to submit them.

[348] 47 U.S.C. § 642(b)(5)(B)(iii).

[349] *See, e.g., Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7542, para. 89 ("[h]aving a tracking system would allow USAC to pass the complaints along to the appropriate provider").

[350] *See* Broadband Mapping Coalition Comments at 28 (highlighted the Commission's proposed procedure of notifying providers regarding challenges, but opposed an alternative method that would require providers to check periodically for challenges to their data—this "alternative could substantially increase provider burdens, especially for smaller providers, and in so doing, create an atmosphere more conducive to challenges slipping through the cracks").

[351] NTCA Comments at 9-10.

demonstrate service availability), either: (1) in favor of the challenger, in which case the provider must remove the location from its Digital Opportunity Data Collection polygon within 30 days of the decision; or (2) in favor of the provider, in which case the location will no longer be subject to the "in dispute/pending resolution" designation on the coverage maps. A provider failing to respond to a challenge, or a challenger failing to respond to a provider's reply, would result in a finding for the other party. We seek comment on this multi-step dispute resolution proposal and the timelines therein.

138. We also seek comment on our proposed use of the "preponderance of the evidence" standard in resolving disputes between challengers and providers.[352] Based on this evidentiary standard, we would weigh the presented evidence and determine whether the challenger had initially established evidence of a lack of service and, if so, whether the service provider has shown by the greater weight of the evidence that it makes service available at the challenger's location. We seek comment on potential alternatives. For example, in response to the *Digital Opportunity Data Collection Order and Further Notice*, the Broadband Mapping Coalition proposed a "clear and convincing" evidence standard, with the burden of proof on the challenger, for resolving challenges, which "is intermediate, being more than mere preponderance, but not to extent of such certainty as is required beyond reasonable doubt as in criminal cases."[353] NCTA recommends that the dispute resolution framework "should be an evidence-based challenge process that places substantive evidentiary requirements on the party submitting the challenge, requires a response from the provider, and leads to a decision by the Commission if there is no resolution between the parties."[354] We seek comment on the dispute resolution framework and whether we should put the burden of proof in the challenge process on the challenger.[355]

139. One of the benefits of the proposed approach is that it balances the interest in avoiding unreliable or malicious availability and location disputes with the need to have finality in disputes to enhance the accuracy of the provider's data and coverage maps. We believe the process we propose would encourage the sharing of information and opportunities for cooperation that will result in many challenges being resolved promptly without the need for Commission intervention. Our goal is to establish a dispute resolution process that achieves the Broadband DATA Act's objectives while minimizing burdens on the parties and conserving valuable Commission resources to the maximum extent possible.

140. *Consumer Challenge of Fabric Data.* We propose a different process for consumers to challenge information in the Fabric. We anticipate that challenges to location information in the Fabric would not generally require the involvement of a broadband provider. We propose, however, that challenges to the Fabric data will be filed on the same portal as challenges of availability and coverage map data, with the submission of much of the same information. As with consumer challenges to availability and coverage map data, for challenges to the Fabric, we propose to provide a selection of pre-established categories of disputes, including, for example: placement of location on the map is wrong (geocoder/broadband serviceable location); location is not broadband serviceable (e.g., condemned, not a habitable structure); or serviceable location is not reflected in the Fabric. We also propose to provide an "other" option, along with the opportunity in the portal for submitting text or documentary evidence in support of the challenge. We propose that the challenge process platform provide each challenger with an

[352] *See, e.g., Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7544, para. 95 ("What evidentiary standard should the Commission establish to resolve such disputes: preponderance of evidence, clear and convincing evidence, or another standard?").

[353] Broadband Mapping Coalition Comments at 33; *see also* GVNW Consulting Comments at 4 ("Such a challenge would require a carrier to provide supporting documentation that provides clear and convincing evidence that the reported broadband service for that particular area is inaccurate.").

[354] NCTA Comments at 12-13.

[355] *See* Broadband Mapping Coalition Comments at 33 (arguing that the burden of proof must reside with the consumer or entity filing the challenge).

acknowledgement of its submission and information about the process, including expected timing, and we propose that the portal notify any affected providers of the challenge and allow, but not require, them to submit information relating to the Fabric challenge. We propose to establish a goal of resolving challenges to the Fabric within 60 days of receipt of the challenge and seek comment on that proposal.

b. Consumer Challenges of Mobile Coverage Data

141. We seek comment on how to create a user-friendly challenge process that encourages participation to maximize the accuracy of the maps, while also accounting for the variable nature of wireless service. However, we recognize that resolving challenges to mobile coverage maps presents unique challenges not present with regard to fixed broadband availability challenges.

142. For consumers seeking to challenge mobile broadband coverage map data, we propose to collect the following information: (1) the name and contact information of challenger (e.g., address, phone number, and/or e-mail address); (2) the street address or geographic coordinates (latitude/longitude) of the location(s) at which mobile broadband Internet access service coverage is disputed; (3) the name of the provider whose coverage is being disputed; (4) a representation that the challenger is a subscriber of the provider that is the subject of the challenge; (5) a category of dispute, selected from pre-established options on the portal (e.g., no mobile broadband signal at a location; mobile broadband speed below defined technology speed parameter at a location); and (6) information regarding the available mobile broadband service. We seek comment about whether the information we propose to collect from consumer challengers would cover all the potential challenges authorized by the Act and facilitate participation in the challenge process, while being detailed enough to discourage frivolous filings. Would it be enough to verify the legitimacy of the challenge and provide enough information for the challenged party to respond? Should the Commission require the submission of other information or should it not require the submission of certain information listed above? Consistent with our proposed process for consumer challenges in the fixed context, we propose that a mobile challenger certify that an authorized person has examined the information contained in the challenge and that, to the best of the person's actual knowledge, information, and belief, all statements of fact contained in the submission are true and correct.

143. In addition to challenges regarding the availability of mobile broadband service, we propose to allow challenges by consumers based on quality of service metrics such as delivered user speeds. We believe that allowing such challenges would help us verify the accuracy of mobile coverage maps by providing us with a source of on-the-ground data that reflects consumer experience in areas across the country. We seek comment on our proposal. What are the advantages and disadvantages of permitting consumers to make such challenges? We propose requiring consumers who are challenging quality of service metrics (such as download or upload speeds) to submit speed test evidence. For consumers using third-party mobile speed test applications to collect data for their challenges, we propose to adopt the same procedures for qualifying applications as the Commission uses for receiving crowdsource data. We seek comment on whether we should establish rules for consumer challengers requiring a minimum number of speed test observations, specifying the distance between speed tests, or requiring that speed tests be conducted during a defined time frame. We seek comment on whether we should require the use of a specific speed test application, such as the FCC Speed Test application or another application. Would requiring the submission of speed test data be consistent with the Broadband DATA Act's requirement that the Commission develop an online mechanism to receive challenges?[356] Would adopting these additional requirements be consistent with the requirement that we create a user-

[356] Section 642(b)(5)(B)(iv) requires the Commission to develop an online mechanism that (1) is integrated into the coverage maps; (2) allows an entity to submit a challenge; (3) makes challenge data available in GIS and non-GIS formats; and (4) clearly identifies the areas in which BIAS is available and the upload/download speeds. 47 U.S.C. § 642(b)(5)(B)(iv).

friendly challenge process as required by the Broadband DATA Act?[357] Alternatively, should we limit challenges in the mobile context to those based only on evidence of a lack of service availability? Would doing so be consistent with the requirements of the Broadband DATA Act?[358] We also seek comment on whether and how the Commission should use signal strength information submitted by carriers, assuming the Commission adopts such a requirement, as part of the challenge process. As noted above, end user throughput can be affected by factors other than signal strength, but often signal strength correlates to expected throughput. Based on this relationship between signal strength and throughput, we seek comment on the role signal strength information could play in the challenge process. Should the Commission adopt a different evidentiary standard or burden of proof in cases where a party submits a challenge in an area where the carrier's RSRP/RSSI falls below a specified threshold? If so, then what RSRP/RSSI value would be appropriate?

144. We propose to use generally the same processes and timeframes for mobile service providers to respond to challenges in the mobile context as we propose to use in the fixed context. Consistent with our proposal for fixed services, we propose that the Commission's dispute tracking portal automatically push notifications through to mobile providers regarding filings made against them and that providers seeking to dispute a challenge be required to submit a reply to a challenge in the online portal within 30 days of being notified of the challenge. We seek comment on this proposal. For challenges involving the delivered speeds associated with a mobile broadband service, we propose that a provider disputing a challenge from a mobile consumer must provide evidence in its reply to the challenger that it has evaluated the speed of its service at the location of the dispute and determined that the delivered speeds of the service match the speeds indicated on the provider's coverage map. We propose that the rest of the challenge process for consumers follow the same approach as for consumer challenges in the fixed context. We seek comment on this approach and on any better alternatives to ensure that the Commission and the provider have complete and accurate information about the challenge. Additionally, we seek comment on whether the rules for consumer challenges should require uniform measurements per grid cell similar to what we propose to adopt for challenges by governmental and other non-consumer entities as set forth below.[359]

3. Challenges by Governmental and Other Entities

a. Challenges by Governmental and Other Entities to Fixed Data

145. *Challenges by Governmental and Other Entities to Service Availability and Coverage.* We also propose to establish two processes for challenges to fixed data by State, local, or Tribal governmental entities or other entities: one for availability and coverage map challenges and one for challenges to Fabric data. These entities will not under normal circumstances be consumers of mass-market broadband services and so we anticipate that the challenges they initiate will be typically in the form of bulk challenges of provider availability, coverage map, or Fabric data. We seek comment on this conclusion. We propose to establish a portal for entity challenges on the same platform used for consumer challenges.

146. While government organizations or other entities (e.g., businesses, trade groups, other organizations) can be customers of a provider at a location (and follow the challenge process above laid out for consumers (or potential consumers) at a specific location), we propose to allow them also to file challenges for locations where they are not customers or potential customers. In those situations, we propose to require some of the same information from the challenger as for consumer availability challenges, including: (1) the name and contact information for the challenger; (2) the geographic

[357] *See* 47 U.S.C. § 642(b)(5)(B)(i)(VI).

[358] Section 642(b)(5)(A)(ii) authorizes challenges to the accuracy of "any information submitted by a provider regarding the availability" of broadband Internet access service. 47 U.S.C. § 642(b)(5)(A)(ii).

[359] *See infra* para. 152.

coordinates (latitude/longitude) or the street addresses of the location(s) at which coverage is disputed; (3) the name[s] of the provider[s] whose availability data are being disputed; (4) narrative description of dispute (e.g., no actual service offering at location; provider failed to install within ten business days of valid order for service; provider denied request for service; installation[s] attempted but unsuccessful; reported speed not available for purchase); (5) evidence/details supporting dispute, including (a) methodology, (b) basis for determinations underlying the challenge, and (c) communications with provider, if any, and outcome; and (6) a certification that the information submitted with the challenge is accurate, equivalent to the certification made by providers in submitting their availability data. We also propose that the processes and timeframes for provider replies and dispute resolution follow the same approach as for consumer challenges to availability and coverage. We seek comment on this approach and on any better alternatives to ensure that the Commission and the provider have complete and accurate information about the challenge.

147. *Challenges by Governmental and Other Entities to the Fabric.* We propose that governmental and other entities' challenges to locations in the Fabric be initiated on the same portal as their challenges to availability, with the same filing requirements as consumer challenges to the Fabric, including the name and contact information for the challenger and the geographic coordinates (latitude/longitude) or the street addresses of the location(s) for which the entity disputes the Fabric data, as well as a description of the disputed information and evidence/details that support the challenge. As with consumer challenges to Fabric data, we propose to establish a goal of resolving disputes of data in the Fabric within 60 days of receipt of the challenge and seek comment on that proposal.

148. We seek comment on these proposals and specifically on whether they would appropriately balance the considerations the Broadband DATA Act requires us to take into account in establishing the challenge process.

b. Challenges by Governmental and Other Entities to Mobile Data

149. *Minimum Requirements for Challengers.* Consistent with our proposal for consumers in the mobile context, we propose to allow challenges from governmental and other entities based on both mobile broadband service availability and quality of service metrics such as delivered speeds. For challenges involving delivered speeds, however, we propose that governmental and other entities follow a different process for submitting standardized challenge data.

150. In the Mobility Fund Phase II proceeding, we required challengers to submit proof of lack of 4G LTE coverage in the form of actual outdoor download throughput speed test measurements to reflect actual consumer experience throughout the entire challenged area.[360] In particular, the Commission adopted a requirement that a challenger must take measurements that were no more than one-half of a kilometer apart from one another in each challenged area and required challengers to demonstrate measured speeds falling below the applicable parameters in 75% of the challenged area.[361] Challengers also faced additional evidentiary requirements, including a requirement to use pre-approved handset models, to purchase a service plan from each provider in the challenged area, and to conduct speed tests during a specified timeframe.[362]

151. In response to the *Digital Opportunity Data Collection Order and Further Notice*, at least one commenter argued that the evidentiary standards the Commission adopted for the Mobility Fund

[360] *Mobility Fund II Order on Reconsideration and Second Report and Order,* 32 FCC Rcd at 6306, 6308, paras. 47, 50. For purposes of the MF-II challenge process, "4G LTE" meant service with a measured download throughput speed of 5 Mbps and "outdoor" meant not inside of a building.

[361] *Procedures for the Mobility Fund Phase II Challenge Process*, WC Docket No. 10-90, WT Docket No. 10-208, Public Notice, 33 FCC Rcd 1985, 1996, para. 21 (rel. Feb. 27, 2018); *Mobility Fund II Order on Reconsideration and Second Report and Order*, 32 FCC Rcd at 6309, 6310, paras. 51, 55.

[362] *Mobility Fund II Order on Reconsideration and Second Report and Order*, 32 FCC Rcd at 6308-09, paras. 50-51.

challenge process were burdensome and difficult to meet, particularly for small entities.[363] CCA explained that collecting drive test data to dispute coverage was a significant challenge because "many rural areas that could be challenged have thousands of square kilometer blocks that must be separately analyzed to determine whether any carrier is providing service."[364] CCA also claimed that the requirement to provide evidence demonstrating lack of coverage in 75% of the area being challenged limited small provider participation because as many as half of rural blocks did "not have enough drivable roads to meet the Commission's 75-percent benchmark."[365] While WTA expressed support for a challenge process generally, it noted that establishing a challenge process in the mobile context is difficult because of the need to collect evidence of mobile broadband performance over vast areas.[366]

152. We propose to adopt an approach for governmental and other non-consumer entities submitting challenge data that is similar to the process for demonstrating compliance with performance requirements that the Commission has proposed in the *5G Fund NPRM*.[367] Under such an approach, we would overlay a uniform grid of one square kilometer (1 km by 1 km) grid cells on each carrier's propagation model-based coverage maps.[368] We would then require governmental and other entities interested in challenging the accuracy of a carrier's map to submit user speed test measurement data showing measured user throughput speeds in the area they wish to challenge. For example, we could require challengers to submit at least 3 speed test measurements per square kilometer grid cell in the disputed area demonstrating that measured throughput speeds do not match reported service levels.[369] Measurement data indicating speed levels below applicable parameters in the challenged area would constitute evidence that a provider's coverage map may not be accurate. We seek comment on the feasibility of this approach for governmental and other entities in the context of our challenge process. We seek comment on the minimum number of measurements that should be required in each grid cell. Would a minimum testing requirement of 3 speed test measurements per square kilometer grid cell in the challenged area provide sufficient data while minimizing costs and logistical burdens for challengers? Do we need to adopt any requirements concerning the three speed tests, such as requiring a minimum distance between tests? Or, should the Commission require a different number of speed test measurements? Are there other types of drive tests that can be conducted with more frequent observations? Alternatively, should the Commission require challengers to submit speed test measurements in a defined percentage of grid cells in a challenged area? What percentage of grid cells would provide a representative sample of coverage in an area? Should we require challengers to submit measurements in 15% of grid cells in the challenged area?[370] Would doing so provide a sufficient sample size on which to base a challenge filing? Are there alternative approaches that would not require challengers to submit speed test data?

153. We propose that tests must be conducted using a device certified by the service provider that is the subject of the challenge as compatible with its service. We further propose that each speed test be taken between the hours of 6:00 AM and 12:00 AM (midnight) local time and that each test be taken outdoors. We propose to require challengers to provide test data from a combination of mobile and stationary tests. For in-vehicle tests, we seek comment about whether we should specify the maximum vehicle speed during which tests may be taken and whether challengers should be required to report the

[363] *See generally* CCA Comments.

[364] CCA Comments at 8.

[365] *Id.* at 9.

[366] WTA Comments at 9-10.

[367] *See 5G Fund NPRM,* 35 FCC Rcd at 4033, para. 113.

[368] *Id.*

[369] *Id.*

[370] *Id.* at 4033-34, para. 114.

speed of the vehicle at the time of the measurements. If tests are conducted with the device in the vehicle, we propose that the measurements must be calibrated to accurately represent outdoor operation and that the calibration procedures be provided with the analysis.[371] We also propose to require that speed test data be substantiated by the certification of a qualified engineer or official. To the extent governmental or other non-consumer entities use third-party applications to collect data used for their challenge process, we propose that the Commission will adopt the same procedures for qualifying applications as it uses for receiving crowdsource data and consumer challenge data. We seek comment on this proposal. We also seek comment on whether and how a challenger might game the results of a challenge. If so, how might the Commission prevent such gaming?

154. We acknowledge that a mobile service provider might have different motives for challenging a competitor's propagation models and coverage maps than governmental entities and other third parties that do not provide competing mobile broadband Internet access service. Should we allow competing mobile service providers to submit challenges, and if so, should we adopt different evidentiary standards for mobile service providers than for governmental agencies and other third parties that are not service providers? We also seek comment on whether to establish different evidentiary standards or permit challengers to use different measurements methods in rural areas. We seek comment on our proposals and ask commenters to discuss any other measures the Commission should adopt to help ensure that it receives useful data while minimizing the time, expense, and administrative burden for both challengers and providers.

155. Lastly, we seek comment on whether the minimum requirements and other standardization procedures we propose here for challenging mobile broadband coverage data, if adopted, would ensure the reliability of the data sufficient to satisfy our obligations under the Broadband DATA Act.[372] If not, then what other processes would be necessary for the Commission to verify and ensure the reliability of the challenge process data in accordance with the Act?

156. *Challenge Responses.* We propose to generally use the same challenge response processes and timeframes for challenges by governmental and other entities as we propose to use for challenges by those entities involving fixed services. For cases where a mobile provider seeks to rebut a governmental or other entity's allegation regarding delivered speeds, however, we propose the following. We will allow the provider to submit comprehensive on-the-ground data, or a statistically valid and sufficient sample of such data to verify its coverage maps in the challenged area. We also propose that the Bureaus have the option to require carriers to submit other data as necessary. We further propose that mobile service providers be subject to the same speed test measurement parameters we ultimately adopt for challengers. We seek comment on our proposals.

157. In order to facilitate the resolution of challenges in the mobile context, we seek comment on requiring providers to submit a standardized "challenge evaluation map" of specific geographic areas being challenged using a Commission-approved propagation model. In the *Second Report and Order* above, we require that a provider's propagation model results be based on certain standardized parameters (and their corresponding minimum values) that we establish for cell edge probability, cell loading, and clutter. We also require that providers must use the same optimized propagation models and parameters that they use in their normal course of network planning and design. Notwithstanding these standardized parameters, there remain many differences among the propagation models used by providers which may result in coverage maps that are difficult for potential challengers to analyze and contrast across providers and different RF environments. Moreover, the propagation models used by providers in their normal

[371] Often, drive tests are conducted with the test device connected to an external antenna and the additional losses for the external antenna calibrated. Tests conducted using the device's internal antenna require much more rigorous calibration methods to verify the vehicle penetration loss for the exact location and orientation of the device within the vehicle.

[372] 47 U.S.C. § 642(b)(5)(B)(ii).

course of business contain RF network engineering parameters that are proprietary and unique, which may make it more difficult for Commission staff to resolve challenges to the results produced by these propagation models.

158. To address these issues, we seek comment on whether to require providers, as part of the challenge process, to produce a standardized "challenge evaluation map" of specific geographic areas being challenged using a Commission-approved propagation model (e.g., Longley-Rice, or E-Hata), so that third parties and the Commission are able to analyze the technical and statistical factors that lead to variations in actual coverage and user experience. Such a Commission-approved standard model, implemented by the service provider(s), would produce signal strength predictions, as well as predictions of expected minimum downlink and uplink user speeds, based on provider specific system parameters (such as spectrum band and bandwidth deployed, transmit power, etc.). We believe that the use of such a standardized propagation model would afford the Commission and challengers additional insight into the expected minimum coverage and speed performance, to resolve the challenge of validating providers' claims beyond what is provided in the maps produced using providers' proprietary and unique RF parameters, especially in challenged areas. However, by requiring coverage prediction in specific geographic areas through the use of a standardized propagation model, we recognize that there may be an additional information collection burden associated with requesting this additional information from licensees. Therefore, we seek comment on the costs and benefits of this proposed requirement and whether adopting it would be consistent with the Broadband DATA Act requirement that the Commission consider " . . . the need to mitigate the time and expense incurred by, and the administrative burdens placed on, entities and individuals in . . . responding to challenges." [373]

159. Are there other alternatives that would achieve the results of balancing the desired outcome of having more transparent maps and predictions with less calibration error and uncertainty? Can a standard model be produced by providers without undue additional burden, given the more extensive and detailed normal-course-of-business RF propagation modeling that providers perform using proprietary tools?

160. For commenters who favor the Commission's adopting a standardized propagation model, we seek comment on the appropriate open RF propagation model(s) and its applicability to meet the accuracy expectations of this proceeding. Is Longley-Rice and/or E-Hata appropriate for the Commission to use for this purpose? How could such models be calibrated, such as through the use of clutter databases and models, to be adequately reflective of their effects on propagation in specific geographic areas? For example, path loss exponents and/or other modeling parameters such as clutter loss may be geographically dependent on the propagation path between two points (between transmitter and receiver) and significantly influence predicted coverage and performance. Commenters should specify how their recommended model(s) would provide the Commission and challengers the insight necessary to evaluate the coverage maps and performance claims produced by providers in their normal course of network planning and design.

161. Could a public dataset(s) of geospatial RF propagation parameters be developed and used, so that a standard evaluation model, or models, may be calibrated for the public benefit? Are there incentives and policies that the Commission should promote to encourage greater transparency and the development of trusted public propagation data in the public's interest? Commenters should specify which parameters should or should not be disclosed to the Commission with supporting reasons for their position on each parameter.

162. We also seek comment on when in the process providers should be required to submit these new coverage maps, if we adopt this requirement to standardize challenge evaluation maps. Should providers submit such maps on a calendar basis or only when coverage and performance is challenged in a specific area? Could the use of standardized challenge evaluation maps reduce the need and cost burden

[373] 47 U.S.C. § 632(b)(5)(B)(i)(III)(bb).

of measurement test campaigns? What other methods or processes can be used to evaluate providers' coverage maps under a challenge process? We seek comment on the above, as well as the relative costs and benefits of these alternative approaches.

163. *Framework for Verifying Data*. We seek comment on the data that should be used in the framework and how such data should be analyzed in ways not otherwise proposed in this *Third Notice*. What metrics from on-the-ground test results and crowdsourced data should be analyzed in the framework and how? To improve our ability to verify provider data, we propose that the framework require results from a certain number of on-the-ground or crowdsourced tests in an area. How many tests are needed to adequately assess coverage in a particular grid cell, set of grid cells, the area covered by a cell site, or a larger portion of a network? In assessing this number, we must consider that test results will be from particular points or lines within a grid cell, while coverage maps depict much larger areas. How often should test results be taken (i.e., across a range of dates and times of day)? How should we account for peak hour or other time-based variations in network traffic?

164. What, if any, additional infrastructure data should we include in the framework? We propose to obtain busy hour metrics for individual cell sites and include that data, as well as backhaul speed and technology, into our analysis. Are there other metrics and data sources that the framework should incorporate? We also propose to include population data and roadway traffic patterns. Should traffic pattern data be used to assess the level of cell loading on the network? If a mobile connection can be established in an area at one point, or one point in time, but not another, especially if the lack of a connection can be explained by high traffic or another factor, should the map of coverage in that area be deemed accurate and reliable? We propose to include a confidence rating within the framework, given the amount of data and level of network traffic variation to account for. We propose that the framework treat urban and rural areas differently. We seek comment on this proposal. We ask that commenters provide in-depth explanations of how various types of on-the-ground tests, crowdsourced data, infrastructure data, and other data can be used to verify mobile coverage pursuant to this framework.

4. Public Availability of Information Filed in the Challenge Process

165. The Broadband DATA Act requires the Commission to establish processes and procedures whereby entities or individuals submitting non-public or competitively sensitive information can protect the security, privacy, and confidentiality of that information with regard to Fabric data and broadband Internet access service data that they submit.[374] While the Broadband DATA Act does not expressly require the Commission to extend such protection to data submitted as part of the challenge process, we propose to do so in a limited capacity. In the *Digital Opportunity Data Collection Order and Further Notice*, we stated that "public input on fixed broadband service coverage will be most effective if some types of data collected in this process are routinely made available to the public."[375] As a result, we directed USAC to make public information about the location that is the subject of the challenge (including the street address and/or coordinates (latitude and longitude)), the name of the provider, and any relevant details concerning the basis for challenging the reported broadband coverage.[376] We propose to adopt the same requirements for information submitted as part of our proposed challenge process (with the exception of the Administrator's involvement), and we seek comment on that approach and any better alternatives. Specifically, we ask whether the information to be made public is too much or too little to adequately inform the public about the nature of a challenge. We also propose to keep all other challenge information private, unless disclosure "would be helpful to improve the quality of broadband data reporting."[377] We seek comment on the extent of this exception and under what circumstances we would

[374] 47 U.S.C. § 642(a)(1)(B)(ii).

[375] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 19.

[376] *Id.*

[377] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7513, para. 20.

make any other challenge information available to the public.

166. In the *Digital Opportunity Data Collection Order and Further Notice*, we also directed that any input from the public on broadband coverage service data be made available as soon as is practical after submission.[378] We did not specify a timeline for making such data publicly available, but expected that there would be regular releases of data.[379] We seek comment on the procedures and timing for making available the public data submitted as part of the challenge process. One option would be to make such information available and searchable in the Digital Opportunity Data Collection, without any official release of data. Another option would be to regularly issue public notices with the appropriate information. We seek comment on the best option for accomplishing our goal of making public challenge data available.

F. Broadband Serviceable Location Database

167. In the *Second Report and Order*, we adopted the Fabric as required by section 642(b) of the Broadband DATA Act, along with other basic Fabric elements prescribed in the Act.[380] As noted in the *Second Report and Order*, the Broadband DATA Act authorizes the Commission to contract for the creation and maintenance of the Fabric, subject to Federal Acquisition Regulations, but we have not been appropriated funding to cover the cost of implementing the Fabric.[381] We intend to initiate a procurement process promptly once adequate funding has been appropriated, and we expect to address many of the technical aspects of the Fabric in the course of that process.

168. In the *Digital Opportunity Data Collection Order and Further Notice*, we sought comment on a number of issues related to the implementation of a comprehensive location database, including how we should define a broadband serviceable location, how to treat multi-structure parcels and multi-tenant environments, and the best way to check the quality of the database.[382] While technical issues related to the Fabric can be addressed in the procurement process, we seek comment on certain proposals related to the Fabric.

169. The Broadband DATA Act requires that the Fabric include "all locations in the United States where fixed broadband Internet access service can be installed."[383] In order to create the Fabric, we will need to provide greater specificity on the criteria to determine whether a location can have fixed broadband service installed at it. In the context of the Connect America Fund (CAF), a "location" is a residential or business location to which providers would extend mass market broadband and voice services.[384] Carriers are directed to base residential locations served on the Census Bureau's definition of a "housing unit," and to report "the locations of businesses that they would expect to demand consumer-

[378] *Id.* at 7513, paras. 19-20.

[379] *Id.* at 7513, para. 20.

[380] *See supra* section III.C.

[381] 47 U.S.C. § 642(b)(1)(A)(ii).

[382] After the adoption of the *Digital Opportunity Data Collection Order and Further Notice*, but before the enactment of the Broadband DATA Act, USAC issued a Request for Information (RFI), titled "Database of Broadband-Addressable Locations," seeking information on how to generate, collect, and publicly share location information. USAC withdrew the RFI on March 25, 2020, due to the enactment of the Broadband DATA Act, but some responses to the RFI were submitted into the record in this proceeding.

[383] 47 U.S.C. § 642(b)(1)(A)(i).

[384] *See Wireline Competition Bureau Provides Guidance to Carriers Receiving Connect America Fund Support Regarding Their Broadband Location Reporting Obligations*, WC Docket No. 10-90, Public Notice, 31 FCC Rcd 12900, 12903 (WCB 2016) (*CAF Public Notice*); *Connect America Fund et al.*, WC Docket No. 10-90 et al., Order on Reconsideration, 33 FCC Rcd 1380, 1390, para. 27 (2018).

grade broadband services, which typically are small businesses."[385] We propose to adopt the CAF approach and seek comment on this proposal.

170. As the Commission has done in the CAF context, we propose to have the Fabric reflect a location as a single point, defined by both geographic coordinates (latitude and longitude) and street address. As we stated in the *Digital Opportunity Data Collection Order and Further Notice*, "[w]e anticipate that this would be the coordinates of a building on a parcel,"[386] to which broadband can be installed. In cases where there are multiple buildings on a parcel, we propose that all of the buildings on a parcel to which broadband can be installed, and only those buildings, be included in the Fabric. We believe that recording each location as a single point has an advantage over reporting the outlines of each building (i.e., a polygon for each location), the latter of which will increase the difficulty of creating the database and the amount of data required, without meaningfully improving the quality of the database. We seek comment on this proposal.

171. Because the Commission specified that a residential location should be based on the definition of a housing unit, locations in the CAF context include the individual units in Multi-Tenant Environments (MTEs), such as an apartment building or office building, not simply the buildings themselves.[387] We seek comment on whether to use the same approach for the Fabric, particularly given that fixed providers likely would not offer service only to some units in an MTE. Should each unit in a building be assigned a unique identifier, or should the building be assigned a unique identifier and the number of units recorded, which is more analogous to the process used for the Connect America Fund? Is it feasible to record the location of each individual unit within an MTE? What are the trade-offs of identifying a separate latitude/longitude (and perhaps altitude) point for each unit versus recording a single point for the building and its total number of units? We are concerned that the added complexity of identifying individual units as individual locations—far more locations and the need to differentiate not just latitude and longitude, but also potentially altitude—would outweigh any benefits. We seek comment on this assumption.

172. Further, we seek comment on whether to identify each location as a residential or business location, which the Broadband Mapping Coalition claims to be a "critical step to ensure that datasets can be appropriately selected and calibrated."[388]

173. We also seek comment on how to ensure the quality of the Fabric. We note that there are different types of errors possible in such a database, for example, incorrectly counting a structure that cannot have a broadband service installation as a location, such as a dilapidated house or a shed. Another type of error could be to exclude locations that should be included, such as a home in a heavily forested area that does not appear on satellite imagery. Finally, there also could be errors about the characteristics of a location, such as identifying the wrong building from among several on a parcel as the one that is broadband serviceable. Given the potential for errors, what data sources and methods can the Commission staff use to verify the accuracy of the Fabric? Should 2020 Census data, the National Address Database, Open Address Database, and/or other sources be used? Should staff manually verify a statistically valid sample of locations in the database? If so, what methods should they use for that verification? We seek comment on these and other approaches to ensure that the Fabric is accurate.

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[385] *See CAF Public Notice*, 31 FCC Rcd at 12903.

[386] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7546, para. 103; Broadband Mapping Coalition Comments at 12-13 ("Regarding the determination of which locations should be defined as 'serviceable,' the BMC agree with the FCC that recording each location as a single point has an advantage over reporting the outlines of each building. Reporting building outlines would increase the complexity of the database without meaningfully improving its quality.").

[387] The Commission requires providers to report buildings as individual records, but then to report the number of units in each building.

[388] Broadband Mapping Coalition Comments at 14-15.

G. Enforcement

174. In the *Second Report and Order*, we adopt the Broadband DATA Act requirement that it is unlawful to willfully and knowingly, or recklessly, submit information or data that is materially inaccurate or incomplete with respect to the availability or the quality of broadband Internet access service.[389] We seek comment on several aspects of the Broadband DATA Act's enforcement requirement. As an initial matter, how should we determine whether an entity or individual "willfully and knowingly" or "recklessly" submitted inaccurate or incomplete information?

175. "Willfully and knowingly" seems to presume that such information was submitted intentionally, and we seek comment on the evidence needed to prove an entity or individual's intent.[390] The Commission has generally found intent in cases where a false statement is "coupled with proof that the party . . . [knew] of its falsity."[391] In addition, we note that other statutes that we enforce include a similar standard of proof. For example, section 510(a) of the Communications Act similarly provides that the United States may seize equipment that is used or sold "with willful and knowing intent to violate" section 301 or 302a of the Communications Act. Should we apply "willfully and knowingly" in the same manner in this context? "Recklessly" suggests something less than intent yet more than mere negligence. What evidence would we need to show that an entity or individual recklessly submitted materially inaccurate or incomplete information?

176. We also seek comment on the definition of "materially inaccurate or incomplete."[392] What level of inaccuracy or incompleteness does the information submitted to us have to reach before it should be considered material? Could it involve just one location or must there be multiple locations involved for the inaccurate or incomplete information to be material? We ask whether we should adopt a quantitative or qualitative standard for determining materiality and what that standard should be. In addition, we note that section 1.17 of the Commission's rules requires that truthful and accurate statements be provided to the Commission in investigatory and adjudicatory matters. Specifically, section 1.17(a)(2) makes it unlawful to "provide material factual information that is incorrect or omit material information."[393] The Commission has held that a false statement may constitute an actionable violation of that rule, even absent an intent to deceive, if it is provided without a reasonable basis for believing that the statement is correct and not misleading.[394]

177. We seek comment on the scope of the information subject to the enforcement requirements. The Broadband DATA Act makes it unlawful to submit "information or data . . . that is materially inaccurate or incomplete information or data with respect to availability of broadband Internet access or the quality of service with respect to broadband Internet access service."[395] Because these are

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[389] 47 U.S.C. § 643.

[390] *See, e.g.,* Next Century Cities Comments at 5 (arguing that it is difficult to enforce a willful misrepresentation standard because it is too ambiguous and a recipe for "no accountability").

[391] *Riverside Youth*, 23 FCC Rcd 10360 (MB 2008) (quoting *David Ortiz Radio Corp*. v. FCC, 941 F.2d 1253, 1260 (D.C. Cir. 1991), quoting *Leflore Broadcasting Co. v. FCC*, 636 F.2d 454, 462 (D.C. Cir. 1980)); *see also SBC Communications, Inc.*, 16 FCC Rcd 19091, 19115, para. 66 (2001) (stating that intent is a "factual question that may be inferred if other evidence shows that a motive or logical desire to deceive exists," quoting *Black Television Workshop*, 8 FCC Rcd 4192, 4198, n.41 (1993) (subsequent history omitted)).

[392] 47 U.S.C. § 643.

[393] 47 CFR 1.117(a)(2).

[394] *See, e.g., Amendment of Section 1.17 Order*, 18 FCC Rcd 4016, 4016-4017, 4021, paras. 1-2, 12 (2003); *see also Aura Holdings of Wisconsin, Inc.*, Notice of Apparent Liability for Forfeiture, 33 FCC Rcd 3688, 3692, para.14 (2018), *aff'd*, Forfeiture Order, 34 FCC Rcd 2540 (2019).

[395] 47 U.S.C. § 643.

the only two types of information required to be reported under the Broadband DATA Act,[396] should enforcement of the prohibition in the Broadband DATA Act be limited to any data or information supplied in biannual Digital Opportunity Data Collection filings? Or, could enforcement be brought against availability and quality of service data submitted in other contexts (e.g., the challenge process, the crowdsource process, by governments or third parties pursuant to 47 U.S.C. § 642(a)(2))? We also seek comment on whether the reference in section 803 of the Broadband DATA Act to the submission of "information and data under this title" applies to filings that are not specifically contemplated by the Act (e.g., the proposed mandatory submission of speed-test data by providers).

178. *Penalties for the submission of materially inaccurate or incomplete data*. We also seek comment on the scope of appropriate penalties for submitting materially inaccurate or incomplete information, including any civil penalties under the Commission's rules or other applicable statues and rules. Should we establish a base forfeiture amount, subject to adjustment pursuant to section 503(b) of the Act? If so, what should that base amount be? We seek comment on the recommendation from the State of Colorado that enforcement actions should include making the provider ineligible to receive USF funds and/or a forfeiture of previously committed USF funds.[397] We also seek comment on the proposal of the Next Century Cities that we should set a "simple and transparent standard that offers multiple warnings before an escalating set of sanctions that takes into account the geographic reach of a provider."[398] Would such an approach send an appropriate signal to filers regarding the importance of their filings and the need for them to ensure their accuracy? Alternatively, should we look at a provider's filing as a singular whole or do we need to consider whether a filing could have multiple omissions or inaccurate data that could each be considered a separate violation?

179. We propose to adopt an approach that properly distinguishes between those entities that make a conscientious, good faith effort to provide accurate data and those that fail to take their reporting obligations seriously or affirmatively manipulate the data being reported.[399] We agree with the Broadband Mapping Coalition that reporting entities that make a good faith effort to comply fully and carefully with reporting obligations should not be sanctioned if their data prove to be flawed in some way, provided that any errors be quickly and appropriately addressed.[400] We also agree with commenters who argue that, while providers are responsible for submitting accurate Digital Opportunity Data Collection data, an excessively aggressive enforcement stance could lead providers to be overly cautious in their

[396] 47 U.S.C. § 642(a)(1)(A).

[397] State of Colorado Comments at 8-9.

[398] Next Century Cities Reply at 6.

[399] See, e.g., Connected Nation Comments at 6 (arguing for a tiered penalty structure for demonstrated intentional misreporting and chronic misreporting); NCTA Comments at 5 ("When errors are identified, the Commission should focus on correcting data so that its future maps are as accurate as possible, not punishing providers for good-faith mistakes."); Alaska Communications Comments at 11 (arguing for no penalties when "reporting entities are attempting in good faith to file accurate and timely information and promptly update it when they become aware of errors"); Broadband Mapping Coalition Reply at 18-19 (penalize filers only for errors that result from willful misrepresentation or repeated negligence); Microsoft Reply at 12 (does not support penalties for filers that in good faith submit data that proves to be inaccurate, but supports penalties only for recklessly or intentionally submitted inaccurate mapping data); ACA Connects Reply at 10 (arguing that the Commission should severely sanction any provider that intentionally and persistently submits inaccurate data); AT&T Reply at 8-9 (arguing that the Commission's compliance mechanism should focus on ensuring accurate data rather than imposing penalties for non-willful errors).

[400] Broadband Mapping Coalition Comments at 25.

filings and possibly distort the coverage maps.[401] We seek comment on this approach.

180. Finally, we seek comment on whether section 803 of the Broadband DATA Act is an exclusive remedy for all actions under that law or whether behavior that may be actionable under existing provisions of the Communications Act or our rules remain subject to enforcement under our general section 503 authority. For example, under rule 1.17(a)(2), provision of written information to the Commission without a reasoned basis is actionable under the Commission's existing authority today. How should this, and other existing provisions, apply?

181. *Penalties for failure to file*. Similar to the conclusion that we reached in the *Digital Opportunity Data Collection Order and Further Notice*, we propose that a failure to timely file required data in the new Digital Opportunity Data Collection may lead to enforcement action and/or penalties as set forth in the Communications Act and other applicable laws.[402] We seek comment on the specific penalties that should be imposed if a provider fails to timely submit its Digital Opportunity Data Collection filings. In instances in which enforcement action and/or penalties are appropriate, should we propose higher fine levels for either failures to file or for misrepresentation of material data?[403] How should we address the extent of untimeliness?

182. *Filing corrected data*. We propose that providers must revise their Digital Opportunity Data Collection filings any time they discover an inaccuracy, omission, or significant reporting error in the original data that they submit, whether through self-discovery, the crowdsource process, Commission discovery, or otherwise.[404] In the *Digital Opportunity Data Collection Order and Further Notice*, we sought comment on how quickly providers should be required to correct any data where they do not refute a lack of coverage.[405] While several commenters argued that providers should be allowed to file any corrections at their next Digital Opportunity Data Collection filing opportunity,[406] we propose instead that providers should file corrections within 45 days of their discovery of incorrect data. We propose that any corrected filings be accompanied by the same level of certifications that accompany the original filings and further propose that, for calculation of the statute of limitations, the one-year limit would begin to accrue on the date of the corrected filing, where the correction was timely under our rules. We believe that this timing would help ensure that the most accurate data possible are available at any particular time. We seek comment on this proposal and on any better alternatives.

183. *Scope of required corrections*. We asked in the *Digital Opportunity Data Collection*

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[401] *See Id.* ("A more forgiving approach also encourages providers to submit their data promptly rather than delaying submission for fear of making a costly error."); ACA Connects Reply at 10 (arguing that it would be more productive for the Commission to encourage and facilitate compliance than adopt a strict enforcement regime and that severe penalties should only be imposed where a provider's reports were intentionally and persistently inaccurate); GeoLinks Reply at 7-8 ("the risk of enforcement action for *any* mistakes, even if unintentional, will only serve to encourage service providers to underreport service availability to avoid the potential of having something challenged" (emphasis in original)).

[402] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7512, para. 16.

[403] We note that we have the discretion to upwardly or downwardly adjust from the base forfeiture, taking into account the particular facts of each individual case. *The Commission's Forfeiture Policy Statement and Amendment of Section 1.80 of the Rules to Incorporate the Forfeiture Guidelines,* Report and Order, 12 FCC Rcd 17087, 17098-99, para. 22 (1997) (noting that "[a]lthough we have adopted the base forfeiture amounts as guidelines to provide a measure of predictability to the forfeiture process, we retain our discretion to depart from the guidelines and issue forfeitures on a case-by-case basis, under our general forfeiture authority contained in Section 503 of the Act"), *recons. denied*, Memorandum Opinion and Order, 15 FCC Rcd 303 (1999).

[404] *Id.* at 7512, para. 16.

[405] *Id.* at 7543, para. 93.

[406] *See* Broadband Mapping Coalition Comments at 29-30; NCTA Comments at 16; Verizon Comments at 7; GeoLinks Comments at 4; Alaska Communications Comments at 14.

Order and Further Notice whether providers should be required to refile earlier Digital Opportunity Data Collection reports where it is determined that current availability data are incorrect.[407] Based on that record, we propose that corrections generally should be forward-looking only, although providers must reflect in their next biannual filing any corrections made as a result of the challenge or crowdsource processes.[408] We seek comment on this proposal and any better alternatives.

H. Details on the Creation of Coverage Maps

184. In the *Second Report and Order*, we adopt requirements pursuant to the Broadband DATA Act to take the granular broadband availability data submitted by providers and others and create the Broadband Map and two different maps depicting the availability of, respectively, fixed and mobile broadband Internet access service.[409] The Broadband DATA Act requires that the Broadband Map depict "the extent of the availability of broadband Internet access service in the United States, without regard to whether that service is fixed broadband Internet access service or mobile broadband Internet access service, which shall be based on data collected by the Commission from all providers."[410] We propose to implement this by publishing aggregated broadband availability data in the Broadband Map that does not distinguish between fixed or mobile data. With regard to the other two maps, we propose to create maps that identify carrier-specific fixed and mobile coverage data, including reported technologies and speeds by provider.[411] We seek comment on these proposals and if there are other steps we should take to ensure that we fulfill the requirements of the Broadband DATA Act in connection with these maps. Are there other features or datasets that would be helpful to inform the Commission and the public with regard to broadband availability?

I. Technical Assistance

185. Pursuant to the Broadband DATA Act, the Commission must hold annual workshops for Tribal governments in each of the 12 Bureau of Indian Affairs regions to provide technical assistance with the collection and submission of data. In addition, every year the Commission, in consultation with the Tribes, must review the need for continued workshops We seek comment on the type of technical assistance the Tribes will need to help them collect and submit data under the Broadband DATA Act's provision allowing State, local, and Tribal government entities that are primarily responsible for mapping or tracking broadband Internet access service coverage in their areas to provide verified data for use in the coverage maps.

186. The Broadband DATA Act also requires the Commission to establish a process in which a provider that has fewer than 100,000 active broadband Internet access service connections may request and receive assistance from the Commission with respect to GIS data processing to ensure that the provider is able to comply with the Broadband DATA Act in a timely and accurate manner. In response to the *Digital Opportunity Data Collection Order and Further Notice*, we received several comments asking for us to provide technical assistance to small providers. Subject to receiving adequate funding to support it, we propose to make service-desk help available, as well as providing clear instructions on the form for the Digital Opportunity Data Collection, to aid providers in making their filings. We seek comment on the extent of such technical assistance and any other help that small providers will need to

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[407] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7544, para. 94.

[408] *See, e.g.,* Broadband Mapping Coalition Comments at 30 ("cannot perceive any compelling reason for the FCC to require the provider to backfile earlier reports"); GeoLinks Comments at 4 (sees no value in resubmitting old data that may be outdated anyway); NCTA Comments at 16 ("The Commission should not require providers to refile old data if there are mistakes."); ACA Connects Comments at 13 (recommending that the Commission only require a provider to fix its current report because of the time and expense required to amend prior filings).

[409] 47 U.S.C. § 642(c)(1).

[410] 47 U.S.C. § 642(c)(1)(A).

[411] 47 U.S.C. §§ 642(c)(1)(A)-(B).

comply with the Broadband DATA Act.

187. Pursuant to the Broadband DATA Act, the Commission also must provide technical assistance to consumers and State, local, and Tribal governments with respect to the challenge process, which must include detailed tutorials and webinars and the provision of Commission staff to provide assistance throughout the challenge process. We seek comment on the type of technical assistance with the challenge process that we should provide pursuant to this requirement, taking into account the current lack of funding for the Commission to implement the provisions of the Broadband DATA Act.

J. Form 477 Reforms

188. Pursuant to the Broadband DATA Act, not later than 180 days after the Commission's broadband Internet access service collection rules take effect, the Commission must: (1) reform the Form 477 broadband deployment service availability collection process to achieve the purposes of the Broadband DATA Act in a manner that enables the comparison of data and coverage maps produced before the implementation of the Broadband DATA Act with data and coverage maps produced after implementation of the Broadband DATA Act and maintains the public availability of broadband Internet access service deployment data; and (2) harmonize reporting requirements and procedures regarding the deployment of broadband Internet access service that are in effect before the new rules are effective with those in effect after the new rules are effective.[412] The measures we propose in this *Third Notice* would only increase the granularity of broadband availability data that we collect so that comparison of new availability data with the data currently collected would only require the aggregation of the new data to the geographic scale currently employed. We propose to publish the new broadband availability data we collect in aggregated forms, so as to allow comparisons with the data we collect now. We believe that these measures will comply with the requirements under the Broadband DATA Act concerning the ability to compare the new and existing data. We seek comment on this conclusion and, to the extent that commenters disagree, we seek comment on any measures we should adopt to ensure compliance with this requirement of the Broadband DATA Act.

1. Mobile Subscriber Data

189. In the *Digital Opportunity Data Collection Order and Further Notice*, the Commission made several changes to its collection of mobile voice and broadband subscriber data in order to obtain more granular data and to improve the usefulness of such data.[413] The Commission required mobile providers to submit broadband and voice subscriber information at the census-tract level based on the subscriber's place of primary use for postpaid subscribers and based on the subscriber's telephone number for prepaid and resold subscribers.[414] Under the *Digital Opportunity Data Collection Order and Further Notice*, the revised mobile broadband and voice subscription reporting requirements were to take effect for submissions filed on June 30, 2020.[415] The Broadband DATA Act directs the Commission to "continue to collect and publicly report subscription data that the Commission collected through the Form

[412] 47 U.S.C. § 642(b)(6)(A).

[413] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7530, para. 58. The Commission found that state-level aggregation of subscription data significantly limited its usefulness, and that collection of census-tract level data would substantially improve our ability to conduct more accurate mobile competition analysis, particularly in secondary market transactions.

[414] *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7530, para. 58.

[415] The mobile subscription reporting requirements under the *Digital Opportunity Data Collection Order and Further Notice* were subject to approval by OMB and would have been effective 30 days after the announcement in the Federal Register of OMB approval. *Digital Opportunity Data Collection Order and Further Notice*, 34 FCC Rcd at 7561, para. 145. OMB approved the collection on March 27, 2020. *See* Office of Management and Budget, OMB Control No. 3060-0816 (Mar. 27, 2020).

477 broadband deployment service availability process, as in effect on July 1, 2019."[416]

190. We interpret the plain language of the Broadband DATA Act as requiring the collection of Form 477 subscription information pursuant to the rules in effect on July 1, 2019, which is before the date the *Digital Opportunity Data Collection Order and Further Notice* was adopted. We therefore propose that for Form 477 filings as of December 31, 2020 and beyond, mobile providers report subscription data under the rules in effect on July 1, 2019 and not under the rule changes adopted in the *Digital Opportunity Data Collection Order and Further Notice*. While the Broadband DATA Act generally addresses reporting requirements for broadband and not voice service, in order to avoid having potentially inconsistent reporting requirements for mobile broadband and voice subscriptions,[417] we propose that, going forward, both mobile voice and mobile broadband subscribership data be reported under the Form 477 rules in effect on July 1, 2019.[418] We seek comment on this proposal and our interpretation of the Broadband DATA Act.

2. Sunsetting FCC Form 477 Census Block Reporting for Fixed Providers

191. In order to ensure continuity in our fixed broadband deployment data, we propose to continue the current census-based deployment data collection under Form 477 for at least one reporting cycle after the new granular reporting collection commences. We seek comment on sunsetting the census-block broadband deployment reporting in the FCC Form 477 and the timing of doing so.

V. PROCEDURAL MATTERS

192. *Ex Parte Rules.* This proceeding shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules.[419] Persons making *ex parte* presentations must file a copy of any 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, then 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 47 CFR § 1.1206(b). In proceedings governed by 47 CFR § 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.

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[416] 47 U.S.C. § 642(b)(6)(B). Section 642(b)(6) of the Broadband DATA Act provides: "(B) CONTINUED COLLECTION AND REPORTING.—On and after the date on which the Commission carries out subparagraph (A), the Commission shall continue *to collect and publicly report* subscription data that the Commission collected through the Form 477 broadband deployment service availability process, *as in effect on July 1, 2019*." 47 U.S.C. § 642(b)(6)(B) (emphasis added).

[417] 47 U.S.C. § 642(b)(6)(B).

[418] No changes to fixed subscribership data were adopted in the *Second Report and Order*.

[419] 47 CFR. §§ 1.1200 *et seq.*

193. *Final Regulatory Flexibility Analysis*. The Regulatory Flexibility Act (RFA)[420] requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."[421] Accordingly, we have prepared a Final Regulatory Flexibility Analysis (FRFA) concerning the possible impact of the rule changes contained in this *Second Report and Order* on small entities. The FRFA is set forth in Appendix C.

194. *Initial Regulatory Flexibility Analysis*. Pursuant to the RFA,[422] the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and actions considered in the *Third Notice*. The text of the IRFA is set forth in Appendix D. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *Third Notice*. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of the *Third Notice*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration.[423]

195. *Paperwork Reduction Act*. The initial rulemaking required under the Broadband DATA Act is exempt from review by OMB and from the requirements of the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13.[424] As a result, the *Second Report and Order* will not be submitted to OMB for review under section 3507(d) of the PRA.

196. *Congressional Review Act*. The Commission will send a copy of the *Second Report and Order* to Congress and the Government Accountability Office pursuant to the Congressional Review Act. *See* 5 U.S.C. § 801(a)(1)(A).

197. *Filing of Comments and Reply Comments*. Interested parties may file comments and reply comments 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) or by paper.[425]

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: https://www.fcc.gov/ecfs/.
- Paper Filers: Parties who 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.

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

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[420] 5 U.S.C. §§ 601–612. The RFA 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).

[421] 5 U.S.C. § 605(b).

[422] 5 U.S.C. § 603.

[423] *See* 5 U.S.C. § 603(a).

[424] 47 U.S.C. § 646(b).

[425] In response to the COVID-19 pandemic, the Commission has closed its current hand-delivery filing location at FCC Headquarters. We encourage outside parties to take full advantage of the Commission's electronic filing system. Any party that is unable to meet the filing deadline due to the building closure may request a waiver of the comment or reply comment deadline, to the extent permitted by law. *FCC Announces Closure of FCC Headquarters Open Window and Change in Hand-Delivery Filing*, Public Notice, DA 20-304 (rel. Mar. 19, 2020), https://www.fcc.gov/document/fcc-closes-headquarters-open-window-and-changes-hand-delivery-policy.

- Filings by commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
- Filings by U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

- People with Disabilities: 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).

198. *Contact Person*. For further information about this proceeding, contact Kirk Burgee, FCC Wireline Competition Bureau, Competition Policy Division, Room 5-C354, 445 12th Street, S.W., Washington, D.C. 20554, (202) 418-1599, Kirk.Burgee@fcc.gov, or Garnet Hanly, FCC Wireless Telecommunications Bureau, Competition Policy Division, Room 6-A160, 445 12th Street, S.W., Washington, D.C. 20554, (202) 418-0995, Garnet.Hanly@fcc.gov.

VI. ORDERING CLAUSES

199. Accordingly, IT IS ORDERED that, pursuant to sections 1-4, 7, 201, 254, 301, 303, 309, 319, 332, and 641-646 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151-154, 157, 201, 254, 301, 303, 309, 319, 332, and 641-646, this *Second Report and Order and Third Further Notice of Proposed Rulemaking* IS ADOPTED.

200. IT IS FURTHER ORDERED that Part 1 of the Commission's rules IS AMENDED as set forth in Appendix A.

201. IT IS FURTHER ORDERED that the *Second Report and Order* SHALL BE effective 30 days after publication in the Federal Register.

202. IT IS FURTHER ORDERED that the Commission's Consumer & Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of the *Second Report and Order* to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A).

203. IT IS FURTHER ORDERED that the Commission's Consumer & Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Second Report and Order and Third Further Notice of Proposed Rulemaking*, including the Final Regulatory Flexibility Analysis and 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

Final Rules

Part 1 – Practice and Procedure

1. The authority citation for part 1 continues to read as follows:

Authority: 47 U.S.C. chs. 2, 5, 9, 13; 28 U.S.C. 2461, unless otherwise noted.

2.. Amend the caption of Part 1, Subpart V to read as follows:

Subpart V - Commission Collection of Advanced Telecommunications Capability Data, Broadband Internet Access Service Data, and Local Exchange Competition Data

2. Amend section 1.7000 to read as follows:

The purposes of this subpart are to set out the terms by which certain commercial and government-controlled entities report data to the Commission concerning (a) the provision of wired and wireless local telephone services and interconnected Voice over Internet Protocol services, ~~and~~(b) the deployment of advanced telecommunications capability, as defined in 47 U.S.C. 1302, and services that are competitive with advanced telecommunications capability**, and (c) the availability and quality of service of broadband Internet access service**.

3. Amend section 1.7001 by revising paragraph (a) to read as follows:

§ 1.7001 Scope and content of filed reports.

(a) *Definitions*. Terms used in this subpart have the following meanings:

* * * * *

(6) *Broadband Internet access service*. Has the meaning given the term in §8.1(b) of this chapter, or any successor regulation.

(7) *Broadband map*. The map created by the Commission under 47 U.S.C. 642(c)(1)(A).

(8) *Cell edge probability*. The likelihood that the minimum threshold download and upload speeds with respect to broadband Internet access service will be met or exceeded at a distance from a base station that is intended to indicate the ultimate edge of the coverage area of a cell.

(9) *Cell loading*. The percentage of the available air interface resources of a base station that are used by consumers with respect to broadband Internet access service.

(10) *Clutter*. A natural or man-made surface feature that affects the propagation of a signal from a base station.

(11) *Fabric*. The Broadband Serviceable Location Fabric established under 47 U.S.C. 642(b)(1)(B).

(12) *FCC Form 477*. Form 477 of the Commission relating to local telephone competition and broadband reporting.

(13) *Indian Tribe*. Has the meaning given the term 'Indian tribe' in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 5304).

(14) *Mobility Fund Phase II*. The second phase of the proceeding to provide universal service support from the Mobility Fund (WC Docket No. 10–90; WT Docket No. 10–208).

(15) *Propagation model*. A mathematical formulation for the characterization of radio wave propagation as a function of frequency, distance, and other conditions.

(16) *Provider*. A provider of fixed or mobile broadband Internet access service.

(17) *Quality of service*. With respect to broadband Internet access service, the download and upload speeds, and latency if applicable, with respect to that service, as determined by, and to the extent otherwise collected by, the Commission.

(18) *Shapefile*. A digital storage format containing geospatial or location-based data and attribute information regarding the availability of broadband Internet access service and that can be viewed, edited, and mapped in geographic information system software.

(19) *Standard broadband installation*. The initiation by a provider of fixed broadband Internet access service in an area in which the provider has not previously offered that service, with no charges or delays attributable to the extension of the network of the provider, and includes the initiation of fixed broadband Internet access service through routine installation that can be completed not later than 10 business days after the date on which the service request is submitted.

4. Add sections 1.7004-1.7010 as follows:

§ 1.7004 Scope, content, and frequency of Digital Opportunity Data Collection filings.

(a) All providers shall make biannual filings with the Commission in the Digital Opportunity Data Collection portal in accordance with the Commission's rules and the instructions to the Digital Opportunity Data Collection.

(b) Digital Opportunity Data Collection filings shall be made each year on or before March 1 (reporting data as of December 31 of the prior year) and September 1 (reporting data as of June 30 of the current year). Providers becoming subject to the provisions of § 1.7004 for the first time shall file data initially for the reporting period in which they become eligible.

(c) Providers shall include in their filings data relating to the availability and quality of service of their broadband Internet access service in accordance with the Commission's rules and the instructions to the Digital Opportunity Data Collection.

(1) Each provider of terrestrial fixed or satellite broadband internet access service shall submit polygon shapefiles or a list of addresses or locations, and each provider of fixed wireless broadband internet access service shall submit propagation maps and model details that reflect the speeds and latency of its service or a list of addresses or locations, that document the areas (1) where the provider has actually built out its broadband network infrastructure, such that the provider is able to provide service, and (2) where the provider is capable of performing a standard broadband installation. Each provider's submission shall include the details of how it generated its polygon shapefiles, propagation maps and model details, or list of addresses or locations.

(i) Terrestrial fixed providers using certain wireline technologies may not report coverage that exceeds a defined maximum distance from an aggregation point, including the drop distance, or that exceeds 500 feet from a deployed line or distribution network infrastructure to the parcel boundary of a served location.

(A) Terrestrial fixed providers using Digital Subscriber Line technology shall not report coverage that exceeds 6,600 route feet from the digital subscriber line access multiplexer to the customer premises for speeds offered at or above 25 Mbps downstream, 3 Mbps upstream. Providers that offer Digital Subscriber Line service in areas at speeds less than 25 Mbps downstream, 3 Mbps upstream shall not be subject to a maximum buffer requirement for such areas.

(B) Terrestrial fixed providers using Fiber to the Premises technology shall not report coverage that exceeds 196,000 route feet from the optical line termination point to the optical network termination point.

(C) Terrestrial fixed providers using Hybrid Fiber Coaxial Cable technology shall not report coverage that exceeds 12,000 route feet from the aggregation point to the customer premises.

(D) Locations can be reported as served beyond the maximum distances to the extent that:

(I) A provider has a current subscriber at a location beyond the bounds of the applicable maximum distance;

(II) A provider previously had a broadband subscriber, using the same technology, at a location beyond the bounds of the maximum distance;

(III) A provider is receiving or has received universal service support to provide broadband service in a particular geographic area—or has other federal, state, or local obligations to make service available in the area—and the provider has begun to make service available in that area; or

(IV) A provider receives a waiver to report coverage beyond the maximum distances.

(ii) Fixed wireless service providers that submit coverage maps shall submit propagation maps and propagation model details based on the following parameters:

(A) A cell edge probability of not less than 75% of receiving the maximum advertised download and upload speeds;

(B) A cell loading factor of not less than 50%; and

(C) Receiver heights within a range of four to seven meters.

(2) Fixed wireless service providers that submit coverage maps shall provide the following information with their propagation maps and model details:

(i) The name of the radio network planning tool(s) used, along with information including:

(A) The version number of the planning tool;

(B) The name of the planning tool's developer;

(C) The granularity of the model (e.g., 3-arc-second square points); and

(D) Affirmation that the coverage model has been validated and calibrated at least one time using on the ground testing and/or other real-world measurements completed by the provider or its vendor.

(ii) The following base station information:

(A) Frequency band(s) used to provide the service being mapped;

(B) Information about whether and how carrier aggregation is used;

(C) The radio technologies used on each frequency band (e.g., 802.11ac-derived OFDM, proprietary OFDM, LTE); and

(D) The elevation above ground for each base station.

(iii) The following terrain and clutter information:

(A) The name and vintage of the datasets used;

(B) The resolution of clutter data;

(C) A list of clutter categories used with a description of each; and

(D) The link budget and a description of the other parameters used in the propagation model, including predicted signal strength.

(iv) Information on the height and power values used for receivers/CPE antennas in their modeling (height must be within a range of four to seven meters).

(3) Mobile providers must submit coverage maps based on the following specified parameters:

(i) For 3G services—a minimum expected user download speed of 200 kbps and user upload speed of 50 kbps at the cell edge; for 4G LTE services—a minimum expected user download speed of 5 Mbps and user upload speed of 1 Mbps at the cell edge; for 5G-NR services—a minimum

expected user download speed of 7 Mbps and user upload speed of 1 Mbps, and a minimum expected user download speed of 35 Mbps and user upload speed of 3 Mbps at the cell edge.

(ii) For each of the mobile broadband technologies, 3G, 4G LTE, and 5G-NR, and for mobile voice services, the provider's coverage maps must reflect coverage areas where users should expect to receive the minimum required download and upload speeds with cell edge coverage probability of not less than 90% and a cell loading of not less than 50%.

(iii) For each of the mobile broadband technologies, 3G, 4G LTE, and 5G-NR, and for mobile voice services, the provider's coverage maps must account for terrain and clutter and use terrain and clutter data with a resolution of 100 meters or better. Each coverage map must have a resolution of 100 meters or better.

(iv) For each of the mobile broadband technologies, 3G, 4G LTE, and 5G-NR, and for mobile voice services, the provider's coverage maps must be submitted in vector format.

(4) Mobile providers must disclose the following information regarding their radio network planning tools:

(i) The name of the planning tool;

(ii) The version number used to produce the map;

(iii) The name of the developer of the planning tool;

(iv) Affirmation that the coverage model has been validated and calibrated at least one time using drive test and/or other real-world measurements completed by the provider or its vendors, to include a brief summary of the process and date of calibration; and

(v) The propagation model or models used. If multiple models are used, the provider should include a brief description of the circumstances under which each model is deployed (e.g., model X is used in urban areas, while model Y is used in rural areas) and include any sites where conditions deviate; and

(vi) The granularity of the models used (e.g., 3-arc-second square points, bin sizes, and other parameters).

(5) Propagation maps submitted by providers must depict outdoor coverage, to include both on-street or pedestrian stationary usage, and in-vehicle mobile usage.

(6) Mobile providers must disclose all applicable link-budgets used to design their networks and provide service at the defined speeds, and all parameters and parameter values included in those link budgets, including the following information:

(i) A description of how the provider developed the link budget(s) and the rationale for using specific values in the link budget(s); and

(ii) The name of the creator, developer or supplier, as well as the vintage of the terrain and clutter datasets used, the specific resolution of the data, and a list of clutter categories used, a description of each clutter category, and a description of the propagation loss due to clutter for each.

(7) For each of the categories of data providers must disclose to the Commission, providers must submit reasonable parameter values and propagation models consistent with how they model their services when designing their networks. In no case may any provider omit link budget parameters or otherwise fail to account for constraints on their coverage projections.

(d) Providers shall include in each Digital Opportunity Data Collection filing a certification signed by a corporate officer of the provider that the officer has examined the information contained in the submission and that, to the best of the officer's actual knowledge, information, and belief, all statements of fact contained in the submission are true and correct.

§ 1.7005 Disclosure of data in the Fabric and Digital Opportunity Data Collection filings.

(a) The Commission shall protect the security, privacy, and confidentiality of non-public or competitively sensitive information submitted by entities or individuals, including information contained in the Fabric, the dataset supporting the Fabric, and availability data submitted pursuant to § 1.7004, by:

(1) Withholding from public inspection all data required to be kept confidential pursuant to § 0.457 of this chapter and all personally identifiable information submitted in connection with the information contained in the Fabric, the dataset supporting the Fabric, and availability data submitted pursuant to § 1.7004; and

(2) Subject to contractual or license restrictions, making public all other information received about the status of broadband Internet access service availability at specific locations, including geographic coordinates and street addresses, whether a provider has reported availability at a location, and whether an entity or individual has disputed a report of broadband Internet access service availability at such location.

(b) Providers may request that provider-specific subscription information in Digital Opportunity Data Act filings be treated as confidential and be withheld from public inspection by so indicating on the filing at the time that they submit such data.

(c) Providers seeking confidential treatment of any other data contained in their Digital Opportunity Data Collection filings must submit a request that the data be treated as confidential with the submission of their filing, along with their reasons for withholding the information from the public, pursuant to § 0.459 of this chapter.

(d) The Commission shall make all decisions regarding non-disclosure of provider-specific information.

(e) The Commission shall release the following information in Digital Opportunity Data Collection filings to the public, and providers may not request confidential treatment of such information:

(1) Provider-specific mobile deployment data;

(2) Data regarding minimum advertised or expected speed for mobile broadband Internet access services; and

(3) Location information that is necessary to permit accurate broadband mapping, including as part of the crowdsourcing or challenge processes.

§ 1.7006 Data Verification.

(a) *Audits*. The Commission shall conduct regular audits of the information submitted by providers in their Digital Opportunity Data Collection filings. The audits:

(1) May be random, as determined by the Commission; or

(2) Can be required in cases where there may be patterns of filing incorrect information, as determined by the Commission.

(b) *Crowdsourcing process*. Entities or individuals may submit in the Commission's online portal specific information regarding the deployment and availability of broadband Internet access service so that it may be used to verify and supplement information submitted by providers for potential inclusion in the coverage maps.

(1) Crowdsourced data filers shall provide:

(i) Contact information of the filer (e.g., name, address, phone number, and e-mail);

(ii) The location that is the subject of the filing, including the street address and/or coordinates (latitude and longitude) of the location;

(iii) The name of the provider;

(iv) Any relevant details disputing the deployment and availability of broadband Internet access service at the location; and

(v) A certification that to the best of the filer's actual knowledge, information, and belief, all statements in the filing are true and correct.

(2) The online portal shall notify a provider of a crowdsourced data filing against it, but a provider is not required to respond to a crowdsourced data filing.

(3) If, as a result of a crowdsourced data filing, the Commission determines that a provider's Digital Opportunity Data Collection information is not accurate, then the provider shall refile updated and corrected data information within 30 days of agreeing with the Commission's determination. Providers are allowed to bundle multiple crowdsourced corrections into one filing during a 30-day period.

(4) All information submitted as part of the crowdsourcing process shall be made public, with the exception of personally identifiable information and any data required to be confidential under§ 0.457 of this chapter.

§ 1.7007 Establishing the Fabric.

(a) The Commission shall create the Fabric, a common dataset of all locations in the United States where fixed broadband Internet access service can be installed. The Fabric shall:

(1) Contain geocoded information for each location where fixed broadband Internet access service can be installed;

(2) Serve as the foundation upon which all data relating to the availability of fixed broadband Internet access service collected pursuant to the Digital Opportunity Data Collection shall be overlaid;

(3) Be compatible with commonly used GIS software; and

(4) Be updated every 6 months by the Commission.

(b) The Commission shall prioritize implementing the Fabric for rural and insular areas of the United States.

§ 1.7008 Creation of Broadband Internet Access Service Coverage Maps.

(a) After consultation with the Federal Geographic Data Committee, the Commission shall use the availability and quality of service data submitted by providers in the Digital Opportunity Data Collection to create:

(1) The Broadband Map, which shall depict areas of the country that remain unserved by providers and depict the extent of availability of broadband Internet access service;

(2) A map that depicts the availability of fixed broadband Internet access service; and

(3) A map that depicts the availability of mobile broadband Internet access service.

(b) The Commission shall use the maps created in paragraph (a) to determine areas where broadband Internet access service is and is not available and when making any funding award for broadband Internet access service deployment for residential and mobile customers.

(c) Based on the most recent Digital Opportunity Data Collection information collected from providers, the Commission shall update the maps created in paragraph (a) at least biannually using the data collected from providers.

(d) *Data reporting from government entities and third parties for use in the coverage maps*. The Commission shall develop a process through which it can collect verified data for use in the

coverage maps from: (1) State, local, and Tribal entities primarily responsible for mapping or tracking broadband Internet access service coverage in their areas; (2) third parties, if the Commission determines it is in the public interest to use their data in the development of the coverage maps or the verification of data submitted by providers; and (3) other federal agencies. Such government entities and third parties shall follow the same filing process as providers submitting their broadband Internet access service data in the Digital Opportunity Data Collection portal.

§ 1.7009 Enforcement.

It shall be unlawful for an entity or individual to willfully and knowingly, or recklessly, submit information or data as part of the Digital Opportunity Data Collection that is materially inaccurate or incomplete with respect to the availability or the quality of broadband Internet access service.

§ 1.7010 Authority to update the Digital Opportunity Data Collection.

The International Bureau, Wireless Telecommunications Bureau, Wireline Competition Bureau, and Office of Economics and Analytics may update the specific format of data to be submitted pursuant to the Digital Opportunity Data Collection to reflect changes over time in Geographical Information Systems (GIS) and other data storage and processing functionalities and may implement any technical improvements or other clarifications to the filing mechanism and forms.

APPENDIX B

Proposed Rules

We propose the following rule changes, subject to comment in the *Third Notice*:

1. Amend section 1.7006 by adding paragraph (c)

§ 1.7006 Data Verification.

* * * * *

(c) *Challenge process*. Consumers; State, local, and Tribal governmental entities; and other entities or individuals may submit coverage data in the Digital Opportunity Data Collection portal to challenge the accuracy at a location of the coverage maps; any information submitted by a provider regarding the availability of broadband Internet access service; or the Fabric.

(1) Challengers must provide in their submissions:

(i) Name and contact information (e.g., address, phone number, e-mail);

(ii) The street address or geographic coordinates (latitude/longitude) of the location(s) at which broadband Internet access service coverage is being challenged;

(iii) Name of provider being challenged;

(iv) Category of dispute, selected from pre-established options on the portal;

(v) For customers or potential customers challenging availability or the coverage maps, evidence and details of a request for service (or attempted request for service), including the date, method, and content of the request and details of the response from the provider, while for non-customers challenging availability or the coverage maps, evidence showing no availability at the disputed location (e.g., screen shot, e-mails). For consumers seeking to challenge mobile broadband coverage map data, information regarding the available mobile broadband service;

(vi) For challengers disputing locations in the Broadband Location Fabric, details and evidence about the disputed location;

(vii) For customer or potential customer availability or coverage map challengers, a representation that the challenger resides or does business at the location of the dispute or is authorized to request service there. For consumers seeking to challenge mobile broadband coverage map data, a representation that the challenger is a subscriber of the provider who is the subject of the challenge;

(viii) A certification from an individual or an authorized officer or signatory of a challenger that the person examined the information contained in the challenge and that, to the best of the person's actual knowledge, information, and belief, all statements of fact contained in the challenge are true and correct; and

(ix) For consumers disputing mobile broadband throughput speeds, speed test evidence. For governmental and other entities disputing mobile broadband throughput speeds, speed test measurement data showing measured throughput speeds in the area they wish to challenge. Governmental and other entities must conduct speed tests using a device certified by the service provider that is the subject of the challenge as compatible with its service and must conduct speed tests outdoors and between the hours of 6:00 AM and 12:00 AM (midnight) local time. Governmental and other entities must also substantiate speed test data by the certification of a qualified engineer or official.

(2) The online portal shall alert a provider if there has been a challenge submitted against it.

(3) For availability and coverage map challenges, within 30 days of receiving an alert, a provider shall reply in the portal by:

(i) Accepting the allegation(s) raised by the challenger, in which case the provider shall submit a correction for the challenged location in the online portal within 30 days of its portal response; or

(ii) Denying the allegation(s) raised by the challenger, in which the case the provider shall, within 60 days after providing notice of its rejection in the portal:

(A) Provide evidence to the challenger that the provider serves (or could serve) the challenged location. For consumer challenges involving the delivered speeds associated with a mobile broadband service, provide evidence that the provider has evaluated the speed of its service at the location of the dispute and determined that the delivered speeds of the service match the speeds indicated on the provider's coverage map. For governmental and other entity challenges involving the delivered speeds associated with a mobile broadband service, provide comprehensive on-the-ground data, or a statistically valid and sufficient sample of such data to verify coverage maps in the challenged area;

(B) Indicate in the online portal that such communication to the challenger was made; and

(C) Attempt to resolve the dispute with the challenger.

(4) Failure to respond to the challenger within the applicable timeframes shall result in a default finding against the provider, resulting in mandatory corrections to the provider's Digital Opportunity Data Collection information as requested by the challenger. Providers shall submit any such corrections within 30 days of the missed reply deadline or the Commission will make the corrections on its own and incorporate such change into the coverage maps or Broadband Location Fabric.

(5) Once a provider submits its response, the location shall be identified on the coverage maps as "in dispute/pending resolution."

(6) If the parties are unable to reach consensus within 60 days after submission of the provider's reply in the portal, then the Commission will review the evidence and make a determination, based on a preponderance of the evidence standard with the burden of proof on the challenger, either:

(i) In favor of the challenger, in which case the provider shall update its Digital Opportunity Data Collection information within 30 days of the decision; or

(ii) In favor of the provider, in which case the location will no longer be subject to the "in dispute/pending resolution" designation on the coverage maps.

(7) For challenges to the Fabric, the Commission shall resolve such challenges within 60 days of receiving the filing.

(8) The provider shall retain for its records, for at least six months after the challenge dispute is resolved, any evidence showing that it actually serves (or could serve) the location being challenged, as well as documentation regarding its communication with the challenger.

(9) Government entities (State, local, Tribal) may file challenges in bulk, but each challenge must contain the requirements set forth in (c)(1) of this section.

(10) The Commission shall make public information about the location that is the subject of the challenge (including the street address and/or coordinates (latitude and longitude)), the name of the provider, and any relevant details concerning the basis for the challenge.

2. Amend section 1.7009 by amending paragraph (a) and adding paragraph (b):

§ 1.7009 Enforcement.

(a) * * * * * Such action may lead to enforcement action and/or penalties as set forth in the Communications Act and other applicable laws.

(b) Failure to make the Digital Opportunity Data Collection filing in accordance with the Commission's rules and the instructions to the Digital Opportunity Data Collection may lead to enforcement action pursuant to the Communications Act of 1934, as amended, and any other applicable law.

APPENDIX C

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA), an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Digital Opportunity Data Collection Order and Further Notice* released in August 2019 in this proceeding. The Commission sought written public comment on the proposals in the FNPRM, including comments on the IRFA. No comments were filed specifically in response to the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.[1]

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

2. With the *Second Report and Order*, the Commission takes steps to adopt certain requirements mandated by the Broadband DATA Act, as well as adopting improvements to the collection of data. Specifically, we establish reporting and disclosure requirements for fixed and mobile broadband providers, filing and certification requirements. We adopt the use of the Fabric to serve as the foundation upon which all data relating to fixed broadband Internet access service availability must be overlaid. We also adopt certain rules for the collection and reporting of data mobile broadband Internet access service. For mobile providers, we implement the requirements of the Broadband DATA Act by requiring them to submit propagation maps and propagation model details based on specified minimum parameters. In addition to requiring mobile broadband providers to use propagation modeling to generate and submit maps showing their 4G LTE coverage, we require providers to submit data and coverage maps for existing 3G networks and next-generation (5G-NR) networks. We also adopt requirements to collect crowdsourced data as well as a process for verifying broadband availability. We believe these actions in the *Second Report and Order* will increase the usefulness of broadband deployment data to the Commission, Congress, the industry, and the public, and satisfy the requirements of the Broadband DATA Act.

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

3. None.

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

4. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA) and to provide a detailed statement of any change made to the proposed rules as a result of those comments.[2]

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

D. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

6. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein.[3] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[4] In addition, the term "small business" has the

[1] *See* 5 U.S.C. § 604.

[2] 5 U.S.C. § 604(a)(3).

[3] 5 U.S.C. § 604(a)(4).

[4] 5 U.S.C. § 601(6).

same meaning as the term "small-business concern" under the Small Business Act."[5] 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).[6]

7. *Small Businesses, Small Organizations, Small Governmental Jurisdictions*. Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive small entity size standards that could be directly affected herein.[7] First, while there are industry-specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA's Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.[8] These types of small businesses represent 99.9% of all businesses in the United States which translates to 28.8 million businesses.[9]

8. Next, the type of small entity described as a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[10] Nationwide, as of August 2016, there were approximately 356,494 small organizations based on registration and tax data filed by nonprofits with the Internal Revenue Service (IRS).[11]

9. Finally, the small entity described as a "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."[12] U.S. Census Bureau data from the 2012 Census of Governments[13] indicate that there were 90,056 local governmental jurisdictions consisting of general

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[5] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[6] 15 U.S.C. § 632.

[7] *See* 5 U.S.C. § 601(3)-(6).

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

[9] *See* SBA, Office of Advocacy, *Frequently Asked Questions, Question 2- How many small businesses are there in the U.S.?,* https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf (June 2016).

[10] 5 U.S.C. § 601(4).

[11] Data from the Urban Institute, National Center for Charitable Statistics (NCCS) reporting on nonprofit organizations registered with the IRS was used to estimate the number of small organizations. Reports generated using the NCCS online database indicated that as of August 2016 there were 356,494 registered nonprofits with total revenues of less than $100,000. Of this number, 326,897 entities filed tax returns with 65,113 registered nonprofits reporting total revenues of $50,000 or less on the IRS Form 990-N for Small Exempt Organizations and 261,784 nonprofits reporting total revenues of $100,000 or less on some other version of the IRS Form 990 within 24 months of the August 2016 data release date. *See* http://nccs.urban.org/sites/all/nccs-archive/html//tablewiz/tw.php where the report showing this data can be generated by selecting the following data fields: Report: "The Number and Finances of All Registered 501(c) Nonprofits"; Show: "Registered Nonprofits"; By: "Total Revenue Level (years 1995, Aug to 2016, Aug)"; and For: "2016, Aug" then selecting "Show Results".

[12] 5 U.S.C. § 601(5).

[13] *See* 13 U.S.C. § 161. The Census of Government is conducted every five (5) years compiling data for years ending with "2" and "7". *See also* Program Description Census of Government, *https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=program&id=program.en.COG#*.

purpose governments and special purpose governments in the United States.[14] Based on this data, we estimate that at least 49,316 local government jurisdictions fall in the category of "small governmental jurisdictions."[15]

1. Broadband Internet Access Service Providers

10. The broadband Internet access service provider industry has changed since the definition was introduced in 2007. The data cited below may therefore include entities that no longer provide broadband Internet access service and may exclude entities that now provide such service. To ensure that this FRFA describes the universe of small entities that our action might affect, we discuss in turn several different types of entities that might be providing broadband Internet access service. We note that, although we have no specific information on the number of small entities that provide broadband Internet access service over unlicensed spectrum, we included these entities in our Initial Regulatory Flexibility Analysis.

11. *Internet Service Providers (Broadband).* Broadband Internet service providers include wired (e.g., cable, DSL) and VoIP service providers using their own operated wired telecommunications infrastructure and fall in the category of Wired Telecommunication Carriers.[16] Wired Telecommunications Carriers are comprised of establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies.[17] The SBA size standard for this category classifies a business as small if it has 1,500 or fewer employees.[18] U.S. Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees.[19] Consequently, under this size standard the majority of firms in this industry can be considered small.

12. *Internet Service Providers (Non-Broadband).* Internet access service providers such as Dial-up Internet service providers, VoIP service providers using client-supplied telecommunications connections, and Internet service providers using client-supplied telecommunications connections (e.g., dial-up ISPs) fall in the category of All Other Telecommunications. The SBA has developed a small business size standard for All Other Telecommunications, which consists of all such firms with gross annual receipts of $32.5 million or less.[20] For this category, U.S. Census data for 2012 shows that there were 1,442 firms that operated for the entire year. Of these firms, a total of 1,400 had gross annual

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

[15] *Id.*

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

[17] *Id*.

[18] *Id*.

[19] U.S. Census Bureau, *Estab & Firm Size: Employment Size of Firms for the U.S. 2012*, https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_22SSSZ2&prodType=table.

[20] 13 CFR § 121.201; NAICS Code 517919.

receipts of less than $25 million.[21] Consequently, under this size standard a majority of "All Other Telecommunications" firms can be considered small.

2. Wireline Providers

13. *Wired Telecommunications Carriers.* The U.S. Census Bureau defines this industry as "establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired communications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services, wired (cable) audio and video programming distribution, and wired broadband Internet services. By exception, establishments providing satellite television distribution services using facilities and infrastructure that they operate are included in this industry."[22] The SBA has developed a small business size standard for Wired Telecommunications Carriers, which consists of all such companies having 1,500 or fewer employees.[23] U.S. Census Bureau data for 2012 show that there were 3,117 firms that operated that year.[24] Of this total, 3,083 operated with fewer than 1,000 employees.[25] Thus, under this size standard, the majority of firms in this industry can be considered small.

14. *Local Exchange Carriers (LECs).* Neither the Commission nor the SBA has developed a size standard for small businesses specifically applicable to local exchange services. The closest applicable NAICS Code category is Wired Telecommunications Carriers.[26] Under the applicable SBA size standard, such a business is small if it has 1,500 or fewer employees.[27] According to Commission data, U.S. Census data for 2012 show that there were 3,117 firms that operated that year.[28] Of this total, 3,083 operated with fewer than 1,000 employees.[29] Thus under this category and the associated size standard, the Commission estimates that the majority of local exchange carriers are small entities.

15. *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.

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[21] U.S. Census Bureau, *Estab & Firm Size: Receipts Size of Firms for the U.S. 2012*, https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk.

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

[23] *See* 13 CFR § 120.201, NAICS Code 517110.

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

[25] *Id*.

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

[27] *Id*.

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

[29] *Id*.

The closest applicable NAICS Code category is Wired Telecommunications Carriers.[30] Under the applicable SBA size standard, such a business is small if it has 1,500 or fewer employees.[31] According to U.S. Census Bureau data for 2012, 3,117 firms operated in that year.[32] Of this total, 3,083 operated with fewer than 1,000 employees.[33] Consequently, the Commission estimates that most providers of incumbent local exchange service are small businesses that may be affected by our actions. According to Commission data, 1,307 Incumbent LECs reported that they were incumbent local exchange service providers.[34] Of this total, an estimated 1,006 have 1,500 or fewer employees.[35] Thus, using the SBA's size standard, the majority of Incumbent LECs can be considered small entities.

16. 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 NAICS Code category is Wired Telecommunications Carriers and under that size standard, such a business is small if it has 1,500 or fewer employees.[36] U.S. Census Bureau data for 2012 indicate that 3,117 firms operated during that year.[37] Of that number, 3,083 operated with fewer than 1,000 employees.[38] Based on these data, the Commission concludes that the majority of Competitive LECS, CAPs, Shared-Tenant Service Providers, and Other Local Service Providers, are small entities. 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.[39] Of these 1,442 carriers, an estimated 1,256 have 1,500 or fewer employees.[40] 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.[41] Also, 72 carriers have reported that they are Other Local Service Providers.[42] Of this total, 70 have 1,500 or fewer

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

[31] *Id.*

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

[33] *Id*.

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

[35] *Id*.

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

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

[38] *Id*.

[39] *See Trends in Telephone Service*, at tbl. 5.3.

[40] *See id.*

[41] *Id*.

[42] *Id.*

employees.[43] Consequently, based on internally researched FCC data, 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.[44]

17. *Interexchange Carriers (IXCs)*. Neither the Commission nor the SBA has developed a definition for Interexchange Carriers. The closest NAICS Code category is Wired Telecommunications Carriers.[45] The applicable size standard under SBA rules consists of all such companies having 1,500 or fewer employees.[46] U.S. Census Bureau data for 2012 indicate that 3,117 firms operated during that year.[47] Of that number, 3,083 operated with fewer than 1,000 employees.[48] According to internally developed Commission data, 359 companies reported that their primary telecommunications service activity was the provision of interexchange services.[49] Of this total, an estimated 317 have 1,500 or fewer employees.[50] Consequently, the Commission estimates that the majority of interexchange service providers are small entities.

18. *Operator Service Providers* (*OSPs*). Neither the Commission nor the SBA has developed a small business size standard specifically for operator service providers. The closest applicable size standard under SBA rules is the category of Wired Telecommunications Carriers.[51] Under the size standard for Wired Telecommunications Carriers, such a business is small if it has 1,500 or fewer employees.[52] U.S. Census Bureau data for 2012 show that there were 3,117 firms that operated that year.[53] Of this total, 3,083 operated with fewer than 1,000 employees.[54] Thus, under this size standard, the majority of firms in this industry can be considered small.

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[43] *Id*.

[44] We have included small incumbent LECs in this present RFA analysis. As noted above, a "small business" under the RFA is one that, *inter alia*, meets the pertinent small business size standard (e.g., a telephone communications business having 1,500 or fewer employees), and "is not dominant in its field of operation." The SBA's Office of Advocacy contends that, for RFA purposes, small incumbent LECs are not dominant in their field of operation because any such dominance is not "national" in scope. We have therefore included small incumbent LECs in this RFA analysis, although we emphasize that this RFA action has no effect on Commission analyses and determinations in other, non-RFA contexts.

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

[46] *Id.*

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

[48] *Id*.

[49] *See Trends in Telephone Service*, at tbl. 5.3.

[50] *Id*.

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

[52] *Id.*

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

[54] *Id.*

19. According to Commission data, 33 carriers have reported that they are engaged in the provision of operator services.[55] Of these, an estimated 31 have 1,500 or fewer employees and two have more than 1,500 employees.[56] Consequently, the Commission estimates that the majority of OSPs are small entities.

20. *Other Toll Carriers*. Neither the Commission nor the SBA has developed a definition for small businesses specifically applicable to Other Toll Carriers. This category includes toll carriers that do not fall within the categories of interexchange carriers, operator service providers, prepaid calling card providers, satellite service carriers, or toll resellers. The closest applicable size standard under SBA rules is for Wired Telecommunications Carriers and the applicable small business size standard under SBA rules consists of all such companies having 1,500 or fewer employees.[57] U.S. Census data for 2012 indicate that 3,117 firms operated during that year.[58] Of that number, 3,083 operated with fewer than 1,000 employees.[59] According to Commission data, 284 companies reported that their primary telecommunications service activity was the provision of other toll carriage.[60] Of these, an estimated 279 have 1,500 or fewer employees.[61] Consequently, the Commission estimates that most Other Toll Carriers are small entities.

3. Wireless Providers—Fixed and Mobile

21. The broadband Internet access service provider category covered by these new rules may cover multiple wireless firms and categories of regulated wireless services.[62] Thus, to the extent the wireless services listed below are used by wireless firms for broadband Internet access service, the actions may have an impact on those small businesses as set forth above and further below. In addition, for those services subject to auctions, we note that, as a general matter, the number of winning bidders that claim to 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 and transfers or reportable eligibility events, unjust enrichment issues are implicated.

22. *Wireless Telecommunications Carriers (except Satellite*). This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless Internet access, and

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[55] *Trends in Telephone Service*, tbl. 5.3.

[56] *Id.*

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

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

[59] *Id.*

[60] *Trends in Telephone Service*, at tbl. 5.3.

[61] *Id*.

[62] This includes, among others, the approximately 800 members of WISPA, including those entities who provide fixed wireless broadband service using unlicensed spectrum. *See* WISPA, *About WISPA,* https://www.wispa.org/About-Us/Mission-and-Goals (last visited June 27, 2019). We also consider the impact to these entities today for the purposes of this IRFA, by including them under the "Wireless Providers – Fixed and Mobile" category.

wireless video services.[63] The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.[64] For this industry, U.S. Census data for 2012 show that there were 967 firms that operated for the entire year.[65] Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.[66] Thus, under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

23. The Commission's own data—available in its Universal Licensing System—indicate that, as of August 31, 2018, there are 265 Cellular licensees that will be affected by our actions.[67] The Commission does not know how many of these licensees are small, as the Commission does not collect that information for these types of entities. Similarly, according to internally-developed Commission data, 413 carriers reported that they were engaged in the provision of wireless telephony, including cellular service, Personal Communications Service (PCS), and Specialized Mobile Radio (SMR) Telephony services.[68] Of this total, an estimated 261 have 1,500 or fewer employees, and 152 have more than 1,500 employees.[69] Thus, using available data, we estimate that the majority of wireless firms can be considered small.

24. *Wireless Communications Services*. This service can be used for fixed, mobile, radiolocation, and digital audio broadcasting satellite uses. The Commission defined "small business" for the wireless communications services (WCS) auction as an entity with average gross revenues of $40 million for each of the three preceding years, and a "very small business" as an entity with average gross revenues of $15 million for each of the three preceding years.[70] The SBA has approved these small business size standards.[71] In the Commission's auction for geographic area licenses in the WCS, there were seven winning bidders that qualified as "very small business" entities and one that qualified as a "small business" entity.

25. *1670–1675 MHz Services*. This service can be used for fixed and mobile uses, except aeronautical mobile.[72] An auction for one license in the 1670–1675 MHz band was conducted in 2003. One license was awarded. The winning bidder was not a small entity.

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[63] U.S. Census Bureau, *2012 NAICS Definitions, 517210 Wireless Telecommunications Carriers (Except Satellite)*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210.

[64] 13 CFR § 121.201, NAICS code 517210.

[65] U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ5, *Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012*, NAICS Code 517210, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517210.

[66] *Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

[67] *See* http://wireless.fcc.gov/uls. For the purposes of this FRFA, consistent with Commission practice for wireless services, the Commission estimates the number of licensees based on the number of unique FCC Registration Numbers.

[68] *Trends in Telephone Service* at Table 5.3.

[69] *Id*.

[70] *Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (WCS)*, GN Docket No. 96-228, Report and Order, 12 FCC Rcd 10785, 10879, para. 194 (1997).

[71] *See* Public Notice, FCC, Comment Sought on Small Business Size Standards (Jan. 13, 1999), at Attach. A, Letter from Aida Alvarez, Administrator, SBA, to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC (filed Dec. 2, 1998) (*Alvarez Letter 1998*), https://ecfsapi.fcc.gov/file/6006142119.pdf.

[72] 47 CFR § 2.106; *see generally* 47 CFR §§ 27.1-27.70.

26. *Wireless Telephony*. Wireless telephony includes cellular, personal communications services, and specialized mobile radio telephony carriers. The closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite).[73] Under the SBA small business size standard, a business is small if it has 1,500 or fewer employees.[74] For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.[75] Of this total, 955 firms had fewer than 1,000 employees and 12 firms had 1000 employees or more.[76] Thus, under this category and the associated size standard, the Commission estimates that a majority of these entities can be considered small. According to Commission data, 413 carriers reported that they were engaged in wireless telephony.[77] Of these, an estimated 261 have 1,500 or fewer employees and 152 have more than 1,500 employees.[78] Therefore, more than half of these entities can be considered small.

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.[79] 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.[80] These standards, defining "small entity" in the context of broadband PCS auctions, have been approved by the SBA.[81] 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% of the 1,479 licenses in the first auction for the D, E, and F Blocks.[82] On April 15, 1999, the Commission completed the reauction of 347 C-, D-, E-, and F-Block licenses in Auction No. 22.[83] Of the 57 winning bidders in that auction, 48 claimed small business status and won 277 licenses.

27. On January 26, 2001, the Commission completed the auction of 422 C and F Block

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[73] U.S. Census Bureau, *2012 NAICS Definitions,* "*517210 Wireless Telecommunications Carriers (Except Satellite*)," *See)*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210.

[74] 13 CFR § 121.201, NAICS Code 517210.

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

[76] *Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

[77] *Trends in Telephone Service*, tbl. 5.3.

[78] *Id*.

[79] *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*, Report and Order, 11 FCC Rcd 7824, 7850-52, paras. 57-60 (1996) (*PCS Report and Order*); *see also* 47 CFR § 24.720(b).

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

[81] *See Alvarez Letter 1998*.

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

[83] *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. *See Amendment of the Commission's Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees*, Fourth Report and Order, 13 FCC Rcd 15743, 15768, para. 46 (1998).

Broadband PCS licenses in Auction No. 35. Of the 35 winning bidders in that auction, 29 claimed small business status. 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. On May 21, 2007, the Commission completed an auction of 33 licenses in the A, C, and F Blocks in Auction No. 71. Of the 12 winning bidders in that auction, five claimed small business status and won 18 licenses. On August 20, 2008, the Commission completed the auction of 20 C-, D-, E-, and F-Block Broadband PCS licenses in Auction No. 78. Of the eight winning bidders for Broadband PCS licenses in that auction, six claimed small business status and won 14 licenses.

28. *Specialized Mobile Radio Licenses.* 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.[84] 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.[85] The SBA has approved these small business size standards for the 900 MHz Service.[86] The Commission has held auctions for geographic area licenses in the 800 MHz and 900 MHz bands. The 900 MHz SMR auction began on December 5, 1995, and closed on April 15, 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 began on October 28, 1997, and was completed on December 8, 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.[87] A second auction for the 800 MHz band conducted in 2002 and included 23 BEA licenses. One bidder claiming small business status won five licenses.[88]

29. The auction of the 1,053 800 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 and qualified as small businesses under the $15 million size standard.[89] 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.[90] Of the 22 winning bidders, 19 claimed small business status and won 129 licenses. Thus, combining all four auctions, 41 winning bidders for geographic licenses in the 800 MHz SMR band claimed status as small businesses.

30. In addition, there are numerous incumbent site-by-site SMR licenses 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 service 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

[84] 47 CFR § 90.814(b)(1).

[85] *Id*.

[86] *See* Letter from Aida Alvarez, Administrator, SBA, to Thomas Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission (filed Aug. 10, 1999) (*Alvarez Letter 1999*).

[87] *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).

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

[89] *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).

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

or fewer employees, which is the SBA-determined size standard.[91] We assume, for purposes of this analysis, that all of the remaining extended implementation authorizations are held by small entities, as defined by the SBA.

31. *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.[92] 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.[93] 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.[94] 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.[95] The SBA approved these small size standards.[96] An auction of 740 licenses (one license in each of the 734 MSAs/RSAs and one license in each of the six Economic Area Groupings (EAGs)) commenced on August 27, 2002, and closed on September 18, 2002. Of the 740 licenses available for auction, 484 licenses were won by 102 winning bidders. Seventy-two of the winning bidders claimed small business, very small business, or entrepreneur status and won a total of 329 licenses.[97] A second auction commenced on May 28, 2003, closed on June 13, 2003, and included 256 licenses: 5 EAG licenses and 476 Cellular Market Area licenses.[98] Seventeen winning bidders claimed small or very small business status and won 60 licenses, and nine winning bidders claimed entrepreneur status and won 154 licenses.[99] On July 26, 2005, the Commission completed an auction of 5 licenses in the Lower 700 MHz band (Auction No. 60). There were three winning bidders for five licenses. All three winning bidders claimed small business status.

32. In 2007, the Commission reexamined its rules governing the 700 MHz band in the *700 MHz Second Report and Order*.[100] An auction of 700 MHz licenses commenced January 24, 2008 and closed on March 18, 2008, which included, 176 Economic Area licenses in the A Block, 734 Cellular Market Area licenses in the B Block, and 176 EA licenses in the E Block.[101] Twenty winning bidders, claiming small business status (those with attributable average annual gross revenues that exceed $15 million and do not exceed $40 million for the preceding three years) won 49 licenses. Thirty-three winning bidders claiming very small business status (those with attributable average annual gross revenues that do not exceed $15 million for the preceding three years) won 325 licenses.

33. *Upper 700 MHz Band Licenses*. In the *700 MHz Second Report and Order*, the

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[91] *See generally* 13 CFR § 121.201, NAICS Code 517210.

[92] *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*).

[93] *See id*. at 1087-88, para. 172.

[94] *See id*.

[95] *See id*., at 1088, para. 173.

[96] *See Alvarez Letter 1999*.

[97] *See Lower 700 MHz Band Auction Closes*, Public Notice, 17 FCC Rcd 17272 (WTB 2002).

[98] *See id*.

[99] *See id*.

[100] *Service Rules for the 698–746, 747–762 and 777–792 MHz Band; Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems et al.*, Second Report and Order, 22 FCC Rcd 15289, 15359 n. 434 (2007) (*700 MHz Second Report and Order*).

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

Commission revised its rules regarding Upper 700 MHz licenses.[102] 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.[103] The auction concluded on March 18, 2008, with three winning bidders claiming very small business status (those with attributable average annual gross revenues that do not exceed $15 million for the preceding three years) and winning five licenses.

34. *700 MHz Guard Band Licensees*. In 2000, in the *700 MHz Guard Band Order*, the Commission adopted size standards for "small businesses" and "very small businesses" for purposes of determining their eligibility for special provisions such as bidding credits and installment payments.[104] 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.[105] 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.[106] SBA approval of these definitions is not required.[107] An auction of 52 Major Economic Area licenses commenced on September 6, 2000, and closed on September 21, 2000.[108] Of the 104 licenses auctioned, 96 licenses were sold to nine bidders. Five of these bidders were small businesses that won a total of 26 licenses. A second auction of 700 MHz Guard Band licenses commenced on February 13, 2001, and closed on February 21, 2001. All eight of the licenses auctioned were sold to three bidders. One of these bidders was a small business that won a total of two licenses.[109]

35. *Air-Ground Radiotelephone Service*. The Commission has previously used the SBA's small business size standard applicable to Wireless Telecommunications Carriers (except Satellite).[110] The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.[111] For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year. Of this total, 955 firms had fewer than 1,000 employees and 12 had employment of 1,000 employees or more.[112] There are approximately 100 licensees in the Air-Ground Radiotelephone Service, and we estimate that almost all of them qualify as small entities under the SBA definition.

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[102] *700 MHz Second Report and Order*, 22 FCC Rcd 15289.

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

[104] *See 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) (*746–764 MHz Band Second Report and Order*).

[105] *See id*. at 5343, para. 108.

[106] *See id*.

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

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

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

[110] U.S. Census Bureau, *2012 NAICS Definitions, 517210 Wireless Telecommunications Carriers (Except Satellite)*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210.

[111] 13 CFR § 121.201, NAICS Code 517210.

[112] *Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

36. For purposes of assigning Air-Ground Radiotelephone Service licenses through competitive bidding, the Commission has defined "small business" as an entity that, together with controlling interests and affiliates, has average annual gross revenues for the preceding three years not exceeding $40 million.[113] A "very small business" is defined as an entity that, together with controlling interests and affiliates, has average annual gross revenues for the preceding three years not exceeding $15 million.[114] These definitions were approved by the SBA.[115] In May 2006, the Commission completed an auction of nationwide commercial Air-Ground Radiotelephone Service licenses in the 800 MHz band (Auction No. 65). On June 2, 2006, the auction closed with two winning bidders winning two Air-Ground Radiotelephone Services licenses. Neither of the winning bidders claimed small business status.

37. 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,[116] the Commission has defined a "small business" as an entity with average annual gross revenues for the preceding three years not exceeding $40 million, and a "very small business" as an entity with average annual gross revenues for the preceding three years not exceeding $15 million. For AWS-2 and AWS-3, although we do not know for certain which entities are likely to apply for these frequencies, we note that the AWS-1 bands are comparable to those used for cellular service and personal communications service. The Commission has not yet adopted size standards for the AWS-2 or AWS-3 bands but proposes to treat both AWS-2 and AWS-3 similarly to broadband PCS service and AWS-1 service due to the comparable capital requirements and other factors, such as issues involved in relocating incumbents and developing markets, technologies, and services.[117]

38. *3650–3700 MHz band*. In March 2005, the Commission released a *Report and Order and Memorandum Opinion and Order* that provides for nationwide, non-exclusive licensing of terrestrial operations, using contention-based technologies, in the 3650 MHz band (i.e., 3650–3700 MHz). As of April 2010, more than 1,270 licenses have been granted and more than 7,433 sites have been registered. The Commission has not developed a definition of small entities applicable to 3650–3700 MHz band nationwide, non-exclusive licenses. However, we estimate that the majority of these licensees are Internet Access Service Providers (ISPs) and that most of those licensees are small businesses.

39. *Fixed Microwave Services.* Microwave services include common carrier,[118] private-operational fixed,[119] and broadcast auxiliary radio services.[120] They also include the Local Multipoint

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[113] *Amendment of Part 22 of the Commission's Rules to Benefit the Consumers of Air-Ground Telecommunications Services et al*, WT Docket No. 03-103 et al., Order on Reconsideration and Report and Order, 20 FCC Rcd 19663, paras. 28-42 (2005).

[114] *Id*.

[115] *See* Letter from Hector V. Barreto, Administrator, SBA, to Gary D. Michaels, Deputy Chief, Auctions and Spectrum Access Division, Wireless Telecommunications Bureau, Federal Communications Commission (filed Sept. 19, 2005).

[116] The service is defined in section 90.1301 *et seq*. of the Commission's Rules, 47 CFR § 90.1301 *et seq*.

[117] *See Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Report and Order, 18 FCC Rcd 25162, Appx. B (2003), *modified by Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Order on Reconsideration, 20 FCC Rcd 14058, Appx. C (2005); *Service Rules for Advanced Wireless Services in the 1915–1920 MHz*, *1995–2000 MHz*, *2020–2025 MHz and 2175–2180 MHz Bands; Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Notice of Proposed Rulemaking, 19 FCC Rcd 19263, Appx. B (2005); *Service Rules for Advanced Wireless Services in the 2155–2175 MHz Band*, Notice of Proposed Rulemaking, 22 FCC Rcd 17035, Appx. (2007).

[118] *See* 47 CFR Part 101, Subparts C and I.

[119] *See* 47 CFR Part 101, Subparts C and H.

[120] Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission's Rules. *See* 47 CFR Part 74. Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary

(continued….)

Distribution Service (LMDS),[121] the Digital Electronic Message Service (DEMS),[122] and the 24 GHz Service,[123] where licensees can choose between common carrier and non-common carrier status.[124] At present, there are approximately 36,708 common carrier fixed licensees and 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. There are approximately 135 LMDS licensees, three DEMS licensees, and three 24 GHz licensees. The Commission has not yet defined a small business with respect to microwave services. The closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite)[125] and the appropriate size standard for this category under SBA rules is that such a business is small if it has 1,500 or fewer employees.[126] For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.[127] Of this total, 955 firms had fewer than 1,000 employees and 12 had employment of 1,000 employees or more.[128] Thus, under this SBA category and the associated size standard, the Commission estimates that a majority of fixed microwave service licensees can be considered small.

40. The Commission does not have data specifying the number of these licensees that have more than 1,500 employees, and thus is unable at this time to estimate with greater precision the number of fixed microwave service licensees that would qualify as small business concerns under the SBA's small business size standard. Consequently, the Commission estimates that there are up to 36,708 common carrier fixed licensees and up to 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services that may be small and may be affected by the rules and policies adopted herein. We note, however, that the common carrier microwave fixed licensee category does include some large entities.

41. *Broadband Radio Service and Educational Broadband Service.* Broadband Radio Service systems, previously referred to as Multipoint Distribution Service (MDS) and Multichannel Multipoint Distribution Service (MMDS) systems and "wireless cable," transmit video programming to subscribers and provide two-way high-speed data operations using the microwave frequencies of the Broadband Radio Service (BRS) and Educational Broadband Service (EBS) (previously referred to as the Instructional Television Fixed Service (ITFS)).[129]

(Continued from previous page)
microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

[121] *See* 47 CFR Part 101, Subpart L.

[122] *See* 47 CFR Part 101, Subpart G.

[123] *See id*.

[124] *See* 47 CFR §§ 101.533, 101.1017.

[125] U.S. Census Bureau, *2012 NAICS Definitions, 517210 Wireless Telecommunications Carriers (Except Satellite)*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210.

[126] *See* 13 CFR § 121.201, NAICS Code 517210.

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

[128] *Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

[129] *Amendment of Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service and Implementation of Section 309(j) of the Communications Act—Competitive Bidding*, Report and Order, 10 FCC Rcd 9589, 9593, para. 7 (1995).

42. *BRS*— In connection with the 1996 BRS auction, the Commission established a small business size standard as an entity that had annual average gross revenues of no more than $40 million in the previous three calendar years.[130] The BRS auctions resulted in 67 successful bidders obtaining licensing opportunities for 493 Basic Trading Areas (BTAs). Of the 67 auction winners, 61 met the definition of a small business. BRS also includes licensees of stations authorized prior to the auction. At this time, we estimate that of the 61 small business BRS auction winners, 48 remain small business licensees. In addition to the 48 small businesses that hold BTA authorizations, there are approximately 392 incumbent BRS licensees that are considered small entities.[131] After adding the number of small business auction licensees to the number of incumbent licensees not already counted, we find that there are currently approximately 440 BRS licensees that are defined as small businesses under either the SBA or the Commission's rules.

43. In 2009, the Commission conducted Auction 86, the sale of 78 licenses in the BRS areas.[132] The Commission offered three levels of bidding credits: (1) a bidder with attributed average annual gross revenues that exceed $15 million and do not exceed $40 million for the preceding three years (small business) received a 15% discount on its winning bid; (2) a bidder with attributed average annual gross revenues that exceed $3 million and do not exceed $15 million for the preceding three years (very small business) received a 25% discount on its winning bid; and (3) a bidder with attributed average annual gross revenues that do not exceed $3 million for the preceding three years (entrepreneur) received a 35% discount on its winning bid.[133] Auction 86 concluded in 2009 with the sale of 61 licenses.[134] Of the ten winning bidders, two bidders that claimed small business status won four licenses; one bidder that claimed very small business status won three licenses; and two bidders that claimed entrepreneur status won six licenses.

44. *EBS*—The SBA's Cable Television Distribution Services small business size standard is applicable to EBS. There are presently 2,436 EBS licensees. All but 100 of these licenses are held by educational institutions. Educational institutions are included in this analysis as small entities.[135] Thus, we estimate that at least 2,336 licensees are small businesses. Since 2007, Cable Television Distribution Services have been defined within the broad economic census category of Wired Telecommunications Carriers. Wired Telecommunications Carriers are comprised of establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies."[136] The

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[130] 47 CFR § 21.961(b)(1).

[131] 47 U.S.C. § 309(j). Hundreds of stations were licensed to incumbent MDS licensees prior to implementation of Section 309(j) of the Communications Act of 1934, 47 U.S.C. § 309(j). For these pre-auction licenses, the applicable standard is SBA's small business size standard of 1,500 or fewer employees.

[132] *Auction of Broadband Radio Service (BRS) Licenses*, *Scheduled for October 27*, *2009*, *Notice and Filing Requirements*, *Minimum Opening Bids*, *Upfront Payments*, *and Other Procedures for Auction 86*, Public Notice, 24 FCC Rcd 8277 (2009).

[133] *Id*. at 8296, para. 73.

[134] *Auction of Broadband Radio Service Licenses Closes*, *Winning Bidders Announced for Auction 86*, *Down Payments Due November 23*, *2009*, *Final Payments Due December 8*, *2009*, *Ten-Day Petition to Deny Period*, Public Notice, 24 FCC Rcd 13572 (2009).

[135] The term "small entity" within SBREFA applies to small organizations (nonprofits) and to small governmental jurisdictions (cities, counties, towns, townships, villages, school districts, and special districts with populations of less than 50,000). 5 U.S.C. §§ 601(4)-(6). We do not collect annual revenue data on EBS licensees.

[136] U.S. Census Bureau, *2017 NAICS Definitions*, *517311 Wired Telecommunications Carriers,* (partial definition), http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017.

SBA's small business size standard for this category is all such firms having 1,500 or fewer employees.[137] U.S. Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees. Thus, under this size standard, the majority of firms in this industry can be considered small.

4. Satellite Service Providers

45. *Satellite Telecommunications.* This category comprises firms "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."[138] Satellite telecommunications service providers include satellite and earth station operators. The category has a small business size standard of $32.5 million or less in average annual receipts, under SBA rules.[139] For this category, U.S. Census Bureau data for 2012 show that a total of 333 firms operated for the entire year.[140] Of this total, 299 firms had annual receipts of less than $25 million.[141] Consequently, we estimate that the majority of satellite telecommunications providers are small entities.

46. *All Other Telecommunications.* The **"**All Other Telecommunications" category is comprised of establishments that are primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation.[142] 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.[143] Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.[144] The SBA has developed a small business size standard for "All Other Telecommunications," which consists of all such firms with gross annual receipts of $32.5 million or less.[145] For this category, U.S. Census Bureau data for 2012 show that there were 1,442 firms that operated for the entire year.[146] Of these firms, a total of 1,400 had gross

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[137] *See* 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS Code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS Code as 517311 for Wired Telecommunications Carriers. *See* https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517311&search=2017+NAICS+Search&search=2017.

[138] U.S. Census Bureau, *2012 NAICS Definitions*, *517410 Satellite Telecommunications*, https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517410&search=2017+NAICS+Search&search=2017.

[139] 13 CFR § 121.201, NAICS Code 517410.

[140] U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, *Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012*, NAICS Code 517410, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ4&prodType=table.

[141] *Id*.

[142] *See* U.S. Census Bureau, *2017 NAICS Definitions, NAICS Code 517919 All Other Telecommunications*, https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517919&search=2017+NAICS+Search&search=2017

[143] *Id*.

[144] *Id*.

[145] 13 CFR § 121.201; NAICS Code 517919.

[146] U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, *Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012*, NAICS Code 517919, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~517919.

annual receipts of less than $25 million.[147] Consequently, a majority of "All Other Telecommunications" firms potentially affected by our action can be considered small.

5. Cable Service Providers

47. Because section 706 of the Act requires us to monitor the deployment of broadband using any technology, we anticipate that some broadband service providers may not provide telephone service. Accordingly, we describe below other types of firms that may provide broadband services, including cable companies, MDS providers, and utilities, among others.

48. *Cable and Other Subscription Programming.* This industry comprises establishments primarily engaged in operating studios and facilities for the broadcasting of programs on a subscription or fee basis. The broadcast programming is typically narrowcast in nature (e.g. limited format, such as news, sports, education, or youth-oriented). These establishments produce programming in their own facilities or acquire programming from external sources. The programming material is usually delivered to a third party, such as cable systems or direct-to-home satellite systems, for transmission to viewers.[148] The SBA size standard for this industry establishes as small, any company in this category that has annual receipts of $38.5 million or less.[149] According to 2012 U.S. Census Bureau data, 367 firms operated for the entire year.[150] Of that number, 319 operated with annual receipts of less than $25 million a year and 48 firms operated with annual receipts of $25 million or more.[151] Based on this data, the Commission estimates that the majority of firms operating in this industry are small.

49. *Cable Companies and Systems (Rate Regulation).* The Commission has developed its own small business size standards for the purpose of cable rate regulation. Under the Commission's rules, a "small cable company" is one serving 400,000 or fewer subscribers nationwide.[152] Industry data indicate that there are currently 4,600 active cable systems in the United States.[153] Of this total, all but eleven cable operators nationwide are small under the 400,000-subscriber size standard.[154] In addition, under the Commission's rate regulation rules, a "small system" is a cable system serving 15,000 or fewer subscribers.[155] Current Commission records show 4,600 cable systems nationwide. Of this total, 3,900 cable systems have fewer than 15,000 subscribers, and 700 systems have 15,000 or more subscribers, based on the same records.[156] Thus, under this standard as well, we estimate that most cable systems are small entities.

50. *Cable System Operators (Telecom Act Standard).* The Communications Act of 1934, as

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[147] *Id.*

[148] S*ee* U.S. Census Bureau, *2012 NAICS Definitions, 515210 Cable and other Subscription Programming*, *https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.515210#.*

[149] *See* 13 C.F.R. 121.201, NAICS Code 515210.

[150] *See* U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, *Information: Subject Series - Estab & Firm Size: Receipts Size of Firms for the U.S.: 2012*, NAICS Code 515210, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~515210.

[151] *Id*. Available census data does not provide a more precise estimate of the number of firms that have receipts of $38.5 million or less.

[152] 47 CFR § 76.901(e).

[153] *See* FCC, Media Bureau, August 15, 2015 Report based on data contained in the Commission's Cable Operations and Licensing System (COALS), https://apps.fcc.gov/coals/.

[154] Data obtained from SNL Kagan database on April 19, 2017.

[155] 47 CFR § 76.901(c).

[156] *See* FCC, Media Bureau, August 5, 2015 report based on its research in COALS, https://apps.fcc.gov/coals/.

amended, also contains a size standard for small cable system operators, which is "a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1% of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed $250,000,000."[157] There are approximately 52,403,705 cable video subscribers in the United States today.[158] Accordingly, an operator serving fewer than 524,037 subscribers shall be deemed a small operator if its annual revenues, when combined with the total annual revenues of all its affiliates, do not exceed $250 million in the aggregate.[159] Based on available data, we find that all but nine incumbent cable operators are small entities under this size standard.[160] We note that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose gross annual revenues exceed $250 million.[161] Although it seems certain that some of these cable system operators are affiliated with entities whose gross annual revenues exceed $250 million, we are unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

6. All Other Telecommunications

51. *Electric Power Generators*, *Transmitters*, *and Distributors.* This U.S. industry is comprised of establishments that are 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.[162] The closest applicable SBA category is "All Other Telecommunications." The SBA's small business size standard for "All Other Telecommunications" consists of all such firms with gross annual receipts of $32.5 million or less.[163] For this category, U.S. Census data for 2012 show that there were 1,442 firms that operated for the entire year. Of these firms, a total of 1,400 had gross annual receipts of less than $25 million.[164] Consequently, we estimate that under this category and the associated size standard the majority of these firms can be considered small entities.

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

52. We expect the rules adopted in the *Second Report and Order* will impose new or additional reporting, recordkeeping, and/or other compliance obligations on small entities. We establish reporting and disclosure requirements for fixed and mobile broadband providers, filing and certification requirements. In an effort to comply with the Broadband DATA Act and develop better quality, more

[157] 47 CFR § 76.90(f) and notes ff. 1, 2, and 3.

[158] *See* SNL KAGAN at http://www.snl.com/interactivex/MultichannelIndustryBenchmarks.aspx.

[159] 47 CFR § 76.901(f) and notes ff. 1, 2, and 3.

[160] *See* SNL KAGAN at http://www.snl.com/interactivex/TopCable MSOs.aspx.

[161] The Commission does receive such information on a case-by-case basis if a cable operator appeals a local franchise authority's finding that the operator does not qualify as a small cable operator pursuant to section 76.901(f) of the Commission's rules. *See* 47 CFR § 76.901(f).

[162] *See* U.S. Census Bureau, http://www.census.gov/cgi-bin/ssssd/naics/naicsrch.

[163] 13 CFR § 121.201; NAICS Code 517919.

[164] U.S. Census Bureau, *Estab & Firm Size: Receipts Size of Firms for the U.S., 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ4&prodType=table.

useful, and more granular broadband deployment data to advance our statutory obligations, we conclude it is necessary to adopt these rules to produce broadband deployment maps that will allow the Commission to precisely target scarce universal service dollars to where broadband service is lacking. We are cognizant of the need to ensure that the benefits resulting from use of the data outweigh the reporting burdens imposed on filers and believe the establishment of the broadband serviceable location fabric will benefit small entities as well as other providers. Further, the Broadband DATA Act requires the Commission to collect from each mobile broadband Internet access service provider propagation maps and propagation model details that indicate coverage based on specified parameters which we conclude will improve the accuracy and reliability of the mobile broadband data we collect. We also adopt requirements to collect crowdsourced data. We find that any additional burdens imposed by our revised reporting approach for providers in comparison are outweighed by the significant benefit to be gained from more precise broadband deployment data. Although the Commission cannot quantify the cost of compliance with the requirements in the *Second Report and Order,* we believe the reporting requirements are necessary to comply with the Broadband DATA Act and complete accurate broadband coverage maps.

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

53. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[165] The Commission's actions in the *Second Report and Order* are primarily in response to the legislative enactment of the Broadband DATA Act and to develop better quality, more useful, and more granular broadband deployment data. In considering the comments in the record, we were mindful of the time, money, and resources that some small entities incur to complete these requirements.

G. Report to Congress

54. The Commission will send a copy of the *Second Report and Order*, including this FRFA, in a report to Congress pursuant to the Congressional Review Act.[166] In addition, the Commission will send a copy of the Second Report and Order, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the *Second Report and Order* and FRFA (or summaries thereof) will also be published in the Federal Register.[167]

[165] 5 U.S.C. § 603(c)(1)-(4).

[166] *See* 5 U.S.C. § 801(a)(1)(A).

[167] *See* 5 U.S.C. § 604(b).

APPENDIX D

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Commission has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities from the policies and rules proposed in this *Third Notice*. The Commission requests written public comment on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *Third Notice*. The Commission will send a copy of the *Third Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).[2] In addition, the *Third Notice* and IRFA (or summaries thereof) will be published in the Federal Register.[3]

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

2. The Commission continues its ongoing efforts to collect accurate and granular broadband deployment data so that we can bring broadband to those areas most in need of it. In the *Third Notice*, the Commission raises issues for consideration and seeks comment on additional steps we can take to obtain more reliable data on the availability and quality of service of broadband Internet access service and how we should implement the requirements in the Broadband DATA Act. Specifically, we seek comment about the standards for collecting and disseminating availability and quality of service data from providers on a biannual basis. Further, we ask about a range of options for verifying the data submitted by providers, including a challenge process, an engineering certification for biannual filers, and obtaining data from government entities and certain third parties. We also provide tentative conclusions and seek comment on how to implement provider coverage map verification methods for mobile services and on how best to use mobile data. While some of the tools we request comment on are required by the Broadband DATA Act, we also inquire about various ways to use other data sources to verify the accuracy of provider coverage maps. Further, we seek comment on the details for establishing the Broadband Serviceable Location Fabric (Fabric) and for the creation of coverage maps depicting broadband availability. Finally, we ask about enforcement issues if providers either fail to make their required filings or they submit materially inaccurate or incomplete data.

B. Legal Basis

3. The proposed action is authorized pursuant to sections 1-5, 201-206, 214, 218-220, 251, 252, 254, 256, 303(r), 332, 403, 405, and 641-646 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151-155, 201-206, 214, 218-220, 251, 252, 254, 256, 303(r), 332, 403, 405, 641-646.

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

4. The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.[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

[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] *Id.*

[4] *See* 5 U.S.C. § 603(b)(3).

[5] *See* 5 U.S.C. § 601(6).

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]

1. Total Small Entities

5. *Small Businesses, Small Organizations, Small Governmental Jurisdictions*. Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three broad groups of small entities that could be directly affected herein.[8] First, while there are industry-specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA's Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.[9] These types of small businesses represent 99.9% of all businesses in the United States, which translates to 28.8 million businesses.[10]

6. Next, the type of small entity described as a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[11] Nationwide, as of August 2016, there were approximately 356,494 small organizations based on registration and tax data filed by nonprofits with the Internal Revenue Service (IRS).[12]

7. Finally, the small entity described as a "small governmental jurisdiction" is defined generally as "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[13] U.S. Census Bureau data from the 2012 Census of Governments[14] indicate that there were 90,056 local governmental jurisdictions consisting of general

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[6] *See* 5 U.S.C. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[7] *See* 15 U.S.C. § 632.

[8] *See* 5 U.S.C. § 601(3)-(6).

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

[10] *See id*.

[11] 5 U.S.C. § 601(4).

[12] Data from the Urban Institute, National Center for Charitable Statistics (NCCS) reporting on nonprofit organizations registered with the IRS were used to estimate the number of small organizations. Reports generated using the NCCS online database indicated that as of August 2016 there were 356,494 registered nonprofits with total revenues of less than $100,000. Of this number, 326,897 entities filed tax returns with 65,113 registered nonprofits reporting total revenues of $50,000 or less on the IRS Form 990-N for Small Exempt Organizations and 261,784 nonprofits reporting total revenues of $100,000 or less on some other version of the IRS Form 990 within 24 months of the August 2016 data release date. *See* http://nccs.urban.org/sites/all/nccs-archive/html//tablewiz/tw.php where the report showing this data can be generated by selecting the following data fields: Report: "The Number and Finances of All Registered 501(c) Nonprofits"; Show: "Registered Nonprofits"; By: "Total Revenue Level (years 1995, Aug to 2016, Aug)"; and For: "2016, Aug" then selecting "Show Results".

[13] 5 U.S.C. § 601(5).

[14] *See* 13 U.S.C. § 161. The Census of Government is conducted every five (5) years compiling data for years ending with "2" and "7". *See also* Program Description Census of Government, *https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=program&id=program.en.COG#*.

purpose governments and special purpose governments in the United States.[15] Based on this data, we estimate that at least 49,316 local government jurisdictions fall in the category of "small governmental jurisdictions."[16]

2. Broadband Internet Access Service Providers

8. To ensure that this IRFA describes the universe of small entities that our action might affect, we discuss in turn several different types of entities that might be providing broadband Internet access service.

9. *Internet Service Providers (Broadband).* Broadband Internet service providers include wired (e.g., cable, DSL) and VoIP service providers using their own operated wired telecommunications infrastructure fall in the category of Wired Telecommunication Carriers.[17] Wired Telecommunications Carriers are comprised of establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies.[18] The SBA size standard for this category classifies a business as small if it has 1,500 or fewer employees.[19] U.S. Census Bureau data for 2012 show that there were 3,117 firms that operated that year.[20] Of this total, 3,083 operated with fewer than 1,000 employees.[21] Consequently, under this size standard the majority of firms in this industry can be considered small.

10. *Internet Service Providers (Non-Broadband).* Internet access service providers such as Dial-up Internet service providers, VoIP service providers using client-supplied telecommunications connections, and Internet service providers using client-supplied telecommunications connections (e.g., dial-up ISPs) fall in the category of All Other Telecommunications.[22] The SBA has developed a small business size standard for All Other Telecommunications, which consists of all such firms with gross annual receipts of $32.5 million or less.[23] For this category, U.S. Census Bureau data for 2012 show that there were 1,442 firms that operated for the entire year.[24] Of these firms, a total of 1,400 had gross annual

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

[16] *Id.*

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

[18] *Id.*

[19] *Id.*

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

[21] *Id.*

[22] *See* U.S. Census Bureau, *2017 NAICS Definitions, NAICS Code 517919 All Other Telecommunications*, https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517919&search=2017+NAICS+Search&search=2017.

[23] 13 CFR § 121.201; NAICS Code 517919.

[24] U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, *Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012*, NAICS Code 517919, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~517919.

receipts of less than $25 million.[25] Consequently, under this size standard, a majority of firms in this industry can be considered small.

3. Wireline Providers

11. *Wired Telecommunications Carriers.* The U.S. Census Bureau defines this industry as "establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired communications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services, wired (cable) audio and video programming distribution, and wired broadband Internet services. By exception, establishments providing satellite television distribution services using facilities and infrastructure that they operate are included in this industry."[26] The SBA has developed a small business size standard for Wired Telecommunications Carriers, which consists of all such companies having 1,500 or fewer employees.[27] U.S. Census Bureau data for 2012 show that there were 3,117 firms that operated that year.[28] Of this total, 3,083 operated with fewer than 1,000 employees.[29] Thus, under this size standard, the majority of firms in this industry can be considered small.

12. *Local Exchange Carriers (LECs).* Neither the Commission nor the SBA has developed a size standard for small businesses specifically applicable to local exchange services. The closest applicable NAICS Code category is Wired Telecommunications Carriers.[30] Under the applicable SBA size standard, such a business is small if it has 1,500 or fewer employees.[31] According to Commission data, U.S. Census data for 2012 show that there were 3,117 firms that operated that year.[32] Of this total, 3,083 operated with fewer than 1,000 employees.[33] Thus, under this category and the associated size standard, the Commission estimates that the majority of local exchange carriers are small entities.

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.

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[25] *Id.*

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

[27] *See* 13 CFR § 120.201, NAICS Code 517110.

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

[29] *Id.*

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

[31] *Id.*

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

[33] *Id.*

The closest applicable NAICS Code category is Wired Telecommunications Carriers. [34] Under the applicable SBA size standard, such a business is small if it has 1,500 or fewer employees.[35] According to U.S. Census Bureau data for 2012, 3,117 firms operated in that year.[36] Of this total, 3,083 operated with fewer than 1,000 employees.[37] Consequently, the Commission estimates that most providers of incumbent local exchange service are small businesses that may be affected by our actions. According to Commission data, 1,307 Incumbent LECs reported that they were incumbent local exchange service providers.[38] Of this total, an estimated 1,006 have 1,500 or fewer employees.[39] Thus, using the SBA's size standard, the majority of Incumbent LECs can be considered small entities.

14. 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 NAICS Code category is Wired Telecommunications Carriers and under that size standard, such a business is small if it has 1,500 or fewer employees.[40] U.S. Census Bureau data for 2012 indicate that 3,117 firms operated during that year.[41] Of that number, 3,083 operated with fewer than 1,000 employees.[42] Based on these data, the Commission concludes that the majority of Competitive LECs, CAPs, Shared-Tenant Service Providers, and Other Local Service Providers, are small entities. 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.[43] Of these 1,442 carriers, an estimated 1,256 have 1,500 or fewer employees.[44] 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.[45] Also, 72 carriers have reported that they are Other Local Service Providers.[46] Of this total, 70 have 1,500 or fewer

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

[35] *Id.*

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

[37] *Id*.

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

[39] *Id*.

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

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

[42] *Id*.

[43] *See Trends in Telephone Service*, at tbl. 5.3.

[44] *Id*.

[45] *Id*.

[46] *Id*.

employees.[47] Consequently, based on internally researched FCC data, 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.[48]

15. *Interexchange Carriers (IXCs)*. Neither the Commission nor the SBA has developed a definition for Interexchange Carriers. The closest NAICS Code category is Wired Telecommunications Carriers.[49] The applicable size standard under SBA rules consists of all such companies having 1,500 or fewer employees.[50] U.S. Census Bureau data for 2012 indicate that 3,117 firms operated during that year.[51] Of that number, 3,083 operated with fewer than 1,000 employees.[52] According to internally developed Commission data, 359 companies reported that their primary telecommunications service activity was the provision of interexchange services.[53] Of this total, an estimated 317 have 1,500 or fewer employees.[54] Consequently, the Commission estimates that the majority of interexchange service providers are small entities.

16. *Operator Service Providers* (*OSPs*). Neither the Commission nor the SBA has developed a small business size standard specifically for operator service providers. The closest applicable size standard under SBA rules is the category of Wired Telecommunications Carriers.[55] Under the size standard for Wired Telecommunications Carriers, such a business is small if it has 1,500 or fewer employees.[56] U.S. Census Bureau data for 2012 show that there were 3,117 firms that operated that

[47] *Id*.

[48] We have included small incumbent LECs in this present RFA analysis. As noted above, a "small business" under the RFA is one that, *inter alia*, meets the pertinent small business size standard (e.g., a telephone communications business having 1,500 or fewer employees) and "is not dominant in its field of operation."[48] The SBA's Office of Advocacy contends that, for RFA purposes, small incumbent LECs are not dominant in their field of operation because any such dominance is not "national" in scope. We have therefore included small incumbent LECs in this RFA analysis, although we emphasize that this RFA action has no effect on Commission analyses and determinations in other, non-RFA contexts.

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

[50] *Id.*

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

[52] *Id*.

[53] *See Trends in Telephone Service*, at tbl. 5.3.

[54] *Id*.

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

[56] *Id.*

year.[57] Of this total, 3,083 operated with fewer than 1,000 employees.[58] Thus, under this size standard, the majority of firms in this industry can be considered small.

17. According to Commission data, 33 carriers have reported that they are engaged in the provision of operator services.[59] Of these, an estimated 31 have 1,500 or fewer employees and two have more than 1,500 employees.[60] Consequently, the Commission estimates that the majority of OSPs are small entities.

18. *Other Toll Carriers*. Neither the Commission nor the SBA has developed a definition for small businesses specifically applicable to Other Toll Carriers. This category includes toll carriers that do not fall within the categories of interexchange carriers, operator service providers, prepaid calling card providers, satellite service carriers, or toll resellers. The closest applicable size standard under SBA rules is for Wired Telecommunications Carriers and the applicable small business size standard under SBA rules consists of all such companies having 1,500 or fewer employees.[61] U.S. Census data for 2012 indicate that 3,117 firms operated during that year.[62] Of that number, 3,083 operated with fewer than 1,000 employees.[63] According to Commission data, 284 companies reported that their primary telecommunications service activity was the provision of other toll carriage.[64] Of these, an estimated 279 have 1,500 or fewer employees.[65] Consequently, the Commission estimates that most Other Toll Carriers are small entities.

4. Wireless Providers – Fixed and Mobile

19. The broadband Internet access service provider category covered by this Order may cover multiple wireless firms and categories of wireless services.[66] Thus, to the extent the wireless services listed below are used by wireless firms for broadband Internet access service, the proposed actions may have an impact on those small businesses as set forth above and further below. In addition, for those services subject to auctions, we note that, as a general matter, the number of winning bidders that claim to 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

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

[58] *Id.*

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

[60] *Id*.

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

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

[63] *Id.*

[64] *Trends in Telephone Service*, at tbl. 5.3.

[65] *Id*.

[66] This includes, among others, the approximately 800 members of WISPA, including those entities who provide fixed wireless broadband service using unlicensed spectrum. *See* WISPA, *About WISPA,* https://www.wispa.org/About-Us/Mission-and-Goals (last visited June 27, 2019). We also consider the impact to these entities today for the purposes of this IRFA, by including them under the "Wireless Providers – Fixed and Mobile" category.

unless, in the context of assignments and transfers or reportable eligibility events, unjust enrichment issues are implicated.

20. *Wireless Telecommunications Carriers (except Satellite*). This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless Internet access, and wireless video services.[67] The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.[68] For this industry, U.S. Census data for 2012 show that there were 967 firms that operated for the entire year.[69] Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.[70] Thus, under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

21. The Commission's own data—available in its Universal Licensing System—indicate that, as of August 31, 2018, there are 265 Cellular licensees that will be affected by our actions.[71] The Commission does not know how many of these licensees are small, as the Commission does not collect that information for these types of entities. Similarly, according to internally-developed Commission data, 413 carriers reported that they were engaged in the provision of wireless telephony, including cellular service, Personal Communications Service (PCS), and Specialized Mobile Radio (SMR) Telephony services.[72] Of this total, an estimated 261 have 1,500 or fewer employees, and 152 have more than 1,500 employees.[73] Thus, using available data, we estimate that the majority of wireless firms can be considered small.

22. *Wireless Communications Services*. This service can be used for fixed, mobile, radiolocation, and digital audio broadcasting satellite uses. The Commission defined "small business" for the wireless communications services (WCS) auction as an entity with average gross revenues of $40 million for each of the three preceding years, and a "very small business" as an entity with average gross revenues of $15 million for each of the three preceding years.[74] The SBA approved these small business size standards.[75] In the Commission's auction for geographic area licenses in the WCS there were seven

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[67] U.S. Census Bureau, *2012 NAICS Definitions, 517210 Wireless Telecommunications Carriers (Except Satellite)*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210.

[68] 13 CFR § 121.201, NAICS Code 517210.

[69] U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ5, *Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012,* NAICS Code 517210, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517210.

[70] *Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

[71] *See* FCC, Universal Licensing System, https://www.fcc.gov/wireless/systems-utilities/universal-licensing-system. For the purposes of this IRFA, consistent with Commission practice for wireless services, the Commission estimates the number of licensees based on the number of unique FCC Registration Numbers.

[72] *Trends in Telephone Service*, tbl. 5.3.

[73] *See id*.

[74] *Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (WCS)*, GN Docket No. 96-228, Report and Order, 12 FCC Rcd 10785, 10879, para. 194 (1997).

[75] *See* Public Notice, FCC, Comment Sought on Small Business Size Standards (Jan. 13, 1999), at Attach. A, Letter from Aida Alvarez, Administrator, SBA, to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC (Dec. 2, 1998) (*Alvarez Letter 1998*), https://ecfsapi.fcc.gov/file/6006142119.pdf.

winning bidders that qualified as "very small business" entities, and one that qualified as a "small business" entity.

23. *1670–1675 MHz Services*. This service can be used for fixed and mobile uses, except aeronautical mobile.[76] An auction for one license in the 1670–1675 MHz band was conducted in 2003. One license was awarded. The winning bidder was not a small entity.

24. *Wireless Telephony*. Wireless telephony includes cellular, personal communications services, and specialized mobile radio telephony carriers. The closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite).[77] Under the SBA small business size standard, a business is small if it has 1,500 or fewer employees.[78] For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.[79] Of this total, 955 firms had fewer than 1,000 employees and 12 firms had 1000 employees or more.[80] Thus, under this category and the associated size standard, the Commission estimates that a majority of these entities can be considered small. According to Commission data, 413 carriers reported that they were engaged in wireless telephony.[81] Of these, an estimated 261 have 1,500 or fewer employees and 152 have more than 1,500 employees.[82] Therefore, more than half of these entities can be considered small.

25. *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.[83] 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.[84] These small business size standards, in the context of broadband PCS auctions, have been approved by the SBA.[85] 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% of the 1,479 licenses in the first auction for the D, E, and F Blocks.[86] On April 15, 1999, the Commission completed

[76] 47 CFR § 2.106; *see generally* 47 CFR §§ 27.1-27.70.

[77] U.S. Census Bureau, *2012 NAICS Definitions, "517210 Wireless Telecommunications Carriers (Except Satellite),")*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210.

[78] 13 CFR § 121.201, NAICS Code 517210.

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

[80] *Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

[81] *Trends in Telephone Service*, tbl. 5.3.

[82] *Id*.

[83] *See Amendment of Parts 20 and 24 of the Commission's Rules – Broadband PCS Competitive Bidding and the Commercial Mobile Radio Service Spectrum Cap; Amendment of the Commission's Cellular/PCS Cross-Ownership Rule*; WT Docket No. 96-59, GN Docket No. 90-314, Report and Order, 11 FCC Rcd 7824, 7850-52, paras. 57-60 (1996) (PCS Report and Order); *see also* 47 CFR § 24.720(b).

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

[85] *See Alvarez Letter 1998.*

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

the reauction of 347 C-, D-, E-, and F-Block licenses in Auction No. 22.[87] Of the 57 winning bidders in that auction, 48 claimed small business status and won 277 licenses.

26. 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.[88] 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.[89] On May 21, 2007, the Commission completed an auction of 33 licenses in the A, C, and F Blocks in Auction No. 71.[90] Of the 12 winning bidders in that auction, five claimed small business status and won 18 licenses.[91] On August 20, 2008, the Commission completed the auction of 20 C-, D-, E-, and F-Block Broadband PCS licenses in Auction No. 78.[92] Of the eight winning bidders for Broadband PCS licenses in that auction, six claimed small business status and won 14 licenses.[93]

27. *Specialized Mobile Radio Licenses.* 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.[94] 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.[95] The SBA approved these small business size standards for the 900 MHz Service.[96] The Commission held auctions for geographic area licenses in the 800 MHz and 900 MHz bands. The 900 MHz SMR auction began on December 5, 1995, and closed on April 15, 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 began on October 28, 1997, and was completed on December 8, 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.[97] A second auction for the 800 MHz band was held on January 10, 2002, and closed on January 17, 2002, and

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[87] *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).

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

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

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

[91] *Id*.

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

[93] *Id.*

[94] 47 CFR § 90.814(b)(1).

[95] *Id*.

[96] *See* Letter from Aida Alvarez, Administrator, SBA, to Thomas Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission (filed Aug. 10, 1999) (*Alvarez Letter 1999*).

[97] *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).

included 23 BEA licenses. One bidder claiming small business status won five licenses.[98]

28. The auction of the 1,053 800 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 and qualified as small businesses under the $15 million size standard.[99] 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.[100] Of the 22 winning bidders, 19 claimed small business status and won 129 licenses. Thus, combining all four auctions, 41 winning bidders for geographic licenses in the 800 MHz SMR band claimed status as small businesses.

29. In addition, there are numerous incumbent site-by-site SMR licenses 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 service 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, which is the SBA-determined size standard.[101] We assume, for purposes of this analysis, that all of the remaining extended implementation authorizations are held by small entities, as defined by the SBA.

30. *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.[102] 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.[103] 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.[104] 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.[105] The SBA approved these small size standards.[106] An auction of 740 licenses (one license in each of the 734 MSAs/RSAs and one license in each of the six Economic Area Groupings (EAGs)) commenced on August 27, 2002, and closed on September 18, 2002. Of the 740 licenses available for auction, 484 licenses were won by 102 winning bidders. Seventy-two of the winning bidders claimed small business, very small business, or entrepreneur status and won a total of 329 licenses.[107] A second auction commenced on May 28, 2003, closed on June

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

[99] *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).

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

[101] *See generally* 13 CFR § 121.201, NAICS code 517210.

[102] *See Reallocation and Service Rules for the 698–746 MHz Spectrum Band (Television Channels 52–59)*, GN Docket No. 01-74, Report and Order, 17 FCC Rcd 1022 (2002) (*Channels 52–59 Report and Order*).

[103] *See id.* at 1087-88, para. 172.

[104] *See id*.

[105] *See id.*, at 1088, para. 173.

[106] *See Alvarez Letter 1999*.

[107] *See Lower 700 MHz Band Auction Closes*, Public Notice, 17 FCC Rcd 17272 (WTB 2002).

13, 2003, and included 256 licenses: 5 EAG licenses and 476 Cellular Market Area licenses.[108] Seventeen winning bidders claimed small or very small business status and won 60 licenses, and nine winning bidders claimed entrepreneur status and won 154 licenses.[109] On July 26, 2005, the Commission completed an auction of five licenses in the Lower 700 MHz band (Auction No. 60). There were three winning bidders for the five licenses. All three winning bidders claimed small business status.

31. In 2007, the Commission reexamined its rules governing the 700 MHz band in the *700 MHz Second Report and Order*.[110] An auction of 700 MHz licenses commenced January 24, 2008, and closed on March 18, 2008, which included 176 Economic Area licenses in the A Block, 734 Cellular Market Area licenses in the B Block, and 176 EA licenses in the E Block.[111] Twenty winning bidders, claiming small business status (those with attributable average annual gross revenues that exceed $15 million and do not exceed $40 million for the preceding three years) won 49 licenses. Thirty-three winning bidders claiming very small business status (those with attributable average annual gross revenues that do not exceed $15 million for the preceding three years) won 325 licenses.

32. *Upper 700 MHz Band Licenses*. In the *700 MHz Second Report and Order*, the Commission revised its rules regarding Upper 700 MHz licenses.[112] 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.[113] 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.

33. *700 MHz Guard Band Licensees*. In 2000, in the 700 MHz Guard Band Order, the Commission adopted size standards for "small businesses" and "very small businesses" for purposes of determining their eligibility for special provisions such as bidding credits and installment payments.[114] 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.[115] 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.[116] SBA approval of these definitions is not required.[117] An auction of 52 Major Economic Area licenses commenced on September 6, 2000, and closed on September 21, 2000.[118] Of the 104 licenses auctioned, 96 licenses were sold to

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[108] *See id.*

[109] *See id.*

[110] *Service Rules for the 698–746, 747–762 and 777–792 MHz Band et al.*, WT Docket No. 07-166 et al., Second Report and Order, 22 FCC Rcd 15289, 15359 n. 434 (2007) (*700 MHz Second Report and Order*).

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

[112] *700 MHz Second Report and Order*, 22 FCC Rcd 15289.

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

[114] *See Service Rules for the 746–764 MHz Bands, and Revisions to Part 27 of the Commission's Rules*, WT Docket No. 99-168, Second Report and Order, 15 FCC Rcd 5299 (2000) (*746–764 MHz Band Second Report and Order*).

[115] *See id*. at 5343, para. 108.

[116] *See id*.

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

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

nine bidders. Five of these bidders were small businesses that won a total of 26 licenses. A second auction of 700 MHz Guard Band licenses commenced on February 13, 2001, and closed on February 21, 2001. All eight of the licenses auctioned were sold to three bidders. One of these bidders was a small business that won a total of two licenses.[119]

34. *Air-Ground Radiotelephone Service*. The Commission previously used the SBA's small business size standard applicable to Wireless Telecommunications Carriers (except Satellite) for this service.[120] The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.[121] For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year. Of this total, 955 firms had fewer than 1,000 employees and 12 had employment of 1,000 employees or more.[122] There are approximately 100 licensees in the Air-Ground Radiotelephone Service, and we estimate that almost all of them qualify as small entities under the SBA definition.

35. For purposes of assigning Air-Ground Radiotelephone Service licenses through competitive bidding, the Commission has defined "small business" as an entity that, together with controlling interests and affiliates, has average annual gross revenues for the preceding three years not exceeding $40 million.[123] A "very small business" is defined as an entity that, together with controlling interests and affiliates, has average annual gross revenues for the preceding three years not exceeding $15 million.[124] The SBA approved these definitions.[125] In May 2006, the Commission completed an auction of nationwide commercial Air-Ground Radiotelephone Service licenses in the 800 MHz band (Auction No. 65). On June 2, 2006, the auction closed with two winning bidders winning two Air-Ground Radiotelephone Services licenses. Neither of the winning bidders claimed small business status.

36. Advanced Wireless Services (AWS) (1710–1755 MHz and 2110–2155 MHz bands (AWS-1); 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz bands (AWS-2); 2155–2175 MHz band (AWS-3)). For the AWS-1 bands,[126] the Commission defined a "small business" as an entity with average annual gross revenues for the preceding three years not exceeding $40 million, and a "very small business" as an entity with average annual gross revenues for the preceding three years not exceeding $15 million. For AWS-2 and AWS-3, although we do not know for certain which entities are likely to apply for these frequencies, we note that the AWS-1 bands are comparable to those used for cellular service and personal communications service. The Commission has not yet adopted size

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

[120] U.S. Census Bureau, *2012 NAICS Definitions, "517210 Wireless Telecommunications Carriers (Except Satellite)*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210.

[121] 13 CFR § 121.201, NAICS Code 517210.

[122] *Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

[123] *Amendment of Part 22 of the Commission's Rules to Benefit the Consumers of Air-Ground Telecommunications Services*, *Biennial Regulatory Review—Amendment of Parts 1*, *22*, *and 90 of the Commission's Rules*, *Amendment of Parts 1 and 22 of the Commission's Rules to Adopt Competitive Bidding Rules for Commercial and General Aviation Air-Ground Radiotelephone Service*, Order on Reconsideration and Report and Order, 20 FCC Rcd 19663, paras. 28-42 (2005).

[124] *Id*.

[125] *See* Letter from Hector V. Barreto, Administrator, SBA, to Gary D. Michaels, Deputy Chief, Auctions and Spectrum Access Division, Wireless Telecommunications Bureau, Federal Communications Commission (filed Sept. 19, 2005).

[126] The service is defined in section 90.1301 *et seq*. of the Commission's Rules, 47 CFR § 90.1301 *et seq*.

standards for the AWS-2 or AWS-3 bands but proposes to treat both AWS-2 and AWS-3 similarly to broadband PCS service and AWS-1 service due to the comparable capital requirements and other factors, such as issues involved in relocating incumbents and developing markets, technologies, and services.[127]

37. *3650–3700 MHz band*. In March 2005, the Commission released a *Report and Order and Memorandum Opinion and Order* that provides for nationwide, non-exclusive licensing of terrestrial operations, using contention-based technologies, in the 3650 MHz band (i.e., 3650–3700 MHz).[128] As of April 2010, more than 1,270 licenses have been granted and more than 7,433 sites have been registered. The Commission has not developed a definition of small entities applicable to 3650–3700 MHz band nationwide, non-exclusive licensees. However, we estimate that the majority of these licensees are Internet Access Service Providers (ISPs) and that most of those licensees are small businesses.

38. *Fixed Microwave Services*. Microwave services include common carrier,[129] private-operational fixed,[130] and broadcast auxiliary radio services.[131] They also include the Local Multipoint Distribution Service (LMDS),[132] the Digital Electronic Message Service (DEMS),[133] and the 24 GHz Service,[134] where licensees can choose between common carrier and non-common carrier status.[135] At present, there are approximately 36,708 common carrier fixed licensees and 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. There are approximately 135 LMDS licensees, three DEMS licensees, and three 24 GHz licensees. The Commission has not yet defined a small business with respect to microwave services. The closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite),[136] and the appropriate size standard for this category under SBA rules is that such a business is small if it has 1,500 or fewer employees.[137] For this industry, U.S. Census Bureau data for 2012 show that there were 967

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[127] *See Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket No. 02-353, Report and Order, 18 FCC Rcd 25162, Appx. B (2003), *modified by Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket No. 02-353, Order on Reconsideration, 20 FCC Rcd 14058, Appx. C (2005); *Service Rules for Advanced Wireless Services in the 1915–1920 MHz*, *1995–2000 MHz*, *2020–2025 MHz and 2175–2180 MHz Bands; Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket Nos. 04-356, 02-353, Notice of Proposed Rulemaking, 19 FCC Rcd 19263, Appx. B (2005); *Service Rules for Advanced Wireless Services in the 2155–2175 MHz Band*, WT Docket No. 07-195, Notice of Proposed Rulemaking, 22 FCC Rcd 17035, Appx. (2007).

[128] *Wireless Operations in the 3650-3700 MHz Band Rules for Wireless Broadband*, ET Docket No. 04-151, Report and Order and Memorandum Opinion and Order, 20 FCC Rcd 6502, 6530, ¶ 75 (2005) (*3650-3700 MHz Band R&O*).

[129] *See* 47 CFR Part 101, Subparts C and I.

[130] *See* 47 CFR Part 101, Subparts C and H.

[131] Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission's Rules. *See* 47 CFR Part 74. Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

[132] *See* 47 CFR Part 101, Subpart L.

[133] *See* 47 CFR Part 101, Subpart G.

[134] *See id*.

[135] *See* 47 CFR §§ 101.533, 101.1017.

[136] U.S. Census Bureau, *2012 NAICS Definitions, 517210 Wireless Telecommunications Carriers (Except Satellite)*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210.

[137] *See* 13 CFR § 121.201, NAICS Code 517210.

firms that operated for the entire year.[138] Of this total, 955 firms had fewer than 1,000 employees and 12 had employment of 1,000 employees or more.[139] Thus, under this SBA category and the associated size standard, the Commission estimates that a majority of fixed microwave service licensees can be considered small.

39. The Commission does not have data specifying the number of these licensees that have more than 1,500 employees, and thus is unable at this time to estimate with greater precision the number of fixed microwave service licensees that would qualify as small business concerns under the SBA's small business size standard. Consequently, the Commission estimates that there are up to 36,708 common carrier fixed licensees and up to 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services that may be small and may be affected by the rules and policies adopted herein. We note, however, that the common carrier microwave fixed licensee category does include some large entities.

40. *Broadband Radio Service and Educational Broadband Service.* Broadband Radio Service systems, previously referred to as Multipoint Distribution Service (MDS) and Multichannel Multipoint Distribution Service (MMDS) systems and "wireless cable," transmit video programming to subscribers and provide two-way high speed data operations using the microwave frequencies of the Broadband Radio Service (BRS) and Educational Broadband Service (EBS) (previously referred to as the Instructional Television Fixed Service (ITFS)).[140] In connection with the 1996 BRS auction, the Commission established a small business size standard as an entity that had annual average gross revenues of no more than $40 million in the previous three calendar years.[141] The BRS auctions resulted in 67 successful bidders obtaining licensing opportunities for 493 Basic Trading Areas (BTAs). Of the 67 auction winners, 61 met the definition of a small business. BRS also includes licensees of stations authorized prior to the auction. At this time, we estimate that of the 61 small business BRS auction winners, 48 remain small business licensees. In addition to the 48 small businesses that hold BTA authorizations, there are approximately 392 incumbent BRS licensees that are considered small entities.[142] After adding the number of small business auction licensees to the number of incumbent licensees not already counted, we find that there are currently approximately 440 BRS licensees that are defined as small businesses under either the SBA or the Commission's rules.

41. In 2009, the Commission conducted Auction 86, the sale of 78 licenses in the BRS areas.[143] The Commission offered three levels of bidding credits: (1) a bidder with attributed average annual gross revenues that exceed $15 million and do not exceed $40 million for the preceding three years (small business) received a 15% discount on its winning bid; (2) a bidder with attributed average

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

[139] *Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

[140] *Amendment of Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service and Implementation of Section 309(j) of the Communications Act—Competitive Bidding*, MM Docket No. 94-131, PP Docket No. 93-253, Report and Order, 10 FCC Rcd 9589, 9593, para. 7 (1995).

[141] 47 CFR § 21.961(b)(1).

[142] 47 U.S.C. § 309(j). Hundreds of stations were licensed to incumbent MDS licensees prior to implementation of Section 309(j) of the Communications Act of 1934, 47 U.S.C. § 309(j). For these pre-auction licenses, the applicable standard is SBA's small business size standard of 1,500 or fewer employees.

[143] *Auction of Broadband Radio Service (BRS) Licenses, Scheduled for October 27, 2009, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 86*, AU Docket No. 09-56, Public Notice, 24 FCC Rcd 8277 (2009).

annual gross revenues that exceed $3 million and do not exceed $15 million for the preceding three years (very small business) received a 25% discount on its winning bid; and (3) a bidder with attributed average annual gross revenues that do not exceed $3 million for the preceding three years (entrepreneur) received a 35% discount on its winning bid.[144] Auction 86 concluded in 2009 with the sale of 61 licenses.[145] Of the ten winning bidders, two bidders that claimed small business status won 4 licenses; one bidder that claimed very small business status won three licenses; and two bidders that claimed entrepreneur status won six licenses.

42. In addition, the SBA's Cable Television Distribution Services small business size standard is applicable to EBS. There are presently 2,436 EBS licensees. All but 100 of these licenses are held by educational institutions. Educational institutions are included in this analysis as small entities.[146] Thus, we estimate that at least 2,336 licensees are small businesses. Since 2007, Cable Television Distribution Services have been defined within the broad economic census category of Wired Telecommunications Carriers; that category is defined as follows: "This industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies."[147] The SBA has developed a small business size standard for this category, which is: all such firms having 1,500 or fewer employees. To gauge small business prevalence for these cable services we must, however, use the most current census data that are based on the previous category of Cable and Other Program Distribution and its associated size standard: all such firms having $13.5 million or less in annual receipts.[148] For this industry, U.S. Census data for 2012 show that there were 3,117 firms that operated that year.[149] Of this total, 3,083 operated with fewer than 1,000 employees.[150] Thus, the majority of these firms can be considered small.

5. Satellite Service Providers

43. *Satellite Telecommunications Providers.* This category comprises firms "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."[151] Satellite telecommunications service providers include satellite and earth station operators. The category has a small business size standard of $32.5 million or less in

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[144] *Id.* at 8296, para. 73.

[145] *Auction of Broadband Radio Service Licenses Closes, Winning Bidders Announced for Auction 86, Down Payments Due November 23, 2009, Final Payments Due December 8, 2009, Ten-Day Petition to Deny Period*, Public Notice, 24 FCC Rcd 13572 (2009).

[146] The term "small entity" within SBREFA applies to small organizations (nonprofits) and to small governmental jurisdictions (cities, counties, towns, townships, villages, school districts, and special districts with populations of less than 50,000). 5 U.S.C. §§ 601(4)-(6). We do not collect annual revenue data on EBS licensees.

[147] U.S. Census Bureau, *2012 NAICS Definitions, 517110 Wired Telecommunications Carriers* (partial definition), http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517110&search=2012.

[148] 13 CFR § 121.201, NAICS code 517110.

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

[150] *Id.*

[151] U.S. Census Bureau, *2017 NAICS Definitions, 517410 Satellite Telecommunications,* http://www.census.gov/naics/2007/def/ND517410.HTM.https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517410&search=2017+NAICS+Search&search=2017.

average annual receipts, under SBA rules.[152] For this category, U.S. Census Bureau data for 2012 show that there were a total of 333 firms that operated for the entire year.[153] Of this total, 299 firms had annual receipts of less than $25 million.[154] Consequently, we estimate that the majority of satellite telecommunications providers are small entities.

44. *All Other Telecommunications.* The "All Other Telecommunications" category is comprised of entities that are primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation.[155] 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.[156] Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.[157] The SBA has developed a small business size standard for "All Other Telecommunications," which consists of all such firms with gross annual receipts of $32.5 million or less.[158] For this category, U.S. Census Bureau data for 2012 show that there were 1,442 firms that operated for the entire year.[159] Of these firms, a total of 1,400 had gross annual receipts of less than $25 million.[160] Consequently, a majority of "All Other Telecommunications" firms potentially affected by our action can be considered small.

6. Cable Service Providers

45. Because section 706 of the Act requires us to monitor the deployment of broadband using any technology, we anticipate that some broadband service providers may not provide telephone service. Accordingly, we describe below other types of firms that may provide broadband services, including cable companies, MDS providers, and utilities, among others.

46. *Cable and Other Subscription Programming.* This industry comprises establishments primarily engaged in operating studios and facilities for the broadcasting of programs on a subscription or fee basis. The broadcast programming is typically narrowcast in nature (e.g., limited format, such as news, sports, education, or youth-oriented). These establishments produce programming in their own facilities or acquire programming from external sources. The programming material is usually delivered to a third party, such as cable systems or direct-to-home satellite systems, for transmission to viewers.[161] The SBA size standard for this industry establishes as small, any company in this category which has

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[152] 13 CFR § 121.201, NAICS Code 517410.

[153] U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, *Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012*, NAICS Code 517410, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~517410.

[154] *Id*.

[155] *See* U.S. Census Bureau, 2017 NAICS Definitions, NAICS Code "517919 All Other Telecommunications", https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517919&search=2017+NAICS+Search&search=2017

[156] *Id*.

[157] *Id*.

[158] 13 CFR § 121.201; NAICS Code 517919.

[159] U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, *Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012*, NAICS Code 517919, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~517919.

[160] *Id.*

[161] *See* U.S. Census Bureau, *2012 NAICS Definitions, 515210 Cable and other Subscription Programming*, https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.515210#.

annual receipts of $38.5 million or less.[162] According to 2012 U.S. Census Bureau data, 367 firms operated for the entire year.[163] Of that number, 319 operated with annual receipts of less than $25 million a year and 48 firms operated with annual receipts of $25 million or more.[164] Based on this data, the Commission estimates that the majority of firms operating in this industry are small.

47. *Cable Companies and Systems (Rate Regulation).* The Commission has developed its own small business size standards for the purpose of cable rate regulation. Under the Commission's rules, a "small cable company" is one serving 400,000 or fewer subscribers nationwide.[165] Industry data indicate that there are currently 4,600 active cable systems in the United States.[166] Of this total, all but nine cable operators nationwide are small under the 400,000-subscriber size standard.[167] In addition, under the Commission's rate regulation rules, a "small system" is a cable system serving 15,000 or fewer subscribers.[168] Current Commission records show 4,600 cable systems nationwide.[169] Of this total, 3,900 cable systems have fewer than 15,000 subscribers, and 700 systems have 15,000 or more subscribers, based on the same records.[170] Thus, under this standard as well, we estimate that most cable systems are small entities.

48. *Cable System Operators (Telecom Act Standard).* The Communications Act of 1934, as amended, also contains a size standard for small cable system operators, which is "a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1% of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed $250,000,000."[171] There are approximately 52,403,705 cable video subscribers in the United States today.[172] Accordingly, an operator serving fewer than 524,037 subscribers shall be deemed a small operator if its annual revenues, when combined with the total annual revenues of all its affiliates, do not exceed $250 million in the aggregate.[173] Based on available data, we find that all but nine incumbent cable operators are small entities under this size standard.[174] We note that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose

[162] *See* 13 C.F.R. 121.201, NAICS Code 515210.

[163] *See* U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, *Information: Subject Series - Estab & Firm Size: Receipts Size of Firms for the U.S.: 2012*, NAICS Code 515210, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~515210.

[164] *Id*. Available census data do not provide a more precise estimate of the number of firms that have receipts of $38.5 million or less.

[165] 47 CFR § 76.901(e).

[166] The number of active, registered cable systems comes from the Commission's Cable Operations and Licensing System (COALS) database on August 15, 2015. *See* FCC, *Cable Operations and Licensing System (COALS)*, www.fcc.gov/coals (last visited Oct. 25, 2016).

[167] *See* SNL KAGAN, *Top Cable MSOs,* https://www.snl.com/Interactivex/TopCableMSOs.aspx.

[168] 47 CFR § 76.901(c).

[169] *See March 31, 2013 Broadcast Station Totals Press Release.*

[170] *See* FCC, *Cable Operations and Licensing System (COALS)*, www.fcc.gov/coals (last visited Oct. 25, 2016).

[171] 47 CFR § 76.90(f) and ns. 1, 2, and 3.

[172] *See* SNL KAGAN at http://www.snl.com/interactivex/MultichannelIndustryBenchmarks.aspx.

[173] 47 CFR § 76.901(f) and ns. 1, 2, and 3.

[174] *See* SNL KAGAN at http://www.snl.com/interactivex/TopCable MSOs.aspx.

gross annual revenues exceed $250 million.[175] Although it seems certain that some of these cable system operators are affiliated with entities whose gross annual revenues exceed $250 million, we are unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

7. All Other Telecommunications

49. *Electric Power Generators*, *Transmitters*, *and Distributors.* This U.S. industry is comprised of establishments that are primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes entities 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. Entities providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.[176] The closest applicable SBA category is "All Other Telecommunications". The SBA's small business size standard for "All Other Telecommunications," consists of all such firms with gross annual receipts of $32.5 million or less.[177] For this category, U.S. Census data for 2012 show that there were 1,442 firms that operated for the entire year. Of these firms, a total of 1,400 had gross annual receipts of less than $25 million.[178] Consequently, we estimate that under this category and the associated size standard the majority of these firms can be considered small entities.

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

50. The potential modifications proposed in the *Third Notice*, if adopted, would impose some new reporting, recordkeeping, or other compliance requirements on some small entities. Specifically, in addition to information adopted in the *Second Report and Order*, we propose that providers of broadband Internet access service submit latency information (for fixed providers), backhaul speed and technology for each base station (for fixed wireless providers), and details of their propagation models (for mobile providers). All providers of broadband Internet access service would be required to provide a certification from a qualified engineer that the information provided in their biannual Digital Opportunity Data Collection filings are true and correct. They also would be able to challenge the broadband coverage maps, providers' availability data, or data in the Fabric.

51. In addition, as a means of improving the accuracy and reliability of broadband Internet access service data, the Commission proposes a number of methods to verify the information in the providers' filings, including a challenge process and receiving verified data from third parties and governmental mapping entities. We also seek comment on how to implement provider coverage map verification and enhancement tools for mobile services, including on-the-ground data, infrastructure data, and a challenge process. The adoption of any of these verification processes could subject small entities and other providers to additional submission, recordkeeping, and compliance requirements.

52. In addition, since the Broadband DATA Act grants fixed broadband Internet access service providers the ability to submit availability data using a list of addresses or locations, the

[175] The Commission does receive such information on a case-by-case basis if a cable operator appeals a local franchise authority's finding that the operator does not qualify as a small cable operator pursuant to section 76.901(f) of the Commission's rules. *See* 47 CFR § 76.901(f).

[176] *See* NAICS Association, *NAICS Code Description*, https://www.naics.com/naics-code-description/?code=517919.

[177] 13 CFR § 121.201; NAICS Code 517919.

[178] *See* U.S. Census Bureau, *American Fact Finder*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ4&prodType=table.

Commission seeks comment on how to implement a location-based reporting requirement for small entities and other providers. We also seek comment on whether to impose penalties for providers that file materially inaccurate or incomplete data related to availability or quality of broadband Internet access service. We also ask about the scope and timing of filing corrected data when it is determined that a provider's Digital Opportunity Data Collection information is inaccurate or incomplete. If adopted, any of these requirements could impose additional reporting, recordkeeping, or other compliance obligations on small entities.

53. The issues raised for consideration and comment in the *Third Notice* may require small entities to hire attorneys, engineers, consultants, or other professionals. At this time, however, the Commission cannot quantify the cost of compliance with any potential rule changes and compliance obligations for small entities that may result from the *Third Notice.* We expect our requests for information on potential burdens on small entities associated with matters raised in the *Third Notice* will provide us with information to assist with our evaluation of the cost of compliance on small entities of any reporting, recordkeeping, or other compliance requirements we adopt.

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

54. 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 (among others) the following four alternatives: (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[179]

55. As an initial matter, we propose to limit the providers required to make biannual Digital Opportunity Data Collection filings to only facilities-based providers. This limitation, if adopted, will save some small entities from having to make Digital Opportunity Data Collection filings. In addition, we propose to eliminate the collection of business-only broadband data which, if adopted, would save small entities from having to track and report such data.

56. To assist the Commission's evaluation of the economic impact on small entities as a result of actions that may result from proposals and issues raised for consideration in the *Third Notice*, and to better explore options and alternatives, the Commission has sought comment from the public on how best to implement the requirements in the Broadband DATA Act. More specifically, the Commission seeks comment on what burdens are associated with the potential requirements discussed in collecting broadband Internet access service data and how such burdens can be minimized for small entities. For example, the Commission has sought comment on the potential burdens on small providers associated with: (1) requiring providers to submit on-the-ground data to validate mobile broadband coverage; and (2) encouraging small providers to participate in the challenge process.

57. In addition, we seek comment on how best to ensure the collection of high-quality broadband availability and quality of service data as part of the Digital Opportunity Data Collection. The Broadband DATA Act requires the Commission to establish a process in which a provider that has fewer than 100,000 active broadband Internet access service connections may request and receive assistance from the Commission with respect to GIS data processing to ensure that the provider is able to comply with the Broadband DATA Act in a timely and accurate manner.[180] We also propose to make service-desk help available, as well as providing clear instructions on the form for the Digital Opportunity Data Collection, to aid small providers in making their filings. In response to the *Digital Opportunity Data*

[179] 5 U.S.C. § 603(c).

[180] 47 U.S.C. § 644(d).

Collection Order and Further Notice, we received several comments asking for us to provide technical assistance to small providers,[181] and we seek comment on the extent of such technical assistance and any other help that small providers will need to comply with the Broadband DATA Act.

58. More generally, the proposals and questions laid out in the *Third Notice* were designed to enable the Commission to understand the benefits, impact, and potential burdens associated with the different approaches that the Commission can pursue to achieve its objective of improving accuracy and reliability of its data collections. Before reaching its final conclusions and taking action in this proceeding, the Commission expects to review the comments filed in response to the *Third Notice* and more fully consider the economic impact on small entities and how any impact can be minimized.

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

59. None.

[181] *See* Connected Nation Comments at 5 (requesting GIS processing assistance for providers under a certain size—perhaps those with fewer than 20,000 connections); WTA Comments at 4 (agreeing with Connected Nation's comments); ACA Connects Reply at 6 (arguing that help desk support will only be useful for smaller providers (those with fewer than 100,000 subscribers) if the Commission provides technical assistance in helping them create shapefiles).

STATEMENT OF
CHAIRMAN AJIT PAI

Re: *Establishing the Digital Opportunity Data Collection*, WC Docket No. 19-195; *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10.

215 years ago today, Meriwether Lewis and William Clark recorded in their journals the distances of various landmarks from their White Bear Island camp, in what would later become the state of Montana. They documented things like a "timbered island" one-and-a-half miles to the southwest and a cliff at a bend in the river one mile south. The intrepid explorers who set out to map the West understood the importance of accurate mapping. And that need is no less evident to us as we push the frontier of broadband access so that all Americans can get connected, no matter where they live.

Closing the digital divide has always been my top priority as FCC Chairman. And we've been moving forward with bold steps to connect Americans we know are currently unserved. The Commission's existing broadband coverage maps have allowed us to identify the least-served parts of the country, such as the more than 5.3 million rural homes and businesses that could receive a broadband connection as a result of the upcoming Rural Digital Opportunity Phase I auction.

But as we continue our efforts to bring digital opportunity to every American, we will need more granular and precise maps to know exactly where broadband is and isn't available. This is especially true for partially served census blocks—areas in which some locations have access to broadband but others don't. And like Lewis and Clark, we recognize we cannot go it alone, but rather must rely in part on those who live and work in these areas to tell us what the facts are on the ground and help make our maps more accurate and reliable.

That's why in 2017, I proposed to update the approach to mapping adopted under the prior Administration, and why we adopted the Digital Opportunity Data Collection last August. Specifically, we approved a three-pronged approach to broadband mapping. First, service providers, who have the best information on the design and location of their networks, would provide the Commission with granular information about the areas where they make service available. Second, the Commission would develop a database of all locations where broadband connections might be needed and overlay upon it the coverage information from service providers. And third, the Commission would empower individual consumers, along with state, local, and Tribal governments and other entities, to contribute to the maps and provide feedback on their accuracy.

In March of this year, Congress passed the Broadband DATA Act, largely ratifying our three-pronged approach to broadband mapping. Today, we take the next step in developing the new broadband maps and implementing the Broadband DATA Act. We build on the approach we adopted last August for fixed and mobile broadband mapping. We provide flexibility to providers to design their networks as they see fit, while still ensuring that coverage maps accurately reflect where consumers can expect to have access in the real world.

We do that by allowing service providers to use the information they have about where they can provide service—within guardrails we impose to prevent providers from overstating coverage—and requiring transparency from providers so that Commission staff and the public can see how the maps were created and target efforts to verify the coverage maps to those areas where problems are most likely to arise. And we take steps today to allow consumers, governments, and other entities to directly participate in the mapmaking process and seek comment on the best way to gather and incorporate that feedback into the maps.

All of these measures will result in accurate and precise maps that will allow us to make sure that when a provider says it covers an area, we can be confident service is actually available. And if the maps indicate that service isn't available, we'll have additional actionable data we can use to target assistance and further promote broadband deployment.

But unfortunately, not all the news on the mapping front is positive. While today's item is a significant step forward that sets many of the standards for the next generation of broadband maps, Congress has yet to provide the funding we need for implementing the necessary systems for collecting and processing providers' coverage data, developing the nationwide fabric of serviceable locations, or conducting the in-depth verification and challenge processes that will ensure the reliability of the maps. In fact, in the Broadband DATA Act, Congress actually took away from us the only source of funding that was available for this vital work by prohibiting the Universal Service Administrative Company from being involved in this project. The solution to this problem is obvious. As I've said repeatedly, and as we've warned since the fall of 2019, Congress must give us the resources we need to implement the Broadband DATA Act. Or to put it another way, we need money before maps, dollars before data. Once we get it, we'll be able to do the hard work of producing broadband availability maps with unprecedented detail, which will boost our efforts to close the digital divide.

My thanks to the staff in every corner of this agency that contributed to this item, including Pamela Arluk, Kirk Burgee, Justin Faulb, Alexander Minard, Kris Monteith, and Michael Ray of the Wireline Competition Bureau; Kenneth Baker, Erin Boone, Monica DeLong, Stacy Ferraro, Ben Freeman, Garnet Hanly, William Holloway, Susannah Larson, Jennifer Salhus, Dana Shaffer, Ziad Sleem, Sean Spivey, Donald Stockdale, Joel Taubenblatt, Thuy Tran, and Janet Young of the Wireless Telecommunications Bureau; Emily Burke, Jonathan Campbell, Patrick DeGraba, Judith Dempsey, Alex Espinosa, Chelsea Fallon, Joanna Fister, Michael Janson, Rachel Kazan, Eugene Kiselev, Kenneth Lynch, Kim Makuch, Catherine Matraves, Jonathan McCormack, Giulia McHenry, Jeffrey Prince, Steven Rosenberg, Sean Sullivan, and Margaret Weiner of the Office of Economics and Analytics; Martin Doczkat, Monisha Ghosh, Ira Keltz, Padma Krishnaswamy, Aspasia Paroutsas, Robert Pavlak, and Ronald Repasi of the Office of Engineering and Technology; Denise Coca, Jameyanne Fuller, Gabrielle Kim, Kerry Murray, Jim Schlichting, and Thomas Sullivan of the International Bureau; Rizwan Chowdhry, Pamela Gallant, Jeffrey Gee, Rosemary Harold, Kalun Lee, and Jeremy Marcus of the Enforcement Bureau; Eduard Bartholme, James Brown, Zac Champ, Gregory Cooke, Matthew Duchesne, Barbara Esbin, Mark Stone, Patrick Webre, and Kimberly Wild of the Consumer and Governmental Affairs Bureau; Deena Shetler of the Office of Managing Director; Jeffery Goldthorp, Lauren Kravetz, Nicole McGinnis, and Austin Randazzo of the Public Safety and Homeland Security Bureau; and Malena Barzilai, Michael Carlson, William Dever, David Horowitz, Richard Mallen, Keith McCrickard, and Bill Richardson of the Office of General Counsel.

STATEMENT OF
COMMISSIONER MICHAEL O'RIELLY

Re: *Establishing the Digital Opportunity Data Collection*, WC Docket No. 19-195; *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10.

The final item for consideration is perhaps one of the most important ones we will consider this year. Some would argue—and I can certainly sympathize with this perspective—that this item should have been front and center on today's agenda and not relegated to the very end of the meeting. No matter where it falls on July's list of items, fixing the Commission's maps, which are woefully inadequate for determining broadband coverage and service, remains a critical priority for the Commission.

Thanks to Congress' successful bipartisan efforts in the Broadband DATA Act, we are finally taking affirmative steps to fix the situation. It never should have come to this. For years, maybe even a decade or more, almost everyone has acknowledged that the Form 477 data was deficient to determine broadband coverage in America. That's because that specific data collection was never meant to be used for this purpose and provided, at best, just a raw snapshot of a provider's coverage. For instance, it served our purpose for establishing model-based support and tracking year-to-year progress in deployment. Unfortunately, when policymakers and even consumers began asking for, and in many cases demanding, more accurate data, we didn't pivot fast enough or with sufficient resolve to meet the real need.

Today, we restart the process of climbing out of the tremendous hole we've dug. Hopefully, we are doing so consistent with Congress' direction, which made a number of corrective changes to the data collection path we set upon just last year, for example, by requiring the establishment of a serviceable location fabric for fixed broadband and precluding the Commission from delegating its mapping responsibilities under the Act to USAC. At the same time, Congress expected the Commission to use the new maps for future decision making and not rush ahead in creating new subsidy programs absent this important data. The law is fairly clear on this point, but in case it wasn't, I've heard directly from a number of Senators on exactly what they expect from the Commission, and I intend to follow their expectations.

In terms of fixing our data deficiencies, I am grateful to the Chairman for accepting some of my requests to improve the item, particularly my requests to adopt more realistic maximum buffers for wireline networks and vastly pare down or seek further comment on the colossally burdensome and highly sensitive infrastructure information being requested from wireless providers, and at the very least, treat this information as presumptively confidential. The revised draft now appropriately reevaluates the need for such sensitive information, and I am grateful that our offices were able to work together to find a suitable landing spot on this issue. This approach is consistent with my longstanding philosophy that reporting requirements should not be unduly burdensome, as I have worked to minimize and eliminate unnecessary reporting across our rules, including in proceedings related to our Disaster Information Reporting System, submarine cable data, rate of return regulation, and Kid Vid rules. In fact, for those with time on their hands, I even wrote an entire blog post several years ago taking stock of the FCC's disproportionate paperwork burdens.

Speaking of my regulatory philosophy, the initially circulated draft was also at odds with my approach to delegation by punting certain major future mapping decisions to Commission staff, or, in other words, leaving those determinations completely up to the Chair and effectively cutting Commissioners out of the process. I thank Chairman Pai for agreeing to adopt my edits to eliminate certain inappropriate delegations and ensure our mapping decisions going forward are transparent and accountable.

In the end, I'm hopeful that we are turning the corner on the Commission's inaccurate mapping problems, and that the products of these efforts will allow us to make better decisions on how best to bring service to those Americans who remain unserved.

STATEMENT OF
COMMISSIONER BRENDAN CARR

Re: *Establishing the Digital Opportunity Data Collection*, WC Docket No. 19-195;
Modernizing the FCC Form 477 Data Program, WC Docket No. 11-10.

As we make more and more progress in closing the digital divide it becomes more and more important that we identify with precision the homes and business that still lack access to high-speed Internet service. This will ensure that we target our efforts and focus our universal service programs on extending Internet infrastructure to the families that live and work in those communities.

There is now bipartisan agreement that doing this requires better maps. The FCC's now infamous Form 477 dates back roughly 20 years. It was never designed to produce the type of granular data needed to generate detailed broadband coverage maps. And when the FCC updated Form 477 in years past, it declined to collect data at a more granular level than the census block. That has led to some gaps in our data, as areas without broadband service can be counted as served under the existing approach.

On the bright side, our Form 477 data are good at identifying areas that are completely unserved. And that's why I am glad the FCC is moving ahead with Phase I of the Rural Digital Opportunity Fund, which can ensure that Americans living in those unserved areas need not wait any longer than necessary to receive high-speed service.

Going forward, though, we are going to need better data, and that's why Chairman Pai decided in 2017 to start the process that could produce those maps. His early efforts on this front are paying off as the Commission took a pivotal step in 2019 when we adopted the Digital Opportunity Data Collection. This Collection will allow us to develop a nationwide broadband map that will have unprecedent detail.

Congress largely codified those FCC efforts when it passed the Broadband DATA Act in March of 2020. So today we take the next step in our work to stand up detailed coverage maps with the backing and guidance provided by Congress in the DATA Act.

As we do so, I want to thank my colleagues for agreeing to some significant changes to our decision. As originally drafted, the Order imposed essentially two sets of requirements on mobile wireless providers. One set of rules flows largely from mandates Congress included in the DATA Act. Those obligations require carriers to submit standardized predictive propagation maps, and they require details on everything from cell edge probability and cell loading to clutter factors and propagation models.

In a separate section, the draft Order required carriers to provide over a dozen sets of network infrastructure information. Given the potential overlap between those two sets of information collections, I asked my colleagues to move the infrastructure section from the Order to the Further Notice. I very much appreciate that my colleagues agreed to this request because this will allow us some additional time to ensure that any additional infrastructure reporting requirements line up with the information we are already going to collect through our DATA Act requirements. I am also pleased that we have made clear that while this information is of great public importance, providers can still seek confidential treatment for sensitive information.

With these changes, I am happy to vote to approve. So I want to thank the staff of the Wireline Competition Bureau, the Wireless Telecommunications Bureau, and the Office of Economics and Analytics for their hard work on his item. It has my support.

STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL,
APPROVING IN PART, DISSENTING IN PART

Re: *Establishing the Digital Opportunity Data Collection*, WC Docket No. 19-195; *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10.

In 1993 the novelist William Gibson is reported to have said "the future is here, it's just not very evenly distributed." Recall at that time accessing the internet meant the hiss and ding of a dial-up modem, mobile phones were the size of a brick, and real bragging rights came with every visit to the world wide web. But in many ways Gibson's commentary is the most honest thing you can say about broadband today. The future of broadband is here, but it's not evenly distributed. There are communities in this country with blazing fast gigabit speeds and areas where buffering means suffering and still others where there is no service to be found at all.

The sad truth is that the Federal Communications Commission does not know with precision where these areas are. We don't know where broadband is and is not across this country. We don't know with accuracy what areas have wired service. We don't know with accuracy what areas have wireless service.

If you think that's crazy, you're right. We're in this mess because for the last several years we have failed to put in place the kind of updated broadband collection that would yield accurate and honest data about where service is located. The agency tried a year ago with its Digital Opportunity Data Collection but then nothing happened. In fact, during the last three years we have made almost no changes to our data gathering process, despite pleas from consumers who are angry that our existing maps say they have service when they know all too well they do not, despite pleas from state and local officials that we have our facts wrong, and despite identical pleas from federal officials—including one cabinet secretary—who dismissed FCC maps as "fake news."

But no more. That's because Congress finally told us to clean up our act in the Broadband DATA Act. So that is what we do here. We implement this new law—and we mostly get it right. We require carriers to produce granular data about where they are able to provide both wired and wireless services. Then we commit to checking and validating this information, in part through the use of crowdsourcing. This is smart because we are using the wisdom of the crowd. There are people across the country who want to help and are willing to participate. As we go forward, we need to make it simple for them as well as our state, local, and Tribal partners to do so. To this end, our rulemaking asks important questions about how the challenge process will work and how we can offer technical assistance to those in need. I am pleased it also asks about an idea I offered long ago—a pilot program to take advantage of existing services like postal trucks that crisscross rural communities every day and could help us perfect our new maps. All in all, this is a big undertaking and we need to get working because statutory deadlines loom.

But there is one thing we surely get wrong. We are going to gather all of this precise data about where broadband is and is not, but we are not going to use any of it this fall when we distribute $16 billion in funding for improved broadband service across the country. In fact, the way this works is that less than one week before the election the FCC will distribute 80 percent of these broadband funds for the next decade. If you think that sounds irresponsible, you're right. Because when a major trade association studied the accuracy of our existing data and maps, it found an error rate of nearly two in five. None of us would ever invest our own funds this way. We shouldn't be so cavalier with public dollars—especially when they are being spent to solve the digital divide and make sure the future is more evenly distributed.

So we have this backwards. We are giving out funding before rolling up our sleeves and doing the hard work to fix our maps. In the end, that is my primary concern with our efforts today. For too long we have accepted the fact that our data is wrong and ignored the fact that it limits our ability to target

policy solutions effectively. I appreciate that we make changes today. But I regret that it took an act of Congress to force us to do so. For these reasons, I approve in part and dissent in part.

STATEMENT OF
COMMISSIONER GEOFFREY STARKS,
CONCURRING

Re: *Establishing the Digital Opportunity Data Collection*, WC Docket No. 19-195; *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10.

It has been nearly six months since the COVID-19 pandemic reached the United States. In that time, our way of life has been transformed. For millions of Americans, work duties, educational resources, and healthcare have all moved online. Our networks have, accordingly, faced unprecedented demand—but not from the millions of others who do not have high quality broadband at home. From the widespread imposition of stay-at-home orders to the anticipated need for remote instruction from many schools in the fall, we have more than enough evidence that we must address the digital divide now.

To meet that challenge, we must have accurate data. As I have said many times, we are leaving real people behind—knowingly—when we make funding decisions based on data that blinds us to the reality of internet inequality in many places. Earlier this year, I argued against spending three-quarters of the Rural Digital Opportunity Fund based on our existing, flawed data. I will continue to oppose efforts to rush the 5G Fund out the door without first fixing our maps. We have for years spent and, because of RDOF, will for the next decade spend, billions and billions of dollars without a comprehensive understanding of where broadband is and is not. Without doubt, today marks the beginning of the end of that era.

Though I wish we had acted sooner, I am glad that Congress created a clear deadline and expectations in the Broadband DATA Act. Today's Order is an important step on the path Congress has laid out. I appreciate the efforts of the many parties that proposed refinements to the reporting standards we adopt today. I was particularly concerned that the buffer size proposed in the draft Order was incompatible with industry standards for rural fiber deployment and might inadvertently increase the costs by encouraging the use of unnecessary aggregation points. The version we adopt today better reflects the capabilities of today's rural fiber networks. I am also pleased that we establish mapping parameters for 5G-NR services. We will soon need that data to ensure that all Americans share the benefits of the 5G future.

Still, our work is not complete, and the Broadband DATA Act requires more than rules the Commission adopts today. In particular, Congress has mandated rigorous challenge and verification processes, and we will need robust engagement from parties in the coming weeks to finalize those procedures before the statutory deadline. I will be particularly focused on suggestions for improving our coordination with state and local governments. Those entities have provided a badly needed check in our past challenge processes. We will need their assistance, and it is regrettable that we did not move sooner to fulfill our statutory obligations under the Broadband DATA Act. The result, I fear, will require those parties—and all interested parties—yet again to act fast with their backs against the wall and billions of federal dollars at stake.

Once these rules are established and the Broadband DATA Act's deadlines are satisfied, we must keep the urgency. Solving internet inequality requires a clear and complete understanding of the challenges we face—something we will not have until revised maps are released.

I thank the staff from across the Commission who came together to produce this detailed and comprehensive item.