

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

In the Matter of	)	
	)	
Inquiry Concerning Deployment of Advanced	)	GN Docket No. 17-199
Telecommunications Capability to All	)	
Americans in a Reasonable and Timely	)	
Fashion	)	

**COMMENTS OF ADTRAN, INC.**

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## SUMMARY

ADTRAN welcomes this review under Section 706 as to “whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.” Unlike the previous two Section 706 Inquiries, this proceeding asks the right questions and suggests that it will conduct the analyses specified by Congress in Section 706. The Commission appears poised to assess progress in advanced services deployment to determine whether it is reasonable and timely – it is not simply asking “are we there yet?” ADTRAN also lauds the Commission for taking an expansive view of the “advanced services” landscape. Unlike previous Section 706 inquiries, this proceeding will fully consider mobile broadband in its assessment of advanced services deployment.

The Commission should continue to use the 25/3 Mbps broadband speed as the benchmark for advanced services in the Section 706 assessment. In its comments in the previous Section 706 inquiry, ADTRAN observed that the 25/3 Mbps benchmark was on the upper end of reasonableness, given the statute's definition of “advanced telecommunications capabilities,” the Commission's interpretation of that term, consumer adoption rates for high speed services, and consumer demand for services such as 4K TV. Nothing has changed that would alter our previous assessment. ADTRAN also supports the use of a 10/1 benchmark for mobile broadband services. Such speeds are capable of supporting all the advanced services except 4K TV, but that is not relevant for the small screens generally used to access mobile broadband. The 10/1 Mbps benchmark is also consistent with minimum speeds required in several of the Commission’s broadband subsidy programs. With respect to ongoing reviews of the benchmarks, as a balance between precision and the burdens of re-assessing the benchmarks, ADTRAN urges the Commission to review the benchmarks every three years.

In conducting its Section 706 analyses, ADTRAN urges the Commission to undertake a fulsome review so that it gets a complete picture of both the geographic and demographic characteristics of service-deprived people and territories. As Section 706 makes clear, the Commission should strive for universal availability of advanced services. By understanding whether an absence of service is due to geographic issues such as density and/or demographic issues such as income levels affecting demand, the Commission can better focus regulatory policies to address the lack of service. With respect to assessing the deployment of advanced services to schools and libraries, the Commission should continue to use the current benchmarks. However, the Commission should assess broadband services available to the schools and libraries, not simply the services purchased. In addition, the Commission should consider all technologies capable of meeting those benchmarks, not just fiber to the premises.

Finally, ADTRAN applauds all of the current Commission efforts to accelerate broadband deployment. ADTRAN suggests some additional steps the Commission should undertake, including fostering broadband within schools by expanding WiFi subsidies and implement the “preferred master contract” model embraced in the Commission’s 2014 *E-Rate Reform Order*. ADTRAN also urges the Commission to terminate the “set-top box” proceeding, which appears to be a thinly-veiled attempt to place the regulator’s thumb on the competitive

scale of MVPD services, and to resolve the still-open USF contribution proceeding to provide certainty to funding for the broadband subsidy programs. In addition to steps it can take itself, ADTRAN believes there are steps the Commission can take in working with others that could help accelerate broadband deployment. These include working with the White House to ensure that its infrastructure program includes broadband, and working with Congress with regard to creating tax incentives for broadband deployment and adoption of “net neutrality” legislation so that an open Internet is not subject to continuing shifts as Administrations change. ADTRAN also urges the Commission to work with other state and federal agencies (and the private sector) on education and training programs for consumers in order to spur broadband adoption, because higher “take rates” will also make deployment of broadband economical in more areas.

## Table of Contents

The <i>Notice of Inquiry</i> is Asking the Right Questions .....	3
Benchmarks.....	5
Undertaking the Assessment of Deployment of Advanced Telecommunications Capability to All Americans .....	11
Actions the Commission Should Undertake to Help Ensure that Advanced Services are Deployed to All Americans .....	14
Conclusion .....	17

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**COMMENTS OF ADTRAN, INC.**

ADTRAN, Inc. (“ADTRAN”) takes this opportunity to comment on several issues raised in the Commission’s *Notice of Inquiry* regarding the Thirteenth Broadband Progress Report undertaken pursuant to Section 706 of the Telecommunications Act of 1996.<sup>1</sup> Congress directed the Commission to determine and report annually on “whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion,”<sup>2</sup> and the *Notice of Inquiry* seeks input from the public that will help allow the Commission to answer that question. ADTRAN offers observations on many of the Commission’s preliminary assessments in the *Notice of Inquiry*, as well as a few suggested improvements to some of the proposed analyses.

ADTRAN, founded in 1986 and headquartered in Huntsville, Alabama, is a leading

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<sup>1</sup> *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 17-199, FCC 17-109, released August 8, 2017 (hereafter cited as “*Notice of Inquiry*”).

<sup>2</sup> 47 U.S.C. § 1302. Section 706 of the Telecommunications Act of 1996, Pub. L. No. 104-104, § 706, 110 Stat. 56, 153 (1996), as amended by the Broadband Data Improvement Act, Pub. L. No. 110-385, 122 Stat. 4096 (2008), as codified in Title 47, Chapter 12 of the United States Code. *See* 47 U.S.C. § 1301 *et seq.*

global provider of networking and communications equipment. ADTRAN's products enable voice, data, video and Internet communications across a variety of network infrastructures.

ADTRAN's solutions are currently in use by service providers, private enterprises, government organizations and millions of individual users worldwide. ADTRAN thus brings an expansive perspective to this proceeding, as well as an understanding of the importance to individuals, communities and our country of robust and ubiquitous broadband. ADTRAN has been a strong advocate in Commission proceedings to help spur broadband deployment,<sup>3</sup> and has itself launched a gigabit initiative that has far surpassed its goal of facilitating the deployment of 200 gigabit communities by the end of 2015, with over 350 gigabit communities deployed last year.<sup>4</sup>

ADTRAN certainly shares the Commission's and Congress' goal of universal availability of advanced services. And ADTRAN believes we are well on our way towards achieving that ultimate goal. In less than a generation, consumers have gone from the best-available wireline technology of 56 kbps dial-up modems to gigabit service to the home in hundreds of markets and

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<sup>3</sup> E.g., Comments of ADTRAN in GN Docket No. 16-245, filed September 6, 2016; Comments of ADTRAN in GN Docket No. 15-191, filed September 15, 2015; Comments of ADTRAN in WC Docket No. 10-90 *et. al.*, filed August 8, 2014; Comments of ADTRAN in WC Docket No. 10-90, filed March 28, 2013; Comments of ADTRAN in WC Docket No. 10-90 *et. al.*, filed January 18, 2012; Comments of ADTRAN in WC Docket No. 10-90 *et. al.*, filed April 18, 2011.

<sup>4</sup> See, *Press Release*, "ADTRAN Sets the Nation's Communities on the Path to Gigabit Transformation -- Utilities, MSOs and land developers deliver Gigabit broadband to over 350 communities," <http://phx.corporate-ir.net/phoenix.zhtml?c=67989&p=irol-newsArticle&ID=2178711>; <http://gigcommunities.net/adtran-reaches-200-gigabit-community-milestone/> ("More than 200 communities are now able to access [next-generation gigabit broadband services](#) as a result of ADTRAN's Enabling Communities, Connecting Lives program, ADTRAN announced August 11."); *Light Reading*, August 13, 2014, "Adtran Launches 'Gig Communities' Initiative," available at <http://www.lightreading.com/broadband/fttx/adtran-launches-gig-communities-initiative/d/d-id/710330>. See also, <http://gigcommunities.net/>.

spreading fast.<sup>5</sup> Wireless carriers have built out fourth generation wireless services nearly everywhere, and are primed to deploy fifth generation mobile broadband services. Satellite service now provides service at speeds up to 40 Mbps to remote and insular areas from Geostationary satellites,<sup>6</sup> with multiple proposals for much greater speeds through constellations of low-Earth orbit satellites. ADTRAN thus welcomes this *Notice of Inquiry*'s fresh and objective analyses of the progress that has already occurred, and whether it is reasonable and timely. ADTRAN also appreciates the Commission's inquiry into what can be done to ensure that progress in deploying advanced services to all Americans will continue -- and accelerate.

### ***The Notice of Inquiry is Asking the Right Questions***

ADTRAN disagreed with the previous two Section 706 inquiries,<sup>7</sup> to the extent that those inquiries seemingly did not "ask the right questions, gather the appropriate data and undertake the proper analyses," but rather appeared to be "merely a rote exercise to produce a negative finding solely to allow the Commission to continue to rely on Section 706 for substantive authority to regulate aspects of the Internet."<sup>8</sup> This inquiry, in contrast, asks the right questions

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<sup>5</sup> According to one recent report, 57.5 million consumers in the United States now have Gigabit services available to them. *Telecompetitor*, September 7, 2017, <http://www.telecompetitor.com/gigabit-report-57-5-million-americans-now-in-gigabit-reach-chicago-and-california-lead/>.

<sup>6</sup> See, e.g., <http://www.engadget.com/2012/02/14/viasat-surfbeam-2-pro-40mbps-satellite-broadband/>.

<sup>7</sup> See, Comments of ADTRAN in WC Docket No. 16-245, filed September 6, 2016; Comments of ADTRAN in WC Docket No. 15-191, filed September 15, 2015.

<sup>8</sup> Comments of ADTRAN in WC Docket No. 16-245, filed September 6, 2016 at p. 3.

and suggests that it will conduct the analyses specified by Congress in Section 706. As the *Notice of Inquiry* explains:

We intend to conduct this *Inquiry* by orienting it toward evaluating whether the progress being made in the deployment of advanced telecommunications capability is occurring in a reasonable and timely fashion.<sup>9</sup>

The Commission in this Section 706 inquiry is thus poised to assess progress in advanced services deployment to determine whether it is reasonable and timely. In contrast, the previous two inquiries simply asked “are we there yet?” -- while defining the destination on a forward looking basis, but looking at stale data to determine if we had arrived. Thus, this time around the Commission seems to be answering the question Congress set forth in Section 706.

ADTRAN also lauds the Commission for taking an expansive view of the “advanced services” landscape. Unlike previous Section 706 inquiries, this proceeding will fully consider mobile broadband in its assessment of advanced services deployment.<sup>10</sup> ADTRAN agrees that the Commission ought to include mobile broadband services in its analyses. Section 706 defines advanced services 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>11</sup> And a significant number of Americans utilize their mobile broadband service for such capabilities.<sup>12</sup> Thus, excluding mobile broadband from

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<sup>9</sup> *Notice of Inquiry* at ¶ 4.

<sup>10</sup> *Notice of Inquiry* at ¶ 5.

<sup>11</sup> 47 U.S.C. § 1302(d)(1).

<sup>12</sup> The Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021 White Paper, available at <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html>, provides an



the analyses would not be examining the whole marketplace. Moreover, Congress' specification that advanced services be defined "using any technology" reinforces the correctness of the *Notice of Inquiry's* expansive review of mobile broadband in its assessment of the availability of advanced services.

## **Benchmarks**

The *Notice of Inquiry* also seeks comment on the appropriate data speeds to use as benchmarks in assessing whether "advanced services" are being deployed. For fixed broadband services, the *Notice of Inquiry* suggests continuing to use the 25 Mbps download and 3 Mbps upload as the proxy for broadband capable of supporting "advanced services."<sup>13</sup> ADTRAN believes that no higher of a benchmark would be justified presently. In its comments in the

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enormous amount of data on current and forecast mobile data traffic. Amongst the findings, the following demonstrate the current and expected significance of that traffic:

**Mobile video traffic accounted for 60 percent of total mobile data traffic in 2016.** Mobile video traffic now accounts for more than half of all mobile data traffic.

**Smartphones (including phablets) represented only 45 percent of total mobile devices and connections in 2016, but represented 81 percent of total mobile traffic.** In 2016, the typical smartphone generated 48 times more mobile data traffic (1,614 MB per month) than the typical basic-feature cell phone (which generated only 33 MB per month of mobile data traffic).

**More than three-fourths of the world's mobile data traffic will be video by 2021.** Mobile video will increase 9-fold between 2016 and 2021, accounting for 78 percent of total mobile data traffic by the end of the forecast period.

**By 2021, mobile-connected tablets and PCs will generate 8.0 GB of traffic per month, a doubling over the 2016 average of 3.4 GB per month.** Aggregate traffic associated with PCs and tablets will be four times greater than it is today, with a CAGR of 33 percent.

<sup>13</sup> *Notice of Inquiry* at ¶¶ 12 and 14.

previous Section 706 inquiry, ADTRAN observed that the 25/3 Mbps benchmark was on the upper end of reasonableness, given the statute's definition of "advanced telecommunications capabilities," the Commission's interpretation of that term, consumer adoption rates for high speed services, and consumer demand for services such as 4K TV.<sup>14</sup> Nothing has changed that would alter our previous assessment.

Consumers have voted with their wallets, and apparently a significant portion of broadband subscribers continue to choose to purchase speeds below 25/3 Mbps.<sup>15</sup> In addition, one of the significant drivers of the Commission's selection of the 25/3 Mbps benchmark was the need to accommodate 4k TV,<sup>16</sup> and that service is still at the early stages of rollout.<sup>17</sup> Moreover,

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<sup>14</sup> Comments of ADTRAN in GN Docket No. 16-245, filed September 6, 2016 at pp. 7-8.

<sup>15</sup> In the *2016 Notice of Inquiry*, 31 FCC Rcd 9140 (2016) at ¶ 77, the Commission noted that "[b]ased upon the June 30, 2015 FCC Form 477 data and our 2015 Household data, we find the overall adoption rate for 25 Mbps/3 Mbps is 42 percent." According to the Industry Analysis and Technology Division Report on Internet Access Services: Status as of June 30, 2016 at Figure 3 (available at **Internet Access Services as of 06/30/16** (released 04/17) Report: [PDF](#)), over 40% of broadband subscriptions are for speeds less than 25/3.

<sup>16</sup> *2015 Broadband Progress Report*, 30 FCC Rcd 1375 (2015) at ¶ 32.

<sup>17</sup> E.g., CNET "4K content guide: What to watch in 4K and HDR today", March 28, 2017. Available at <https://www.cnet.com/how-to/4k-content-guide-what-to-watch-in-4k-today/>

Looking forward to watching your favorite baseball team in 4K? Can't wait to TiVo HBO's 4K broadcasts of "Game of Thrones?" Excited to rebuy the "Lord of the Rings" (Extended Edition) box set on 4K Blu-ray?

Don't hold your breath. 4K TVs are falling in price with the speed of a runaway train, but 4K content, the stuff you can actually watch in 4K today, can seem stalled in the station. The same goes for HDR (high dynamic range), which in our tests makes bigger picture quality difference than 4K.

If you want your 4K fix right now, you'd better have a fast Internet connection and be a fan of original series on Netflix and Amazon. Or you could buy a 4K Blu-ray player and (gasp) *actual physical discs* at \$15 a pop and up. ...

broadband service with 25 Mbps download speeds can accommodate 4K TV in any event.<sup>18</sup> And the fact that service providers are deploying gigabit broadband capabilities in advance of consumer demand for such speeds<sup>19</sup> ought to be applauded by the Commission – it should not be used as an excuse to raise the benchmark. Thus, ADTRAN urges the Commission to retain the 25/3 Mbps benchmark for fixed broadband service for purposes of this Thirteenth Broadband Progress Report.

The *Notice of Inquiry* seeks comment on whether a different benchmark than 25/3 Mbps should apply for purposes of assessing deployment of “advanced services” in the case of mobile broadband.<sup>20</sup> ADTRAN agrees that the proposed benchmark of 10 Mbps download and 1 Mbps upload would be a valid measure for supporting “advanced services” provided over mobile broadband. Mobile broadband at 10/1 Mbps will support “high-quality voice, data, graphics, and video telecommunications,” although admittedly the video telecommunications would not include Ultra 4K TV (which requires 15-20 Mbps for streaming). However, given the small

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Live and on-demand TV from cable, satellite, over-the-air antenna or a streaming service like Sling TV is almost never in 4K or HDR. DirecTV has the biggest selection, with a 24-hour channel that carries a few events, and Dish Network has dabbled in 4K too. Cable doesn't have any 4K broadcasts in the US yet.

In short, it'll be a long time before you can watch your favorite broadcast TV shows and sports in 4K and/or HDR.

<sup>18</sup> Netflix recommends a downlink speed of 25 Mbps for streaming Ultra 4K TV, although other sources indicate that 15 Mbps will be sufficient to support 4K TV. Compare <https://help.netflix.com/en/node/306> (Netflix recommendation of 25 Mbps) with <https://recombu.com/digital/article/how-much-is-netflix-4k-ultra-hd-min-broadband-speed> (indicates that 15-20 Mbps can support 4K TV).

<sup>19</sup> See, n. 4, *supra*.

<sup>20</sup> *Notice of Inquiry* at ¶¶ 19-20.

screens that commonly utilize mobile broadband – smart phones, phablets and tablets – the absence of Ultra 4K TV is unlikely to be relevant to consumers, who would not perceive any difference from HD TV (which requires 5 Mbps for streaming<sup>21</sup>).

In addition, the Commission has used 10/1 Mbps as the standard for supported broadband service in some of the Commission’s subsidy programs. As the *Notice of Inquiry* discusses, the Mobility Fund II program specifies that the median data speed of the network for the supported area must be 10 Mbps/1 Mbps.<sup>22</sup> In addition, in the Connect America Fund subsidy program the Commission adopted a minimum speed standard of 10/1 Mbps for price-cap and rate-of-return carriers receiving high-cost support.<sup>23</sup> Thus, for purposes of this Thirteenth Broadband Progress Report, ADTRAN supports the proposed benchmark of 10/1 Mbps for mobile broadband.

The *Notice of Inquiry* also seeks comments on a framework for updating the benchmarks.<sup>24</sup> The statutory definition of “advanced services” is not intended to be static. As broadband technologies and end user applications evolve, and customer demand for new capabilities both react to and drive changes in those capabilities, the broadband speeds needed to meet those demand will also change. Thus, ADTRAN believes that the Commission should conduct periodic reviews to determine whether the benchmark(s) should be updated. But given that benchmarks are a tool for measuring general progress, exact precision is unnecessary, and

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<sup>21</sup> E.g., <https://help.netflix.com/en/node/306> (Netflix recommends 5 Mbps for HD quality streaming).

<sup>22</sup> *Notice of Inquiry* at ¶ 20.

<sup>23</sup> *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order, 29 FCC Rcd 15644 (2014) at ¶ 15.

<sup>24</sup> *Notice of Inquiry* at ¶¶ 23-25.

indeed may be counterproductive. Stability in the benchmark allows year-over-year comparisons. Moreover, annual re-assessments of the benchmarks would require the Commission and commenters to dedicate resources to conduct analyses of various determinants of the benchmarks. ADTRAN thus suggests that the Commission should only conduct re-assessments of the benchmarks every three years.

In undertaking that analysis, the Commission should look at both the services/applications that customers are accessing, as well as the broadband speeds customers are subscribing to. Both provide evidence of the evolving “high-quality voice, data, graphics, and video telecommunications” that comprise advanced services. Consumer choices as to the broadband speeds being purchased when provided a range of options reflects expectations about being able to enjoy a variety of desired applications. Such actual marketplace decisions are entitled to more weight than some bureaucrats simply calculating throughput requirements for cutting edge technologies while making assumptions about demand. By way of example, if you wanted to simply justify a relatively high benchmark, you could assume that subscribers wanted to operate multiple, Ultra 4K TV video conference streams while engaging in multiple virtual reality video games. But such an exercise would hardly lead to valid benchmark to conduct an objective assessment of whether “advanced services” are being deployed on a reasonable and timely basis as specified in Section 706.

The *Notice of Inquiry* also seeks comment on whether, in addition to setting a benchmark, the Commission should look at other speeds or “vanguard services” to gain a more fulsome view of advanced telecommunications capabilities.<sup>25</sup> ADTRAN believes that it would be useful to

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<sup>25</sup> *Notice of Inquiry* at ¶ 28.

undertake as broad a review of technology deployment as possible in assessing the reasonableness and timeliness of progress. While even medium-range forecasts can be very unreliable,<sup>26</sup> the Commission should attempt to look forward over the next three to five years to determine whether expected demand for new capabilities is likely to be met. Thus, things like wider deployment of Ultra 4K TV, connected cars and expanded Internet of Things applications can be expected. But at the same time, based on current deployments and pilot programs, the Commission could anticipate wider deployment of 5G mobile services, mega-constellations of high-capacity low Earth orbits satellite systems and gigabit communities capable of supporting those vanguard services.

Such an assessment of slightly over-the-horizon developments should result in the Commission ensuring that there will not be any regulatory impediments to the deployment of these new services and capabilities. The Commission should not wait until it has to make a negative assessment under Section 706(b) before taking “immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.” Being proactive instead of reactive is certainly consistent with Section 706 and the public interest.

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<sup>26</sup> As the article “Cutting the Cord” in *The Economist* on October 7, 1999 observed:

HERE is a cautionary tale about a telephone giant and a management consultancy. In the early 1980s AT&T asked McKinsey to estimate how many cellular phones would be in use in the world at the turn of the century. The consultancy noted all the problems with the new devices—the handsets were absurdly heavy, the batteries kept running out, the coverage was patchy and the cost per minute was exorbitant—and concluded that the total market would be about 900,000. At the time this persuaded AT&T to pull out of the market, although it changed its mind later.

## **Undertaking the Assessment of Deployment of Advanced Telecommunications Capability to All Americans**

The *Notice of Inquiry* asks several questions with regard to Section 706(b)'s directive to assess "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion."<sup>27</sup> ADTRAN urges the Commission to undertake a fulsome review so that it gets a complete picture of both the geographic and demographic characteristics of service-deprived people and territories. As Section 706 makes clear, the Commission should strive for universal availability of advanced services. By understanding whether an absence of service is due to geographic issues such as density and/or demographic issues such as income levels affecting demand, the Commission can better focus regulatory policies to address the lack of service. In addition, such information can be useful in targeting subsidies. For example, it may be more efficient to provide subsidies to a broadband service provider to bring advanced services to an Indian reservation, but only provide subsidies to low-income families if bringing advanced services to cabins at a ski resort.

The *Notice of Inquiry* proposes to evaluate progress in the deployment of advanced telecommunications capability by comparing deployment to census blocks in the present year to deployment to census blocks in previous years.<sup>28</sup> Such an assessment should provide a good measure of fixed broadband deployment using available information sources from the Form 477 and Census Bureau information on census blocks. The *Notice of Inquiry* also asks whether other

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<sup>27</sup> *Notice of Inquiry* at ¶¶ 30-37.

<sup>28</sup> *Notice of Inquiry* at ¶ 30.

geographic metrics should be used, such as states, counties, road miles or crop land.<sup>29</sup> ADTRAN believes it makes sense to assess deployment progress on a state-by-state basis, because that may provide insight on particular state policies that encourage or inhibit broadband deployment. In addition, because the Commission is evaluating the availability of mobile broadband service, road miles would be a good metric for evaluating deployment progress.<sup>30</sup>

Consistent with Section 706(b)'s specific reference to assessing deployment "including, in particular, elementary and secondary schools and classrooms," the *Notice of Inquiry* seeks comment on measuring deployment to schools and libraries.<sup>31</sup> ADTRAN believes that the Commission can evaluate progress in achieving deployment to all libraries, schools and classrooms using the previous metrics of (i) for schools, a short-term goal of 100 Mbps per 1000 students and staff, and a long-term goal of 1 Gbps per 1,000 students and staff and (ii) for libraries that serve fewer than 50,000 people, broadband speeds of at least 100 Mbps, and for libraries that serve 50,000 people or more broadband speeds of at least 1 Gbps. However, the *Notice of Inquiry* proposes to rely principally on the Form 471's.<sup>32</sup> Unfortunately, that form provides data on the services ordered by the schools and libraries – it does not provide information on the broadband services that are available to the schools and libraries.

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<sup>29</sup> *Notice of Inquiry* at ¶ 32.

<sup>30</sup> While ADTRAN agrees that broadband connectivity has become increasingly important for agricultural applications (and indeed, nearly all commercial activities), if there is connectivity to the farm or ranch, then the farmer/rancher can readily deploy their own outdoor WiFi transmitter with a range of multiple kilometers (at a cost of under \$500) to extend coverage to their cropland or ranchland. Thus, ADTRAN believes it is unnecessary for the Commission to track separately mobile broadband coverage of farmland or ranchland.

<sup>31</sup> *Notice of Inquiry* at ¶¶ 39-40.

<sup>32</sup> *Notice of Inquiry* at ¶ 45.



Moreover, in assessing progress the Commission should not simply look to whether fiber is deployed to the school or library like the previous Section 706 Inquiry. The definition of “advanced telecommunications capability” in Section 706(d)(1) includes the principle of “using any technology,” and other technologies besides fiber can provide the necessary capacity. For example, advances in copper technologies have greatly increased the capabilities of the embedded copper loops. G.fast is deployed from distribution points located deep in the outside plant, and can deliver combined upstream and downstream speeds of up to 1 Gbps over short copper loops.<sup>33</sup> And interoperability tests of DOCSIS 3.1 products for a new generation of high-speed hardware have demonstrated that this technology can deliver up to 10 Gbps on Hybrid Fiber-Coax (HFC) networks.<sup>34</sup> In addition, fixed wireless broadband solutions are also available presently that provide 1 Gbps and higher services.<sup>35</sup>

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<sup>33</sup> ITU-T Recommendation G.9701, “Fast Access to Subscriber Terminals (FAST) – Physical layer specification,” December 2014. *See also*, *Light Reading*, “All That’s Gigabit Doesn’t Glitter” (<http://www.lightreading.com/gigabit/dsl-vectoring-gfast/all-thats-gigabit-doesnt-glitter/d/d-id/735558>); *Light Reading*, “Adtran Gfast Extends Gigabit Reach,” (<http://www.lightreading.com/gigabit/dsl-vectoring-gfast/adtran-gfast-extends-gigabit-reach/d/d-id/735624/>).

<sup>34</sup> *E.g.*, <http://www.businesswire.com/news/home/20141216005295/en/Multi-Gigabit-Cable-Broadband-Speeds-Closer-Consumers#.VPSbTk2Ya70>. *See also*, Gigaom, “Comcast shows off 1 Gbps broadband,” <https://gigaom.com/2011/06/16/comcast-shows-off-1-gbps-broadband/>; *ars technica*, “Comcast Planning Gigabit Cable for Entire US Territory in 2-3 Years,” <http://arstechnica.com/business/2015/08/comcast-planning-gigabit-cable-for-entire-us-territory-in-2-3-years/>

<sup>35</sup> *E.g.*, [http://www.bridgewave.com/company/pressreleases\\_20141011.cfm](http://www.bridgewave.com/company/pressreleases_20141011.cfm) (“Bridgewave Unveils Multi- Gigabit Millimeter Wave Wireless Backhaul and Front Haul Solutions”); <http://www.dragonwaveinc.com/products/packet-microwave/horizon-quantum> (“Delivering from 2 to 4 Gbps per link, Horizon Quantum represents the next generation in packet microwave technology and sets a new benchmark for performance.”).

The *Notice of Inquiry* also seeks comment on assessing “reasonable” and “timely” deployment.<sup>36</sup> Section 706 acknowledges that while universal availability of advanced telecommunications capability is an aspirational goal, it may not be possible to achieve that goal. “Reasonableness” acknowledges that it may not be economical to deploy broadband throughout the vast expanses of America with current technology. Hence it may take longer for some areas to receive service since they need to await new technology, such as high-capacity low Earth orbits satellites. Thus, the Commission’s analysis should not be simply “are we there yet?” – with “there” being the goal of 100% coverage. But rather the Commission should be assessing whether progress towards that goal is continuing at a constant, accelerating or slowing pace. And in determining whether progress is timely and reasonable, ADTRAN believes it is useful to examine the status of deployment in other countries as benchmarks for comparison.<sup>37</sup>

**Actions the Commission Should Undertake to Help Ensure that Advanced Services are Deployed to All Americans**

ADTRAN applauds the Commission for returning the Section 706 Inquiry to its intended role of objectively assessing the progress of deployment of advanced services – rather than as merely a rote exercise to provide authority for adoption of “net neutrality” rules. Part of that assessment should examine the particular areas where progress is not occurring and the reasons for the lack of progress. That should allow the Commission to target subsidies or other relief where they are most needed, and can provide the greatest benefit, because the Commission’s subsidy resources are not unlimited.

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<sup>36</sup> *Notice of Inquiry* at ¶ 37.

<sup>37</sup> *Notice of Inquiry* at ¶ 38.

As the *Notice of Inquiry* recognizes,<sup>38</sup> the Commission is already undertaking a number of actions to accelerate the deployment of broadband services, including the Broadband Deployment Advisory Committee process to develop model codes, two rulemaking to eliminate regulatory impediments to wireline and wireless broadband deployment, allocation of additional spectrum to support 5G wireless services, and elimination of vague and unnecessary Open Internet rules. In addition, the Commission continues to implement new methods of allocating subsidies for broadband deployment using reverse auctions. All of these actions are beneficial and will help ensure that all Americans have access to advanced services in a reasonable and timely fashion, and ADTRAN supports all of these regulatory activities.

ADTRAN believes there are some additional steps the Commission can take that will further accelerate broadband deployment. First, with regard to broadband deployment to schools, ADTRAN would urge the Commission to re-examine the current limit of \$150 per student every five years for Category-2 subsidies.<sup>39</sup> Broadband connections to the school at the benchmark speeds are useful only if there is also connectivity to the students within the schools. However, based on ADTRAN's experiences with the E-rate program, it appears as if the current limits are inadequate to build out reliable internal connections and WiFi capabilities to connect the students. Second, the Commission adopted, but has not yet implemented, a "preferred master contracts" model that could enhance the efficiency of the E-Rate subsidy program.<sup>40</sup> The

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<sup>38</sup> *Notice of Inquiry* at ¶ 47.

<sup>39</sup> *Modernizing the E-rate Program for Schools and Libraries*, 29 FCC Rcd 8870 (2014)(hereafter cited as "*E-rate Reform Order*") at ¶ 86.

<sup>40</sup> *E-rate Reform Order* at ¶¶ 170-173.

Commission should implement that measure, which would also help schools afford the necessary connectivity within the school.

With respect to broadband deployment more generally, ADTRAN urges the Commission to ensure that service providers' transitions to new technologies are not hampered by unnecessary regulatory delays.<sup>41</sup> ADTRAN also urges the Commission to terminate the proceeding with regard to video navigation choices.<sup>42</sup> Although ostensibly addressing set top boxes, the proceeding is a thinly-veiled attempt to "spur competition" in the MVPD marketplace, and the threat of the Commission placing its thumb on the competitive scale can deter investment in broadband networks that provide video and broadband services. In addition, ADTRAN urges the Commission to resolve the long-pending USF contribution proceeding<sup>43</sup> so as to stabilize the funding for the broadband, Lifeline and schools and libraries subsidy programs. The most recent proposed USF contribution factor of 18.8% reflects the distortive effects of assessing the USF fees on a declining segment of the telecommunications market.<sup>44</sup>

Finally, ADTRAN believes there are steps the Commission can take in working with others that could help accelerate broadband deployment. These include working with the White House to ensure that its infrastructure program includes broadband, and working with Congress

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<sup>41</sup> See, e.g., ADTRAN Comments in GN Docket No. 13-5, filed February 5, 2015; ADTRAN Comments in WC Docket No. 17-84, filed June 15-2017.

<sup>42</sup> *Expanding Consumers' Video Navigation Choices*, 31 FCC Rcd 1544 (2016).

<sup>43</sup> This proceeding was begun over a decade ago. *Universal Service Contribution Methodology*, 21 FCC Rcd 7518 (2006).

<sup>44</sup> *Public Notice*, "Proposed Fourth Quarter 2017 Universal Service Contribution Factor," DA 17-84, released September 12, 2017 (proposes a USF contribution factor of 18.8%).

with regard to creating tax incentives for broadband deployment and adoption of “net neutrality” legislation so that an open Internet is not subject to continuing shifts as Administrations change, and continuing appellate court reviews of those changing policies. ADTRAN also urges the Commission to work with other state and federal agencies (and the private sector) on education and training programs for consumers. Such activities should help improve broadband adoption,<sup>45</sup> and the resulting higher “take rates” can make it more economical for service providers to deploy broadband in more areas.

## **Conclusion**

ADTRAN welcomes this inquiry based on the intended purpose Congress set out in Section 706 to review objectively progress in deployment of advanced telecommunications services throughout America. ADTRAN believes that such an assessment will reveal significant progress, but with more work to be done in some territories. And as explained in these comments, ADTRAN believe there are steps the Commission can take by itself, and by working with others, that will foster the deployment of broadband to all Americans. Such actions will

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<sup>45</sup> As the Commission explained in Chapter IX of The National Broadband Plan (<https://www.fcc.gov/general/national-broadband-plan>), digital literacy and demonstrations of relevance are necessary for consumer adoption of broadband. It is not simply the cost of service that is deterring adoption.

thus well serve the public interest by ensuring reasonable and timely deployment of advanced telecommunications services, consistent with Congressional directives.

Respectfully submitted,  
ADTRAN, Inc.

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