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Economic Evaluation of the Factual Basis
for the FCC's Open Internet Order

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The Federal Communications Commission's (FCC) highly anticipated Open Internet Order, released on March 12, 2015,¹ was upheld by the U.S. Court of Appeals for the District of Columbia on June 14, 2016.² The Order for the first time imposed common carrier regulation on providers of fixed and *mobile* services that provide mass-market Internet access to households and businesses. Previously, consistent with the Telecommunications Act of 1996³ and earlier FCC orders,⁴ Internet access providers had been subject to moderate regulation. Among the new regulatory restrictions is an outright ban on paid prioritization, which prevents providers from offering and content providers from paying for higher-quality Internet transmission. And although not definitively prohibiting a similar arrangement in which content

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¹ Protecting and Promoting the Open Internet, GN Dkt. No. 14-28, 80 Fed. Reg. 19,738, 30 FCC Rcd. 5601 (Apr. 13, 2015) (codified at 47 C.F.R. pts. 1, 8, 20) [hereinafter 2015 Open Internet Order].

² United States Telecom Ass'n v. FCC, 825 F.3d 674 (D.C. Cir. 2016).

³ Pub. L. No. 104-104, 110 Stat. 56 (codified as amended in scattered sections of 47 U.S.C.); see 47 U.S.C. § 230(a)(4) ("The Congress finds . . . [t]he Internet and other interactive computer services have flourished, to the benefit of all Americans, with a minimum of government regulation.").

⁴ For example, when it classified broadband services offered by cable companies as information services, the FCC noted:

[W]e believe "broadband services should exist in a minimal regulatory environment that promotes investment and innovation in a competitive market." In this regard, we seek to remove regulatory uncertainty that in itself may discourage investment and innovation. And we consider how best to limit unnecessary and unduly burdensome regulatory costs.

Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities, GN Dkt. No. 00-185, 17 FCC Rcd. 4798, 4802 (Mar. 15, 2002) (quoting Appropriate Framework for Broadband Access to Internet Over Wireline Facilities, 17 FCC Rcd. 3019, 3022 (Feb. 15, 2002)), *aff'd in part, vacated in part, and remanded*, Brand X Internet Servs. v. FCC, 345 F.3d 1120 (9th Cir. 2003), *rev'd and remanded*, 545 U.S. 967 (2005).

from certain edge providers⁵ is not counted against a mobile subscriber's monthly data caps, the Order opened the possibility that such innovations could be challenged and potentially found in violation of the new conduct standard designed to prevent providers from interfering or disadvantaging end-users or edge providers.

The FCC's primary economic rationale for these new regulations was that competition among broadband service providers is not strong enough to prevent broadband providers from engaging in anticompetitive practices that would harm consumers and edge providers, thereby threatening innovation and investment: "Without rules in place to protect the open Internet, the overwhelming incentives broadband providers have to act in ways that are harmful to investment and innovation threaten both broadband networks and edge content."⁶

The FCC rendered this "predictive judgment" despite the facts that (1) it cited only two enforcement actions and a handful of allegations over a period of more than a decade that in any way manifest the "overwhelming incentive" providers have to disrupt the functioning of the Internet and (2) there was no evidence to date that investment and innovation had been harmed. In particular, broadband providers have been offering services of increasing quality to greater numbers of consumers. Indeed, rather than corroborate the FCC's judgment that competition is insufficient and anticompetitive harms are likely, the evidence calls into question a nearly identical predictive judgment a few years earlier that competition was insufficient then because one-fifth of households had no choice among broadband providers at the highest reported downstream speed (ten megabits per second) and only two percent of household had three or more alternatives. Within four years, the industry responded so that only two percent of households have no choice and over ninety percent of households have three or more alternatives.⁷

Rather than conclude that whatever problem might have existed had been solved, the FCC instead raised the bar by defining broadband to require faster downstream and upstream speeds (redefining broadband service to require downstream speeds of 25 megabits per second (Mbps) and upstream speeds

⁵ The FCC's Order uses the term "edge provider" to denote a service such as Netflix, which provides content to consumers of ISPs such as Comcast, Verizon, or AT&T. 2015 Open Internet Order, 80 Fed. Reg. at 19,767, 30 FCC Rcd. at 5603.

⁶ *Id.* at 19,751–52, 30 FCC Rcd. at 5645.

⁷ Timothy J. Tardiff, *Net Neutrality: Economic Evaluation of Market Developments*, 11 J. COMPETITION L. & ECON. 701, 715–16 (2010). Mobile wireless providers were included in this comparison. As shown in Table 1 below, the corresponding growth for fixed broadband providers was between 2 percent and 65 percent. Because the FCC changed how mobile wireless broadband speeds are measured in its recently released data, the remainder of this article does not include mobile broadband alternatives. Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Dkt. No. 15-191, 31 FCC Rcd. 699, 734 (Jan. 29, 2016) [hereinafter 2016 Broadband Progress Report].

of 3 Mbps, up from the requirements of 4 Mbps downstream and 1 Mbps upstream under the previous definition)⁸ and then proceeded to observe that at this new definition a remarkably similar one-fifth of households had no alternatives and only two percent had three or more alternatives.⁹ In the words of dissenting Commissioner Ajit Pai, growth in broadband services between the FCC's two questionable judgments that competition is not adequate instead demonstrates that "[t]he Internet is not broken. There is no problem for the government to solve."¹⁰

This article first describes the majority and dissenting opinions in the D.C. Circuit's upholding the 2015 Open Internet Order and then describes an initial evaluation of the FCC's latest predictive judgment, based on data that became available in 2015 and 2016. These data reinforce the trend evident in the FCC's previous report series—Internet services were developing in a way that calls into question the need for rigorous regulation.

In Part I, I summarize the majority and dissenting opinions presented in the D.C. Circuit's upholding of the 2015 Open Internet Order. In Part II, I evaluate the effects of the FCC's changes in how it measures and reports broadband development. In Part III, I examine the implications of the trend in broadband development revealed by recently released data. Part IV concludes.

I. THE D.C. CIRCUIT OPINION

In a 2-to-1 decision, the U.S. Court of Appeals for the D.C. Circuit upheld the 2015 Open Internet Order, emphasizing from the start that its decision was based on an assessment of whether the FCC's Order was consistent with the authority that Congress has delegated to the agency:

[O]ur "role in reviewing agency regulations is a limited one." Our job is to ensure that an agency has acted "within the limits of [Congress'] delegation of authority," and that its action is not "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." Critically, we do not "inquire as to whether the agency's decision is wise as a policy matter; indeed, we are forbidden from substituting our judgment for that of the agency."¹¹

⁸ Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Dkt. No. 14-126, 30 FCC Rcd. 1375, 1377 (Feb. 4, 2015) [hereinafter 2015 Broadband Report].

⁹ Tom Wheeler, The Facts and Future of Broadband Competition, Remarks at the 1776 Headquarters, Washington, D.C., at 2 (Sept. 4, 2014), https://apps.fcc.gov/edocs_public/attachmatch/DOC-329161A1.pdf; 2015 Broadband Report, 30 FCC Rcd. at 1421 n.314.

¹⁰ 2015 Open Internet Order, 30 FCC Rcd. at 5933 (Pai, Comm'r, dissenting).

¹¹ *United States Telecom Ass'n v. FCC*, 825 F.3d 674, 696–97 (D.C. Cir. 2016) (first quoting *Ass'n of Am. R.R.s. v. Interstate Commerce Comm'n*, 978 F.2d 737, 740 (D.C. Cir. 1992); then quoting *Chevron, U.S.A.*,

The majority's 55-page opinion by Judges David Tatel and Sri Srinivasan then concluded that the FCC had acted within its delegated authority in (1) changing the classification of broadband Internet access services (both fixed and mobile) from information services (subject to less stringent regulation) to common carrier telecommunications services, subject to Title II of the Communications Act, (2) forbearing from applying certain provisions of Title II to reclassified broadband Internet access services, and (3) establishing five specific rules: prohibition of blocking, throttling, and paid prioritization; a general conduct rule prohibiting broadband providers from "unreasonably interfer[ing] with or unreasonably disadvantage[ing] (i) end users . . . or (ii) edge providers;¹² and an enhanced transparency rule. The bulk of the majority's approval of the FCC's actions focused on reclassification (approximately 30 pages). Major issues in upholding reclassification were (1) that changing the classification of fixed services was the same type of agency judgment (approved by the Supreme Court) that the FCC exercised when it previously classified these services as information services and (2) the FCC's redefinition of mobile broadband services from private (not subject to Title II) to switched mobile services was a proper exercise of agency judgment. The majority opinion spent less time on forbearance (6 pages) and the specific rules (6 pages).¹³ In approving the rules, the majority noted that it "fully adopt[ed] . . . our conclusion that the Commission's virtuous cycle theory provides reasonable grounds"¹⁴ for the Commission's actions.

The dissenting opinion by Judge Stephen Williams paid particular attention to the majority's use of the virtuous cycle theory to justify its ban on paid prioritization, the "jewel in the crown"¹⁵ of the FCC's specific rules. At one point referring to the majority's explanation of the virtuous circle as "handwaving,"¹⁶ Judge Williams concluded that "the record contains multiple reasons for thinking that the Commission's new rules will retard rather than enhance the 'virtuous cycle,' and the Commission's failure to answer those objections renders its decision arbitrary and capricious."¹⁷ In particular, Judge Williams noted that the Commission's assertion that the ban on paid

Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837, 865 (1984); then quoting 5 U.S.C. § 706(2)(A); and then quoting *Ass'n of Am. R.Rs.*, 978 F.2d at 740 (citations omitted).

¹² *Id.* at 696.

¹³ The first 8 pages reviewed the events leading up to the 2015 Open Internet Decision and the last 5 pages dealt with First Amendment issues.

¹⁴ *United States Telecom Ass'n*, 825 F.3d at 734. The D.C. Circuit previously upheld the FCC's virtuous cycle rationale in its 2014 opinion overturning certain rules adopted in the FCC's 2010 Open Internet Order. *Verizon v. FCC*, 740 F.3d 623 (D.C. Cir. 2014). The "virtuous cycle" is a process within which quality broadband networks facilitate the development of new applications by edge providers, in turn providing ISPs with incentives to continually upgrade their networks to accommodate these new uses. Tardiff, *supra* note 7, at 703.

¹⁵ *United States Telecom Ass'n*, 825 F.3d at 745 (Williams, J., dissenting).

¹⁶ *Id.* at 773.

¹⁷ *Id.* at 756.

prioritization is supported by a well-established body of economic literature is “false”¹⁸ and noted that a former FCC chief economist advised against such a ban in comments that the Commission chose to ignore.¹⁹ Judge Williams further observed that, contrary to the Commission’s stated intent of avoiding slow lanes for edge providers unable to pay for paid prioritization, the outcome could be quite the opposite,²⁰ since larger edge providers such as Google and Netflix already pay for higher quality through the use of content delivery networks, which are not subject to the FCC’s ban.²¹ In a similar vein, Judge Williams observed: “The short of it is that the Commission has nowhere explained why price distinctions based on quality of service would tend to impede the flourishing of the internet, or, conversely, why the status quo ante would not provide a maximum opportunity for the flourishing of edge providers as a group—or small innovative edge providers as a subgroup.”²²

Judge Williams was also critical of the majority’s approval of the 2015 Open Internet Order, because that Order lacked a serious competitive analysis:

Title II is legacy legislation from the era of monopoly telephone service. It has no inherent provision for evolution to a competitive market. It fits cases where all hope (of competitive markets) is lost. . . . Two central paradoxes of the majority’s position are how an Act intended to “reduce regulation” is used instead to increase regulation and how an Act intended to “promote competition” is used at all in a context in which the Commission specifically forswears any findings of a lack of competition.²³

Judge Williams observed that there were “a fairly large number of competitors in most markets, with 74% of American households having access to at least two fixed providers giving speeds greater than 10 Mbps and 88% with at least two fixed providers giving access to service at 3 Mbps.”²⁴ While

¹⁸ *Id.* at 761, 763–64.

¹⁹ *Id.* at 764; see also Tardiff, *supra* note 7, at 719–20.

²⁰ See *United States Telecom Ass’n*, 825 F.3d at 768 (Williams, J., dissenting). The assertion that a ban on paid prioritization is needed to prevent the emergence of slow lanes is an old argument that continues to be made despite the fact that broadband investment has increased the availability of providers at increasing speeds—that is, to the extent that some traffic would be slower under paid prioritization, it would be traveling at super highway speeds relative to the speeds available when the slow lane concern was first raised. Tardiff, *supra* note 7, at 724 n.67.

²¹ *United States Telecom Ass’n*, 825 F.3d at 767 (Williams, J., dissenting); see also Tardiff, *supra* note 7, at 702 n.5.

²² *United States Telecom Ass’n*, 825 F.3d at 762 (Williams, J., dissenting). With regard to the status quo, I observed that the FCC itself lauded the amounts of investment by broadband providers, particularly by mobile wireless providers, suggesting that more stringent new rules were not needed to preserve the virtuous cycle. Tardiff, *supra* note 7, at 721. I further noted that the FCC’s conclusion that the new rules do not raise a takings issue, because they would enhance the value of broadband providers’ networks is not consistent with its judgment that there are overwhelming incentives for broadband providers to act anti-competitively vis-à-vis edge providers. Tardiff, *supra* note 7, at 722.

²³ *United States Telecom Ass’n*, 825 F.3d at 770 (Williams, J., dissenting).

²⁴ *Id.* at 750.

observing that the FCC emphasized the lack of competition at its then newly adopted benchmark of 25 Mbps downstream/3 Mbps upstream, the dissenting opinion criticized this focus as not being grounded in economic analysis.²⁵ In particular, (1) the lower speeds are sufficient for popular applications, such as Netflix,²⁶ and (2) because only about 30 percent of households at that time were subscribing to broadband at this speed level, it is not surprising that competitors had not simultaneously rolled out “the latest, priciest service” everywhere.²⁷ Instead of these economic considerations, the FCC’s adoption of the new standard was based on a scenario in which multiple household members were attempting to access the Internet at the same time—a situation analogous to “setting a standard for cars that requires space for seven passengers.”²⁸ Judge Williams then observed that “[t]he weakness of the Commission’s reasoning suggests that its main purpose in setting the ‘standard’ may simply be to make it appear that millions of Americans are at the mercy of only one supplier, or at best two, for critically needed access to the modern world.”²⁹

Judge Williams also expressed concern about the adverse effects of the general conduct standard, noting, among other things, that the process of obtaining advisory opinions from the FCC’s Enforcement Bureau would likely be slow.³⁰ The majority disagreed, stating that the dissenting opinion’s concern about slowness “stem[med] solely from the absence of firm deadlines,”³¹ opining that “there [was] no indication at this point, however, that the Bureau [would] fail to offer timely guidance.”³²

II. EFFECTS OF CHANGES IN THE FCC’S MEASUREMENT OF BROADBAND DEVELOPMENT

For periods ending December 2009 through December 2013, the FCC consistently measured and released biannual reports on the availability of broadband services available to residential customers for accessing the Internet. The FCC relied on these data in drawing generally pessimistic conclusions

²⁵ *Id.* at 751.

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.* at 755–56.

³¹ *Id.* at 738 (majority opinion).

³² *Id.* If, contrary to the majority’s belief, the Enforcement Bureau does not act expeditiously, one of its major reasons for approving the general conduct rule—“the speed with which broadband technology continues to evolve”—implies that the rule will create investment disincentives for both broadband providers and edge providers. The dialogue addressing the Enforcement Bureau’s likely timeliness was with respect to advisory opinions. The Enforcement Bureau is also charged with adjudicating formal complaints. In this regard, the Enforcement Bureau’s resolution of pole attachment complaints, which are most likely better defined than complaints under the general conduct rule, have generally taken a substantial amount of time. Tardiff, *supra* note 7, at 706 n.28.

about the adequacy of competition. In particular, in its 2010 Open Internet Order, whose premise was an earlier determination that the deployment of broadband services was not reasonable and timely, the FCC noted that:

The risk of market power is highest in markets with few competitors, and most residential end users today have only one or two choices for wireline broadband Internet access service. As of December 2009, nearly 70 percent of households lived in census tracts where only one or two wireline or fixed wireless firms provided advertised download speeds of at least 3 Mbps and upload speeds of at least 768 Kbps—the closest observable benchmark to the minimum download speed of 4 Mbps and upstream speed of 1 Mbps that the Commission has used to assess broadband deployment. About 20 percent of households are in census tracts with only one provider advertising at least 3 Mbps down and 768 Kbps up. For Internet service with advertised download speeds of at least 10 Mbps down and upload speeds of at least 1.5 Mbps up, nearly 60 percent of households lived in census tracts served by only one wireline or fixed wireless broadband provider, while nearly 80 percent lived in census tracts served by no more than two wireline or fixed wireless broadband providers.³³

Similarly, after the D.C. Circuit overturned the rules that the FCC adopted in the 2010 Open Internet Order, the FCC opened a proceeding that resulted in new rules adopted in the 2015 Open Internet Order, with the following pessimistic assessment of the adequacy of competition as of the end of 2012:

We also seek comment on the state of competition in broadband Internet access service, and its effect on providers' incentives to limit openness In the fixed broadband context, we have seen evidence of limited choice between broadband providers in many areas of the country. As the speed threshold increases to 6 Mbps downstream and 1.5 Mbps upstream, the number of households that are located in census tracts with at least three providers that report serving customers at those higher speeds dips down to a mere 34 percent.³⁴

Although the FCC consistently interpreted the data described in the 2010 Open Internet Order and the 2014 Notice of Proposed Rulemaking (NPRM) as indicative of a lack of competition, the data actually show considerable growth in the number of alternatives. Because the December 2012 results for downstream speeds of at least 10 Mbps and upstream speeds of at least 1.5 Mbps are virtually identical to the results for 6 Mbps downstream and 1.5 Mbps upstream, the increase in competitive alternatives at the higher

³³ Preserving the Open Internet, GN Dkt. No. 09-191, 25 FCC Rcd. 17,905, 17,923–24 (Dec. 23, 2010) [hereinafter 2010 Open Internet Order].

³⁴ Protecting and Promoting the Open Internet, GN Dkt. No. 14-28, 29 FCC Rcd. 5561, 5578 (May 15, 2014) [hereinafter 2014 NPRM].

speeds described by the FCC measures the development of broadband choice between 2009 and 2012. In particular, although the FCC's 2010 Open Internet Order reported that about 80 percent of households were in census tracts with no more than two providers, the source document for that statement indicates that the 80 percent statistic is the percentage with *fewer* than two alternatives. Ninety-eight percent of households lived in census tracts with no more than two providers—that is, fewer than three providers—offering speeds of 10 Mbps downstream and 1.5 Mbps upstream as of the end of 2009. By the end of 2012, that percentage had decreased to approximately two-thirds. Over the same period, the proportion of households with no choice among providers—that is, fewer than two alternatives—decreased from approximately 80 percent to 30 percent.

The complete set of reports reveal substantial growth at downstream speeds of at least 3 Mbps and upstream speeds of at least 768 Kbps—the closest observable benchmark to the minimum downstream speed of 4 Mbps and upstream speed of 1 Mbps that the Commission used to assess broadband deployment until it changed the standard in early 2015,³⁵ as well as continued growth at all reported speeds through the end of 2013, after which the FCC changed the definition and measurement of broadband availability. Table 1 reports the growth in broadband availability shown in the FCC's data.

Table 1. 2009 to 2013 Growth in Alternative Fixed Broadband Providers

Alternatives	At least 3 Mbps downstream & 768 Kbps upstream			At least 10 Mbps downstream & 1.5 Mbps upstream		
	Dec-09 [1]	Dec-12 [2]	Dec-13 [3]	Dec-09 [4]	Dec-12 [5]	Dec-13 [6]
3 or more	28%	70%	86%	2%	33%	65%
2	48%	27%	13%	20%	37%	29%
1	21%	2%	1%	58%	28%	5%
0	3%	1%	0%	21%	2%	1%

Sources: FEDERAL COMMUNICATIONS COMMISSION, INTERNET ACCESS SERVICES: STATUS AS OF DECEMBER 31, 2009, at 7 fig.3(a) (Dec. 2010) [hereinafter DECEMBER 2010 INTERNET ACCESS REPORT], https://apps.fcc.gov/edocs_public/attachmatch/DOC-303405A1.pdf; FEDERAL COMMUNICATIONS COMMISSION, INTERNET ACCESS SERVICES: STATUS AS OF DECEMBER 31, 2012, at 9 fig.5(a) (Dec. 2013), https://apps.fcc.gov/edocs_public/attachmatch/DOC-324884A1.pdf; FEDERAL COMMUNICATIONS COMMISSION, INTERNET ACCESS SERVICES: STATUS AS OF DECEMBER 31, 2013, at 9 fig.5(a) (Oct. 2014) [hereinafter OCTOBER 2014 INTERNET ACCESS REPORT], https://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db1016/DOC-329973A1.pdf.

³⁵ 2015 Broadband Progress Report, 30 FCC Rcd. at 1377.

The left side of Table 1 reports growth at the broadband standard prevailing until early 2015. The proportion of households in census tracts with one or two broadband providers fell from about 70 percent in 2009, as noted by the FCC, to less than 30 percent by December 2012 (a fact not discussed in the 2014 NPRM) to less than 15 percent by the end of 2013. Similarly, whereas about one-quarter of all households lived in census tracts with no choice among providers (that is, zero or one alternative) in 2009, by the end of 2013 that percentage had fallen to one percent. Availability at the highest speed then reported showed similar substantial growth. The proportion of households in census tracts with one or two broadband providers fell from about 78 percent in 2009 to about 65 percent in December 2012 to about 35 percent in December 2013. Similarly, although about four-fifths of all households lived in census tracts with no choice among providers (zero or one alternative) in 2009, by the end of 2013 that percentage had fallen to six percent. Perhaps most significant, the FCC's data for the end of December 2013, which were available over four months before the FCC adopted the 2015 Open Internet Order,³⁶ showed that the percentage of households in census tracts with three or more alternatives had approximately doubled in one year—from a “mere” one-third of households at the end of 2012 (as noted in the 2014 NPRM) to approximately two-thirds of households one year later.

Even though the FCC's Internet Access Report data had informed the discussion in the 2010 Open Internet Order and the 2014 NPRM that initiated the proceeding resulting in the 2015 Open Internet Order, the Internet Access Report data—in particular, the latest available data from December 2013—appear to have had a role neither in establishing the new broadband standard of 25 Mbps downstream/3 Mbps upstream adopted shortly before the 2015 Open Internet Order, nor in the Order itself. Instead, the FCC relied on data then collected by the National Telecommunications and Information Administration for the National Broadband Map.³⁷ In addition to presenting broadband availability at higher speeds than were included in the Internet Access Report series, the NTIA data provide a strikingly different picture of how many alternative providers are available for residential broadband subscribers. Table 2 illustrates the differences.

³⁶ Press Release, Fed. Comm'n's Comm'n, FCC Releases New Data on Internet Access Services and Local Telephone Competition (Oct. 16, 2014), https://apps.fcc.gov/edocs_public/attachmatch/DOC-329990A1.pdf.

³⁷ See, e.g., 2015 Open Internet Order, 80 Fed. Reg. at 19,748, 30 FCC Red. at 5632 (commenting on the percentage of households with no choice of providers at the 25 Mbps/3 Mbps speed level).

Table 2. Fixed Broadband Availability: Internet Access Reports Versus NTIA Data

Alternatives	Dec-13 Internet Access Report	Wheeler Speech (Dec-13 Data)		Dec-09 Internet Access Report
	10 Mbps down/ 1.5 Mbps up [1]	10 Mbps down/ 0.768 Mbps up [2]	25 Mbps down/ 3 Mbps up [3]	10 Mbps down/ 1.5 Mbps up [4]
3 or more	65%	9.8%	2.4%	2%
2	29%	51.5%	22.9%	20%
1	5%	30.3%	55.3%	58%
0	1%	8.4%	19.4%	21%

Sources: OCTOBER 2014 INTERNET ACCESS REPORT, *supra* Table 1, at 9 fig.5(a); Wheeler, The Facts and Future of Broadband Competition, *supra* note 9, at 2; DECEMBER 2010 INTERNET ACCESS REPORT, *supra* Table 1, at 7 fig.3(a).

Table 2 compares December 2013 broadband availability from the Internet Access Services Report with the corresponding broadband statistics presented by FCC Chairman Wheeler in a September 2014 speech.³⁸ Column 1 of Table 2, which duplicates Column 6 of Table 1, shows that about two-thirds of households had three or more fixed alternatives and only six percent had no choice (zero or one alternative). In contrast, Column 2 shows Chairman Wheeler's results at a somewhat *lower* performance level. Whereas the downstream speed from Chairman Wheeler's results is the same as from the Internet Access Services data, the upstream speed is only 0.768 Mbps (compared with 1.5 Mbps in Column 1). Nonetheless, fewer than 10 percent of households had three or more alternatives, with almost 40 percent having no choice. Column 3 presents Chairman Wheeler's percentages at the new broadband standard of 25 Mbps downstream/3 Mbps upstream. At this higher speed, only about 2 percent of households had three or more alternatives and

³⁸ Wheeler, The Facts and Future of Broadband Competition, *supra* note 9, at 2. Chairman Wheeler's figure identifies NTIA as the source for the availability data. NTIA collects broadband data at the census block level, indicating that the availability measures are the percentage of households in census blocks with zero, one, two, or three or more broadband providers with service in the census block. NATIONAL BROADBAND MAP: ASSEMBLING THE DATA, <http://www.broadbandmap.gov/about/technical-overview/assembling-the-data>. The "25 Mbps" bar from Chairman Wheeler's speech, reproduced as Column 3 of Table 2, matches the data reported in footnote 314 of the 2015 Broadband Progress Report. Chairman Wheeler also appeared to be referring to the data summarized in Table 2 in a later speech in which he reported that 75 percent of U.S. households do not have a choice of providers at the then brand-new 25 Mbps standard:

Increasing the standard for broadband to 25 Mbps also clarifies one of the biggest challenges facing our broadband future: the lack of meaningful competition. It's bad enough that 17 percent of Americans have no access to 25 megabit service. But at those speeds, about 75 percent of U.S. households can choose from only one provider. Where there is no choice the market cannot work.

Tom Wheeler, Remarks at Silicon Flatirons Center, Boulder, CO 2 (Feb. 9, 2015), <http://www.fcc.gov/document/chairman-wheeler-silicon-flatirons-center-boulder-colorado>.

about one-fifth of households had no broadband alternatives at this level. As Column 4 reports, the pattern of available alternatives shown in Chairman Wheeler's data is remarkably similar to the pattern measured four years earlier for the highest speed level measured in the Internet Access Services data (also shown in Column 4 of Table 1).

The large discrepancy between the two sources for the same time period appears to be the result two major differences, both of which result in lower measures of availability for Chairman Wheeler's data. First, whereas the Internet Access Services data measure appears to be designed to capture all available alternatives at a particular speed,³⁹ Chairman Wheeler's data do not include satellite or fixed wireless alternatives.⁴⁰ Second, Chairman Wheeler's data measure broadband availability at the census *block* level, but the Internet Access Services data for 2013 and earlier years measured availability at the census *tract* level. The latter measurement produces a larger degree of availability because all households in a census tract are considered to have a broadband choice when that alternative is available anywhere in the census tract, but measuring at the block level excludes households for which that alternative is available in the tract, but not in those households' blocks.⁴¹

Starting with data for 2014, the separate NTIA data source used by Chairman Wheeler and the data collection for the Internet Access Services reports have been consolidated.⁴² The purpose of acquiring those data for

³⁹ The Technical Notes to the Internet Access Services reports describe an "all other [category] (which is included to capture deployment of additional technologies over time)." OCTOBER 2014 INTERNET ACCESS REPORT, *supra* Table 1, at 79.

⁴⁰ 2015 Broadband Progress Report, 30 FCC Rcd. at 1379–80, 1421 n.314 (explaining that the FCC excluded satellite data due to its concern over the quality and reliability of these data, and describing how Chairman Wheeler's figure excludes fixed wireless data, even though fixed wireless data were included in similar availability statistics reported elsewhere).

⁴¹ Because (as the FCC has previously recognized) alternatives need not be present everywhere in a geographic area in order to impose competitive discipline, the competitive presence at the census tract level is an informative indicator of the extent and progress of competition. SBC Commc'ns Inc. & AT&T Corp. Applications for Approval of Transfer of Control, WC Dkt. No. 05-65, 20 FCC Rcd. 18,290, 18,338–39, 18,341–42 (Nov. 17, 2005).

⁴² In addition to changing the collection and measurement of broadband availability, the FCC has changed the data series that was consistently reported from December 2009 through December 2013. Rather than report the percentage of *households* living in particular types of areas (for example, census tracts) with 3 or more, 2, 1, and no alternative providers, the most recent Internet Access Services report instead presents the percentages of occupied *census blocks* (blocks with one or more housing unit) in each provider category. *See, e.g.*, FEDERAL COMMUNICATIONS COMMISSION, INTERNET ACCESS SERVICES: STATUS AS OF DECEMBER 31, 2014, at 10 fig.5 (Mar. 2016) [hereinafter MARCH 2016 INTERNET ACCESS REPORT], https://apps.fcc.gov/edocs_public/attachmatch/DOC-338630A1.pdf. That is, although the FCC previously weighted broadband availability by the potential demand (people or houses) in an area, its latest report presents an unweighted statistic for which a census block with one house counts as much as another census block with 1,000 houses. Because of this change, it is not meaningful to compare seemingly comparable statistics from the newer reports with earlier statistics and data in seemingly similar contemporaneous reports. For example, the result that in December 2014, 30 percent of census blocks had no providers offering broadband at 25 Mbps/3 Mbps according to the March 2016 Internet Access Report cannot be meaningfully compared to the statistic that according to the same underlying data, 10 percent

December 2014, June 2015, and December 2015⁴³ was to evaluate the recent growth in broadband availability and to assess how each of the two factors contributes to the differences shown for 2013. Table 3 shows the results of the latter analysis.

Table 3. Effect of Included Technologies and Geographic Detail on Fixed Broadband Availability Statistics: 10 Mbps Downstream/0.768 Mbps Upstream

Alternatives	December 2013	December 2014			
	Block without fixed wireless or satellite [1]	Block without fixed wireless or satellite [2]	Block without satellite [3]	Block with fixed wireless and satellite [4]	Tract with fixed wireless and satellite [5]
3 or more	9.8%	8.9%	22.8%	83.1%	98.5%
2	51.5%	60.4%	51.6%	13.9%	1.4%
1	30.3%	23.6%	20.0%	3.0%	0.1%
0	8.4%	7.1%	5.6%	0.0%	0.0%

Sources: Wheeler, *The Facts and Future of Broadband Competition*, *supra* note 9, at 2 (Column 1); FEDERAL COMMUNICATIONS COMMISSION, FIXED BROADBAND DEPLOYMENT DATA FROM FCC FORM 477 (Columns 2–5), <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>; U.S. CENSUS BUREAU, 2010 CENSUS BLOCK DATA (on file with author) (Columns 2–5).

Column 1 of Table 3 repeats the December 2013 data reported in Column 2 of Table 2. The data in Column 2 approximate the availability measure used by Chairman Wheeler. The availability pattern in the December 2014 data is quite close to the corresponding pattern in Chairman Wheeler's data, the main difference being an apparent growth from about 60 percent to about 70 percent in the proportion of households living in census blocks with two or more alternative broadband providers. Column 3 adds fixed wireless services, which were available to (but not included in) Chairman Wheeler's percentages. The primary effect of including fixed wireless is an increase in the percentage of households with three alternative providers from under 10 percent to about one-quarter. Column 4 includes satellite broadband alternatives, which were measured and included in December 2014 but not used by the FCC in the December 2013 results. Because satellite broadband at 10 Mbps downstream/0.768 Mbps upstream is available virtually everywhere,⁴⁴ 83 percent of households are in census blocks with at least

of Americans lived in census blocks without broadband at this speed level according to the 2016 Broadband Progress Report, 31 FCC Rcd. at 731.

⁴³ See FEDERAL COMMUNICATIONS COMMISSION, FIXED BROADBAND DEPLOYMENT DATA FROM FCC FORM 477, <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>.

⁴⁴ MARCH 2016 INTERNET ACCESS REPORT, *supra* note 42, at 10 fig.5 ("Satellite service providers report offering Internet access at bandwidths of at least 10 Mbps downstream and 1 Mbps upstream in 99.4% of developed census blocks [defined as having at least one housing unit].").

3 broadband alternatives.⁴⁵ Column 5 shows that 99 percent of households are in census tracts with at least 3 providers. The apparent growth between 2013 from two-thirds of households living in census tracts with three or more providers to virtually all households having at least three alternatives suggests that the availability of satellite alternatives at the formerly fastest measured speed increased substantially in one year.⁴⁶

Table 4 reports the corresponding comparisons for the 25 Mbps downstream/3 Mbps upstream speed category.

Table 4. Effect of Included Technologies and Geographic Detail on Fixed Broadband Availability Statistics: 25 Mbps Downstream/3 Mbps Upstream

Alternatives	December 2013	December 2014			
	Block without fixed wireless or satellite [1]	Block without fixed wireless or satellite [2]	Block without satellite [3]	Block with fixed wireless and satellite [4]	Tract with fixed wireless and satellite [5]
3 or more	2.4%	2.2%	6.5%	6.5%	26.8%
2	22.9%	28.6%	30.4%	30.4%	48.8%
1	55.3%	57.3%	51.9%	51.9%	22.4%
0	19.4%	11.9%	11.1%	11.1%	2.1%

Sources: Wheeler, The Facts and Future of Broadband Competition, *supra* note 9, at 2 (Column 1); FEDERAL COMMUNICATIONS COMMISSION, FIXED BROADBAND DEPLOYMENT DATA FROM FCC FORM 477 (Columns 2–5), <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>; U.S. CENSUS BUREAU, 2010 CENSUS BLOCK DATA (on file with author) (Columns 2–5).

Column 1 of Table 4 repeats Chairman Wheeler's December 2013 results reported in Column 3 of Table 2. The data in Column 2 approximate that same availability measure in December 2014. The availability pattern in the December 2014 data is close to the corresponding pattern in Chairman Wheeler's data, the main difference being an apparent growth from about 78 percent to about 86 percent in the proportion of households living in census blocks with one or two alternative broadband providers, with a corresponding reduction in the percentage of households without broadband

⁴⁵ This result reinforces the dissenting opinion's observation that "there are a fairly large number of competitors in most markets." United States Telecom Ass'n v. FCC, 825 F.3d 674, 750 (D.C. Cir. 2016) (Williams, J., dissenting). When satellite alternatives are included 83 percent of American households had access to *three or more* fixed providers giving speeds greater than 10 Mbps (compared to 74 percent having access to at least two fixed providers in 2013 when satellite was not included).

⁴⁶ When satellite alternatives are excluded, the proportions become 52.6 percent, 44.8 percent, 2.4 percent, and 0.2 percent for households in census tracts with at least 3 providers, 2 providers, 1 provider, and 0 providers, respectively. When both satellite and fixed wireless are excluded (as Chairman Wheeler's calculations do), the corresponding tract level percentages become 37.7 percent, 58.7 percent, 3.3 percent, and 0.3 percent.

alternatives. Column 3 adds fixed wireless services, which were available to (but not included in) Chairman Wheeler's percentages. The primary effect of including fixed wireless is an increase in the percentage of households with two or more alternative providers from about 31 percent to 37 percent, with a corresponding reduction in the proportion of households with no choice (zero or one alternative).⁴⁷ Column 4 includes satellite broadband alternatives, which were measured and included in December 2014 but not used by the FCC in the December 2013 results. Because there are apparently no satellite providers offering services at 25 Mbps downstream/3 Mbps upstream,⁴⁸ the availability pattern in Column 3 and Column 4 is identical. Finally, Column 5 shows that, in December 2014, about three-quarters of households lived in census tracts with two or more broadband providers and one-quarter lived in households with one or fewer providers.⁴⁹

IV. MARKET DEVELOPMENTS REVEALED IN RECENTLY AVAILABLE BROADBAND DEPLOYMENT DATA

As described earlier, Table 2 reports remarkably similar patterns of broadband availability in the data that Chairman Wheeler presented for the new 25 Mbps downstream/3 Mbps upstream standard as of December 2013 and the pattern measured four years earlier for the highest speed level measured in the Internet Access Services data. This outcome, in conjunction with the historical growth in competitive alternatives that ameliorated deficiencies that the FCC had observed in its generally pessimistic assessments of competition, invites the question: Did broadband availability (as measured by Chairman Wheeler) continue to match historical availability at the lower speed level? Table 5 provides the answer.

⁴⁷ The percentages of households with no providers (11.1 percent), one provider (51.9 percent), and more than one provider (37.0 percent) shown in the Columns 3 and 4 of Table 4 are (not surprisingly) close to the corresponding percentages of Americans of 10 percent, 51 percent, and 38 percent, respectively, which the FCC presented in the 2016 Broadband Progress Report based on the same December 2014 data. 2016 Broadband Progress Report, 31 FCC Rec. at 736 tbl.6.

⁴⁸ *Id.* at 721.

⁴⁹ When satellite alternatives are excluded, the proportions in the last column do not change. When both satellite and fixed wireless alternatives are excluded, the proportions become 20.5 percent, 53.0 percent, 24.3 percent, and 2.3 percent for households in census tracts with at least 3 providers, 2 providers, 1 provider, and 0 providers, respectively.

Table 5. Increase in Fixed Broadband Deployment in Two Years

Alternatives	10 Mbps downstream/1.5 Mbps upstream				25 Mbps downstream/3 Mbps upstream			
	Dec-09 [1]	Dec-10 [2]	Jun-11 [3]	Dec-11 [4]	Dec-13 [5]	Dec-14 [6]	Jun-15 [7]	Dec-15 [8]
3 or more	2%	3%	3%	3%	2.4%	2.2%	2.5%	2.6%
2	20%	25%	28%	29%	22.9%	28.6%	28.5%	28.6%
1	58%	57%	55%	55%	55.3%	57.3%	57.0%	57.0%
0	21%	15%	14%	13%	19.4%	11.9%	12.0%	11.8%

Sources: OCTOBER 2014 INTERNET ACCESS REPORT, *supra* Table 1, at 9 fig.5(a) (Column 1); FEDERAL COMMUNICATIONS COMMISSION, INTERNET ACCESS SERVICES: STATUS AS OF DECEMBER 31, 2010, at 8 fig.3(a) (Oct. 2011) (Column 2), https://apps.fcc.gov/edocs_public/attachmatch/DOC-310261A1.pdf; FEDERAL COMMUNICATIONS COMMISSION, INTERNET ACCESS SERVICES: STATUS AS OF JUNE 30, 2011, at 8 fig.3(a) (June 2012), https://apps.fcc.gov/edocs_public/attachmatch/DOC-314630A1.pdf; FEDERAL COMMUNICATIONS COMMISSION, INTERNET ACCESS SERVICES: STATUS AS OF DECEMBER 31, 2011, at 9 fig.5(a) (Feb. 2013) (Column 4), https://apps.fcc.gov/edocs_public/attachmatch/DOC-318810A1.pdf; Wheeler, The Facts and Future of Broadband Competition, *supra* note 9 (Column 5); FEDERAL COMMUNICATIONS COMMISSION, FIXED BROADBAND DEPLOYMENT DATA FROM FCC FORM 477 (Columns 3, 6–8), <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>; U.S. CENSUS BUREAU, 2010 CENSUS BLOCK DATA (on file with author) (Columns 3, 6–8).

Indeed, the trajectory of broadband availability at the new 25 Mbps downstream/3 Mbps upstream standard over its first two years closely tracks broadband development at the 10 Mbps downstream/1.5 Mbps upstream speed level four years earlier. In particular, over the first two years of those trajectories, the proportions of households with no alternatives decreased by about eight percentage points, with a similar increase in the percentage of households with two alternative providers.⁵⁰ This outcome reinforces the earlier observation that the history of broadband availability and customer demand suggests that, in the absence of unnecessary regulation that may dampen investment incentives, transitory shortfalls in competitive alternatives may be ameliorated in fairly short order as ISPs invest to make broadband services increasingly available and at greater speeds. Narrowly focusing on how many alternatives might now be available at the highest speeds would ignore the lesson that sufficient competitive alternatives at speeds that previously had been deemed adequate for broadband has heretofore been forthcoming.

Finally, the recently available data show that broadband services are advancing in additional ways. Between the end of 2013 and the end of 2015, the number of residential fixed broadband connections increased by 6.7 percent,⁵¹ representing a 4.8-percent increase in the proportion of households with fixed broadband alternatives.⁵² There was a substantial shift toward higher-speed service. In particular, the percentage of fixed broadband connections with downstream speeds of at least 25 Mbps increased from 32.5 percent at the end of 2013 to 53.5 percent by the end of 2015.⁵³ Finally, there was a 32.1-percent increase in the number of residential mobile broadband connections between 2013 and 2015, increasing mobile's share of all broadband connections from 64.5 percent to 69.1 percent.⁵⁴

⁵⁰ The 7.5-percentage-point reduction in the percentage of houses with no alternatives between December 2013 and December 2014 is very similar to the seven-percentage-point reduction in the percentage of the U.S. population without alternative providers shown in Table 7 of the FCC's 2016 Broadband Progress Report. 2016 Broadband Progress Report, 31 FCC Rcd. at 737 tbl.7.

⁵¹ OCTOBER 2014 INTERNET ACCESS REPORT, *supra* Table 1, at 31 tbl.11; FEDERAL COMMUNICATIONS COMMISSION, INTERNET ACCESS SERVICES: STATUS AS OF DECEMBER 31, 2015, at 26 fig. 29 (Nov. 2016) [hereinafter NOVEMBER 2016 INTERNET ACCESS REPORT], https://apps.fcc.gov/edocs_public/attachmatch/DOC-342358A1.pdf.

⁵² According to the U.S. Census, there was a 1.7-percent increase in the number of households between 2013 and 2015. Therefore, fixed broadband connections per household grew by $(1 + 0.067)/(1 + 0.017) - 1 = 4.9$ percent.

⁵³ OCTOBER 2014 INTERNET ACCESS REPORT, *supra* Table 1, at 30 tbl.10; NOVEMBER 2016 INTERNET ACCESS REPORT, *supra* note 51, at 25 fig.28. Because the FCC's Internet Access Services Reports report the number of connections by downstream and upstream speeds separately, the growth in connections at the new standard of 25 Mbps downstream/3 Mbps upstream is not available from these reports. The 2016 Broadband Progress Report reported that the proportion of the population adopting fixed broadband services at the new 25 Mbps downstream/3 Mbps upstream standard increased from 29 percent at the end of 2013 to 37 percent one year later. 2016 BROADBAND PROGRESS REPORT, 31 FCC Rcd. at 744 tbl.10.

⁵⁴ NOVEMBER 2016 INTERNET ACCESS REPORT, *supra* note 51, at 16 fig.8.

CONCLUSION

The Federal Communication Commission's 2015 Open Internet Order, which the U.S. Court of Appeals for the D.C. Circuit has upheld, imposed new regulations on broadband Internet service providers. An examination of data available at the time of that Order suggests that apparent insufficiencies in competitive alternatives at the fastest available speeds have been ameliorated in fairly short order by new offerings by multiple ISPs. Those findings imply that basing new restrictions on a putative dearth of competition for recently available service levels and transmission speeds is likely to be overtaken by technological and market developments, rendering such *ex ante* rules superfluous, at best, and counterproductive to competition and innovation, at worst. This article updates the previous analysis, based on data made available subsequent to the FCC's Order. Differences in seemingly comparable statistics available in the previous and newer data series are explored and the earlier conclusion on the pace of market developments is tested and corroborated.