



Perspectives from FSF Scholars
August 24, 2023
Vol. 18, No. 34

The FCC Should Define "Broadband" Based on Actual Consumer Usage

by

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I. Introduction and Summary

Last month, Federal Communications Commission Chairwoman Jessica Rosenworcel [announced, for the second time in a year](#), her intention to assess the status of "broadband" deployment. As part of that inquiry, she proposed a new definition of "broadband": 100 Megabits per second (Mbps) downstream and 20 Mbps upstream (100/20 Mbps). A recent [news report](#) (subscription required), however, indicates that an evenly divided (2-2) Commission is unlikely to move that inquiry forward.

We contend that the reason for this apparent stalemate regarding the proposed new benchmark is that it seemingly is based on preconceived policy notions, rather than on evidence-based technical and economic foundations. The Biden Administration consistently has acted in ways to prioritize a specific distribution technology – fiber-based networks – over other wholly viable, and often far more cost-effective, solutions. Federal agencies tasked with distributing multiple billions in broadband subsidies have collaborated in that effort by issuing rules that embrace eligibility requirements – relating to both speeds and distribution technologies – that tilt the scales toward fiber.

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But to meaningfully determine "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion," as it is required to do annually by [Section 706 of the Communications Act](#), the FCC ought to leverage its technical and economic expertise, and input from the public, to develop an evidence-based model as to what "advanced telecommunications capability" in fact entails. A deep dive into actual consumer usage of the Internet is required and in all likelihood will produce much different – and more relevant – results than policy-driven line-drawing that starts with favored distribution technologies and works backward.

Unfortunately, the horse already has left the barn with respect to billions in government funding. However, the FCC can still make a meaningful contribution to the development of sound broadband policies. A fact-intensive assessment of real-world use cases taking into account the actual speeds and performance Americans require today and in the foreseeable future, one that is divorced from preconceived policy predilections, would produce a more informed, more fiscally responsible working definition of "broadband" that both Congress and federal agencies could and should rely upon going forward.

II. The FCC Has Allowed Other Agencies to Define "Broadband"

Pursuant to [Section 706 of the Communications Act](#), it is the responsibility of the FCC to determine annually whether high-speed Internet access – "advanced telecommunications capability" aka "broadband" – is "being deployed to all Americans in a reasonable and timely fashion." As part of that assessment, the agency must articulate a concise technical definition of what "broadband" is (minimum download speed, upload speed, latency, and so on).

The FCC has not revised its definition of "broadband" for close to a decade. [In 2015](#), it increased the definitional benchmarks from 4/1Mbps to 25/3 Mbps, without regard to the underlying distribution technology, but they have remained unchanged since. Consequently, Congress and other federal agencies tasked with distributing broadband subsidies have taken matters into their own hands. The result is a disconcerting collection of inconsistent standards, informed by policy preferences divorced from actual consumer needs. This approach likely will result in duplicate funding and waste.

A [March 2021 Fact Sheet](#) issued by the White House was explicit: the Biden Broadband Plan "prioritizes building 'future proof' broadband infrastructure." [As we explained shortly thereafter](#), "indications are that the 'future proof' lingo, in practice, is nothing more than code for 'fiber.'" The bipartisan negotiations that produced the [Infrastructure Investment and Jobs Act](#) (IIJA), however, reached a far different result.

In IIJA Congress defined, for purposes of the BEAD Program, an "unserved" location as receiving less than 25/3 Mbps and an "underserved" location as receiving less than 100/20 Mbps. These benchmarks were established so that non-fiber distribution technologies – cable, 5G, satellite, unlicensed wireless, and others – could help achieve the goal of universal access, particularly in areas where terrain and other factors rendered fiber construction costly and otherwise impractical.

Notably, these thresholds do not appear to have been dictated by data regarding real-world consumer usage. Instead, they reflect congressional intent to embrace the principle of technological neutrality and reject [calls](#) for 100 Mbps – or even 1 gigabit – symmetrical service, performance standards that effectively require the construction of fiber-based networks.

But as highlighted in "[Future Guidance Can Fix NTIA's Flawed 'Fiber-First' Approach](#)," a May 2022 *Perspectives from FSF Scholars*, the rules for the \$42.45 billion [Broadband Equity, Access, and Deployment](#) (BEAD) Program run by the National Telecommunications and Information Administration (NTIA) defy the intent of Congress in ways both explicit (expressly defining "Priority Broadband Projects" as those that use end-to-end fiber-optic architecture) and practical (treating as "unserved" areas where service is provided via satellite or unlicensed spectrum) in order to reprioritize fiber.

Similarly, and as pointed out most recently in "[Wasteful Duplication by Design: A Case Study on Overlapping Federal Broadband Subsidies](#)," a May 2023 *FSF Perspectives*, the rules for the Department of Treasury's \$350 billion [State and Local Fiscal Recovery Funds](#) (SLFRF) and \$10 billion [Capital Projects Fund](#), and those for the latest round of the Department of Agriculture's \$3 billion (to date) [ReConnect Program](#), reject the principle of technological neutrality and favor fiber.

Given that these programs are well underway, we may be stuck with their inconsistent and improperly biased definitions regarding what qualifies as "broadband." That does not mean, however, that the way that the FCC defines "broadband" for purposes of Section 706 can't have significant consequences for broadband policy. Wholly distinct from decisions as to what types of networks federal dollars can be used to construct is the question regarding precisely what level of service consumers require. As the presumed expert agency on this matter, the Commission uniquely is situated to create an evidence-based model, based on technological and economic realities, regarding what it really means to have access to enough bandwidth – in other words, to have access to "broadband."

III. A Section 706 Inquiry Provides the FCC an Opportunity to Assess Actual Usage

[Section 706 of the Communications Act](#) directs the FCC to conduct an annual inquiry to "determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion." [The last such report](#) was released in January 2023. Based upon "compelling evidence," it concluded "for a third consecutive year" that it was.

On July 25, 2023, FCC Chairwoman Jessica Rosenworcel announced by way of a [press release](#) that she has circulated to her fellow Commissioners an item that, if approved, would kick off another Section 706 proceeding. (She made a [similar proclamation](#) last July.)

However, it is impossible to determine to what extent "advanced telecommunications capability" is available without defining what "advanced telecommunications capability" is. Subsection (d)(1) defines "advanced telecommunications capability" – and does so in a way that indisputably embraces the principle of technological neutrality – but only by reference to use cases, not specific performance metrics: "[t]he term 'advanced telecommunications capability' is

defined, *without regard to any transmission media or technology*, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications *using any technology*" (emphasis added).

The question, then, is as follows: In 2023, how much bandwidth do consumers require "to originate and receive *high-quality voice, data, graphics, and video telecommunications*" (emphasis added)?

The agency last updated its technical definition of "advanced telecommunications capability" in its [2015 Section 706 Report](#), increasing the minimum download speed from 4 Megabits per second (Mbps) to 25 Mbps and the upload speed from 1 Mbps to 3 Mbps. But as Michelle P. Connolly, Ph.D., a member of the Free State Foundation's Board of Academic Advisors and Professor of the Practice within the Economics Department at Duke University, wrote in "[Mindfully Wasteful Spending: The Definition of Broadband](#)," a May 2023 *FSF Perspectives*, both of those benchmarks appear to have been driven by policy concerns rather than real-world consumer demand – specifically, a desire to disregard the ability of satellite-based offerings to deliver "broadband," and thereby "maximize measures of unserved households."

Chairwoman Rosenworcel for the second year in a row has proposed to increase those thresholds to 100 Mbps for downloads and 20 Mbps for uploads (100/20 Mbps). The press release states that the draft Notice of Inquiry "discusses a range of evidence supporting this standard, including the requirements for new networks funded by the" IIA. (We will have to wait for the Notice of Inquiry's eventual release, [which in turn may hinge upon the seating of a fifth Commissioner](#), to see what other "evidence" it cites.)

In addition, it "proposes to set a separate national goal ... for the future" of 1 Gigabit per second (Gbps) downstream and 500 Mbps upstream. As explained above, the former (100/20 Mbps), which reflects the bipartisan compromise embodied in the IIA, is founded in a policy-based intention to render eligible for BEAD Program subsidies non-fiber distribution technologies: cable, 5G, satellite, fixed wireless, and so on. It does not appear to be rooted in data regarding consumer usage. The latter (1 Gbps/500 Mbps), meanwhile, is at best aspirational – and, at worst, yet another expression of the fiber-first bias that starts at the Biden White House and trickles downward to federal agencies.

To again quote Professor Connolly, for purposes of Section 706:

The FCC's definition [of broadband] is supposed to represent the *minimum threshold* for service to officially count as broadband service. It is not supposed to represent the minimum needed for a household with five gamers, two live streamers, and two grandparents streaming to two ultra-high-definition 4K TVs 24 hours a day. Nor should it.

Extremely high speeds are not necessary for every household, and this is not how one should define a *minimum threshold* for a technology – especially when that minimum threshold will dictate the size and existence of presumed digital divides, how much federal money will be spent to close them, precisely where that money

will go, and the extent to which it will be used to subject existing, privately financed networks to government-subsidized competition.

We certainly agree that the outlier example Professor Connolly describes should not determine what it means to be "served." But how, then, should the Commission determine what that "minimum threshold" is? We suggest that, rather than point to as "evidence" metrics that emerged from a legislative compromise, the next Section 706 inquiry ought to solicit input from an informed and interested public – and use the responses received to develop an evidence-based model that reflects actual demand from actual users in actual real-world circumstances. Such a model would incorporate factual inputs, educated predictions as to how online behavior is expected to evolve over time, and overt responsive policy choices.

To understand what we mean, consider the following foundational questions:

- Section 706 refers to "Americans," but demand for bandwidth, particularly in the context of fixed Internet service, generally is discussed in terms of households. This especially was the case during the COVID-19 public health crisis, when breadwinners and dependents alike relied simultaneously upon home Internet connections to work and learn. So how many members should the model household include? According to the [United States Census Bureau](#), between 2017 and 2021, the average number of persons per household was 2.6. From a purely factual perspective, that seems to be a reasonable response. From a policy perspective, however, there might be an argument why that number ought to be higher – or at least rounded up to 3. The key is for the FCC to start from an evidentiary premise and "show its work."
- Consumers increasingly rely upon smartphones and other devices tailored to their individualized needs. According to [Pew Research Center data from early 2021](#), 15 percent of adults are "smartphone-only" users – and "[f]ully 71 percent of non-broadband users say they are not interested in having such a connection at home." Consequently, should the FCC consider defining "broadband" technical requirements on a per-person basis? If so, to what extent might the total bandwidth needs of a 3-person household be less than the sum of its parts, for example due to communal viewing of streaming video?
- Regarding streaming video, [according to Sandvine](#), "in [the] first half of 2022, video accounted for a hefty 65.93% of total volume over the Internet. That's a 24% increase over H1 2021." In March 2023, [Netflix alone represented 15 percent of total Internet traffic](#). Netflix [recommends](#) at least 15 Mbps for ultra-high-definition (4K) video. If the assumption is 3 people per household, how many simultaneous 4K video streams should a shared fixed wireline connection be able to support? How is video consumption changing over time? Are next-generation streaming video protocols expected to be deployed in the near future? Will they require more or less bandwidth? (In other words, will greater bandwidth demands due to increased picture quality outpace offsetting improvements in compression techniques – or vice versa?)
- What other applications require substantial amounts of bandwidth? Video conferencing, the use of which skyrocketed during the COVID-19 public health crisis, is perhaps the most prominent example that uses significant amounts of both downstream and upstream capacity. The highest download speed that [Zoom](#) recommends, for gallery view receiving

with 49 views, is 4.0 Mbps downstream. The highest upstream speed it recommends is 3.8 Mbps for 1080p HD video.

- Online gaming also can be bandwidth-intensive – and places a premium on low latency. A [March 2021 CNET article written by Kristen Bolden](#) recommends download speeds between 25 and 35 Mbps, while an [August 2021 piece for ZDNET by Adam Benjamin](#) draws the latency line at 15 milliseconds. Incidentally, does online gaming appropriately fall within the definition of "advanced telecommunications capacity," which refers to "voice, data, graphics, and video telecommunications"?
- More broadly, from a policy perspective, what use cases ought the model include? And what assumptions ought the model make regarding simultaneous usage? Professor Connolly's extreme example – "five gamers, two live streamers, and two grandparents streaming to two ultra-high-definition 4K TVs 24 hours a day" – seems the wrong candidate, but then what is the right choice?

We do not claim to know the exact methodology that the FCC ought to employ to model accurately, for the purposes of a Section 706 inquiry, Americans' real-world bandwidth needs. The questions presented above may or may not be all the right ones to ask. Another possibility might be to engage in the large-scale empirical observation of online activity, similar to the [FCC's app-based speed tests](#).

Rather, the point is to highlight that, rather than starting with a list of favored distribution technologies and working backwards, a meaningful assessment by the Commission as to "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion" – an assessment true to Congress's intent in adopting Section 706 – demands a fact-based model of "advanced telecommunications capability" grounded in present-day technological and economic realities, not speculative conjecture about scenarios that may or may not come to pass further into the future.

As the presumed expert agency on such matters, and given its technical and economic capabilities, the FCC ideally is positioned to take on this task as long as it does so without adhering to preconceived outcome-determinative notions. And once the Commission has developed a clear definition, it should encourage Congress and those other departments and agencies active in this space to rely upon it going forward.

IV. Conclusion

Multiple billions of taxpayer dollars are being spent to achieve the policy goal of universal "broadband" access. Congress and the various agencies holding the purse strings have made judgment calls regarding the level of performance – and, more problematically, the types of distribution technologies – eligible to receive federal broadband network construction subsidies. And given that those funding efforts are well underway, it may be too late for any action by the FCC to have an impact.

Nevertheless, there remains a separate, significant, and seemingly unexplored to date, question: For purposes of Section 706, how much bandwidth is needed for a connection to be deemed "advanced telecommunications capability"? The FCC should develop an evidence-based

response to this question by soliciting from the interested public detailed and highly specific factual information regarding current and near-future real-world usage.

We are confident that the questions posed above do not represent the universe of relevant queries. But we do know the FCC has been tasked by Congress to assess "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion" – and that undertaking requires more "evidence" than a circular reference back to the bipartisan compromises that enabled passage of the IIJA.

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Further Readings

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