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Federal Communications Commission  
Washington, D.C. 20554

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In the Matter of	)	
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Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act	)	GN Docket No. <u>09-137</u>
	)	
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51

**SIXTH BROADBAND DEPLOYMENT REPORT**

**Adopted:** July 16, 2010

**Released:** July 20, 2010

**By the Commission:** Chairman Genachowski and Commissioners Copps and Clyburn issuing separate statements; Commissioners McDowell and Baker dissenting and issuing separate statements.

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## I. INTRODUCTION

1. This is the Commission's Sixth Report issued under section 706 of the Telecommunications Act of 1996, as amended,<sup>1</sup> which requires the Commission to determine annually whether broadband<sup>2</sup> is being deployed to all Americans in a reasonable and timely fashion.<sup>3</sup> Our analysis of broadband subscribership data and the broadband availability model constructed for the National Broadband Plan<sup>4</sup> indicates that while a substantial majority of Americans have access to broadband connections capable of "originat[ing] and receiv[ing] high-quality voice, data, graphics, and video telecommunications,"<sup>5</sup> roughly 80 million American adults do not subscribe to broadband at home,<sup>6</sup> and approximately 14 to 24 million Americans remain without broadband access capable of meeting the requirements set forth in section 706.

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<sup>1</sup> 47 U.S.C. § 1302(b) (2010). Section 706 of the Telecommunications Act of 1996, Pub. L. No. 104-104, § 706, 110 Stat. 56, 153 (the Act), as amended in relevant part by the Broadband Data Improvement Act, Pub. L. No. 110-385, 122 Stat. 4096 (2008) (BDIA), is now codified in Title 47, Chapter 12 of the United States Code. *See* 47 U.S.C. § 1301 et seq. We now refer to the reports required under section 706 of the Act as "broadband deployment reports" and have updated our references to prior reports accordingly.

<sup>2</sup> As explained below, in this report we use the term "broadband" synonymously with "advanced telecommunications capability." *See infra* para. 10.

<sup>3</sup> 47 U.S.C. § 1302(b). As a one-time event, to take advantage of the Commission's parallel effort to understand the state of broadband deployment when developing the National Broadband Plan, this year's inquiry was conducted in conjunction with the National Broadband Plan proceeding. *See* FCC, OMNIBUS BROADBAND INITIATIVE (OBI), CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN, GN Docket No. 09-51 (2010) (NATIONAL BROADBAND PLAN); *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act; A National Broadband Plan for Our Future*, GN Docket Nos. 09-51, 09-137, Notice of Inquiry, 24 FCC Rcd 10505, 10513, para. 14 (2009) (*Sixth Broadband Deployment NOI*); *A National Broadband Plan for Our Future*, GN Docket No. 09-51, Notice of Inquiry, 24 FCC Rcd 4342 (2009) (*National Broadband Plan NOI*), subsequent Public Notices omitted; *see also* 47 U.S.C. § 1305(k)(2) ("The national broadband plan required by this section shall seek to ensure that all people of the United States have access to broadband capability . . ."). As a consequence, much of the analysis we rely on in this report is summarized in the National Broadband Plan and documents released in support thereof. To avoid unnecessary duplication, some of our findings and analyses from the Plan are adopted by reference.

<sup>4</sup> As explained below, we estimate broadband availability using two sources of data: the FCC Form 477 Part 1A broadband data collection for December 2008 (Dec. 2008 Form 477 Broadband Data) and the National Broadband Plan model (Model). *See infra* Part III.B; Apps. B & C.

<sup>5</sup> 47 U.S.C. § 1302(d)(1) (defining "advanced telecommunications capability"); *see supra* note 2.

<sup>6</sup> *See* NATIONAL BROADBAND PLAN at 167 (relying on the *2010 Broadband Consumer Survey* and stating that "[w]hile 65% of Americans use broadband at home, the other 35% (roughly 80 million adults) do not"); JOHN HERRIGAN, OBI, BROADBAND ADOPTION AND USE IN AMERICA 3 (OBI Working Paper Series No. 1, Feb. 2010) (2010 BROADBAND CONSUMER SURVEY), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-296442A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf). We note that the *2010 Broadband Consumer Survey* counted home broadband users as "those who said they used any one of the following technologies to access the internet from home: cable modem, a DSL-enabled phone line, fixed wireless, satellite, a mobile broadband wireless connection for your computer or cell phone, fiber optic, [or] T-1" without reference to the download or upload speed of their connection. *Id.* at 3. If the broadband speed benchmark used in this report had been used in the survey, it is likely that a larger number of Americans would have been reported as not having broadband.

Notwithstanding tremendous efforts by industry and government, those Americans will not gain such access in the near future absent changes in policy.<sup>7</sup>

2. Accordingly, we conclude that broadband deployment to *all* Americans is not reasonable and timely. This conclusion departs from previous broadband deployment reports, which held that even though certain groups of Americans were not receiving timely access to broadband, broadband deployment “overall” was reasonable and timely.<sup>8</sup>

3. As a consequence of that conclusion, section 706 mandates that the Commission “take immediate action to accelerate deployment of [advanced telecommunications] capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.”<sup>9</sup> The Commission will fulfill that requirement in part by addressing the proposals for Commission action set forth in the National Broadband Plan.<sup>10</sup>

4. In determining whether broadband is being deployed to all Americans in a reasonable and timely fashion, this Sixth Report takes the overdue step of raising the minimum speed threshold for broadband from services in “excess of 200 kilobits per second (kbps) in both directions”—a standard adopted over a decade ago in the *1999 First Broadband Deployment Report*.<sup>11</sup> As anticipated in previous broadband deployment reports, “technologies, retail offerings, and demand among consumers”—or in other words, network capabilities, consumer applications and expectations—have evolved in ways that demand increasing amounts of bandwidth and require us to “[raise] the minimum speed for broadband

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<sup>7</sup> See *infra* Part IV; see also NATIONAL BROADBAND PLAN at 136; *infra* note 121 (explaining that broadband revenue potential in certain areas of the United States is likely insufficient to cover the costs of deploying and operating broadband networks, thus depriving industry of a business case to offer broadband services in these areas).

<sup>8</sup> See *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket No. 98-146, Report, 15 FCC Rcd 20913, 20918, 20995–21003, paras. 8, 217–43 (2000) (*2000 Second Broadband Deployment Report*) (concluding that “[o]verall, deployment of [broadband] to residential customers is reasonable and timely” although certain categories of Americans—including low-income consumers, those living in sparsely populated or rural areas, minority consumers, Indians, persons with disabilities and those living in the U.S. territories—are vulnerable to not having timely access to broadband); see also *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket No. 98-146, Report, 14 FCC Rcd 2398, 2405, para. 16 (1999) (*1999 First Broadband Deployment Report*); *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket No. 98-146, Report, 17 FCC Rcd 2844, 2845, para. 1 (2002) (*2002 Third Broadband Deployment Report*); *Availability of Advanced Telecommunications Capability in the United States*, GN Docket No. 04-54, Report, 19 FCC Rcd 20540, 20547 (2004) (*2004 Fourth Broadband Deployment Report*); *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, GN Docket No. 07-45, Report, 23 FCC Rcd 9615, 9616, para. 1 (2008) (*2008 Fifth Broadband Deployment Report*).

<sup>9</sup> 47 U.S.C. § 1302(b).

<sup>10</sup> See, e.g., NATIONAL BROADBAND PLAN at xi–xv.

<sup>11</sup> See *1999 First Broadband Deployment Report*, 14 FCC Rcd at 2406, para. 20 (stating, in relevant part, that “broadband” and “advanced telecommunications capability” “hav[e] the capability of supporting, in both the provider-to-consumer (downstream) and the consumer-to-provider (upstream) directions, a speed . . . in excess of 200 [kbps] in the last mile”).

from 200 kbps to, for example, a certain number of megabits per second (Mbps).”<sup>12</sup> To put 200 kbps in context, in 1999, voice-over-broadband or interconnected voice over Internet protocol (VoIP) was just beginning to emerge as a consumer application, and web pages were almost entirely text-based, with little embedded graphics or video, making 200 kbps an arguably sufficient benchmark for broadband capability at the time. Today, interconnected VoIP is subscribed to by over 21 million Americans,<sup>13</sup> most web sites feature rich graphics and many embed video, and numerous web sites now exist primarily for the purpose of serving video content to broadband users.<sup>14</sup> As a result, and as predicted by previous broadband deployment reports, services at 200 kbps are not now capable of “originat[ing] and receiv[ing] high-quality voice, data, graphics, and video telecommunications,” as those capabilities are delivered by today’s technology and experienced and expected by today’s broadband users.<sup>15</sup> As a result, we find that the 200 kbps threshold is no longer the appropriate benchmark for measuring broadband deployment for the purpose of this broadband deployment report.

5. As an alternative benchmark for this year’s report, and given that this year’s inquiry was conducted in conjunction with the National Broadband Plan proceeding, we find it appropriate and reasonable to adopt instead the minimum speed threshold of the national broadband availability target proposed in the National Broadband Plan. The National Broadband Plan recommends as a national broadband availability target that every household in America have access to affordable broadband service offering actual download (i.e., to the customer) speeds of at least 4 Mbps and actual upload (i.e., from the customer) speeds of at least 1 Mbps.<sup>16</sup> This target was derived from analysis of user behavior, demands this usage places on the network, and recent experience in network evolution.<sup>17</sup> It is the minimum speed required to stream a high-quality—even if not high-definition—video while leaving sufficient bandwidth for basic web browsing and e-mail, a common mode of broadband usage today that comports directly with section 706’s definition of advanced telecommunications capability.<sup>18</sup> As the target for the broadband capability that the National Broadband Plan recommends should be available to all Americans, this speed threshold provides an appropriate benchmark for measuring whether broadband

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<sup>12</sup> *Id.* at 2407–08, para. 25 (“[W]e may find in future reports that evolution in technologies, retail offerings, and demand among consumers has raised the minimum speed for broadband from 200 kbps to, for example, a certain number of megabits per second (Mbps).”); *see also* 2000 *Second Broadband Deployment Report*, 15 FCC Rcd at 20921, para. 14 (similar); 2002 *Third Broadband Deployment Report*, 17 FCC Rcd at 2851, para. 10 (“recogniz[ing] that products are beginning to emerge that require high-bandwidth capability, such as high-definition video” and that it may be “appropriate to adjust the points at which we gauge advanced telecommunications capability in the future”); 2004 *Fourth Broadband Deployment Report*, 19 FCC Rcd at 20549. *See also* NATIONAL BROADBAND PLAN at 16–17 & Exh. 3-C.

<sup>13</sup> Service providers reported more than 21 million U.S. subscriptions for interconnected VoIP service in the FCC’s Form 477 data collection for December 2008. *See* Dec. 2008 Form 477 Broadband Data.

<sup>14</sup> *See* NATIONAL BROADBAND PLAN at 16, Exh. 3-B (reporting that 42% of home broadband users have downloaded or streamed video); *see also* NATIONAL BROADBAND PLAN at 17 (stating that “Cisco forecasts that video consumption on fixed and mobile networks will grow at over 40% and 120% per year, respectively, through 2013”).

<sup>15</sup> 47 U.S.C. § 1302(d)(1); *see also infra* Part III.A.

<sup>16</sup> *See infra* Part III.A (benchmarking broadband for purposes of this report); NATIONAL BROADBAND PLAN at 135 (recommending that the national broadband availability target also include “acceptable quality of service for the most common interactive applications”).

<sup>17</sup> *See* NATIONAL BROADBAND PLAN at 21, 25 n.50, 135–36; *see also* OBI, BROADBAND PERFORMANCE (Technical Paper, forthcoming).

<sup>18</sup> 47 U.S.C. § 1302(d)(1) (defining “advanced telecommunications capability”).

deployment to all Americans is proceeding in a reasonable and timely fashion. It is by this benchmark that we find that broadband remains unavailable to approximately 14 to 24 million Americans.<sup>19</sup>

6. We recognize that ensuring universal broadband is the great infrastructure challenge of our time and deploying broadband nationwide—particularly in the United States—is a massive undertaking.<sup>20</sup> Therefore, we emphasize that our conclusion in no way diminishes the achievements industry has made deploying better and faster forms of broadband to most Americans, nor the Commission’s past efforts to foster broadband deployment.<sup>21</sup> The fact remains, however, that to ensure the realization of section 706’s goal that *all* Americans may benefit from the full range of services described in the statute, much more remains to be done to foster broadband deployment.<sup>22</sup>

7. As a consequence of our conclusion that broadband is not being deployed to all Americans in a reasonable and timely fashion, section 706 mandates that the Commission “take immediate action to accelerate deployment of [advanced telecommunications] capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.”<sup>23</sup> The National Broadband Plan outlines a number of ways the Commission and others may accelerate broadband deployment.<sup>24</sup> In compliance with section 706, we will consider the proposals for Commission action set forth in the National Broadband Plan for ways to remove barriers to infrastructure investment and promote competition in telecommunications markets. The Commission issued a proposed agenda for considering key recommendations of the National Broadband Plan.<sup>25</sup> The Commission explained the purpose and timing of more than sixty rulemakings and other notice-and-comment proceedings that when completed

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<sup>19</sup> See *infra* Part III.B; Apps. B & C; see also, e.g., NATIONAL BROADBAND PLAN at 136 (stating that, “[a]t present, there are 14 million people living in seven million housing units that do not have access to terrestrial broadband infrastructure capable of meeting the National Broadband Availability Target”). Even if the Commission were to use a significantly slower speed threshold to measure broadband, the evidence shows that 12 million Americans today lack access to terrestrial broadband services capable of delivering actual download speeds in excess of 768 kbps. See *id.* at 157 n.7.

<sup>20</sup> See *id.* at 3.

<sup>21</sup> See, e.g., Letter from Jay Bennett, Assistant Vice President – Federal Regulatory, AT&T Services Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-137, Attach. (filed June 14, 2010) (AT&T June 14 *Ex Parte* Letter) (summarizing industry achievements in broadband deployment); Letter from Glenn T. Reynolds, Vice President – Policy, USTelecom, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-137 (filed July 2, 2010) (USTelecom July 2 *Ex Parte* Letter) (similar).

<sup>22</sup> See USTelecom July 2 *Ex Parte* Letter at 5 (“It is absolutely appropriate for the Commission to be concerned about the remaining small percentage of Americans who may not have access to broadband in the foreseeable future because such deployment is not currently economically viable—indeed, Section 254 of the Act gives the Commission both the responsibility and the authority to ensure ‘access to advanced telecommunications and information services . . . in all regions of the Nation.’”); AT&T June 14 *Ex Parte* Letter at 2 (emphasizing that “to the extent advanced telecommunications capability is not available over terrestrial networks in some limited areas, the Commission’s own data show that such lack of availability is due to the extremely high cost of serving those areas”).

<sup>23</sup> 47 U.S.C. § 1302(b).

<sup>24</sup> See, e.g., NATIONAL BROADBAND PLAN at xi–xv; *id.* at xv (stating that half of the recommendations in the National Broadband Plan are offered to the Commission).

<sup>25</sup> See *FCC Announces Broadband Action Agenda*, FCC News Release (rel. Apr. 8, 2010) (FCC Broadband Action Agenda); see also Proposed 2010 Broadband Action Agenda Items, <http://www.broadband.gov/plan/broadband-action-agenda.html> (last visited June 30, 2010).

“will accelerate deployment and adoption of robust, affordable broadband for all Americans.”<sup>26</sup> Through proceedings already underway and those that are still to be announced, we will work to ensure that “every American has a meaningful opportunity to benefit from the broadband communications era” as envisioned by section 706.<sup>27</sup>

## II. BACKGROUND

8. Section 706 requires the Commission to annually “initiate a notice of inquiry concerning the availability of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms).”<sup>28</sup> In conducting this inquiry, the Commission must “determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.”<sup>29</sup> Section 706 also requires the Commission to provide “demographic information for unserved areas”<sup>30</sup> and include an international comparison in its annual broadband deployment report.<sup>31</sup> The Commission must also conduct a consumer survey to evaluate “the national characteristics of the use of broadband” and make the results of the survey public at least once per year.<sup>32</sup> If the Commission finds that broadband is not being deployed to all Americans in a reasonable and timely fashion, then the Commission “shall take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications

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<sup>26</sup> FCC Broadband Action Agenda at 1. For example, the National Broadband Plan explains that, “[i]nfrastructure such as poles, conduits, rooftops and rights-of-way play an important role in the economics of broadband networks. Ensuring service providers can access these resources efficiently and at fair prices can drive upgrades and facilitate competitive entry.” NATIONAL BROADBAND PLAN at xii. To optimize infrastructure, the National Broadband Plan recommends that the Commission “[e]stablish low and more uniform rental rates for access to poles, and simplify and expedite the process for service providers to attach facilities to poles” and “[i]mprove rights-of-way management for cost and time savings.” *Id.* The Commission has active proceedings to address pole attachments and rights-of-way issues. See FCC Broadband Action Agenda at 6; *Implementation of Section 224 of the Act; Amendment of the Commission’s Rules and Policies Governing Pole Attachments*, WC Docket No. 07-245, RM-11293, RM-11303, Notice of Proposed Rulemaking, 22 FCC Rcd 20195 (2007); *Implementation of Section 224 of the Act, A National Broadband Plan for Our Future*, WC Docket No. 07-245, GN Docket No. 09-51, Order and Further Notice of Proposed Rulemaking, FCC 10-84 (rel. May 20, 2010); *Wireline Competition Bureau Seeks Comment on Level 3 Communications’ Petition for Declaratory Ruling that Certain Right-of-Way Rents Imposed by the New York State Thruway Authority are Preempted Under Section 253*, WC Docket No. 09-153, Public Notice, 24 FCC Rcd 10998 (2009).

<sup>27</sup> See *Joint Statement on Broadband*, GN Docket No. 10-66, 25 FCC Rcd 3420, para. 1 (2010).

<sup>28</sup> 47 U.S.C. § 1302(b).

<sup>29</sup> *Id.*

<sup>30</sup> 47 U.S.C. § 1302(c) (requiring the Commission, in part, to “compile a list of geographical areas not served by any provider of advanced telecommunications capability”).

<sup>31</sup> 47 U.S.C. § 1303(b).

<sup>32</sup> 47 U.S.C. § 1303(c). Although the Commission must make publicly available the results of the consumer surveys it conducts at least once per year, the statute does not require that this be done in the broadband deployment report. 47 U.S.C. § 1303(c)(2). As discussed below, the Commission unveiled the results of its first consumer survey on February 23, 2010. See *infra* Part III.B.3; 2010 BROADBAND CONSUMER SURVEY.

market.”<sup>33</sup> The *Sixth Broadband Deployment NOI* contains a more detailed discussion of background information relevant to the present inquiry.<sup>34</sup>

### III. STATUS OF BROADBAND DEPLOYMENT

#### A. Benchmarking Broadband

9. Section 706 defines “advanced telecommunications capability” as “high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.”<sup>35</sup> Over a decade ago in the *1999 First Broadband Deployment Report*, the Commission determined that “advanced telecommunications capability” and “advanced services”—and, in effect, “broadband”—are services and facilities with an upstream (customer-to-provider) and downstream (provider-to-customer) transmission speed of more than 200 kbps.<sup>36</sup> At that time, the Commission rightly predicted “that as technologies evolve, the concept of broadband will evolve with it: we may consider today’s ‘broadband’ to be narrowband when tomorrow’s technologies are deployed and consumer demand for higher bandwidth appears on a large scale.”<sup>37</sup> Nevertheless, all of the Commission’s subsequent broadband deployment reports have been based on the broadband speed threshold the Commission adopted in the *1999 First Broadband Deployment Report*.

10. After considering the evidence in the record,<sup>38</sup> we conclude that the Commission’s broadband speed threshold has not kept pace with the evolution of technology and consumer expectations. Although we continue to treat advanced telecommunications capability and broadband as synonymous terms in this report,<sup>39</sup> we find that 200 kbps simply is not enough bandwidth to enable a user, using current technology, “to originate and receive high-quality voice, data, graphics, and video telecommunications,” as section 706 requires of such services.<sup>40</sup> Today, Americans increasingly are using their broadband connections to

<sup>33</sup> 47 U.S.C. § 1302(b).

<sup>34</sup> See *Sixth Broadband Deployment NOI*, 24 FCC Rcd at 10505–21, paras. 1–32 (discussing the nation’s evolving broadband goals, improvements in broadband data collection, and the actions the Commission, Congress, and other governmental entities have taken concerning broadband that are relevant to the present report).

<sup>35</sup> 47 U.S.C. § 1302(d)(1).

<sup>36</sup> *1999 First Broadband Deployment Report*, 14 FCC Rcd at 2406, para. 20. The Commission has used the term “high-speed” to describe services with over 200 kbps capability in at least one direction. See *2000 Second Broadband Deployment Report*, 15 FCC Rcd at 20920, para. 11; *2002 Third Broadband Deployment Report*, 17 FCC Rcd at 2850–51, para. 9; *2004 Fourth Broadband Deployment Report*, 19 FCC Rcd at 20551.

<sup>37</sup> See *supra* note 12.

<sup>38</sup> In the *Sixth Broadband Deployment NOI* and throughout this proceeding, we asked for comment on how the Commission should define broadband. See *Sixth Broadband Deployment NOI*, 24 FCC Rcd at 10523–25, paras. 36–41; *National Broadband Plan NOI*, 24 FCC Rcd at 4346–48, paras. 15–22; *Comment Sought on Defining “Broadband” NBP Public Notice # 1*, GN Docket Nos. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 10897 (2009).

<sup>39</sup> See, e.g., CTIA Comments at 28 (stating that Congress apparently used “broadband” and “advanced telecommunications capability” interchangeably and that the two terms, in fact, mean the same thing); Time Warner Cable Comments at 4 (same); Western Telecommunications Alliance Comments at 4–5; NASUCA June 8, 2009 Comments in GN Docket 09-51 at 12–13.

<sup>40</sup> 47 U.S.C. § 1302(d)(1); see, e.g., NATIONAL BROADBAND PLAN at 17, Exh. 3-C. The Commission previously has recognized that 200 kbps is insufficient bandwidth to enable the transmission of live video. See, e.g., *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 (VoIP) Subscribership*, WC Docket No. 07-38, Report and Order and Further Notice of Proposed Rulemaking, 23 FCC Rcd 9691, 9700, para. 19 (2008) (*2008 Broadband Data Gathering Order*)

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access high-quality video, and we anticipate that this demand will only continue to grow in the future.<sup>41</sup> For example, many Americans now communicate with their families and friends through desktop videoconference calls.<sup>42</sup> Many users also now post their own videos and view others' on such sites as YouTube and Hulu.<sup>43</sup> Instead of reading articles online, Americans often watch videos of today's top stories.<sup>44</sup> The growth and demand for high-quality videos by Americans is substantial, and this demand is expected to grow at over 40 percent and 120 percent per year, respectively, through 2013.<sup>45</sup>

11. Thus, for purposes of this report,<sup>46</sup> we update the Commission's broadband speed threshold. Specifically, we benchmark broadband as a transmission service that actually enables an end user to download content from the Internet at 4 Mbps and to upload such content at 1 Mbps over the broadband provider's network.<sup>47</sup> Of the many possible service characteristics that could be used for this purpose, we

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(explaining that "the range of information transfer capacities included in the current lowest tier of 200 kbps to 2.5 mbps captures a wide variety of services, ranging from services capable of transmitting real time video to simple always-on connections not suitable for more than basic email or web browsing activities"); Order on Reconsideration, 23 FCC Rcd 9800 (2008). Nevertheless, in previous broadband deployment reports, the Commission declined to modify its understanding of broadband to account for this limitation in part because consumer demand for such services was only starting to emerge. *See, e.g., 2002 Third Broadband Deployment Report*, 17 FCC Rcd at 2852, para. 12 (stating that "certain applications, such as some video products, require transmission speeds in excess of 200 kbps" and that "[a]s technology continues to evolve, and with it, consumer expectations, it may be appropriate to adopt a higher threshold for advanced telecommunications capability and revisit our analysis of deployment").

<sup>41</sup> NATIONAL BROADBAND PLAN at 17.

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> *Id.* (stating that "Cisco forecasts that video consumption on fixed and mobile networks will grow at over 40% and 120% per year, respectively, through 2013").

<sup>46</sup> We emphasize that we are benchmarking broadband in this report solely for purposes of complying with our obligations under section 706. We specifically do not intend this speed threshold to have any other regulatory significance under the Commission's rules absent subsequent Commission action. For example, today's report has no impact on which entities are classified as interconnected VoIP providers or what facilities must be provided on an unbundled basis. *See* 47 C.F.R. § 9.3 (defining interconnected VoIP service in relevant part as a service that "[r]equires a broadband connection from the user's location"); 47 C.F.R. § 51.5 (defining "advanced services"); 47 C.F.R. § 51.319(a)(2) (setting forth UNE obligations for hybrid loops). This report also does not prejudice the outcome of possible changes to the Universal Service Fund (USF) or other Commission proceedings. *See, e.g., NATIONAL BROADBAND PLAN* at 140-51; *Connect America Fund, A National Broadband Plan for Our Future, High-Cost Universal Service Support*, WC Docket No. 10-90, GN Docket No. 09-51, WC Docket No. 05-337, Notice of Inquiry and Notice of Proposed Rulemaking, FCC 10-58 (rel. Apr. 21, 2010) (*Connect America Fund NOI and NPRM*). Similarly, our decision to benchmark broadband by means of a 4 Mbps download and 1 Mbps upload speed threshold does not mean that the Commission will stop collecting and analyzing data on services provided at slower and faster speeds. *See generally* 47 C.F.R. § 1.7000-1.7002 (requiring entities to provide advanced telecommunications capability data to the Commission in accord with the FCC Form 477 instructions).

<sup>47</sup> By increasing the broadband transmission speed threshold, we find a decreased level of broadband availability. This is a natural consequence of consumer expectations and the bandwidth demands of technology rising faster than broadband is being deployed to all Americans. We recognize that broadband providers continue to increase the availability of services that provide lower transmission speeds, including those in excess of 200 kbps in each direction. *See App. D, INDUST. ANALYSIS & TECH. DIV., FCC, HIGH-SPEED SERVICES FOR INTERNET ACCESS: STATUS AS OF DECEMBER 31, 2008*, at 3 (rel. Feb. 2010) (February 2010 High Speed Report). The benchmarks we

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find this benchmark appropriate for several reasons.<sup>48</sup> First, as discussed above, section 706 requires that broadband services enable users “to originate and receive high-quality voice, data, graphics, and video telecommunications.”<sup>49</sup> Our examination of overall Internet traffic patterns reveals that consumers increasingly are using their broadband connections to view high-quality video, and want to be able to do so while still using basic functions such as email and web browsing.<sup>50</sup> Indeed, we expect that it is not uncommon for more than one person to make use of a single Internet connection simultaneously, particularly in multi-member households that subscribe to a single Internet access service. The evidence shows that streaming standard definition video in near real-time consumes anywhere from 1-5 Mbps, depending on a variety of factors.<sup>51</sup> The availability of broadband connections that actually enable an end user to download content from the Internet at 4 Mbps and to upload such content at 1 Mbps over the broadband provider’s network is therefore a reasonable estimate of the availability of “advanced telecommunications services” as defined by the statute.

12. We also believe the benchmark is a reasonable point at which to measure broadband availability because it has been updated to reflect current demand patterns. The record shows that approximately half of all broadband consumers today purchase service that is advertised to deliver download speeds of “up to” 7 Mbps (though evidence suggests that the actual speeds of these connections may be roughly half of advertised speeds).<sup>52</sup> In addition, current trends indicate that consumers are likely

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adopt in this report refer to “actual” speeds rather than advertised or “up to” speeds for essentially the same reasons as set forth in the National Broadband Plan. *See* NATIONAL BROADBAND PLAN at 18–22; *but see* Letter from Neil M. Goldberg, Vice President and Counsel for National Cable & Telecommunications Association, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51 (filed Mar. 26, 2010). When referring to the speed of a transmission “over the broadband provider’s network,” we generally mean the data throughput delivered between the network interface unit (NIU)—i.e., the subscriber’s modem or other customer premise equipment (CPE)—and the service provider’s Internet gateway that is the shortest administrative distance from that NIU. *See* NATIONAL BROADBAND PLAN at 156 n.2. We may adopt a different understanding of “actual” speed in future proceedings.

<sup>48</sup> *See, e.g.*, ADTRAN Comments at 10 (urging the Commission to assess broadband deployment and availability, not by the speed advertised by providers, but rather by the actual speeds consumers can reasonably expect under ordinary operating conditions); Free Press Comments at 15 (same); NASUCA June 8, 2009 Comments in GN Docket 09-51 at 18–19 (same). Unlike prior broadband deployment reports, we do not adopt a symmetrical broadband speed threshold. The Commission previously has recognized, “given the asymmetric use of most residential subscribers, fast upload rates do not appear to be as necessary as fast download rates.” *2004 Fourth Broadband Deployment Report*, 19 FCC Rcd at 20552. We continue to “believe that Congress intended [broadband] to bring to all Americans a two-way, truly interactive medium, rather than one that is passive and entertainment-oriented.” *2000 Second Broadband Deployment Report*, 15 FCC Rcd at 20921, para. 12. Symmetrical broadband speeds, however, are not necessarily a requirement for fully interactive broadband service today. At present, symmetrical capacity is rarely offered to residential customers. *See, e.g.*, ADTRAN Comments at 13–14; NCTA Reply at 3–4; Verizon Reply at 16–17.

<sup>49</sup> 47 U.S.C. § 1302(d)(1).

<sup>50</sup> *See* NATIONAL BROADBAND PLAN at 16–17.

<sup>51</sup> *See* FCC Broadband Task Force Status Update at the FCC September Commission Meeting 23 (Sept. 29, 2009), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-293742A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-293742A1.pdf).

<sup>52</sup> Thus, approximately half of all broadband subscribers in the United States purchase broadband service meeting our benchmark today. *See* NATIONAL BROADBAND PLAN at 21 (“Estimates of the average advertised ‘up to’ download speed that Americans currently purchase range from 6.7 Mbps to 9.6 Mbps, with the most detailed data showing an average of approximately 8 Mbps and a median of approximately 7 Mbps.”); *see also id.* (explaining that the broadband speed consumers experience, on average, is about half of the speed to which they subscribe); *id.* at 156 n.3 (stating that the median actual download speed in the United States in the first half of 2009 was approximately 3 Mbps and is expected to exceed 4 Mbps by the end of 2010); *id.* at 135; *see also* February 2010

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to continue purchasing increasingly fast broadband connections in the future. In particular, the record shows that “the average advertised speed purchased by broadband users has grown approximately 20% each year for the last decade.”<sup>53</sup> In contrast, when the Commission initially adopted a broadband speed threshold for purposes of complying with section 706, it estimated that only 0.4 percent of residential customers subscribed to a level of service meeting the adopted speed threshold.<sup>54</sup>

13. Naturally, any benchmark the Commission might adopt to measure broadband availability could be criticized as being too low in some contexts and too high in others.<sup>55</sup> Our present goal in selecting a benchmark to measure broadband availability is one shared with prior Commissions: to “giv[e] us a relatively static point at which to gauge the progress and growth in the advanced services market from one Report to the next.”<sup>56</sup> The broadband benchmark takes estimated future demand into account, in part to minimize the risk of the Commission being forced to update its broadband benchmarks on an overly frequent basis.<sup>57</sup> We find that the speed threshold we adopt today satisfies the historic purpose of this report by establishing a practical goal: one that is neither so lofty as to be merely aspirational, nor so minimal that consumers are consigned to rudimentary Internet access that does not support the high-quality services (including video) referenced in the statute.<sup>58</sup> In any event, even if the Commission were to use a significantly slower speed threshold to measure broadband, we would still find that a significant number of Americans are unserved by broadband. For example, the evidence shows that

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High Speed Report at 18, chart 13 (reporting distribution of residential fixed high-speed connections by download speed tier as of December 31, 2008).

<sup>53</sup> See NATIONAL BROADBAND PLAN at 21.

<sup>54</sup> See 1999 *First Broadband Deployment Report*, 14 FCC Rcd at 2446, para. 91; see also *id.* at 2430–31, para. 61 (chart showing the availability, download speed and partial cost of various Internet access technologies at the time the Commission’s initial broadband speed threshold was adopted).

<sup>55</sup> For example, while broadband providers in many urban areas currently offer Internet access service at speeds well in excess of 4 Mbps download/1 Mbps upload today, in other areas, consumers do not have the option to subscribe to terrestrial broadband services capable of delivering even 768 kbps actual download speeds because their residence is more than 16,000 feet from the nearest digital subscriber line access multiplexer (DSLAM). See NATIONAL BROADBAND PLAN at 20–21, Exhs. 3-E & 3-F (presenting timelines for network upgrades by provider and technology); *id.* at 157 n.7; see also *infra* note 58 (illustrating that commenters recommended a very wide range of speed thresholds for measuring broadband availability).

<sup>56</sup> 2002 *Third Broadband Deployment Report*, 17 FCC Rcd at 2851, para. 10; 2004 *Fourth Broadband Deployment Report*, 19 FCC Rcd at 20552 (stating that “[n]ow that first-generation broadband is available to the vast majority of U.S. households, it will become important to monitor the migration to next-generation networks and services”).

<sup>57</sup> We base our predictions of future demand partially on trend data, which suggest that demand for advertised download speeds is growing at a compound annual growth rate of approximately 20%, which translates to a doubling in speed approximately every 2 to 4 years. See NATIONAL BROADBAND PLAN at 25 n.50 (reporting annual growth rates in subscribed speed of approximately 20–25% per year).

<sup>58</sup> See, e.g., Covad Comments at i (suggesting 100 Mbps by 2015); Internet2 Sept. 8, 2009 Reply, GN Docket Nos. 09-47, 09-51, 09-137 at 7 (stating that the Commission should adopt a definition of 100 Mbps in both directions for individual consumers); Verizon Comments at 9 (recommending a “downstream target of 50 Mbps for fixed services and 5 Mbps for mobile services”); but see DCPSC Comments at 4 (recommending we adopt the same speeds as the National Telecommunications and Information Administration (NTIA) and the Department of Agriculture’s Rural Utilities Service (RUS) of at least 768 kbps downstream and at least 200 kbps upstream to end users); NCTA Comments at 3, 5 (same); TCA Comments at 3 (same).

12 million Americans today lack access to terrestrial broadband services capable of delivering actual download speeds in excess of 768 kbps.<sup>59</sup>

14. Finally, the benchmark we have selected mirrors the speed threshold the National Broadband Plan recommends as an initial national broadband availability target.<sup>60</sup> The analysis that underlies the selection of the national broadband availability target is equally applicable to our obligation to select an appropriate benchmark for determining whether broadband is being deployed in a reasonable and timely fashion. In both cases, the selection of a speed threshold focused on end user demand for high-quality voice, data, graphics and video capabilities, not just as those services are used or experienced by current subscribers, but as we expect them to evolve in the next several years.<sup>61</sup> Furthermore, the benchmark we have selected will allow the Commission to more easily measure progress towards accomplishment of the goals set forth in the National Broadband Plan, which recommends that the Commission publish an evaluation of plan progress and effectiveness as part of the annual broadband inquiry.<sup>62</sup> Maintaining consistency with the National Broadband Plan will avoid the confusion that likely would result from the introduction of an additional speed threshold into the nationwide discussion of the National Broadband Plan.

15. The Commission's broadband speed threshold benchmarks are not static, and we expect that in the future consumers will demand other service features, perhaps including higher upload and download speeds, service that meets specific functional criteria such as particular latency or jitter thresholds, a symmetrical broadband connection, or the ability to stream high-definition video. We recognize that "as technologies evolve, the concept of broadband will evolve with it."<sup>63</sup> Thus, we will continue to monitor available technology and consumer expectations and modify our broadband benchmarks accordingly.<sup>64</sup> For the reasons described above, however, we find it appropriate for the purposes of this report to benchmark broadband as a transmission service that actually enables an end user to download content from the Internet at 4 Mbps and to upload such content at 1 Mbps over the broadband provider's network.

#### **B. Evidence of Broadband Availability**

16. This year's broadband deployment report is based on more comprehensive broadband data than any of the Commission's prior reports. Our specific estimates of broadband availability are based primarily on two sources of data: the Model that Commission staff created in conjunction with the development of the National Broadband Plan and, consistent with previous broadband deployment reports, the broadband subscribership data the Commission collects on FCC Form 477.<sup>65</sup> For the first

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<sup>59</sup> See NATIONAL BROADBAND PLAN at 157 n.7.

<sup>60</sup> *Id.* at 135. The National Broadband Plan also recommends that the actual 4 Mbps download and 1 Mbps upload benchmark be used as a guide to public funding for broadband. See *id.* As explained above, this report adopts benchmarks for broadband solely for the purposes of complying with the Commission's obligations under section 706 and does not prejudice any issues related to possible changes to USF funding mechanisms or other support. See *supra* note 46.

<sup>61</sup> See 47 U.S.C § 1302(d)(1); NATIONAL BROADBAND PLAN at 16–17.

<sup>62</sup> See NATIONAL BROADBAND PLAN at xv, 334.

<sup>63</sup> 1999 *First Broadband Deployment Report*, 14 FCC Rcd at 2407–08, para. 25.

<sup>64</sup> For example, the National Broadband Plan recommends revisiting the National Broadband Availability Target every four years. See NATIONAL BROADBAND PLAN at 135.

<sup>65</sup> See *supra* note 4; Dec. 2008 Form 477 Broadband Data; Apps. B & C; NATIONAL BROADBAND PLAN at 20, 129, 136; see also *id.* at 157 n.6; OBI, THE BROADBAND AVAILABILITY GAP (Technical Paper No. 1, 2010) (2010 BROADBAND AVAILABILITY GAP), attached to Connect America Fund NOI and NPRM at App. C. Naturally, our

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time, we also used Census Bureau data to help us understand how broadband availability varies by particular demographics, such as income level and population density.<sup>66</sup> To gain further insight into the “national characteristics of the use of broadband service capability,” the Commission conducted a consumer survey.<sup>67</sup> Finally, we have conducted an international comparison of the extent of broadband service capability, which will be released shortly.<sup>68</sup>

17. Comprehensive broadband data are essential to determining whether broadband is being deployed to all Americans in a reasonable and timely fashion. Congress, the Commission, and other federal agencies all have taken steps to improve broadband data collection efforts.<sup>69</sup> Because these efforts are on-going, the full range of new broadband data are not yet available. For example, February 2011 is the deadline for the NTIA to post on its web site “a comprehensive nationwide inventory map of existing broadband service capability and availability.”<sup>70</sup> In addition, the National Broadband Plan recommends that the Commission collect and analyze detailed market-by-market information on broadband pricing and competition.<sup>71</sup> We therefore expect that future broadband deployment reports will benefit from the

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methods are limited by the available data and are therefore imperfect. For example, subscriber data are an imperfect proxy for broadband availability or deployment. *See, e.g., Sixth Broadband Deployment NOI*, 24 FCC Rcd at 10526–27, para. 45; *1999 First Broadband Deployment Report*, 14 FCC Rcd at 2402, para. 7 (relying on subscribership data as a proxy for deployment and availability, and noting that such data “may not be a precise estimate of actual deployment and availability”); *see also* February 2010 High Speed Report at 4–5, nn.16 & 17 (explaining that mobile wireless connections are only reported at the state level and some business connections could be miscategorized as residential connections); AT&T Comments at 34–35 (supporting the use of Form 477 data because it is “the Commission’s primary and most reliable source of subscribership statistics”); *but see* CPUC Reply at 4 (recommending against the use of subscribership data because “[a]vailability data, or infrastructure data, shows where broadband is available. Meanwhile, subscribership data denotes where consumers are choosing to purchase broadband service.”). In addition, the only demographic information we collect in our subscription data is the Census Tract in which the subscriber receives service. *See infra* note 105. We therefore caution that, due to the limitations of the data, the lists of unserved areas compiled in this report necessarily are approximations and may be both over- and under-inclusive. We will continue striving to improve the quality of the data we collect and our analysis.

<sup>66</sup> The Commission was unable to conduct this type of analysis in prior broadband deployment reports because the data it previously collected were not sufficiently granular to allow a meaningful analysis of Census Bureau categories. *See* February 2010 High Speed Report at 2–3 (describing significant changes the Commission made in 2008 in the broadband subscribership data it collects and the implications of this change); *see also* 47 U.S.C. § 1302(c) (directing the Commission to determine “the population, the population density, and the average per capita income” for unserved areas to the extent that Census Bureau data are available).

<sup>67</sup> 47 U.S.C. § 1303(c)(1). *See infra* Part III.B.3; 2010 BROADBAND CONSUMER SURVEY.

<sup>68</sup> *See International Comparison Requirements Pursuant to the Broadband Data Improvement Act, International Broadband Data Report*, GN Docket No. 09-47, (forthcoming) (*International Broadband Data Report*); *see also* 47 U.S.C. § 1303(b).

<sup>69</sup> *See Sixth Broadband Deployment NOI*, 24 FCC Rcd at 10513–21, paras. 15–32. In 2008, the Commission improved the quality of the data it collects on Form 477 and issued a Further Notice to consider additional improvements in its broadband data collection. *See 2008 Broadband Data Gathering Order*, 23 FCC Rcd at 9708–12, paras. 33–40.

<sup>70</sup> 47 U.S.C. § 1305(l); *see also* 47 U.S.C. § 1304(e)(10), (g); *National Broadband Plan NOI*, 24 FCC Rcd at 4364–65, para. 61. NTIA must make this inventory map accessible to the public on an NTIA website in a form that is both interactive and searchable. 47 U.S.C. § 1305(l).

<sup>71</sup> NATIONAL BROADBAND PLAN at 43–44.

continued progress being made to better understand broadband availability, which in turn should help the nation reach its goal of universal broadband deployment.<sup>72</sup>

### 1. Model

18. As part of the development of the National Broadband Plan, Commission staff developed a nationwide model for broadband availability for both wired and wireless technologies.<sup>73</sup> The output of that model shows that approximately 14 million Americans, living in 7 million housing units, cannot get residential broadband service that meets the benchmark adopted in this report.<sup>74</sup>

### 2. Subscribership Data

19. Consistent with previous broadband deployment reports, we also estimate broadband availability by analyzing the residential broadband subscribership data the Commission collects on Form 477.<sup>75</sup> Every six months, the Commission collects on Form 477 basic service information from broadband providers. Form 477 requires a provider to report, by Census Tract, the total number of subscribers, the proportion of these subscribers that are residential subscribers, and the number of subscribers broken down by speed tier (i.e., the bandwidth of the Internet access connection provided to that customer) and technology.<sup>76</sup> Our analysis of the Commission's subscribership data confirms the overall levels of broadband availability indicated by the Model.<sup>77</sup>

#### a. Unserved Areas

20. Before presenting our estimates, we highlight several key features of our analysis. First, although the Commission's subscribership data are collected by Census Tract, we have aggregated providers' residential subscribership totals for the whole county (or county equivalent) due to questions about the accuracy of the most recent data collected at the Census Tract level on Form 477.<sup>78</sup> We

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<sup>72</sup> See, e.g., 47 U.S.C. § 1301(3) (stating that “[i]mproving Federal data on the deployment and adoption of broadband service will assist in the development of broadband technology across all regions of the Nation”).

<sup>73</sup> See *supra* note 4; NATIONAL BROADBAND PLAN at 20, 129, 136; see also *id.* at 157 n.6; 2010 BROADBAND AVAILABILITY GAP at 17.

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

<sup>75</sup> See Dec. 2008 Form 477 Broadband Data; see also, e.g., 2002 Third Broadband Deployment Report, 17 FCC Rcd at 2850, para. 9; 2004 Fourth Broadband Deployment Report, 19 FCC Rcd at 20567; 2008 Fifth Broadband Deployment Report, 23 FCC Rcd at 9618, para. 6. Subscribership data from Form 477 also were analyzed for purposes of better understanding competition among broadband providers in conjunction with the development of the National Broadband Plan. See NATIONAL BROADBAND PLAN, CHAPTER 4: BROADBAND COMPETITION AND INNOVATION POLICY at 33–61. Because that competition analysis did not focus on broadband availability, we do not rely on it in this report.

<sup>76</sup> See 2008 Broadband Data Gathering Order, 23 FCC Rcd at 9700–01, para. 20 n.66. The analysis above was based on the data collected under the modified Form 477 requirements. Formerly, Form 477 required covered providers to report the number of broadband connections they provide in each state as well as the 5-digit ZIP codes for which they had at least one customer. *Local Competition and Broadband Reporting*, CC Docket No. 99-301, Report and Order, 15 FCC Rcd 7717, 7743–46, paras. 49–52 (2000).

<sup>77</sup> Compare *supra* note 73 (Model) with *infra* note 89 (Form 477 subscribership data).

<sup>78</sup> See February 2010 High Speed Report at 4–5 (stating that “for reasons of accuracy and confidentiality” certain results are presented at the level of the whole county); see also *id.* at 5 n.17 (explaining that the data as filed disclose 10% of Census Tracts have a share of households with high-speed connections over fixed-location technologies at or above 100% and that the number of such “outliers” is substantially reduced, to 1%, when estimates are made for individual counties and that “[s]ome misinterpretation of reporting instructions can be expected whenever a substantially modified data collection is implemented for the first time. We are investigating the reasons for these

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emphasize this decision is driven by the data and does not represent a Commission conclusion that counties necessarily always are the best way to determine the “geographical areas that are not served” by broadband under section 706.<sup>79</sup> Second, because the speed tiers used to collect broadband information on Form 477 do not match exactly the broadband benchmark adopted for purposes of this report, we must select a reasonable proxy to conduct our analysis. Of the 72 combinations of upload and download advertised transmission speeds for which the Commission collects data, the tiers closest to the benchmark adopted in this report are those beginning at 3 Mbps or 6 Mbps download speed and 768 kbps or 1.5 Mbps upload speed.<sup>80</sup> Because both OBI analysis and Form 477 data indicate that higher speeds are available to more subscribers than elect to purchase them,<sup>81</sup> and because the Form 477 data reflects subscriber purchasing choices rather than availability,<sup>82</sup> we take a conservative approach and select 3 Mbps download speed and 768 kbps upload speed as the cutoffs for the subscriber choice likely to indicate that service offering actual speeds of 4 Mbps download and 1 Mbps upload is available to the subscriber.<sup>83</sup>

21. Third, we have applied a “*de minimis* threshold,” under which we find broadband to be available in a county only if at least 1 percent of the households in that county subscribe to broadband.<sup>84</sup> We do not believe it is appropriate to assume that broadband is available to everyone in a county merely because a single person in that county subscribes to broadband.<sup>85</sup> At the same time, we recognize that not

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anomalous census tract results and are working with the Form 477 filers to improve the accuracy of the data currently collected and for future collections.”).

<sup>79</sup> See 47 U.S.C. § 1302(c); see also, e.g., NCTA Comments at 8–9 (suggesting the Commission should define geographic area in terms of Census Tracts, as it currently does for Form 477 but consider going forward, using Census Block data, in coordination with NTIA). Because Form 477 currently does not collect data for geographic areas smaller than the Census Tract, such as a Census Block, we reject suggestions to analyze the Commission’s broadband subscribership data on the basis of geographic areas smaller than a Census Tract. See, e.g., DCPSC Comments at 8; Free Press Comments at 77–78; NJ Rate Counsel Comments at 12–13.

<sup>80</sup> See 2008 Broadband Data Gathering Order, 23 FCC Rcd at 9700–01, para. 20.

<sup>81</sup> OBI analysis indicates that 95% of the U.S. population lives in housing units with access to terrestrial, fixed broadband infrastructure capable of supporting actual download speeds of at least 4 Mbps. NATIONAL BROADBAND PLAN at 20. However, no more than half of those that purchase high-speed Internet access service actually purchase services capable of delivering 4 Mbps download speeds. See *supra* para. 12, note 52. Our analysis of Form 477 data likewise shows that in counties where cable modem service with advertised download speeds of 3 Mbps and upload speeds of 768 kbps are available, only 39% of cable modem subscribers choose to purchase at that speed or higher. See Dec. 2008 Form 477 Broadband Data.

<sup>82</sup> See FCC, FCC FORM 477, INSTRUCTIONS FOR MARCH 1, 2010 FILING (OF DATA AS OF 12/31/2009) at 6, Part III.B, available at <http://www.fcc.gov/Forms/Form477/477inst.pdf>.

<sup>83</sup> Were the Commission to conduct its Form 477 analysis with cutoffs of 6 Mbps download speed and 1.5 Mbps upload speed, a larger number of Americans would be reported as lacking broadband access capable of meeting the requirements set forth in section 706.

<sup>84</sup> For each area we examine, we define the subscription rate as the number of residential connections that are at least 3 Mbps down and 768 kbps up divided by the number of households in the area. See App. B, Technical Notes 2 & 3. See also February 2010 High Speed Report at 5 n.17 (noting that the household subscription rate for an area is the total number of residential connections in that area at a particular speed threshold divided by the estimated number of households in that area).

<sup>85</sup> See, e.g., Letter from Melissa E. Newman, Vice President – Federal Relations, Qwest Corporation, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 09-47, 09-51, 09-137, Attach. at 15 (filed Sept. 17, 2009) (providing Qwest’s proposal for broadband deployment to unserved areas and recognizing that the Commission’s former “use (continued...)”) (continued...)

everyone for whom broadband is available elects to purchase it. For example, many consumers today obtain Internet access via transmission services slower than the 4 Mbps upload and 1 Mbps download speed threshold adopted in this report, even if a transmission service meeting this threshold is available.<sup>86</sup> Given current subscription rates for Internet access transmission services of various speeds, we find applying a 1 percent *de minimis* threshold in our availability analysis appropriately balances these concerns.<sup>87</sup> In particular, a 1 percent threshold will treat every county that literally is “not served by *any* provider” of broadband as unserved, as well as those counties in which only a small fraction of the households subscribe to broadband service.<sup>88</sup> At the same time, because the 1 percent threshold is low, we minimize the risk that we classify an area as unserved when broadband service in fact is available to a majority of households, even if household adoption rates in that area happen to be relatively low.

(i) **1,024 Counties are Unserved Areas**

22. Based on the analysis described above, we estimate that 1,024 out of 3,230 counties in the United States and its territories are unserved by broadband.<sup>89</sup> These unserved areas are home to 24 million Americans living in 8.9 million households.<sup>90</sup> As set forth in more detail in Appendix B, the 1,024 unserved areas have, on average: (1) a population of 23,479; (2) a population density of 138.3 people per square mile; and (3) a per capita income of \$14,565 measured in 1999 dollars.<sup>91</sup> In contrast, a typical U.S. census area has, on average: (1) a population of 95,481; (2) a population density of 283.5 people per square mile; and (3) a per capita income of \$17,232 measured in 1999 dollars.<sup>92</sup>

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of zip codes [was] problematic; as commentators have pointed out . . . it is questionable to conclude that an area is served by a broadband provider if any part of the relevant zip code enjoys broadband service”).

<sup>86</sup> See *supra* note 81.

<sup>87</sup> Based on the Commission’s subscribership data collected on Form 477, 56% of all households subscribe to an Internet access service faster than dial-up, and 45% of all households that subscribe to such a service, subscribe to a service meeting our speed benchmark. These figures are somewhat lower than the figures reported in the National Broadband Plan and in the *2010 Broadband Consumer Survey*, which are based upon more recent data. See NATIONAL BROADBAND PLAN at 167 (relying on the *2010 Broadband Consumer Survey* and stating that “[w]hile 65% of Americans use broadband at home, the other 35% (roughly 80 million adults) do not”); 2010 BROADBAND CONSUMER SURVEY at 13 (reporting that 65% of Americans use broadband at home where broadband is understood to be any Internet access technology faster than dial-up).

<sup>88</sup> 47 U.S.C. § 1302(c) (emphasis added). We find our interpretation of the statutory language described above to be reasonable and faithful to Congress’s intent, and preferable to the alternative interpretations of the statute we considered. Nevertheless, we may find it appropriate to modify the *de minimis* threshold for identifying unserved areas in the future.

<sup>89</sup> 47 U.S.C. § 1302(c); Apps. B & C; NCTA Comments at 8 (stating that “[t]he degree to which the size of the [unserved] list shrinks over time will be a simple, yet effective, measure of the success of the Commission’s National Broadband Plan”).

<sup>90</sup> 47 U.S.C. § 1302(c); App. B (reporting the number of unserved areas in each state and U.S. territory).

<sup>91</sup> 47 U.S.C. § 1302(c) (directing the Commission to determine the population, the population density, and the average per capita income for unserved areas to the extent that Census Bureau data are available); App. B. As of the time of this report, Per Capita Income was available from the Census Bureau only in 1999 dollars. See App. B, Technical Note 4; CENSUS BUREAU, CENSUS 2000 SUMMARY FILE 3, <http://www.census.gov/Press-Release/www/2002/sumfile3.html> (last visited Mar. 24, 2010).

<sup>92</sup> App. B.

**(ii) Unserved Areas Appear to Have Lower Income Levels**

23. The unserved areas appear to have lower income levels than the U.S. as a whole.<sup>93</sup> To measure economic well-being, we examined Median Household Income and the percent of the population living in poverty.<sup>94</sup> We find that, when measured in 1999 dollars, on average, the 1,024 unserved areas have a Median Household Income of \$28,626 compared to \$34,809 for the U.S. as a whole. We find that, when measured in 2008 dollars, for 934 of the 1,024 unserved areas for which we have this information,<sup>95</sup> the unserved areas have a Median Household Income, on average, of \$37,785 compared to \$44,172 for the U.S. overall.<sup>96</sup> Moreover, based on the percent of the population estimated by the Census Bureau to live in poverty in 2008, we find, on average, 18.4 percent of the population live in poverty in the 934 unserved areas for which we have data, compared to 15.2 percent of the population for the U.S. overall.<sup>97</sup>

**(iii) Unserved Areas Appear to Be More Rural**

24. The unserved areas also appear to be more rural than the U.S. as a whole.<sup>98</sup> To determine whether the unserved areas we identified were in urban or rural areas, we examined both household density and housing units categorized as rural by the Census Bureau.<sup>99</sup> On average, these 1,024 unserved areas have a household density of 46.8 households per square mile and have 73 percent of the housing units categorized as rural by the Census Bureau. In contrast, for the U.S as a whole, the typical county

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<sup>93</sup> *Id.*

<sup>94</sup> *Id.*

<sup>95</sup> *Id.* While we have Median Household Income in 1999 dollars for all 1,024 counties, we only have Median Household Income in 2008 dollars for 934 of the 1,024 unserved areas. *See id.*, Technical Note 4. We do not have Median Household Income in 2008 for one county in Alaska, one county in Hawaii, and for all of the U.S. territories. *Id.*

<sup>96</sup> *See* App. B.

<sup>97</sup> *Id.* & Technical Note 5. Hypothesis testing reveals a statistically significant difference, at the 95% confidence level, in the mean income level between served and unserved areas for the income measures included in our analysis. The Commission's recent High-Speed Report also suggests that subscription rates tend to increase with income. *See* February 2010 High Speed Report at 52, 57, Charts 20 & 25; *see also* 2010 BROADBAND CONSUMER SURVEY at 5 (reporting that "36% of non-adopter [respondents] cite cost as the main reason they do not have high-speed Internet at home"); AT&T Comments at 47 (stating that "low-income households struggling to make ends meet may be reluctant to, or simply unable to, spend precious funds on broadband service"); NAT'L TELECOMM. AND INFO. ADMIN., DIGITAL NATION: 21ST CENTURY AMERICA'S PROGRESS TOWARD UNIVERSAL BROADBAND INTERNET ACCESS at 15 (2010), *available at* [http://www.ntia.doc.gov/reports/2010/NTIA\\_internet\\_use\\_report\\_Feb2010.pdf](http://www.ntia.doc.gov/reports/2010/NTIA_internet_use_report_Feb2010.pdf) ("Affordability . . . rates highest among the major reasons for eschewing broadband at home among those with either no Internet at home or only dial-up service.").

<sup>98</sup> *See* App. B & Technical Notes 6 & 7; *see also* Broadband Opportunity Coalition Comments at 7 (stating that "deployment is severely lacking in isolated rural communities, such as Weirwood, Virginia, that are not situated along major highways"); Qwest Comments at 5 (stating that "[c]learly the status quo is not working in regard to rural deployment and change is needed"); USTA Comments at 10 (stating that "more needs to be done to ensure the timely and reasonable deployment of broadband to Americans in rural and other uneconomic areas"); Verizon Comments at 6 (stating that "some Americans living in remote, sparsely populated, or otherwise hard-to-serve areas still lack . . . broadband service other than satellite"). *See also infra* note 121.

<sup>99</sup> *See* App. B & Technical Notes 6 & 7.

has a household density of 108.2 households per square mile and has 59 percent of housing units categorized as rural by the Census Bureau.<sup>100</sup>

**b. Subscription Rates Are Lower in Native Homeland Areas<sup>101</sup>**

25. The Commission has in past broadband deployment reports examined broadband availability for various demographic groups, such as minorities, persons with disabilities, and Americans living in Tribal areas.<sup>102</sup> In particular, the Commission has recognized that certain categories of these Americans are particularly vulnerable to not having access to broadband.<sup>103</sup> In 2008, the Commission required Form 477 filers to report broadband connections by Census Tract permitting the Commission to conduct a demographic analysis of subscription patterns.<sup>104</sup> This change enables us to examine the subscription rates in Native Homeland areas for the first time.<sup>105</sup> We find that counties where at least half the population lives in a Native Homeland area or where at least half the land mass is a Native Homeland area also tend to have lower broadband subscription rates than the U.S. as a whole. We find that only 12.5 percent of all households on Native Homeland areas subscribe to a broadband service faster than dialup compared to 56 percent of all households nationwide.<sup>106</sup>

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<sup>100</sup> *Id.* Hypothesis testing reveals a statistically significant difference, at the 95% confidence level, in the mean income level between served and unserved areas for the rural indicator measures included in our analysis.

<sup>101</sup> We designate a county as a Native Homeland area if at least 50% of the land mass is designated by the Census Bureau as American Indian Area/Alaska Native Area/Hawaiian Homeland or at least 50% of the 2000 population resided in the land area designated by the Census Bureau as American Indian Area/Alaska Native Area/Hawaiian Homeland.

<sup>102</sup> *See, e.g., 2000 Second Broadband Deployment Report*, 15 FCC Rcd at 20918, para. 8; *see also supra* note 8.

<sup>103</sup> *See supra* note 8.

<sup>104</sup> *See* February 2010 High Speed Report at 2.

<sup>105</sup> We are, however, unable to draw definitive conclusions from the broadband subscription data for other demographic groups. The Commission collects broadband providers' subscription data by geographic area (Census Tract) and does not collect customers' demographic identity. At the time of this report, almost all of the county-level demographic information that is readily available is from the 2000 Census. The Census Bureau estimates that 1 in 6 Americans move each year, and that roughly a third of these individuals change their county residence. *See* KRISTIN A. HANSEN, CENSUS BUREAU, POPULATION PROFILE OF THE UNITED STATES: GEOGRAPHIC MOBILITY, <http://www.census.gov/population/www/pop-profile/geomob.html> (last visited Mar. 24, 2010). Given the overall migration patterns that may have occurred in the U.S. since 2000, we were concerned it could be misleading to draw any inferences about demographic populations, such as minorities or persons with disabilities who likely changed their residence. We assume that the geographic areas designated as Native Homelands did not significantly change since 2000. Thus, we were able to confidently report on the subscription rates in Native Homeland areas. We note that the Commission's Consumer Survey, discussed below, also reported demographic statistics for survey respondents. *See infra* Part III.B.3. If we instead would designate a county as a Native Homeland area solely by whether at least 50% of the land mass is designated by the Census Bureau as American Indian Area/Alaska Native Area/Hawaiian Homeland, we would find similar levels of unserved Americans in such areas as compared to what is reported below. *See supra* note 101. Specifically, under this alternative definition, we find there would be 106 unserved counties in Native Homeland areas, representing approximately 5 million Americans. Finally, we note that other sources of information report that "[s]ome segments of the population—particularly low-income households, racial and ethnic minorities, seniors, rural residents and people with disabilities—are being left behind." NATIONAL BROADBAND PLAN at 167; *see also id.* at 167, Exh. 9-A (reporting current adoption rates for different demographic groups).

<sup>106</sup> *See* Dec. 2008 Form 477 Broadband Data; *see also supra* note 87 (explaining a basis for why these figures, which are based on the Commission's Form 477 data, differ somewhat from data reported in the *National Broadband Plan* and the *2010 Broadband Consumer Survey*).

### 3. Consumer Survey

26. In October and November 2009, the Commission conducted its first periodic survey of end-users of the Internet “[f]or the purpose of evaluating, on a statistically significant basis, the national characteristics of the use of broadband service capability.”<sup>107</sup> On February 23, 2010, in compliance with our new annual obligation, we released the results of our first survey, which was “an effort to understand the state of broadband adoption and use, as well as barriers facing those who do not have broadband at home.”<sup>108</sup> The survey is novel in that it focused on the non-adoption of broadband at home so that its results will help provide insight into factors associated with Americans who do not subscribe to an Internet access service, even if one is available.<sup>109</sup> With respect to non-adopters, the consumer survey found that 35 percent or 80 million American adults do not use broadband at home and these Americans fall into three categories, each with distinct demographic characteristics: (1) 22 percent of all American adults do not use the Internet at all; (2) 6 percent of all American adults use the Internet but do not have access at home, and (3) 6 percent of all American adults use dial-up Internet connections to go online from home.<sup>110</sup> The Commission will periodically conduct other consumer surveys, some of which may focus on other aspects of the “national characteristics of the use of broadband service capability.”<sup>111</sup>

### 4. International Report

27. Section 1303 requires the Commission to include an international comparison in its annual broadband deployment report.<sup>112</sup> Specifically, section 1303 requires the Commission to “include information comparing the extent of broadband service capability (including data transmission speeds and price for broadband service capability) in a total of 75 communities in at least 25 countries abroad for each of the data rate benchmarks for broadband service utilized by the Commission to reflect different speed tiers.”<sup>113</sup> We are incorporating by reference a report from our International Bureau that will be released shortly.<sup>114</sup> This inaugural *International Broadband Data Report* will present data and information on international broadband service capability, which is based on information submitted to the

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<sup>107</sup> 47 U.S.C. § 1303(c)(1).

<sup>108</sup> See 2010 BROADBAND CONSUMER SURVEY at 3; 47 U.S.C. § 1303(c)(2).

<sup>109</sup> See 2010 BROADBAND CONSUMER SURVEY at 11. Survey respondents were asked what type of Internet access transmission service they used at home, including dial-up. See, e.g., *id.* at 14. Because we are unable to discern from the survey results what portion of the respondents use a broadband service, we do not rely on survey responses regarding the availability of Internet access service to draw inferences regarding the availability of broadband in this report.

<sup>110</sup> See *id.* at 24; see also NATIONAL BROADBAND PLAN at 167.

<sup>111</sup> See, e.g., 47 U.S.C. § 1303(c)(1) (directing the Commission to conduct “surveys of consumers in urban, suburban, and rural areas, in the large business, small business, and residential consumer markets”). On June 1, 2010, the Commission released the results of its second consumer survey, which focused on American’s perspectives on online connection speeds. JOHN HARRIGAN & ELLEN SATTERWHITE, OBI, AMERICANS’ PERSPECTIVES ON ONLINE CONNECTION SPEEDS FOR HOME AND MOBILE DEVICES (2010), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-298516A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-298516A1.pdf); see also Press Release, FCC, *FCC Survey Finds 4 Out of 5 Americans Don’t Know Their Broadband Speeds, Agency Announces Plans for National Speed Testing, Starts Recruitment for 10,000 Volunteers* (June 1, 2010), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-298525A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-298525A1.pdf).

<sup>112</sup> 47 U.S.C. § 1303.

<sup>113</sup> 47 U.S.C. § 1303(b).

<sup>114</sup> *International Broadband Data Report*. As the *International Broadband Data Report* will explain, that report satisfies the Commission’s obligations under the BDIA.

Commission and data gathered by Commission staff. The forthcoming *International Broadband Data Report* also will provide information on, for example, actual prices advertised to consumers for broadband services, community-level data, and information about the broadband market and broadband regulations in various countries around the world.<sup>115</sup>

#### IV. BROADBAND IS NOT BEING DEPLOYED TO ALL AMERICANS IN A REASONABLE AND TIMELY FASHION

28. Based on our analysis, we conclude that broadband is not being deployed to all Americans in a reasonable and timely fashion.<sup>116</sup> Our analysis shows that roughly 80 million American adults do not subscribe to broadband at home,<sup>117</sup> and approximately 14 to 24 million Americans do not have access to broadband today.<sup>118</sup> The latter group appears to be disproportionately lower-income Americans and Americans who live in rural areas. The goal of the statute, and the standard against which we measure our progress, is universal broadband availability.<sup>119</sup> We have not achieved this goal today, nor does it appear that we will achieve success without changes to present policies. The evidence further indicates that market forces alone are unlikely to ensure that the unserved minority of Americans will be able to obtain the benefits of broadband anytime in the near future.<sup>120</sup> Therefore, if we remain on our current course, a large number of Americans likely will remain excluded from the significant benefits of broadband that most other Americans can access today. Given the ever-growing importance of broadband to our society,<sup>121</sup> we are unable to conclude that broadband is being reasonably and timely deployed to all Americans in this situation.<sup>122</sup>

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<sup>115</sup> The International Bureau has gathered: (1) information for actual prices advertised to consumers for broadband services in different parts of the world from the websites of competitive and new entrant broadband providers; (2) community-level data and information from the Organization for Economic Co-operation and Development (OECD), broadband adoption data from the European Commission's regional data, and other data from individual government agencies, either through the national statistical agency or the communications ministry and/or regulator; and (3) information about the broadband market and broadband regulations in various countries around the world.

<sup>116</sup> 47 U.S.C. § 1302(b). We find that although 97% of schools have access to the Internet, crucial gaps exist. See NATIONAL BROADBAND PLAN at 20. More than 50% of teachers say slow or unreliable Internet access presents obstacles to their use of technology in classrooms. *Id.*

<sup>117</sup> See *id.* at 167 (relying on the 2010 *Broadband Consumer Survey* and stating that “[w]hile 65% of Americans use broadband at home, the other 35% (roughly 80 million adults) do not”).

<sup>118</sup> See *supra* Part III.B.1 & 2.

<sup>119</sup> We interpret “all Americans” in this context as having its ordinary meaning, and thus as establishing the goal of universal broadband availability for every American. We also adopt a straightforward interpretation of “reasonable and timely” as calling for broadband to be made available as soon as possible assuming all reasonable steps are taken. In the absence of indications to the contrary, we find that the ordinary meaning of the statutory language accurately expresses the legislative purpose. See *Gross v. FBL Financial Services, Inc.*, 129 S.Ct. 2343 (2009).

<sup>120</sup> See NATIONAL BROADBAND PLAN at 136 (“Because service providers in [areas with low population density] cannot earn enough revenue to cover the costs of deploying and operating broadband networks, including expected returns on capital, there is no business case to offer broadband services in these areas. As a result, it is unlikely that private investment alone will fill the broadband availability gap.”); *id.* at 21 (stating that “it is unlikely there will be a significant change in the number of unserved Americans based on planned upgrades over the next few years, although some small companies may upgrade their networks to support broadband in currently unserved areas”).

<sup>121</sup> Recent Congressional legislation further underscores the importance of ensuring broadband availability to all Americans as soon as reasonably possible, and its position as a top priority for the Commission. As Congress found in 2008 when it amended section 706, broadband “has resulted in enhanced economic development and public safety for communities across the Nation, improved health care and educational opportunities, and a better quality of life for all Americans.” 47 U.S.C. § 1301(1); see also, e.g., 47 U.S.C. § 1301(2) (stating that “[c]ontinued progress in

(continued...)

**V. IMMEDIATE ACTION TO ACCELERATE DEPLOYMENT**

29. If the Commission finds that broadband is not being deployed in a reasonable and timely manner, it must “take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.”<sup>123</sup> We have already begun. The National Broadband Plan, which also seeks to ensure that all people of the United States have access to broadband, proposes a number of ways to accelerate broadband deployment by removing barriers to infrastructure investment and by promoting competition.<sup>124</sup> Several proceedings currently before the Commission provide a means to address some of these recommendations.<sup>125</sup> Through these proceedings, and others still to be commenced, we will work to ensure that broadband is being deployed to all Americans in a reasonable and timely fashion.

**VI. ORDERING CLAUSES**

30. Accordingly, IT IS ORDERED that, pursuant to section 706 of the Telecommunications Act of 1996, as amended by the Broadband Data Improvement Act, 47 U.S.C. § 1301 et seq., this Report IS ADOPTED.

## FEDERAL COMMUNICATIONS COMMISSION



Marlene H. Dortch  
Secretary

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(...continued from previous page)

the deployment and adoption of broadband technology is vital to ensuring that our Nation remains competitive and continues to create business and job growth”); 47 U.S.C. § 1305(k)(2) (directing the Commission to develop a National Broadband Plan that would “seek to ensure that all people of the United States have access to broadband capability”). Indeed, broadband is playing an increasingly central role in most aspects of American society. For instance, broadband helps advance “consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes.” 47 U.S.C. § 1305(k)(2)(D).

<sup>122</sup> As stated above, we emphasize that our conclusion in this report in no way diminishes the progress broadband providers have made to expand broadband deployment throughout America. *See supra* at para. 6. Nor should our conclusion be taken as evidence that we are questioning the adequacy of the Commission’s prior efforts to increase broadband deployment.

<sup>123</sup> *See* 47 U.S.C. § 1302(b).

<sup>124</sup> *See* NATIONAL BROADBAND PLAN at xi–xv; *see also supra* para. 7. Instead of choosing a specific path for broadband in America, the plan describes actions the Commission and others should take in “fostering innovation and competition in networks, devices and applications; redirecting assets that government controls or influences in order to spur investment and inclusion; and optimizing the use of broadband to help achieve national priorities.” *See* NATIONAL BROADBAND PLAN at 5.

<sup>125</sup> *See supra* note 26.

## APPENDIX A

## Comments in GN Docket No. 09-137

<b><u>Committer</u></b>	<b><u>Abbreviation</u></b>
ADTRAN, Inc.	ADTRAN
AT&T Inc.	AT&T
Broadband Opportunity Coalition <i>et al.</i>	Broadband Opportunity Coalition
Comcast Corporation	Comcast
Covad Communications Company	Covad
CTIA - The Wireless Association	CTIA
District of Columbia Public Service Commission	DCPSC
Free Press	Free Press
National Association of State Utility Consumer Advocates	NASUCA
National Cable & Telecommunications Association	NCTA
National Telecommunications Cooperative Association	NTCA
New Jersey Division of Rate Counsel	NJ Rate Counsel
One Economy	One Economy
OPASTCO	OPASTCO
PCIA and The DAS Forum	PCIA
Pennsylvania Public Utility Commission	PPUC
Qwest Corporation	Qwest
Schools, Health and Libraries Broadband Coalition	SHLB
Section 706 Joint Conference Committee	Joint Conference
Sprint Nextel	Sprint
SUNESYS, LLC	SUNESYS
TCA Inc.	TCA
Time Warner Cable Inc.	Time Warner Cable
United States Telecom Association	USTA
Verizon and Verizon Wireless	Verizon
Wayne Longman	Wayne Longman
Western Telecommunications Alliance	Western Telecommunications Alliance
Wireless Internet Service Providers Association	WISPA
YourTel America Inc.	YourTel

## Replies in GN Docket No. 09-137

<b>Replies</b>	<b>Abbreviation</b>
AT&T Inc.	AT&T
California Public Utilities Commission	CPUC
Free Press	Free Press
Georgia Power Company	Georgia Power Company
GVNW Consulting, Inc.	GVNW
National Association of State Utility Consumer Advocates	NASUCA
National Cable & Telecommunications Association	NCTA
Verizon and Verizon Wireless	Verizon

## APPENDIX B

**Unserved Areas  
By State or U.S. Territory**

	Areas <sup>1</sup>	Population (1000s) <sup>2</sup>	Households (1000s) <sup>3</sup>	Average Population	Average Households	Average Per Capita Income (1999) <sup>4</sup>	Average Median Household Income (1999) <sup>4</sup>	Average Median Household Income (2008) <sup>4</sup>	Average % Living in Poverty (2008) <sup>5</sup>	Average Household Density <sup>6</sup>	Average Population Density <sup>6</sup>	Average % Rural Housing <sup>7</sup>
All Areas	3,230	308,404.1	115,221.7	95,481	35,672	\$17,232	\$34,809	\$44,172	15.2	108.20	283.47	59.1
Unserved Areas	1,024	24,042.0	8,895.8	23,479	8,687	\$14,565	\$28,627	\$37,785	18.4	46.79	138.30	72.6
Puerto Rico	78	3,954.0	1,307.8	50,693	16,766	\$6,943	\$13,189	NA	NA	432.56	1,315.85	11.5
North Carolina	19	3,450.8	1,338.3	181,623	70,438	\$18,784	\$37,345	\$42,974	17.0	129.51	332.45	53.0
Texas	142	2,527.4	910.7	17,799	6,413	\$15,348	\$30,163	\$38,896	18.1	8.42	23.07	66.1
South Carolina	23	1,751.4	657.9	76,148	28,602	\$16,135	\$32,840	\$38,891	19.7	44.16	117.72	62.4
Mississippi	59	1,522.4	562.9	25,803	9,540	\$13,636	\$26,699	\$32,551	24.4	16.95	45.64	75.0
Arkansas	61	1,454.5	569.1	23,844	9,329	\$14,882	\$27,888	\$33,545	20.8	13.23	33.72	69.5
Oklahoma	58	1,424.8	548.0	24,566	9,448	\$15,294	\$29,099	\$38,532	17.6	12.11	31.35	67.0
Kentucky	59	1,239.2	487.0	21,004	8,254	\$14,028	\$26,125	\$32,425	23.9	22.71	57.76	81.5
Missouri	54	997.2	389.7	18,467	7,217	\$14,879	\$29,374	\$36,216	18.1	12.60	32.29	78.3
Georgia	54	770.2	288.6	14,263	5,344	\$15,193	\$29,701	\$35,625	21.6	16.05	42.58	86.7
Louisiana	29	751.5	273.9	25,913	9,445	\$13,371	\$26,219	\$34,437	22.9	12.59	34.78	70.7
Alabama	23	562.9	219.4	24,472	9,539	\$14,019	\$26,586	\$32,912	22.2	13.86	35.48	89.4
California	8	368.2	125.8	46,031	15,729	\$18,049	\$32,883	\$40,602	16.7	4.94	14.10	70.7
Tennessee	18	317.6	123.1	17,645	6,841	\$14,731	\$27,819	\$32,816	21.9	17.31	44.67	84.3
Kansas	38	280.3	112.8	7,377	2,969	\$16,892	\$32,281	\$40,732	11.8	3.93	9.79	83.3
Montana	30	198.7	79.9	6,624	2,663	\$14,982	\$28,287	\$36,721	15.4	1.09	2.70	91.9
South Dakota	44	192.2	69.9	4,369	1,589	\$14,016	\$28,230	\$37,530	18.2	1.72	4.61	95.9
Alaska	22	179.9	59.5	8,176	2,702	\$19,167	\$45,251	\$53,837	14.1	0.28	0.80	82.3
Michigan	8	145.3	58.6	18,158	7,323	\$16,433	\$31,109	\$36,540	16.9	9.73	24.04	84.3
Minnesota	9	145.1	56.0	16,120	6,219	\$16,468	\$34,147	\$42,576	12.7	5.89	15.31	85.3

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New Mexico	10	136.4	51.0	13,637	5,104	\$13,844	\$26,102	\$32,446	19.5	1.18	3.15	72.7
Utah	13	131.9	43.9	10,146	3,379	\$14,248	\$33,697	\$45,477	13.1	1.13	3.29	79.2
Wisconsin	8	131.5	51.4	16,438	6,430	\$16,492	\$35,111	\$44,244	13.0	10.32	26.65	94.0
North Dakota	27	128.2	50.2	4,749	1,861	\$15,417	\$30,125	\$42,435	13.9	1.55	3.98	94.0
U.S. Virgin Islands	3	108.6	40.6	36,204	13,549	\$14,647	\$26,925	NA	NA	315.37	831.58	17.2
Nebraska	33	108.5	43.4	3,289	1,316	\$15,094	\$29,650	\$37,598	13.5	2.04	5.14	96.3
Illinois	6	107.5	41.6	17,916	6,934	\$17,767	\$36,164	\$43,527	15.1	14.77	38.30	60.7
Wyoming	5	106.4	42.4	21,277	8,486	\$17,760	\$35,259	\$54,543	8.3	1.92	4.84	74.4
Colorado	19	100.5	38.1	5,289	2,007	\$16,830	\$31,610	\$39,726	17.7	2.17	5.55	88.4
Nevada	10	98.9	38.2	9,894	3,822	\$18,492	\$39,158	\$50,779	12.7	1.07	2.61	71.1
Arizona	2	90.3	28.7	45,147	14,354	\$11,951	\$24,592	\$32,351	29.7	1.85	5.36	72.3
Idaho	11	75.4	27.2	6,853	2,471	\$15,014	\$32,460	\$42,417	13.3	2.04	5.79	88.8
Northern Mariana Islands	3	69.2	14.1	23,072	4,685	\$9,897	\$24,935	NA	NA	107.54	528.26	41.4
Florida	5	61.1	20.1	12,225	4,017	\$13,448	\$28,406	\$36,216	22.8	8.31	25.08	90.5
American Samoa	4	57.3	9.3	14,323	2,337	\$4,203	\$17,295	NA	NA	88.50	538.92	54.8
West Virginia	6	54.6	21.9	9,104	3,648	\$13,680	\$26,013	\$31,772	20.4	11.38	28.75	92.7
Virginia	7	52.8	20.6	7,544	2,947	\$17,920	\$35,024	\$43,930	12.3	59.84	150.15	85.7
Ohio	2	45.1	17.7	22,567	8,839	\$15,140	\$30,329	\$39,543	17.7	19.03	48.58	86.3
Iowa	4	44.4	17.8	11,106	4,458	\$16,761	\$33,083	\$43,595	12.3	7.25	18.02	87.8

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Indiana	2	37.3	13.8	18,632	6,921	\$17,493	\$39,088	\$47,844	13.0	16.53	44.50	90.2
Oregon	5	33.4	13.1	6,675	2,618	\$16,378	\$32,093	\$39,205	15.6	0.82	2.16	83.0
Washington	2	28.8	11.6	14,387	5,778	\$16,384	\$31,956	\$38,112	18.7	7.50	18.53	53.4
Hawaii	1	0.1	0.1	117	105	\$13,756	\$9,333	NA	NA	7.96	8.86	100.0

**Technical Notes:**

- 1) We examine a total of 3,230 counties or county equivalent areas, including 3,141 counties in the States and District of Columbia, 78 Municipal areas in Puerto Rico and 11 Municipal areas in American Samoa, Guam, Northern Mariana Islands and the U.S. Virgin Islands. We exclude two county equivalent areas in the Northern Mariana Islands (Rose Island Municipality and Northern Mariana Islands Municipality) due to data irregularities. As we work to improve our data, we anticipate that we will have a more precise identification of unserved areas. *See supra* Part III.B.2.a. & note 69.
- 2) We base our analysis on the most recent Census Bureau data available. We rely on Census Bureau 2008 population estimates for 3,140 counties in the 50 States and the District of Columbia, and 78 Municipalities in Puerto Rico. We rely on Census Bureau 2000 population estimates for a single county in Alaska and the 11 Municipal areas in American Samoa, Guam, Northern Mariana Islands and the U.S. Virginia Islands. *See* CENSUS BUREAU, POPULATION ESTIMATES DATA SETS, <http://www.census.gov/popest/datasets.html> (last visited Mar. 24, 2010).
- 3) We estimate households for 2008 by assuming that the relationship between household size and population size in each area has not changed between 2000 and 2008. Specifically,  $Households_{2008} = Population_{2008} / Household\ Size_{2000}$ , where  $Household\ Size_{2000} = Population_{2000} / Households_{2000}$ . For the 12 counties in which we do not have 2008 population estimates, we use Households based upon the 2000 Census. *See, e.g.*, CENSUS BUREAU, CENSUS 2000 SUMMARY FILE 1 (SF 1) 100-PERCENT DATA, [http://factfinder.census.gov/servlet/DownloadDatasetServlet?\\_lang=en](http://factfinder.census.gov/servlet/DownloadDatasetServlet?_lang=en) (last visited Mar. 24, 2010) (2000 Census Data).
- 4) We report two Income measures, Per Capita Income and Median Household Income. Per Capita Income and Median Household Income in 1999 dollars are reported for all county or county equivalent areas in the Census 2000 Summary File 3. *See, e.g.*, CENSUS BUREAU, CENSUS 2000 SUMMARY FILE 3, <http://www.census.gov/Press-Release/www/2002/sumfile3.html> (last visited Mar. 24, 2010). Median Household Income in 2008 dollars is available for 3,139 county or county equivalent areas. We do not have Median Household Income in 2008 for one county in Alaska and Hawaii, and all of the U.S. territories. *See* CENSUS BUREAU, SMALL AREA INCOME AND POVERTY ESTIMATES: STATE AND COUNTY ESTIMATES FOR 2008, <http://www.census.gov/did/www/saibe/data/statecounty/data/2008.html> (last visited Mar. 24, 2010).
- 5) Proportion of Population Living in Poverty in 2008 is reported by the Census Bureau for 3,139 of the 3,230 county or county equivalent areas. *Id.*

- 6) Household density is defined as the ratio of households to the total land area in the county. Population Density is defined as the ratio of population to the total land area in the area. These estimates are based upon the most recent Census Bureau data available. *See supra* Technical Notes 2 and 3.
- 7) Rural Housing Proportion is defined as the number of housing units categorized as rural by the Census Bureau divided by the total number of housing units in the county. *See* 2000 Census Data; *supra* Technical Note 3.