



December 7, 2017

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Via Electronic Filing

Re: *Restoring Internet Freedom*, WC Docket No. 17-108

Dear Ms. Dortch:

New America's Open Technology Institute ("OTI") has previously filed comments addressing the proper classification of broadband internet access service (BIAS) and the impacts of the Domain Name System (DNS) and caching on that classification.¹ In particular, OTI has argued that BIAS is a telecommunications service and that domain-to-IP address translation DNS (called "DNS" in this ex parte) and caching are services, when provided by ISPs, that fit in the management exception of the definition of information services.

Nevertheless, the Federal Communications Commission (FCC) insists (in the draft of the Order) that DNS and caching are not for the management of a telecommunications service, and therefore, the FCC surmises, the services provide sufficient reason to classify BIAS providers (or "internet service providers" or "ISPs") as information services. These claims are based on misconceptions of arguments in the docket and the Order relies on some of these misconceptions. This filing aims to correct some of those misconceptions.

It Is Wrong to Argue that Without ISP-Provided DNS, DNS would not exist.

The Order spends substantial time discussing DNS. But that section incorrectly assumes that without ISP-provided DNS, consumers would have no DNS at all. Specifically, the FCC argues that "[w]hile ISPs are not the sole providers of DNS services, the vast majority of ordinary consumers rely upon the DNS functionality provided by their ISP, and the absence of ISP-provided DNS would fundamentally change the online experience for the consumer."² This argument is categorically false.

¹ *Generally* OTI Comments at 30-34; OTI Reply Comments at 19.

² Draft Order, ¶ 33.

Almost nothing would change should ISPs decide to stop providing DNS tomorrow. Online content providers have an extremely obvious incentive to ensure that consumers can continue finding those companies by typing “www.[companyname].com” into a browser, rather than an IP address. While ISPs can and do provide this service, third parties *also* can (and do) provide this service. In fact, as the Order points out but then largely ignores, there are several third party DNS providers, including Dyn, Google, and OpenDNS.

The only thing stopping “the majority of ordinary consumers” from adopting a different DNS provider is the fact that changing your DNS provider, while extraordinarily easy, is hidden from plain view. If ISPs stopped providing DNS, third parties would likely make changing DNS providers trivial. An operating system or a browser could make it a choice on first boot-up. A router manufacturer could ask users to choose from a list of known DNS providers when they setup their router. Or online companies could facilitate that change. At any rate, third parties would continue providing these services should ISPs decide to stop. Thus, the order sets up a false comparison by assuming that unless consumers have ISP-provided DNS, their online experience would change dramatically.

Third, it appears as though third party DNS providers are gaining in popularity. In the Order, the FCC states that “[w]hile ISPs are not the sole providers of DNS services, the vast majority of ordinary consumers rely upon the DNS functionality provided by their ISP...”³ However, the article cited and relied on by Sandvine (“*DNS Resolvers* study”), argues that “it is now common to see customers using a public DNS service instead” of an ISP’s service.⁴ In addition, there is at least some evidence that third party DNS providers are more secure than ISP-provided DNS.⁵

Users Observe Essentially No Impact on Performance Between ISP-provided and Third Party-provided DNS

The FCC relies on Sandvine’s statement that ISP-provided DNS is “superior” to third party services.⁶ However, the *DNS Resolvers* study, relied on by Sandvine, does not support this claim. User experience will primarily be dictated by the throughput of the application, and the study showed that throughput differences between the European ISP-provided DNS and the Google DNS are minimal. The European ISP-provided DNS allowed 3.2 mbps throughput, while Google DNS allowed 3 mbps throughput. This similarity led the authors of the study to state “both DNS services result in a similar throughput despite a different [round-trip-time].”⁷ Even if we assumed that round-trip-time were the primary dictator of user experience, the differences

³ Draft Order, ¶ 33.

⁴ Hadrien Hours *et al.*, *A Study of the Impact of DNS Resolvers on Performance Using a Causal Approach*, <https://www.tlc-networks.polito.it/oldsite/mellia/papers/ITC15DNS.pdf> at 1 (“DNS Resolvers Study”).

⁵ Dan Price, *4 Reasons Why Using Third-Party DNS Is More Secure*, MakeUseOf (Apr. 17, 2017), <http://www.makeuseof.com/tag/reasons-third-party-dns-servers-secure>.

⁶ Draft Order, ¶ 33 n.110.

⁷ DNS Resolvers Study at 5.

there are minimal as well. The European ISP-provided DNS averaged 20ms round-trip-time and the Google DNS averaged 48ms round-trip-time. That negligible difference in round-trip-time is likely imperceptible to the user.

The *DNS Resolvers* study also compared the speeds and throughput of one *European* ISP and Google DNS *in Europe*, making its conclusions questionably applicable here. Other studies that measured latency of third party DNS providers found that Google's average latency (worldwide) was 32.94ms (much faster than the 48ms in the study), and OpenDNS had average latency of 45ms and Dyn measured at 50ms.⁸ These lower round-trip-times may indicate a more even and comparable experience between ISP DNS and third party DNS than the *DNS Resolvers* study shows.

DNS and Caching Are Incidental to the Transmission Component of BIAS and Do Not Transform BIAS into an Information Service.

The incidental nature of DNS and caching as compared to the transmission component has two implications. First, ISP-provided DNS and caching qualify under the systems management exception in the "information service" definition because they are incidental to BIAS and do not alter the fundamental character of the telecommunications service.⁹ As the *2015 Order* explained, "[a]lthough the Commission assumed in the Cable Modem Declaratory Ruling—*sub silentio*—that DNS fell outside the telecommunications systems management exception, Justice Scalia's assessment finds support both in the language of section 3(24), and in the Commission's consistently held view that 'adjunct-to-basic' functions fall within the telecommunications systems management exception to the 'information service' definition."¹⁰ Similarly, caching merely facilitates transfer of information, making it incidental to transmission.¹¹

Second, the incidental nature of DNS and caching is relevant to the consumer's perception as to whether BIAS is an offering of telecommunications or rather an information

⁸ Archana Kesavan, *Comparing the performance of popular public DNS providers*, Network World (May 10, 2017), <https://www.networkworld.com/article/3194890/internet/comparing-the-performance-of-popular-public-dns-providers.html>.

⁹ See 47 U.S.C. § 153(24) ("[t]he term 'information service' means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, . . . but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service."). *Protecting and Promoting the Open Internet, Report and Order on Remand, Declaratory Ruling, and Order*, 30 FCC Rcd. 5601, 5766-67 ¶ 367 (2015) ("*2015 Open Internet Order*") (stated that uses that fit within the management exception "(1) must be 'incidental' to an underlying telecommunications service—i.e., 'basic' in purpose and use in the sense that they facilitate use of the network; and (2) must 'not alter the fundamental character of [the telecommunications service].'" (citations omitted)).

¹⁰ *2015 Open Internet Order*, 30 FCC Rcd. at 5766-67 ¶ 367.

¹¹ *Id.* ¶ 372.

service.¹² If the information service component is *incidental* and the transmission component is *fundamental*, then it is hard or impossible to conclude that consumers perceive BIAS as an information service. Indeed, the ISPs apparently think so too. Their marketing and promotional material is barren of any mentions of DNS or caching.¹³

Conclusion

ISPs provide DNS and caching to facilitate transmission of information over the network. These services are used to manage ISP networks and thus BIAS is not an information service.

Respectfully submitted,

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¹² See *NCTA v. Brand X*, 545 U.S. 967, 989-90 (2005) (holding that the term “offer” as used in the definition of telecommunications service is ambiguous, and finding that the Commission properly took into consideration the term’s “common usage . . . [including] what the customer perceives to be the integrated finished product, even to the exclusion of discrete components that compose the product” in classifying the service as a telecommunications or information service); see also *USTA v. FCC*, 825 F.3d 674, 708 (D.C. Cir. 2016) (“when interpreting [the telecommunications service] provision in *Brand X*, the Supreme Court held that classification of broadband turns on consumer perception.”) (citation omitted).

¹³ See, e.g., *2015 Open Internet Order*, 30 FCC Rcd. at 5757 ¶ 354 (“[t]he record suggests that fixed broadband Internet access service providers market distinct service offerings primarily on the basis of the transmission speeds associated with each offering. Similarly, mobile providers market their service offerings primarily on the basis of the speed, reliability, and coverage of their network. Marketing broadband services in this way leaves a reasonable consumer with the impression that a certain level of transmission capability—measured in terms of ‘speed’ or ‘reliability’—is being offered in exchange for the subscription fee, even if complementary services are also included as part of the offer.”) (citations and some internal quotation marks omitted); *USTA*, 825 F.3d at 699, 709 (“broadband providers focus their advertising on the speed of transmission. . . . [I]n the present order the Commission cited ample record evidence supporting its current view that consumers perceive a standalone offering of transmission.”) (citation omitted).



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Filed electronically via ECFS

Re: *Restoring Internet Freedom*, WB Docket No. 17-108

Dear Ms. Dortch:

New America's Open Technology Institute, by its attorneys, the Institute for Public Representation, comments on the by the Federal Communications Commission ("FCC" or "Commission") to rely on the impossibility exception as the legal basis for preempting state laws governing the intrastate practices of broadband providers.

As an initial matter, any preemption in the final order would be procedurally deficient in violation of the Administrative Procedure Act because the Commission failed to provide adequate notice of its intent to preempt and the basis for its preemption. The Commission's purported authority to preempt, the impossibility exception, is a fact-intensive determination that, if justified, allows agencies to exercise *narrow* preemption authority of state laws and regulations that govern activities that are purely interstate or impossible to separate from intrastate activities. At this point, the public lacks a full understanding of the facts needed to make this determination. The facts currently at the public's disposal, however, dictate that the Commission does not have authority to preempt.

I. The Commission’s preemption authority is strictly limited by Section 152(b).

As a first matter, “Section 152(b) constitutes . . . a congressional denial of power to the FCC”¹ prohibiting “the Commission[’s] jurisdiction with respect to . . . charges, classifications, *practices*, services, facilities, or regulations for or in connection with *intrastate* communication service by wire or radio of any carrier.”² It effectively “fences off from FCC reach or regulation intrastate matters,” even when the intrastate matters are done in connection with the interstate matters³ and when facilities are physically inseparable.⁴ The FCC cannot “nevertheless take action which it thinks will best effectuate a federal policy. An agency may not confer power upon itself.”⁵ Notably, “[t]he extent of the authority to regulate intrastate communications services reserved to the states . . . does not turn on whether the services are provided on a common carrier or non-common carrier basis”⁶

Contrary to the Commission’s claim in the draft order, it cannot engage in wholesale preemption of state broadband laws without an express preemption provision or unambiguous command from Congress. The provisions of the Telecommunications Act of 1996 are “subject to the substantive and interpretative limitations of Section 152(b)”⁷ and “should not be read to confer upon the FCC jurisdiction over [intrastate activities] unless [the provisions are] ‘so unambiguous or straightforward so as to override the command of § 152(b).’”⁸ No provision in the Act expressly provides for the Commission to preempt all state laws related to the practices of broadband providers. The draft order suggests that the passage of the 1996 Act and its policy statement laying out the general purpose of the Act constitute an unambiguous command from Congress.⁹ They do not.

II. The impossibility exception provides for only narrow preemption authority.

Even if the Commission is unconvinced of its lack of authority to preempt, the impossibility exception will not save it. Under the impossibility exception, the FCC may preempt state laws when “(1) it is not possible to separate the interstate and intrastate aspects of the service, and (2) federal regulation is necessary to further a *valid* federal regulatory objective,”¹⁰ and it must also justify its entire preemption order by “demonstrating that the order is narrowly tailored to preempt only such state regulations as would negate valid FCC regulatory goals.”¹¹ It

¹ Louisiana Pub. Serv. Comm’n v. FCC (“Louisiana PSC”), 476 U.S. 355, 374 (1986).

² 47 U.S.C. § 152. (emphasis added).

³ Louisiana PSC at 370.

⁴ Nat’l Ass’n of Regulatory Util. Comm’rs v. FCC (“NARUC III”), 880 F.2d 422, 428 (D.C. Cir. 1989).

⁵ Louisiana PSC at 374 (1986).

⁶ People of State of Cal. v. FCC (“California I”), 905 F.2d 1217, 1242 (9th Cir. 1990).

⁷ Illinois Pub. Telecommunications Ass’n v. FCC, 117 F.3d 555, 561 (D.C. Cir. 1997).

⁸ *Id.* at 561 (D.C. Cir. 1997) (quoting Louisiana PSC at 377).

⁹ Draft Order at ¶¶ 198-99.

¹⁰ Minnesota Pub. Utilities Comm’n. v. FCC, 483 F.3d 570, 578 (8th Cir. 2007) (emphasis added).

¹¹ California I at 1243.

is not enough merely to show that “some of the preempted state regulation would, if not preempted, frustrate FCC regulatory goals.”¹²

A. Certain aspects of broadband service can easily be separated into interstate and intrastate.

The Commission cites several FCC orders and a couple cases as the basis for asserting that broadband is jurisdictionally interstate.¹³ To its credit, the Commission is right that these sources show that when a broadband-based activity travels across state lines or when it is impossible to determine whether the traffic is travelling across state lines, it is jurisdictionally interstate. However, when the facts of these orders and cases are read closely, they demonstrate that when a broadband provider can determine that the start and end points of an activity occur only within a state, it is possible to separate the interstate and intrastate aspects of the service, and thus the impossibility exception would not apply under the first prong.

Certain state laws that govern the relationship between an ISP and its customers within a state cannot be preempted under the impossibility exception. Unlike some of the situations in the sources cited in the draft order, the beginning and end points of the interaction between the customer and the ISP can be easily identified and are both within the state—the device the customer uses to access the ISP’s network and the closest ISP headend, tower, or other facility to the customer where the ISP can collect information from the customer and can manipulate the customer’s broadband service. In this case, it would be quite easy for an ISP to comply with the particular state laws without having to apply the same requirements to its interstate communications.

B. The FCC cannot have a valid federal policy goal when it disclaims all authority over broadband practices.

The draft order’s reliance on the impossibility exception also falls apart because it fails to acknowledge that preemption by the Commission must be pursuant to a *valid* federal policy goal. But any goal the Commission asserts is invalid because the order disclaims its general authority to regulate the practices of broadband providers at all. According to the draft order’s own terms, once broadband is classified as an information service, the FCC lacks authority to impose any conduct rules on ISPs.¹⁴ The Commission cannot thereafter assert that it has a policy goal of removing regulations for something over which it has no authority. By way of analogy, if the FCC were to issue an order stating that it does not have authority to regulate food safety, it would defy logic for it to claim it has a policy of deregulating food safety measures. Once the FCC decides to abdicate authority, it extracts itself from any oversight and precludes itself from preempting state efforts on similar issues.

¹² California I at 1243; *see also* NARUC III at 430 (D.C. Cir. 1989) (“We conclude, therefore, that the Commission may take appropriate measures in pursuit of that goal, but only to the degree necessary to achieve it.”).

¹³ Draft Order at ¶ 195.

¹⁴ *Id.* at ¶ 263.

C. Complete preemption does not meet the narrow tailoring requirement of the impossibility exception.

The Commission has not met its burden of justifying that its preemption approach is narrowly tailored. As discussed above, it is not difficult to imagine state laws that purely govern the intrastate activities of ISPs and their customers. A preemption approach cannot be narrowly tailored if it does not account for these possibilities. In fact, a Ninth Circuit decision suggests that courts are wary of broad sweeping preemption.¹⁵ Thus, the Commission should exercise caution in preempting all state laws governing broadband providers.

III. Section 10(e) does not support preemption.

Finally, it is worth noting that, especially absent other valid preemption authority, the Commission cannot hang its hat on Section 10(e) of the Act. The Commission only relies on this provision for “support,” but even still, it is unavailing for the same reason that the Commission’s policy goals fail. Forbearance from exercising authority is different from disclaiming any authority in the first place.

Respectfully submitted,

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¹⁵ California I at 1239-43 (vacating the Commission’s attempt to preempt “nearly all state regulation of the sale of enhanced services by communications common carriers”).



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Re: *Restoring Internet Freedom*, WC Docket No. 17-108

Dear Ms. Dortch:

Since 2004, when the Federal Communications Commission (“FCC”) first addressed net neutrality in an official way, consumers and edge providers have relied on some form of FCC-enforced open internet protections to ensure that internet service providers (“ISPs”) do not discriminate, manipulate, or alter traffic going over their networks. This ensures a proper marketplace on the internet without undue influence from infrastructure providers. The proposed order, which would repeal open internet protections and abdicate meaningful FCC oversight of the ISP market, would upset these reliance interests and trigger an enhanced explanation required by *FCC v. Fox*.

When an Administrative Agency’s Policy Engenders Reliance Interests, Changes to that Policy Require a More Detailed Justification than When the Agency Creates Policy from a Blank Slate

In the plurality decision in *FCC v. Fox*,¹ the Supreme Court established the general rule that an agency action changing prior policy does not require a more substantial explanation than if the agency had acted in the first instance. In that case, the Court held that the FCC’s change in position on fleeting expletives was not arbitrary and capricious because the agency acknowledged its change in position and provided rational reasons for its new position, thus meeting Administrative Procedure Act requirements.

In certain circumstances, however, a reviewing court will impose a higher standard. When a policy has engendered reliance interests, a reviewing court will look for “a more detailed justification than what would suffice for a new policy created on a blank slate . . . when, for

¹ Federal Communications Commission v. Fox Television Stations, Inc., 556 U.S. 502 (2009) (“*Fox*”).

example, . . . its prior policy has engendered serious reliance interests that must be taken into account.”² The Court stated in *Fox* that ignoring the interests of those that have relied on prior policy would be arbitrary and capricious.³ Thus, when an agency’s policy engenders reliance interests, changing that position requires the agency to provide a stronger explanation than is normally necessary.⁴

Consumers and edge providers have come to rely on an FCC-enforced open internet regime that ensures consumers can access the content they desire without ISP interference or discrimination

Beginning in 2004, the FCC has sought to protect the open internet through a series of agency documents, proceedings, and rulemakings. For more than a decade, the FCC has had rules on the books, policy statements favoring net neutrality protections, and clear enforcement actions against discriminatory conduct, all of which reduced incentives for broadband providers to discriminate based on content. These actions occurred under both Republican and Democratic administrations. In February 2004, Republican FCC Chairman Michael Powell argued that “consumers are entitled to ‘internet freedom’” and challenged the industry to honor four specific net neutrality principles.⁵ The following year, the FCC adopted these principles in an informal policy statement.⁶ The FCC enforced these principles early on: prior to issuing the informal policy statement, the FCC took action in response to complaints that an internet service provider was blocking VoIP traffic which resulted in a consent decree;⁷ the FCC forced broadband providers to accept the principles as binding conditions on the approval of mergers in 2005⁸ and 2007.⁹ The FCC then opened a proceeding in 2007 to formalize these principles, and that proceeding resulted in the 2010 Open Internet Order.¹⁰ In 2014, the D.C. Circuit vacated much of that order on authority grounds, and the FCC initiated a new proceeding to again determine how to adopt these principles. After extensive public comment, the FCC finally put the open internet rules on firm legal grounding by reclassifying broadband providers as Title II telecommunications carriers, providing the authority necessary to pass strong open internet

² *Fox* at 515-16.

³ *Id.*

⁴ The Supreme Court firmly established the reliance interests requirement in *Encino Motorcars, LLC v. Navarro*, 136 S.Ct. 2117 (2016).

⁵ Michael K. Powell, Preserving Internet Freedom: Guiding Principles for the Industry, at 5 (Feb. 8, 2004), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-243556A1.pdf.

⁶ Policy Statement, Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, 20 FCC Rcd 14986, para. 4-5 & n. 15 (2005).

⁷ Order, Madison River Communications LLC, 20 FCC Rcd 4295 (2005).

⁸ Memorandum Opinion & Order, SBC Communications Inc. and AT&T Corp. Applications for Approval of Transfer of Control, 20 FCC Rcd 18290 (2005).

⁹ Memorandum Opinion & Order, AT&T Inc. and BellSouth Corporation Application for Transfer of Control, 22 FCC Rcd 5662, app. F, at 5814-15 (2007).

¹⁰ Report & Order, *Preserving the Open Internet*, 25 FCC Rcd 17905 (2010).

protections. The D.C. Circuit upheld this Order in 2015 and denied rehearing en banc.¹¹ The current proceeding seeks to undo this classification and the rules themselves.

Consumers and edge providers have clear reliance interests in the FCC's open internet protections. Without such rules in place, it is almost certain that broadband providers would be engaging in substantial content and traffic discrimination for a variety of purposes, with little to no recourse for consumers or edge providers. Both an edge provider's ability to succeed and a consumer's ability to engage in online commerce, speech, and other daily activities would be called into question if broadband providers begin engaging in widespread traffic discrimination.

In prior proceedings, commenters (consumer advocates and edge providers alike) have pointed to the need for strong, enforceable, and predictable open internet rules that will increase certainty for consumers and edge providers that content will be delivered to consumers who desire it. For instance, consumer groups in 2009 wrote about protecting online investment and the online economy: "[i]nvestment in the applications and content subsectors will be substantially and negatively impacted by the abandonment of Net Neutrality, and as a result, overall growth in the U.S. economy will suffer[.]"¹² and "[n]etwork neutrality protects the revenue generated by Internet content providers, increasing their incentive to invest."¹³

In 2017, NASUCA argued "[c]onsumer reliance on [open] access to Internet content is the bedrock of a free Internet. Protecting consumers from ISP interference is as compelling today as it was in 2015."¹⁴ Consumers themselves have repeatedly expressed their reliance on stable, non-discriminatory internet access in consumer complaint forums. For example, one Comcast customer posted the following in an online forum during the interconnection disputes of 2014:

My needs are simple—I work in a local university hospital, and sometimes need to connect from home overnight or on weekends for urgent patient cases. So when I'm not using the connection as a home internet connection, I primarily connect to a VPN with a Citrix server, which hosts some proprietary software that displays certain patient data and relevant video. Video is vital to what I do, so I require reasonable speed. At certain times of the day I've managed to get 15mbit/s down, and video runs at a decent speed. At peak times, however, I rarely see speeds upward of 700kbit/s down from the VPN, and the video is so slow as to be unusable, I might as well hop in my car and drive to work. . . . I have tried our local IT contacts, but they have been of limited assistance (of the "unplug and reboot your computer" variety). Thanks!¹⁵

¹¹ *USTA v. FCC*, Order Denying Rehearing en Banc, Dkt. 15-1063, May 1, 2017 [https://www.cadc.uscourts.gov/internet/opinions.nsf/06F8BFD079A89E13852581130053C3F8/\\$file/15-1063-1673357.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/06F8BFD079A89E13852581130053C3F8/$file/15-1063-1673357.pdf)

¹² Comments of Free Press at 69 (Jan. 14, 2010), Dkt. 09-191.

¹³ Comments of Institute for Policy Integrity at New York University School of Law at 4, (Apr. 26, 2010), Dkt. 09-191.

¹⁴ Comments of NASUCA at 9 (July 17, 2017). See also Comments of CCIA at 36 (July 17, 2017).

¹⁵ Susan Crawford, *The Cliff and the Slope*, Wired (Oct. 30, 2014), <https://www.wired.com/story/jammed/>.

Consumer reliance on open internet protections is especially acute for telecommuters. In 2014, the American Society of Civil Engineers explained the spillover effects of interconnection disputes on people who connect to their employers via home internet connections: “Telecommuters can lose their jobs over these kinds of issues.”¹⁶

Independent filmmakers also noted their reliance on open internet protections in 2017:

There is ample evidence in the history of U.S. cinema, broadcast and cable television that infrastructure providers look to control content to feed their own networks and then displace outside suppliers[.]

. . . .

[C]urrent conditions in the video and online marketplace, as well as the record underlying the 2015 Open Internet Order, amply support the need for enforceable regulations that will protect the ability of third party providers of legal content, services and applications to rely on broadband access to reach consumers and to deliver the broad array and choice of content that U.S. public policy seeks to inspire.¹⁷

Online companies have filed similar arguments. For instance, in 2005, Amazon wrote the following:

Companies that provide . . . consumer content and applications will not invest in it without assurances that users will be able to reach their offerings without interference from broadband service providers. The success of broadband Internet access is dependent on users being able to access the products and services they want to reach with their fast connections.

. . . .

Content providers cannot be expected to make substantial new investments absent assurances that consumers will be able to reach their products without discriminatory interference from broadband service providers.¹⁸

In 2007, Google filed the following:

For nearly thirty years, the FCC has presided over a regulatory framework that resulted in a network neutral market environment. The antecedent to the current

¹⁶ Open Technology Institute, *Beyond Frustrated: The Sweeping Consumer Harms as a Result of ISP Disputes*, (Nov. 2014) at 5 (included as an attachment to this ex parte filing).

¹⁷ Comments of the Independent Film and Television Alliance at 2 (July 17, 2017).

¹⁸ Notice of Ex Parte by Amazon.com at 14, 16 (filed Aug. 2, 2005), Dkts. 02-52 et al.

debate over network neutrality lies in the narrowband world of dial-up online services, which began in the late 1970s. To a large extent, where we are now, and where we are going, is based on where we have been.

. . . .

Among other downsides, broad “principles” without consistent, enforceable rules risk a significant chilling effect on innovators who rely upon regulatory clarity to assure the existence of Internet platforms without artificial barriers.¹⁹

In 2009, Skype argued that a policy that provides “greater certainty” and “will set consumers free to use their broadband connections to access, organize, and disseminate knowledge” will benefit “all concerned in the broadband Internet ecosystem.”²⁰ And in 2017, Etsy argued that its business relies on the ability of its sellers to reach their customers, which in turn means sellers are “dependant on strong, enforceable net neutrality protections.”²¹

Libraries also rely on an open internet and strong open internet policies. The Association of Research Libraries filed comments in this proceeding providing specific examples of projects that would have been more difficult or impossible to engage in without an open internet. One such example includes “DocSouth,” a program designed to document and dissemination information about the American south and its history.²² Several state Attorneys General also argued “consumer reliance on unfettered access to Internet content continues to grow.”²³

Other edge providers have argued they rely on strong open internet policies as well. Engine, which represents hundreds of small start-up companies, stated the following in a 2014 ex parte:

The Commission’s long-standing commitment and actions undertaken to protect the open Internet are a central reason why the Internet remains an engine of entrepreneurship and economic growth.... This Commission should take the necessary steps to ensure that the Internet remains an open platform for speech and commerce so that America continues to lead the world in technology markets.²⁴

Engine echoed these concerns in its 2017 filing, stating that

Strong net neutrality rules are the bedrock of an open and free Internet. In reliance on these protections, investors have poured billions into startups that

¹⁹ Comments of Google at 5 (June 15, 2007), Dkt. 07-52.

²⁰ Comments of Skype at i (Apr. 26, 2010), Dkt. 09-191.

²¹ Comments of Etsy at 2 (July 17, 2017).

²² Reply Comments of the Association of Research Libraries at 4 (Aug. 29, 2017).

²³ Revised Comments of the Attorneys General of the States of Illinois, et al. at 17 (May 18, 2017).

²⁴ Notice of Ex Parte by Engine and Julie Samuels (May 7, 2014), Dkt. 14-28.

have changed the world, creating countless new jobs and vast economic growth in the process. Eliminating these rules, as the present NPRM proposes, would severely disrupt the future potential of the Internet sector.²⁵

Netflix reminded the FCC in its recent comments that “[w]hen Netflix was starting out, an open internet enabled us to offer consumers an innovative option for watching movies and TV shows” and went on to argue that broadband providers are still gatekeepers and Netflix continues to rely on open internet protections.²⁶ INCOMPAS argued that many new services and platforms

rely on the protections of the Open Internet order to bring innovative content and services to millions of consumers. And these are not all new-fangled inventions from technology companies. Real-estate agents, local appliance dealers and other businesses up and down Main Street are increasingly providing goods and services that are network-dependent that consumers access via the Internet. For example, online markets like Zillow or Trulia linking realtors with homebuyers are increasingly popular.²⁷

For its part, OTI has brought up these concerns as well. In July 17, 2014, comments, OTI argued that “[i]n the absence of strong net neutrality rules, investment in the tech industry could easily suffer.”²⁸

Network providers also want certainty. For instance, XO Communications argued in 2010 that “[i]n light of the *Comcast* decision, and to avoid the uncertainty and delay that would likely result if the Commission were to rely exclusively on Title I authority, XO believes the Commission should reasonably exercise its Title II jurisdiction consistent with providing certainty.”²⁹

Consumer and edge provider reliance interests have been clearly identified in the record. Any policy changes that would upset these reliance interests requires a heightened explanation for why the FCC is changing course despite these reliance interests.

The FCC’s Recent Notice of Proposed Rulemaking Threatens to Upset These Reliance Interests

Now that consumers’ and edge providers’ reliance interests in a strong, federally-enforced open internet regime has been established, it is clear that the proposed order would upset those interests.

²⁵ Comments of Engine at 31 (July 17, 2017); see also *id.* at 4-24 (explaining in detail how start-ups would be harmed by repealing strong open internet protections).

²⁶ Comments of Netflix at 2 (July 17, 2017).

²⁷ Comments of INCOMPAS at 41 (July 17, 2017).

²⁸ Comments of the Open Technology Institute and Benton Foundation at 3-17 (July 17, 2014), Dkt. 14-28.

²⁹ Reply Comments of XO Communications at 2 (Apr. 26, 2010), Dkt. 09-191.

First, the draft Order proposes to reclassify BIAS as a Title I service. This effectively eviscerates the FCC's ability to protect consumers. Without Title II authority, the FCC is left with Title I "ancillary" jurisdiction, which has proven a feeble and ineffective source of authority; prior FCC attempts to use that authority to protect the open internet have been futile and Sisyphean.³⁰ It is blindingly obvious that an abdication of FCC authority to enforce strong open internet rules would significantly affect consumer and edge provider reliance interests.

Second, the draft Order proposes to repeal all conduct-based rules and retain only a weak transparency requirement, backed up by FTC enforcement.³¹ The record is replete with reasons why the FCC should retain the rules and why self-governance of the open internet is a farce and why ex post enforcement of open internet standards is toothless.³² That is not up for debate. What is relevant here is that if the FCC eliminates essentially all open internet protections, some form of which has been in place since 2004, then it has some explaining to do to meet the *Fox* standard.

Conclusion

Consumers and edge providers have deeply entrenched reliance interests, and they have acted in reliance on the certainty provided by strong open internet rules. FCC enforcement has been in place in some form, and has grown stronger as new practices emerged, since 2004. For the FCC to diverge from longstanding regime this would seriously upset these reliance interests, triggering a heightened standard of review under *FCC v. Fox*.

Respectfully submitted,

/s/ Eric Null

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³⁰ *Verizon v. FCC*, 740 F.3d 623 (D.C. Cir. 2014); *Comcast v. FCC*, 600 F.3d 642 (2010).

³¹ Draft Order, ¶¶ 203-300.

³² *E.g.*, OTI Comments at 14-21 (July 17, 2017); Free Press Comments at 68 (July 17, 2017).



December 7, 2017

Ex Parte

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: *Restoring Internet Freedom*, WC Docket No. 17-108

Dear Ms. Dortch:

The Open Technology Institute at New America (“OTI”) has filed extensive comments and reply comments in the above-referenced proceeding in support of the Commission’s existing open internet rules and its Title II classification for broadband internet access service (BIAS). We write today to submit and reiterate facts and data that OTI filed recently in response to the Commission’s Section 706 Notice of Inquiry showing that mobile BIAS is a complement to – but very definitely not a direct competitive substitute for – home or business fixed BIAS connections.¹

The Commission’s draft order asserts that “the primary market failure rationale for classifying broadband Internet access service under Title II is absent” because “fixed broadband Internet access providers frequently face competitive pressures.”² The draft order attempts to bolster this claim with Form 477 data showing the *geographic area deployments* of fixed BIAS rather than with data on the *actual availability* of competitive offerings to consumers.³ Even this inflated characterization of the actual availability of competitive offerings to homes and small firms shows that roughly half (48.9%) of the

¹ Comments of the Open Technology Institute at New America, GN Docket No. 17-199 (Sept. 21, 2017); *see also* Reply Comments of the Open Technology Institute at New America, GN Docket No. 17-199 (Oct. 6, 2017).

² *Restoring Internet Freedom* Draft Order (“Draft Order”), WC Docket No. 17-108, at ¶ 123.

³ *Id.* at ¶¶ 124-126. Additionally, the Commission’s most recent Internet Access Services Report, released in April 2017, and based on data as of June 30, 2016, found that only 42 percent of developed census blocks in the U.S. have access to more than one provider offering fixed broadband speeds of at least 25/3 Mbps (37 percent of developed census blocks had one provider offering 25/3 Mbps service, while 21 percent of those developed census blocks had no providers). Of course, a deployment at one location in a census block does not mean that all or even a majority of locations in that block have access to that BIAS offering.

population resides in census blocks with at most a single wireline BIAS provider offering the minimum throughput for advanced telecommunications (25/3 mbps).⁴

The draft order seeks to further bolster its claim about competition in the market for home and business BIAS by stating that “[b]oth the *Title II Order* and its supporters in the current proceeding fail to properly account for the pressure mobile Internet access might exert on fixed, including fixed wireline, Internet access supply.”⁵ The suggestion that mobile BIAS is at present either an adequate substitute or a substantial competitive threat to high-capacity fixed BIAS is quite simply false. OTI’s Comments and many other filings in the record of the Commission’s pending Section 706 *Notice of Inquiry* clearly demonstrate that mobile BIAS is currently a complement and not a substitute for high-capacity fixed BIAS.⁶ OTI has attached its comments in response to the Section 706 *NOI*, which documents in detail why mobile BIAS is both inadequate as a substitute and why the overwhelming majority of households and firms that can afford to subscribe to both mobile and a fixed BIAS do so.

In our Section 706 *NOI* comments and reply comments, OTI debunked the notion that mobile BIAS is a substitute for fixed BIAS. Mobile BIAS does not yet constitute “advanced telecommunications capability” and is, at best, a *complement* to fixed BIAS—not a replacement. Mobile BIAS is typically far more expensive on a per gigabyte basis, less reliable (especially in rural areas), slower, and subject to data caps and expensive overage fees that result in data consumption that is a fraction of what fixed broadband households consume. Moreover, mobile BIAS is typically accessed on devices with smaller screens and limited computational abilities that cannot complete the full range of functions of a desktop or laptop computer.

Consumer behavior indicates mobile BIAS is not viewed as a replacement for fixed BIAS, since the overwhelming number of households that can afford subscribe to both mobile and fixed BIAS. Indeed, the survey data the Commission cites to support the notion that mobile BIAS is being used more frequently as a substitute for fixed BIAS explicitly states low-income Americans are far more likely to become mobile dependent than consumers who have higher income, as OTI’s attached comments describe in further detail.⁷

⁴ *Id.* at ¶ 125 (“Percent of U.S. population in developed census blocks in which residential broadband wireline ISPs reported deployment” table).

⁵ Draft Order at ¶ 130.

⁶ *See, e.g.*, Comments of INCOMPAS, GN Docket No. 17-199 (Sept. 21, 2017), at 10; Comments of Microsoft, GN Docket No. 17-199 (Sept. 21, 2017), at 7; Comments of Public Knowledge, et al., GN Docket No. 17-199 (Sept. 21, 2017), at 20; Comments of Wireless Internet Service Providers Association, GN Docket No. 17-199 (Sept. 21, 2017); Comments of NTCA-The Rural Broadband Association, GN Docket No. 17-199 (Sept. 21, 2017), at 24; Comments of Deere & Company, GN Docket No. 17-199 (Sept. 21, 2017), at 2; Comments of Institute for Local Self-Reliance and Next Century Cities, GN Docket No. 17-199 (Sept. 21, 2017), at 1 and 3; Comments of Mimosa Networks, GN Docket No. 17-199 (Sept. 21, 2017), at 3.

⁷ Draft Order ¶ 130; *see also* Giulia McHenry, “Evolving Technologies Change the Nature of Internet Use,” National Telecommunications and Information Administration Blog (April 19, 2016), *available at* <https://www.ntia.doc.gov/blog/2016/evolving-technologies-change-nature-internet-use>, “There are significant demographic disparities, however, in the degree to which this is the case. For example, low-income households that used the Internet at home were significantly more likely to depend on a mobile data plan than those with higher incomes... Although the proportion of high-income households that exclusively used mobile Internet service at home

The Commission has previously found, and most consumers intuitively understand, that the two services serve distinct purposes with very different capabilities. As OTI's attached comments detail, mobile BIAS, unlike fixed BIAS, is inadequate for primary home or business use for many reasons, most notably:

- (1) households consume significantly more data over fixed BIAS (190 gigabytes on average per month as of 2016) than mobile BIAS allows due to data caps or thresholds ("soft caps," which for AT&T and Verizon "unlimited" data plans are 22 gigabytes per month);
- (2) consumers would incur enormous overage costs if they were to use nearly as much data over mobile as they do fixed BIAS;
- (3) there are significant differences between mobile and fixed BIAS average throughput speeds; and
- (4) the speeds and performance of mobile BIAS tends to be much less reliable and resilient than fixed BIAS, particularly in rural areas and indoors, which is where the overwhelming share of high-bandwidth applications are utilized.

Finally, concerning the relevance of more or less competition among BIAS providers, it's critical to note that the Commission's 2015 Open Internet Order was correct in concluding that a "market failure rationale" is not a prerequisite for the most basic network neutrality consumer protections. Even if there was effective competition among BIAS providers, this would not diminish the rationale for basic "rules of the road" for network neutrality. Basic non-discrimination protections – for consumers, edge providers and the economy more broadly – is too important to be left to the vagaries of the market.

The fact that most consumers have more choices for mobile ISPs than for wireline service also has questionable relevance given that the recent history of the mobile industry demonstrates that "competition does not assure openness."⁸ Whereas wireline ISPs have generally not attempted to block or degrade consumer access to devices, applications or services over the Internet since 2010, mobile carriers have done so repeatedly in recent years.⁹ Moreover, even if there was robust competition among mobile

grew somewhat more rapidly between 2013 and 2015, online households with higher incomes are still far less reliant on mobile alone for Internet access than those in the lowest income group.").

⁸ Prepared Remarks of FCC Chairman Tom Wheeler, 2014 CTIA Show, Las Vegas, NV (Sept. 9, 2014), *available at*: http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0909/DOC-329271A1.pdf. The Chairman stated; "I remember when the [mobile] industry was united around the walled garden, where the only apps that reached the consumer were those which the carrier approved, usually in return for a payment. . . . [I]t is instructive that the walled garden existed despite multi-carrier competition. At least in the short run, this suggests that competition does not assure openness."

⁹ *See, e.g.*, Comments of OTI, WC Docket No. 17-108 at 11-13 (July 17, 2017); Comments of Electronic Frontier Foundation, GN Docket Nos. 14-28, 10-127, at 23-24 (July 17, 2014) ("examples of discriminatory practices by mobile providers abound"); Joint Comments of Internet Engineers, Pioneers, and Technologists on the Technical Flaws in the FCC's Notice of Proposed Rule-making and the Need for the Light-Touch, Bright-Line Rules from the Open Internet Order, WC Docket No. 17-108, at 33-40, *available at* https://www.eff.org/files/2017/07/17/comments_of_internet_engineersfcc_nn.pdf.

carriers, mobile ISPs have a common interest in seeking rents from adjacent market providers and in securing a competitive advantage for their own competing apps, content, and services.

Respectfully submitted,

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**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of

GN Docket No. 17-199

Inquiry Concerning Deployment of Advanced
Telecommunications Capability to All Americans
in a Reasonable and Timely Fashion

COMMENTS OF THE OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA

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September 21, 2017

TABLE OF CONTENTS

Executive Summary	2
I. Introduction	3
II. Mobile and Fixed BIAS Are Complementary Services, Not Substitutes	4
A. Mobile BIAS is Inadequate For Primary Home or Business Use	5
B. Mobile BIAS Is Not Viewed by Consumers As A Substitute To Fixed BIAS	17
C. The Commission Should Encourage Spectrum Sharing Frameworks Such As CBRS To Encourage Deployment of Fixed Wireless Broadband	20
III. OTI supports increasing throughput benchmarks for fixed BIAS	22
IV. Conclusion	25

Executive Summary

In the current proceeding, the Commission should adopt forward-looking goals that ensure all Americans have access to robust broadband service. In these comments, the Open Technology Institute at New America explains why mobile BIAS is not a substitute for fixed BIAS and how spectrum sharing and increasing throughput benchmarks helps achieve the goal of broad, nationwide deployment of advanced telecommunications capability.

OTI strongly opposes the notion that mobile BIAS is a substitute for fixed BIAS. Mobile BIAS does not yet constitute “advanced telecommunications capability” and is, at best, a *complement* to fixed BIAS—not a replacement. Mobile BIAS is typically more expensive, less reliable (especially in rural areas), slower, and subject to data caps and expensive overage fees that result in data consumption that is a fraction of what fixed broadband households consume. Moreover, mobile BIAS is typically accessed on devices with smaller screens and limited computational abilities that cannot complete the full range of functions of a desktop or laptop computer. Consumer behavior indicates mobile BIAS is not viewed as a replacement for fixed BIAS, since the overwhelming number of households that can afford subscribe to both mobile and fixed BIAS. OTI urges the Commission to encourage deployment of both fixed and mobile fixed BIAS in rural and other underserved areas through its proceedings on the 3.5 GHz Citizens Broadband Radio Service band, and of point-to-multipoint (P2MP) fixed wireless deployments in the 3700 - 4200 MHz band.

Lastly, the Commission should continue to steadily increase its speed benchmarks to reflect the changing nature of BIAS. In the last section 706 proceeding, OTI recommended a new benchmark of 50 Mbps/20 Mbps to reflect the new landscape. Since then, use of bandwidth-intensive applications has continued to grow, making robust speed benchmarks even

more important. There is also extensive evidence that broadband throughput has improved rapidly. The Commission should establish benchmarks that recognize these improvements.

I. Introduction

New America's Open Technology Institute has contributed to Section 706 Inquiry proceedings multiple times.¹⁰ Those prior comments have followed similar themes. First, the phrase “advanced telecom capability” is a forward-looking concept and it would be inappropriate for the Commission merely to look backward and set the standard at what most or all consumers already access.¹¹ It is in that spirit that the Commission, as part of its National Broadband Plan in 2009, set a goal of getting 100 million households connected to broadband with a throughput of 50 Mbps download and 20mbps upload by 2015. Unfortunately, this goal continues to be unmet even for 200 Kbps connections.¹²

Second, the Commission should endeavor to steadily increase its benchmarks to reflect the changing nature of consumer needs. Specifically, OTI argued in the most recent 706 inquiry that the Commission should increase its fixed BIAS benchmark to 50 Mbps download and 20 Mbps upload immediately with a plan to reach a symmetrical benchmark in the near future. OTI also argued that the Commission should adopt a fixed BIAS latency threshold of 50ms that would trigger a broader investigation into other quality of service metrics like packet loss and jitter.

Third, OTI argued that the Commission should monitor mobile connections, perhaps consider adopting a 10 Mbps download and 1 Mbps upload mobile BIAS benchmark, and

¹⁰ Comments of New America's Open Technology Institute, Dkt. 16-245, Sept. 6, 2016 (attached herein as Appendix A) (“2016 OTI Comments”); Reply Comments of the Open Technology Institute at New America, Dkt. 14-126, Sept. 19, 2014.

¹¹ 2016 OTI Comments at 2.

¹² *Internet Access Services: Status as of June 30, 2016*, Federal Communications Commission (April 2017), https://apps.fcc.gov/edocs_public/attachmatch/DOC-344499A1.pdf at 30 (see figure 32 showing that only 55,718,000 households have access to 25mbps/3mbps, and that the 100 million household goal still remains unmet for 200 Kbps speeds).

include data caps in assessing whether advanced telecom capability is being deployed.¹³ OTI's prior comments went into great detail about why the Commission should adopt these benchmarks, and they are attached as an appendix to this set of comments as they remain relevant and true today.

This year's Section 706 Notice of Inquiry (NOI) proposes a dramatic change in how Section 706 proceedings are handled. The Commission proposes to focus this inquiry "on whether *some form* of advanced telecommunications capability, be it fixed *or* mobile, is being deployed to all Americans in a reasonable and timely fashion."¹⁴ This proposed focus is inappropriate for a variety of reasons, including differences between throughput and quality of service between fixed and mobile BIAS. Further, OTI continues to support throughput benchmarks for fixed BIAS, as well as a latency metric that would trigger a larger investigation into quality of service if not met.¹⁵

II. Mobile and Fixed BIAS Are Complementary Services, Not Substitutes

The questions posed by the NOI presuppose that mobile and fixed BIAS are substitutes for each other. However, as the Commission has previously found, and as most consumers understand, the two services serve distinct purposes with very different capabilities. Mobile BIAS is not an adequate substitute for fixed BIAS. First, mobile-only broadband access would be insufficient for primary home or business use. Second, consumer behavior shows that the two services are not viewed as substitutes.

Mobile BIAS is not a substitute for fixed BIAS. "Advanced telecommunications capability" requires a broadband connection that allows for users to originate and receive high-quality

¹³ See generally 2016 OTI Comments.

¹⁴ *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 17-199, FCC 17-109, ¶ 9 (Aug. 8, 2017), http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0808/FCC-17-109A1.pdf ("NOI").

¹⁵ *Id.*

voice, data, graphics, and video.¹⁶ But on a purely mobile connection, a business or family would not have adequate capabilities. A contrary finding by the Commission would fail to take into account the realities of how consumers and businesses view mobile BIAS compared to fixed BIAS, the differences in the capabilities of mobile and fixed BIAS networks, and the great disparity in the cost and data capacities of mobile networks versus fixed wireline networks. The Commission found in its *2016 Broadband Progress Report* that “fixed and mobile broadband are often used in conjunction with one another and, as such, are not functional substitutes.”¹⁷ Access to mobile BIAS without access to a high-capacity fixed BIAS (of at least 25 Mbps download and 3 Mbps upload) does not provide adequate connectivity for Americans to work, learn, communicate with friends and family, telecommute, engage fully in civic life, or participate in the modern economy. Therefore, mobile BIAS should not be considered “advanced telecommunications capability” on its own.

A. Mobile BIAS is Inadequate For Primary Home or Business Use

The Commission makes many assumptions when it proposes to focus its Section 706 inquiry on whether Americans have access to fixed or mobile BIAS. The Commission’s assumptions fail because mobile BIAS, unlike fixed BIAS, is inadequate for primary home or business use for several reasons: (1) consumers use significantly more data over fixed BIAS than mobile BIAS allows given data caps or thresholds (“soft caps”); (2) consumers would likely incur significant overage costs if they were to use as much data over mobile as they do fixed BIAS; (3) there are significant differences between mobile and fixed BIAS average throughput; and (4) mobile BIAS tends to be much less reliable and resilient than fixed BIAS.

¹⁶ 47 U.S.C. § 1302(d)(1).

¹⁷ 2016 *Broadband Progress Report*, 31 FCC Rcd 699, ¶ 24 (Jan. 28, 2016), https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf (“2016 *Broadband Progress Report*”).

1. Consumers on Average Consume Far More Broadband Data over Fixed BIAS Than they Do Over Mobile BIAS

One significant reason mobile BIAS is an insufficient substitute for fixed BIAS is the substantial amount of data used per household over fixed broadband connections on average and the relatively restrictive data caps or thresholds that mobile carriers impose on their customers. One would expect that if the services were substitutes, a household could make the same or substantially similar uses of the internet over both platforms. Consumers, however, are unable to make similar uses of these services.

Households consume vast amounts of data over their fixed broadband connections. In 2016, U.S. households averaged 190 Gigabytes per month over fixed BIAS. That number is rising steadily since “average monthly broadband usage [will] increase substantially moving forward.”¹⁸ Given the growth of high-bandwidth online services,¹⁹ as well as home broadband uses such as running an online business, or even accessing everyday financial, health, information, education, and government services that are increasingly online, this upward trend is expected.

Mobile BIAS connections almost always come with data caps or thresholds. The nation’s top two mobile carriers, AT&T and Verizon, both offer customers 22 Gigabytes of data per

¹⁸ Joan Engebretson, *iGR: Average Monthly Broadband Usage is 190 Gigabytes Monthly Per Household*, Telecompetitor (Sept. 26, 2016), <http://www.telecompetitor.com/igr-average-monthly-broadband-usage-is-190-gigabytes-monthly-per-household> (citing to a subscription-only report from iGR Research, https://igr-inc.com/advisory-subscription-services/wireless-mobile-landscape/us_home_broadband_wifi_for_recast_2020.asp); James K. Wilcox, *How Easy Is It to Burn Through a 1TB Data Cap?*, Consumer Reports (Oct. 19, 2016), <https://www.consumerreports.org/telecom-services/how-easy-to-burn-through-1TB-data-cap> (“Of course, a downside to even a generous data cap is that while it might be sufficient for current usage, all evidence points to U.S. consumers using more broadband data every year. What seems like a huge amount of data now could feel restrictive a few years down the line. One reason broadband usage is accelerating is the proliferation of devices inside the home that all want access to the Internet.”).

¹⁹ See Appendix A and Section III below.

month (as part of their “unlimited data” packages) before throttling their connections.²⁰ In other words, even allegedly “unlimited” mobile service plans are not truly unlimited and in fact constitute only a small fraction of the amount of data consumers expect and consume over fixed BIAS. For instance, AT&T’s caps for fixed BIAS (ranging from 300 Gigabytes to 1 Terabyte depending on throughput speed) are roughly 13 to 45 times more than the 22 GB limit AT&T and Verizon’s mobile data services provide consumers.²¹

Consumers expecting to substitute mobile BIAS for fixed BIAS may confront difficult choices. Once the customer hits their provider’s “soft” data cap, they either must endure their service slowing to a crawl, thus making it difficult to use various online applications or services, or they must absorb a far more expensive bill. Many families and individuals are forced to ration their use of mobile apps during the waning days of a billing cycle (potentially only being able to use their service for email, but not video streaming), but at least most can achieve that functionality when they get home if they subscribe to a fixed BIAS connection. However, the “13 percent of Americans across all demographic groups [that] are relying solely on smartphones” for internet access referred to in the NOI are not able to rely on a fixed BIAS connection at home in the final days of their billing cycle.²²

Consumers who rely on mobile BIAS as their sole means of connectivity are at a major disadvantage when it comes to telecommuting, accessing education and information services, and providing the connection necessary for entertainment and government-related information due to the restrictions of carriers’ data plans detailed above. In its *2016 Broadband Progress*

²⁰ *AT&T Shop Unlimited Data Plans*, AT&T (2017), <https://www.att.com/plans/unlimited-data-plans.html>; *The new Verizon Plan*, Verizon Website (2017), <https://www.verizonwireless.com/support/new-verizon-plan-unlimited-faqs/>

²¹ Jon Brodtkin, *AT&T boosts data caps for home Internet and steps up enforcement*, *Ars Technica* (March 29, 2016), <https://arstechnica.com/information-technology/2016/03/att-boosts-data-caps-for-home-internet-and-steps-up-enforcement/>; see also XFINITY Terabyte Internet Data Usage Plan Frequently Asked Questions, <https://dataplan.xfinity.com/faq>.

²² NOI at ¶ 19.

Report, the Commission recognized the limitations that mobile data caps impose on consumers who must rely on the service for their work, noting that “data-intensive activities such as telecommuting or the highest-quality multimedia experiences are generally inappropriate for mobile devices.”²³

2. Data Costs Significantly More over Mobile BIAS than over Fixed BIAS

The cost of mobile broadband data is prohibitively high compared to fixed broadband connections for the average family or small business. Mobile broadband costs 37 times more per month than fixed broadband on a data allotment basis in 2017 and costs 14 times more than fixed broadband on a usage basis.²⁴ Research from Point Topic shows the median residential broadband price in the U.S. was \$80 per month during the second quarter of 2017.²⁵ Meanwhile, the limited amount of data (22 GB) advertised as “unlimited” by AT&T and Verizon cost \$60 and \$75 a month, respectively, per line.²⁶

It would be unreasonable to expect mobile broadband offerings to satisfy a user relying on their home broadband for an average 190 GB monthly for work, basic online services, and entertainment. For such a user, depending on mobile BIAS would likely bring massive overage charges and/or extremely slow services once the customer goes over their cap and the carrier slows their service.²⁷ In a dramatic example of this phenomenon, Verizon recently and suddenly cut off mobile internet access to roughly 8,500 rural users in 13 states because the customers

²³ 2016 *Broadband Progress Report* at ¶ 29.

²⁴ Kyung Mun, *Industry Voices—Mun: Mobile pricing drops from \$9/GB to \$1.80/GB in just 1 year*, Fierce Wireless (Aug. 15, 2017), <http://www.fiercewireless.com/wireless/industry-voices-mun-mobile-pricing-drops-from-9-gb-to-1-80-gb-just-1-year> (comparing on a dollar-per-gigabyte basis fixed and mobile BIAS, Fierce Wireless calculated that it costs 5 cents per gigabyte of data for fixed broadband, compared to \$1.80 per gigabyte of data for mobile broadband based on data allotment).

²⁵ Carl Weinschenk, *Report: U.S. Median Broadband Price is \$80 Monthly*, Telecompetitor (Aug. 8, 2017), <http://www.telecompetitor.com/report-u-s-median-broadband-price-is-80-monthly/>

²⁶ AT&T and Verizon websites.

²⁷ FCC *Broadband Progress Report* ¶ 41 (“Consumers that are dependent solely on mobile broadband are significantly more likely to exceed their monthly data allowances, causing them to incur additional fees or forego use of the Internet.”).

used too much data. In one instance, a family of four had never used more than 50 GB per month.²⁸ With carriers cutting off customers for using significantly less than 190 GB per month of data, mobile BIAS would not adequately substitute for fixed BIAS.

Telecommunications industry analyst Craig Moffett has found that consumers cannot reasonably depend on mobile BIAS largely because of data constraints in mobile carriers' offerings and the cost mobile users incur as a result. "It's not hard to understand why" just 6 to 7 percent of consumers are wireless-only, "[c]ellular broadband typically offers lower speeds and weaker reliability than its wireline counterparts."²⁹ He also noted that wireless customers are on metered data plans that penalize overages with heavy fees or that dramatically slow data speeds.

While AT&T, Verizon, Sprint, and T-Mobile all offer hotspot functionality for laptops or other devices, tethering comes with significant constraints. For one, some providers charge an additional fee for tethering.³⁰ Further, AT&T, Sprint, and Verizon allow up to only 10 GB of LTE data per line before slowing speeds to 2G or 3G speeds, and T-Mobile offers a similar limit.³¹ The limitations to hotspots' ability to offer reliable internet access are even more of a hindrance to adequate internet access and usage than the already-strained mobile BIAS.

²⁸ Jon Brodtkin, *8,500 Verizon customers disconnected because of "substantial" data use*, Ars Technica (Sep. 15, 2017), <https://arstechnica.com/information-technology/2017/09/verizon-kicks-8500-rural-customers-off-network-for-using-roaming-data>.

²⁹ Karl Bode, *Unlimited Wireless No Threat to Fixed ISPs (Yet)*, Analyst Says, DSL Reports (April 17, 2017), <http://www.dslreports.com/shownews/Unlimited-Wireless-No-Threat-to-Fixed-ISPs-Yet-Analyst-Says-139362>.

³⁰ See T-Mobile Internet and E-Mail offers, https://www.t-mobile.com/shop/addons/Services/information.aspx?PAsset=InternetEmail&tp=Svc_Tab_HotSpot&tsp, ("Turn your phone into a Mobile HotSpot: \$14.99 per month Turn your smartphone into a mobile hotspot with the Smartphone Mobile HotSpot service. Share your phone's high-speed internet connection on the go with up to five Wi-Fi devices (tablet, e-reader, laptop, portable gaming device, and more) all at the same time—no coffee shop or hotel Wi-Fi needed.").

³¹ MoffettNathanson Research, *U.S. Cable and U.S. Telecom: Could Unlimited Wireless Plans Pose A Threat to Wired Broadband?* (April 12, 2017) at 10 ("MoffettNathanson Report").

Americans living in sparsely-populated parts of the country also have fewer—if any—choices for 4G/LTE mobile BIAS, as the Commission’s own data shows. The limited number of providers in large portions of the country also hinder deployment of mobile BIAS, which could strengthen the service toward becoming an adequate substitute for fixed BIAS in the future. The Commission should use its Section 706 authority to create policies that help competitors deploy infrastructure and offer more choices for mobile broadband services in high market concentration areas. If the Commission were to catalyze greater competition in markets that currently have few choices for providers, it would work toward the Commission’s mandated goal of encouraging advanced telecommunications capability.

Currently, the mobile BIAS marketplace in rural and less densely populated areas are far more concentrated than urban and more densely populated markets, according to the Commission’s draft of its *Twentieth Mobile Wireless Competition Report*.³² The Commission determined that the mobile BIAS markets in low-density population areas rank as very highly concentrated based on the Herfindahl-Hirschman Index (HHI) used by the Antitrust Division of the Justice Department to measure market concentration.³³ Further, the mobile BIAS markets across *all* population areas were deemed by the Commission to be highly concentrated. The weighted average HHI for mobile BIAS was 3,101 as of the end of 2016, much higher than 2,500, which indicates high concentration in a specific market (1,500 to 2,500 indicates moderate concentration).³⁴ This concentration in the mobile BIAS market has increased since 2013, when the weighted average HHI was 3,027.³⁵ The mobile BIAS market is already

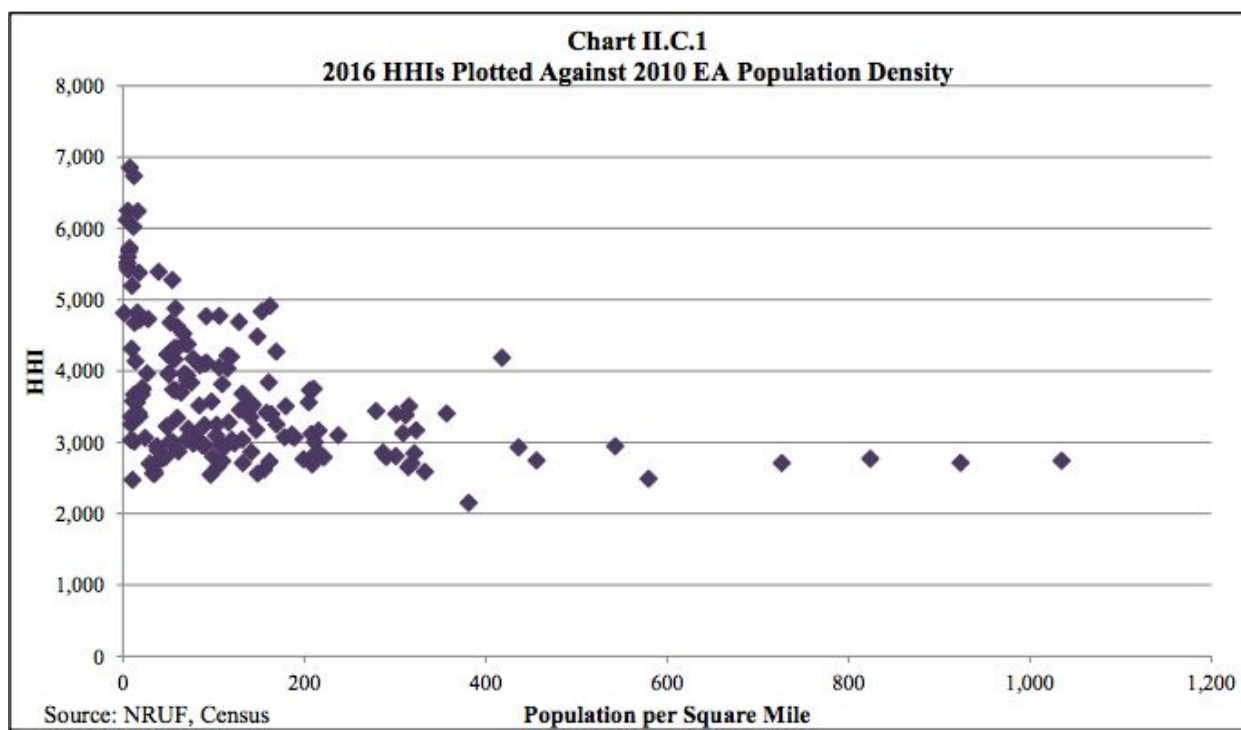
³² *Twentieth Mobile Wireless Competition Report, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services* (Sept. 7, 2017), ¶¶ 31-32; Chart II.C.1, http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0907/DOC-346595A1.pdf (“This chart indicates that HHI values tend to decline as the population density increases. The most concentrated EAs tend to be more rural, while major metropolitan areas lie in the least concentrated EAs.”).

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

excessively concentrated as a general matter. However, as the Commission's chart below shows, rural areas have market concentration that ranks as effectively off the charts.



3. Mobile BIAS Throughput is Inadequate for most Consumers

There is a drastic difference in throughput and related capabilities between mobile and fixed BIAS. Fixed BIAS offers much faster throughput than mobile BIAS, in part because mobile BIAS does not have the same capability as fixed BIAS to process high levels of data.

Consumers increasingly are accustomed to high throughput levels on fixed BIAS that they would not receive over mobile BIAS.³⁶

The Commission itself suggests a lower throughput benchmark for mobile BIAS, amounting to a concession that the services are not substitutes. In asking what mobile BIAS throughput benchmark to adopt, the Commission stated in the NOI “[w]e anticipate that any speed benchmark we set would be lower than the 25 Mbps/3 Mbps benchmark adopted for

³⁶ MoffettNathanson Report at 9.

fixed broadband services, given differing capabilities of mobile broadband.”³⁷ The Commission then seeks comment on a potential mobile BIAS throughput benchmark of 10 Mbps download and 1 Mbps upload.³⁸ The Commission thus has acknowledged the inferior data rate capability of mobile BIAS compared to fixed BIAS.

For example, a recent report found that the United States ranked 36th in a list of the fastest mobile internet throughput worldwide with an average throughput of 12.5 Mbps, which was substantially slower than the global average LTE speed³⁹ of 17.4 Mbps and the benchmark of 25 Mbps for high-speed fixed broadband.⁴⁰ Ookla documented the United States’ low ranking among other nations when comparing mobile BIAS throughput, noting the country has “lost footing in the global race for fastest mobile internet speeds with a rank slip from 42nd to 44th in the world based on data from Q1-Q2 2017” in a recent report.⁴¹ The Commission’s data shows rural areas on average have an even lower percentage of wireless connections that meet the 25 Mbps download and 3 Mbps upload throughput benchmark. Currently only 6 to 7 percent of consumers are mobile BIAS users only due to slower speeds, less reliability, and higher costs from usage caps than what fixed BIAS offers users.⁴²

³⁷ NOI at ¶ 18.

³⁸ NOI at ¶ 19.

³⁹ Verizon, *What is 4G LTE and why it matters*, (May 1, 2012), <http://www.verizon.com/about/news/vzw/2012/05/what-is-4GLTE-and-why-it-matters>.

⁴⁰ Joon Ian Wong, *The countries with the world’s fastest mobile internet*, Quartz (Feb. 22, 2017), <https://qz.com/915726/the-countries-with-the-worlds-fastest-mobile-internet> (“Roughly in the middle of our chart sits the U.S., which was one of the first countries to launch LTE and has one of the highest rates of 4G penetration in the world. But U.S. LTE networks are on the slow side, which brings down the country’s overall score.”).

⁴¹ *Speedtest United States Report*, Ookla (Sep. 7, 2017), <http://www.speedtest.net/reports/united-states>.

⁴² Karl Bode, *Unlimited Wireless No Threat to Fixed ISPs (Yet)*, *Analyst Says*, DSL Reports (April 17, 2017), <http://www.dslreports.com/shownews/Unlimited-Wireless-No-Threat-to-Fixed-ISPs-Yet-Analyst-Says-139362> (“Moffett claims that just 6 to 7% of consumers are currently only wireless broadband only, and that number hasn’t changed in several years. Why? Slower speeds, less reliability, and higher costs from usage caps. ‘It’s not hard to understand why,’ said Moffett. ‘Cellular broadband typically offers lower speeds and weaker reliability than its wireline counterparts.’”).

While mobile BIAS provides a crucial service to millions of Americans to access the internet away from their primary internet connection at home or at work, the limitations of the throughput and data capacity of mobile BIAS demonstrates its distinct characteristics from fixed BIAS at this time. The Commission should consider these limitations and find that mobile BIAS is not yet advanced telecommunications capability on its own.

4. Mobile BIAS Is Not as Reliable as Fixed BIAS

Mobile BIAS does not have the capacity or consistency of service to support many of the services that consumers come to expect from their internet connections. Mobile BIAS also has inconsistent signal strengths, particularly when it comes to building penetration, and connection strength is even weaker in rural areas.

Mobile BIAS is ill-equipped to handle most bandwidth-intensive uses, including video conferencing applications used by telehealth, telework, and education platforms, as well as full-screen HD video streaming and online gaming.⁴³ The importance of having a strong home broadband connection is increasing as the majority of adults (61 percent) aged 18-29 are primarily watching television using an online streaming service instead of a cable or satellite subscription or a digital antenna.⁴⁴ The inconsistency and data limits of a mobile BIAS would make it difficult for individuals to stream all of their television and news as well as using that connection for work, education, communication, shopping, and many other day-to-day uses.

Mobile signal strengths are uneven and often inadequate, particularly in rural and other low-population density areas where mobile broadband would be most necessary to act as a

⁴³ 2016 Broadband Progress Report at ¶ 41 (“And, as several commenters note, mobile broadband networks lack the capacity or consistency of service to support most bandwidth intensive uses such as full-screen HD video streaming, online gaming, and video conferencing applications including telehealth and education platforms.”).

⁴⁴ Lee Rainie, *About 6 in 10 young adults in U.S. primarily use online streaming to watch TV*, Pew Research Center (Sept. 13, 2017), <http://www.pewresearch.org/fact-tank/2017/09/13/about-6-in-10-young-adults-in-u-s-primarily-use-online-streaming-to-watch-tv>.

substitute for fixed broadband. Mobile broadband is subject to environmental obstacles that fixed broadband transmissions are not, which limits mobile broadband from achieving a similar level of signal strength consistency as fixed services with current technology.⁴⁵ Mobile broadband throughput and quality can also fluctuate widely depending on congestion caused by additional users sharing the same access point. Moreover, while both mobile and fixed BIAS tend to experience reduced speeds during peak periods of usage, mobile connections have a far greater disparity between peak and off-peak periods of congestion than fixed. Mobile network congestion can lead to substantially reduced data rates during peak usage, which would in turn negate consumers' ability to use mobile broadband as a reliable and consistent source of internet connection for important work, education, information, health care, and other purposes. Video conferencing applications, for example, require consistent throughput and latency to operate without interruption.

The weakness of mobile broadband indoors is similarly well documented.⁴⁶ The lackluster connection to a mobile network indoors served as major impetus for some participants, like T-Mobile, to buy up low-band spectrum in the Commission's recent incentive auction.⁴⁷ The shortcomings of mobile BIAS—even the newest technology such as 4G LTE—is reflected in the offerings of some mobile carriers, such as T-Mobile and Sprint, to include “signal

⁴⁵ *2016 Broadband Progress Report*, at ¶ 29 (“Mobile transmissions are subject to environmental factors that fixed line transmissions do not encounter and, thus, cannot achieve the same kinds of consistent speeds at the current level of technology.”).

⁴⁶ Remarks of Steve Sharkey, Vice President of Technology and Engineering Policy at T-Mobile, at New America Event, *Auctioning America's Wireless Future: Will 5G be Restricted to Big Mobile Carriers?* (Sept. 20, 2017) (“We struggle to get into buildings, a lot of the times we're expected to pay very high fees to get into those buildings.”).

⁴⁷ Marguerite Reardon, *For T-Mobile's wireless ambitions, a make-or-break moment looms*, CNET (June 23, 2015), <https://www.cnet.com/news/why-t-mobile-is-crusading-for-a-leg-up-in-the-wireless-wars/> (“But if it wants to surpass AT&T and Verizon, T-Mobile needs better coverage in key suburban markets and even some rural regions... Filling in those dead zones will go a long way to legitimizing T-Mobile's service. That's where next year's spectrum auction comes in. The so-called incentive auction -- named because the FCC is incentivizing TV broadcasters to sell off their unused spectrum -- is valuable because the wireless licenses that are up for grab run at a lower frequency or band, which means they're able to travel longer distances and penetrate obstacles like buildings.”).

boosters” for indoors to boost LTE coverage.⁴⁸ While these devices can certainly improve LTE coverage into a user’s home, they still bring the same issues with using mobile BIAS as a primary form of internet access such as cost, data capacity, and throughput. The extra hardware would do nothing to alleviate these concerns and could add additional costs to the consumer.

Additionally, the problem of building penetration is unlikely to improve with the upcoming 5G revolution, as carriers are looking to rely on high-frequency spectrum (above 24 GHz) to fuel the high-speed and low-latency connections that define “5G”.⁴⁹ Due to the characteristics of high-band spectrum, 5G signals relying on high-capacity millimeter wave spectrum will not penetrate into buildings or cover large areas from a single access point, making it difficult to see mobile broadband in 5G successfully replacing home broadband as a feasible internet connection for consumers and business owners.⁵⁰

If the Commission declared that mobile BIAS is an adequate substitute for fixed BIAS, it would cause substantial and disproportionate harm to Americans who live in rural, tribal, and low-income communities that do not yet have the same signal reliability or mobile broadband capability as urban areas. A dozen U.S. senators recently explained: “The lack of service for high-speed internet is preventing individuals in these communities from applying for jobs; their children from doing their homework; and many small business owners from running businesses

⁴⁸ Edward C. Baig, *T-Mobile offers free LTE mini-tower to boost indoor cell coverage*, USA Today (Nov. 2, 2015), <https://www.usatoday.com/story/tech/columnist/baig/2015/11/02/t-mobile-offers-free-lte-mini-tower-bolster-cell-coverage-indoors/75039098/>; Marguerite Reardon, *Sprint’s Magic Box boosts your 4G LTE at home for free*, CNET (May 3, 2017), <https://www.cnet.com/news/sprint-to-offer-free-wireless-signal-booster-magic-box-small-cell>.

⁴⁹ *5G Spectrum: Public Policy Position*, GSM Association (Nov. 2016), <https://www.gsma.com/spectrum/wp-content/uploads/2016/06/GSMA-5G-Spectrum-PPP.pdf>; Statement of Chairman Tom Wheeler, GN Docket No. 14-177, July 14, 2016, https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-89A1.pdf.

⁵⁰ GSM Association, *5G Spectrum: Public Policy Position* (Nov. 2016), <https://www.gsma.com/spectrum/wp-content/uploads/2016/06/GSMA-5G-Spectrum-PPP.pdf>.

out of their homes.”⁵¹ Americans in these areas depend on reliable broadband connections as much as urban Americans—and perhaps more so—but they are still awaiting the same broadband connection opportunities. The Commission should not redefine “advanced telecommunications capability” by lowering the standard for broadband connectivity, but should instead continue to push to extend high-capacity and high-speed fixed BIAS to these underserved communities. Members of these communities cannot afford to rely on expensive and slower mobile BIAS packages that would likely be insufficient to help fuel small businesses, participation in the internet economy, and other needs.

The NOI would also have a disproportionate and damaging impact on communities of color and low-income Americans, who are much more likely to be reliant on mobile BIAS alone, despite it being an imperfect solution to bridging the digital divide.⁵² Twenty percent of Americans who make \$30,000 a year or less rely on smartphones to access the internet, compared to just 4 percent of those who make \$100,000 or more annually.⁵³ That divide exists between different ethnic groups in the U.S as well. While only 65 percent of Black Americans and 58 percent of Hispanic Americans say they have home broadband, 72 percent of Black Americans and 75 percent of Hispanic Americans report owning smartphones.⁵⁴ As long as

⁵¹ Letter to FCC Commissioners Pai, Clyburn, O’Rielly, Carr, and Rosenworcel from Senators Al Franken, Sherrod Brown, Tammy Baldwin, Richard Blumenthal, Heidi Heitkamp, Amy Klobuchar, Elizabeth Warren, Brian Schatz, Edward Markey, Tom Udall, Kirsten Gillibrand and Ron Wyden, GN Docket No. 17-199, dated August 31, 2017, <https://ecfsapi.fcc.gov/file/10831295624214/Senate%20Letter%20re%20GN%20Docket%20No.%2017-199.pdf> (“Letter from Senator Franken, et al.”).

⁵² Voices For Internet Freedom Coalition Comments at 68, WC Docket No. 17-108, July 19, 2017, <https://ecfsapi.fcc.gov/file/107202424413478/Voices%20Coalition%20NN%20Comments%20-%20WC%20Docket%2017-108%20-%202007.19.2017.pdf>.

⁵³ Monica Anderson, *Digital divide persists even as lower-income Americans make gains in tech adoption*, Pew Research Center (March 22, 2017), <http://www.pewresearch.org/fact-tank/2017/03/22/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption>.

⁵⁴ Andrew Perrin, *Smartphones help blacks, Hispanics bridge some – but not all – digital gaps with whites*, Pew Research Center (Aug. 31, 2017), <http://www.pewresearch.org/fact-tank/2017/08/31/smartphones-help-blacks-hispanics-bridge-some-but-not-all-digital-gaps-with-whites>.

these communities lack strong and reliable broadband connections, they will not be able to realize the economic and personal prosperity such connections bring.⁵⁵ As detailed in the section prior, the mobile BIAS market is also substantially weaker than the already-highly concentrated urban markets in lower population density and rural areas.

B. Mobile BIAS Is Not Viewed by Consumers As A Substitute To Fixed BIAS

The Commission seeks comment on whether it should evaluate the deployment of broadband “based on the presence of both fixed *and* mobile services.”⁵⁶ While mobile BIAS provides an important service for consumers nationwide, consumers do not view mobile BIAS as a substitute for fixed BIAS, in large part for the reasons discussed above. The way mobile BIAS is sold and marketed is strikingly different from fixed BIAS, particularly due to the allocation of a limited amount of data before carriers charge overage fees or drastically slow users’ speeds.⁵⁷ The data caps, limited bandwidth capacity, and unique pricing models provided by mobile BIAS compared to fixed BIAS reflect the fact that the two services meet distinct consumer needs. These unique needs and differing pricing models act as proof that mobile broadband is not a sufficient substitute for fixed broadband.⁵⁸ The Commission acknowledges in the NOI that “[m]obile and fixed broadband have different technical characteristics and limitations.”⁵⁹ The Commission’s proposal to adopt radically different throughput benchmarks for mobile BIAS versus fixed BIAS shows it recognizes the functional differences between the two as well.⁶⁰

The differences between fixed and mobile BIAS networks are not merely technical; the two services are marketed to consumers differently. Fixed and mobile BIAS serve different

⁵⁵ Letter from Sen. Franken, et al., *supra* note 44.

⁵⁶ NOI at ¶ 10 (emphasis in the original).

⁵⁷ 2016 *Broadband Progress Report* at ¶¶ 33-34.

⁵⁸ *Id.* at ¶ 31.

⁵⁹ *Id.*

⁶⁰ *Id.* at ¶ 19.

needs for consumers. Fixed BIAS provides high-speed internet access at home for work, education, and other needs, while mobile BIAS enables consumers to access the internet away from their homes, typically for more immediate and lower-bandwidth needs such as email, search, maps, and low-definition video streaming. The Commission noted this in its *2016 Broadband Progress Report*, where it found that mobile and fixed BIAS are not adequate substitutes for one another. As the Commission stated in the report: “This finding is also strongly supported by the preferences and purchasing decisions of American consumers, who overwhelmingly adopt both services when they have the means.”⁶¹

Consumers also *use* the services in much different ways. Mobile devices are smaller than devices that use fixed BIAS, as part of the very nature of “mobile” broadband. The portability of mobile devices restricts their screen size and computational abilities, making it more difficult for consumers to use mobile devices for all the same functions as a desktop or laptop for work, education, and other crucial services.⁶² The Pew Research Center found that nearly half of the Americans they surveyed who had used a smartphone as part of a job search had problems accessing content that did not display properly on the phone and reading non-mobile optimized job content.⁶³ The smaller screens and keyboards combined with an incompatibility with some online platforms lead to degraded functionality for work, communication, and entertainment on mobile broadband devices compared to fixed.⁶⁴

Most consumers adopt both fixed and mobile BIAS, rather than one or the other. In a 2015 report, Pew found that 55 percent of adults reported having both a home broadband

⁶¹ *Id.* at ¶ 31.

⁶² *Id.* at ¶ 29.

⁶³ Monica Anderson and John B. Horrigan, *Smartphones help those without broadband get online, but don't necessarily bridge the digital divide*, Pew Research Center (Oct. 3, 2016) <http://www.pewresearch.org/fact-tank/2016/10/03/smartphones-help-those-without-broadband-get-online-but-dont-necessarily-bridge-the-digital-divide/> (37 percent of respondents said they had trouble submitting required files or supporting documents as part of their job application process over their smartphone).

⁶⁴ MoffettNathanson Report at 10.

connection and a smartphone, marking an increase from 47 percent in 2013.⁶⁵ Further, 73 percent of U.S. adults were home broadband users in 2016. And despite the improved capabilities of 4G/LTE mobile services, the number of home broadband users has not experienced any noticeable decline that would reflect consumers moving to mobile broadband instead of fixed, according to the “Home broadband use over time” chart in the Pew report.⁶⁶ If consumers *did* view mobile BIAS as a viable substitute for fixed BIAS, one would expect widespread broadband “cord cutting” as users canceled fixed BIAS subscriptions, much as a majority of people have now abandoned wireline telephone service because mobile telephony has essentially the same functionality as a home telephone “land line” *and* is mobile. That has not happened.⁶⁷

Moreover, consumers themselves report they would not replace their fixed broadband connections with only mobile internet access. A survey conducted on behalf of Public Knowledge found that 92 percent of those surveyed said they were “very” or “somewhat” unlikely to cancel their home broadband service in favor of a “purely mobile experience.”⁶⁸ T-Mobile noted in a 2015 filing with the Commission that millions of Americans subscribe to both fixed and mobile BIAS and that number is increasing.⁶⁹

C. The Commission Should Encourage Spectrum Sharing Frameworks Such As CBRS To Encourage Deployment of Fixed Wireless Broadband

⁶⁵ John B. Horrigan and Maeve Duggan, *Home Broadband 2015*, Pew Research Center (Dec. 21, 2015), <http://www.pewinternet.org/2015/12/21/home-broadband-2015>.

⁶⁶ *Internet/Broadband Fact Sheet*, Pew Research Center (Jan. 12, 2017), <http://www.pewinternet.org/fact-sheet/internet-broadband>.

⁶⁷ MoffettNathanson Report at 4-5; *NOI* at ¶ 9 (Even though 13 percent of broadband subscribers are mobile-only, there are likely other reasons for that, including cost or availability of fixed BIAS); See John B. Horrigan and Maeve Duggan, *Barriers to broadband adoption: Cost is now a substantial challenge for many non-users*, Pew Research Center (Dec. 21, 2015), <http://www.pewinternet.org/2015/12/21/3-barriers-to-broadband-adoption-cost-is-now-a-substantial-challenge-for-many-non-users/>.

⁶⁸ John B. Horrigan, PhD, *Smartphones and Broadband*, Public Knowledge (Nov. 2014), https://www.publicknowledge.org/assets/uploads/blog/Smartphones_and_Broadband.pdf

⁶⁹ T-Mobile Comments, GN Docket No. 15-191 (Sep. 30, 2015), <https://ecfsapi.fcc.gov/file/60001325985.pdf>, at 3

The Commission seeks comment on whether additional actions from the agency “might encourage more expansive and rapid deployment of networks that provide advanced telecommunications capability.”⁷⁰ If the Commission were to add mobile-only service as an “advanced telecommunications service,” it would severely downplay the digital divide because the Commission would count as served areas of the country that have access to only mobile BIAS, which, as described above, is a complement to—and not a substitute for—fixed BIAS. OTI strongly urges the Commission to consider the damaging effects for low-income and rural consumers if mobile-only service were to be added as an “advanced telecommunications service” and reject this proposal.

An example of the complementary nature of fixed and mobile BIAS -- and how the two in tandem can improve connectivity in underserved or rural areas -- is the potential of fixed wireless providers and spectrum sharing frameworks such as the Citizens Broadband Radio Service in bringing service to unserved users. Under the rules adopted by the Commission in 2016, the CBRS 3.5 GHz band will enable a broad and diverse set of users and use cases to use targeted bands of spectrum to bring connectivity to areas in need of service. The set of users and use cases include rural Wireless ISPs (WISPs), utilities, enterprise broadband providers, private LTE networks (including neutral host networks in high-traffic venues), government agencies, schools, and libraries.⁷¹ The Commission should expedite the implementation of the current CBRS framework to facilitate the “wide deployment of wireless broadband in industrial applications,” as the Commission expected when passing the rules.⁷² OTI also urges the Commission to reject proposals from the mobile industry to change the

⁷⁰ NOI at ¶ 48.

⁷¹ See OTI and Public Knowledge Reply Comments at 2, GN Docket No. 12-354.

⁷² John Leibovitz, *Breaking Down Barriers to Innovation in the 3.5 GHz Band*, Federal Communications Commission blog (April 21, 2015), <https://www.fcc.gov/news-events/blog/2015/04/21/breaking-down-barriers-innovation-35-ghz-band>.

CBRS licensing rules.⁷³ Most critical to the goals of Section 706 - and to the goal of closing the rural broadband gap in particular -- is to maintain Priority Access license areas that are small and affordable enough for WISPs and other small and rural ISPs.

OTI also strongly urges the Commission to authorize a new, licensed, point-to-multipoint (P2MP) fixed wireless service in the 3700 – 4200 MHz spectrum band used primarily by fixed satellite services, but that are woefully underutilized. This spectrum has the capability to accelerate the deployment of very high-capacity fixed wireless broadband services in areas lacking sufficient consumer choice and where fiber-to-the-home deployments are not cost-effective. Deploying these fixed wireless services could improve connectivity in rural, suburban, and tribal areas and would provide more affordable high-speed internet connections to small businesses, libraries, and other community anchor institutions.⁷⁴ As OTI has previously described to the Commission, there is strong interest among fixed wireless broadband service providers to gain access to additional mid-band spectrum to allow them to improve and expand service, and several providers have filed comments with the Commission arguing they “urgently” or “desperately” need more spectrum to address the digital divide problem for rural areas.⁷⁵ The record in that docket supports the assertion that fixed wireless broadband service could be deployed expeditiously and in a cost-effective manner in the 3700 – 4200 MHz band, and also without foreclosing future mobile broadband uses of the band as that becomes feasible.⁷⁶

The Commission taking action in these spectrum sharing initiatives can improve deployment of advanced telecommunications services in rural and other underserved areas in the country in a way consistent with the fact that mobile and fixed broadband services are

⁷³ See *generally* OTI and Public Knowledge Reply Comments GN Docket No. 12-354.

⁷⁴ See *generally* Broadband Access Coalition Petition For Rulemaking, https://na-production.s3.amazonaws.com/documents/3.7_GHz_Band_Petition_for_Rulemaking-FINAL_wi_th_Exhibits-06.21.17.pdf.

⁷⁵ Reply Comments of the Broadband Access Coalition, RM- 11791, at 5 nn.9, 10.

⁷⁶ *Id.* at 7

currently complements to one another. OTI strongly recommends the Commission examine these avenues for improving connectivity rather than accepting mobile BIAS as a substitute for fixed BIAS and potentially exacerbating the digital divide for millions of Americans.

III. OTI supports increasing throughput benchmarks for fixed BIAS

OTI has helped build the record in past Section 706 inquiry proceedings that the Commission should continue to increase its throughput benchmarks (particularly the upload benchmark), as well as include a latency metric that would trigger an investigation into other quality of service metrics, including packet loss and jitter, if not met by a particular service.⁷⁷ OTI reiterates these arguments and supplements them with additional evidence below.

Since last year, online innovation has continued to grow, making increased benchmarks for “advanced telecom capability” even more important. Consumers continue to have more options for 4K streaming.⁷⁸ Online video game distribution has grown.⁷⁹ The number of consumers playing video games online is also increasing.⁸⁰ The number of eSports viewers (streaming high-quality video game programming) is also increasing.⁸¹ Content that was traditionally reserved for cable television is moving online, particularly live sports coverage.⁸² The cloud storage market is predicted to grow at nearly 30% every year through 2022.⁸³ New

⁷⁷ See Appendix A.

⁷⁸ David Katzmaier, *4K content guide: What to watch in 4K and HDR today*, CNET (Mar. 28, 2017), <https://www.cnet.com/how-to/4k-content-guide-what-to-watch-in-4k-today>.

⁷⁹ Nate Hohl, *Gemly is a new PC game distribution platform from techland*, GameCrate (July 27, 2017), <https://www.gamecrate.com/gemly-new-pc-game-distribution-platform-techland/16800>; *Is Amazon taking on Steam?*, Autconomy (Jan. 29, 2017), <https://autconomy.com/2017/01/29/is-amazon-taking-on-steam>.

⁸⁰ See Mary Meeker, *Internet Trends 2017 - Code Conference*, Kleiner Perkins (May 31, 2017), <http://www.kpcb.com/internet-trends> (slide 98, 136) (“Meeker Presentation”).

⁸¹ Meeker Presentation, slides 141-42.

⁸² Kevin Tran, *Facebook is becoming a go-to platform for live streaming sports*, Business Insider (June 29, 2017), <http://www.businessinsider.com/facebook-becoming-go-to-platform-live-streaming-sports-2017-6>

⁸³ *Cloud Storage Market - Forecasts from 2017 to 2022*, Reports and Markets (Sept. 6, 2017), <https://www.reportsandmarkets.com/reports/cloud-storage-market-forecasts-from-2017-to-2022-1570806>.

cloud storage companies are emerging such as Stripe, which processes billions of transactions per year.⁸⁴

Upload throughput matters as well. The internet is a two-way communications medium, but many ISPs still emphasize download over upload throughput, as the Commission does. But the Commission should move toward a symmetrical throughput benchmark for download and upload. Popular mobile apps are implementing video upload features, and video streaming and uploading are also growing.⁸⁵ Upload throughput matters for healthcare too as consumers continue to adopt health wearables.⁸⁶

Upload throughput is also vitally important because uploading is the mechanism through which people exercise free speech and create content. Without uploading, the internet is just cable television. With uploading, individual users from any corner of the internet can speak online in a variety of ways, and create and share content with other users. Of particular importance has been videos of police brutality, political demonstrations, and other recordings that gained notoriety and attention.⁸⁷ Further, upload is particularly important for historically marginalized communities who often find themselves left out of the popular media narrative and thus have to tell their own stories.⁸⁸ Continuing to downplay the importance of upload throughput exacerbates barriers to these communities' rights to speak up and out and to ensure their stories are told and heard.

Even if the Commission were to look at currently available throughput (rather than looking toward future consumer needs as OTI has argued the Commission should), there is

⁸⁴ Meeker Presentation, slide 185.

⁸⁵ Many services require upload capability, particularly for video or streaming, such as Twitch, Youtube, Facebook Live, Instagram, and Snapchat.

⁸⁶ Meeker Presentation, slide 309.

⁸⁷ See, e.g., Rose Hackman, *New app aims to help citizens record police brutality using cellphones*, Guardian (May 7, 2015), <https://www.theguardian.com/us-news/2015/may/07/new-app-citizens-record-police-brutality-cellphones>.

⁸⁸ See *Digital Culture Shift*, Center for Media Justice (Aug. 2015), http://centerformediajustice.org/wp-content/uploads/2015/08/digital_culture_shift_report.pdf at 7.

extensive evidence that fixed BIAS throughput has increased rapidly, and the Commission's 706 inquiry should recognize that improvement. As OTI argued in its 2017 Open Internet comments,

[w]hen Measurement Lab (M-Lab) analyzed the 5.6 million tests performed by users against the M-Lab platform over the past 6 years, it found that from 2012 to 2014, internet speeds in the US improved at a rate of .23 Mbps every year. That is, every four years, the median rate should improve by around a megabit. From 2015 to 2017, it found that Internet speeds in the US improved at a rate of 1.9 Mbps per year. . . . The Internet Association similarly reported that cable broadband speeds have doubled from 2014 to 2016.⁸⁹

Not only is fixed BIAS throughput improving, it is improving more quickly than it has in previous years. Thus, it is time the Commission increased its benchmarks for advanced telecom capability.

IV. Conclusion

The Commission should not consider mobile-only to be “advanced telecom capability” because mobile service is not a substitute for fixed service. The Commission should, instead, focus on and increase the benchmarks for fixed service to recognize the growing bandwidth needs of Americans.

⁸⁹ Reply Comments of the Open Technology Institute at New America at 38, Dkt. No. 17-108 (Aug. 30, 2017) (citations removed). Further, according to Ookla (speedtest.net), average fixed download throughput in the United States is already 64.17 Mbps, with average upload throughput at 22.79 Mbps (improved from 47.1 Mbps download and 15.4 Mbps upload last year). That report also stated that this year has seen “the introduction of 300 Mbps, 400 Mbps and 1 Gbps speed tiers delivered over the DOCSIS 3.1 cable standard and a widespread deployment of 1 Gbps fiber service from Verizon Fios.” *Fixed Speed Report in United States*, Speedtest.net (Sept. 7, 2017), <http://www.speedtest.net/reports/united-states/#fixed>; see also *New report says fixed broadband in the U.S. is fast and getting faster*, NCTA (Sept. 12, 2017), https://www.ncta.com/whats-new?share_redirect=/whats-new#colorbox=node-2974 (citing Ookla/Speedtest.net report as proof that throughput is increasing).