



Testimony of
Matthew F. Wood
Policy Director, Free Press

Before the
Massachusetts Senate
Special Committee on Net Neutrality and Consumer Protection

Tuesday, February 6, 2018

Founded and Flourishing in Massachusetts, Free Press Works to Save the Open Internet

Senator Creem, Senator Tarr, and esteemed members of the Special Senate Committee, thank you for inviting me to testify today on the Federal Communications Commission's recent, and wrong-headed, decision to repeal its Net Neutrality rules.

My name is Matt Wood, and I am the Policy Director for Free Press, a nationwide nonpartisan nonprofit with 1.4 million members working to protect people's rights to connect and communicate. We have nearly 35,000 members in Massachusetts, and it's a special honor for me to be here. Though I work in our Washington, DC office, Free Press has a headquarters in Florence, and started just down the road from there in Northampton some fifteen years ago.

During much of our history, and over the course of a now decade-plus legal battle on this issue, Free Press has been a leader in advocating for Net Neutrality. Since you already had the wisdom to form this Special Committee on the topic, and have heard from so many expert witnesses this morning, I need not offer you a lengthy definition of "Net Neutrality." It guarantees that internet users can access what they want online – choosing what they see and what they say on the internet – without blocking, degradation, or unreasonable discrimination by internet access providers (or "ISPs") like Verizon, Comcast, and Charter.

My organization has written a lot on this topic, and I mean a lot, because we think internet users' fundamental freedoms are worth defending. In the 2017 FCC proceeding that, unfortunately, led to the repeal in question here today – to the agency's removal of strong Net Neutrality rules, and its abandonment of the proper legal framework for broadband internet access – Free Press submitted almost 500 pages of legal analysis and economic data on broadband investment and deployment.¹ And that's just 2017. Our full body of agency and court filings, reports, and legislative testimony on the topic surely numbers in the thousands of pages.

Rather than attempting to summarize all of that, I will focus on two essential truths countering the spurious legal claims and dubious data that led to the FCC's Net Neutrality repeal.

- **First**, neither the Net Neutrality rules nor the law on which they were based prior to the repeal were new and untested inventions of the Obama administration. Net Neutrality is a time-honored yet still vital iteration of nondiscrimination law for communications networks, including broadband internet access networks.
- **Second**, ISPs claim nonetheless that these rules are bad for their business, asserting that the legal framework the FCC just discarded dampens broadband investment and deployment. ISPs' claims on this score are simply not true, as these companies' own data and statements to investors prove. What's more, as Massachusetts-specific deployment data shows, the FCC's 2015 restoration of the now-repealed rules did not materially change broadband deployment in urban or rural areas in the Commonwealth.

¹ See, e.g., Comments of Free Press, WC Docket No. 17-108 (filed July 17, 2017), https://www.freepress.net/sites/default/files/resources/free_press_title_II_comments.pdf ("Free Press Comments"); Reply Comments of Free Press, WC Docket No. 17-108 (filed Aug. 30, 2017), https://www.freepress.net/sites/default/files/resources/free_press_reply_comments_open_internet_proceeding.pdf.

Reactions to the FCC's Unwise and Unpopular Net Neutrality Repeal

Before discussing those two principles, it may be useful to summarize nationwide and state-specific responses to the FCC's unwise and unpopular Net Neutrality repeal. On December 14, 2017, the FCC voted 3 to 2 to repeal rules set in place in 2015. The repeal abdicates the agency's congressional mandate to prevent unreasonable ISP practices.

Make no mistake: that vote cleared the way for blocking, throttling and discrimination by the nation's largest phone and cable companies. Some of these companies circulated on Beacon Hill in advance of this hearing a sheet purporting to describe what it labeled Net Neutrality "myths" and "facts." Sadly, these talking points got it all backwards. Free Press's response (attached here as Exhibit A) explains away the claims in this ISP "alternative facts" sheet.

The FCC's 2017 repeal did not restore a "light-touch" regulatory framework for internet access: it repealed all rules preventing ISP discrimination, and tossed aside the only legal foundation upheld in court for such rules. The prior FCC restored that legal framework in 2015, ironically enough after Verizon appealed and overturned an earlier version of these rules because they were grounded on the weaker statutory authority that ISPs now say they would prefer.

The FCC's 2017 reversals leave internet users without sufficient protections, not only against Net Neutrality violations like blocking content or slowing it down, but also against privacy violations when ISPs make unauthorized and unpermitted use of customers' personal data. The FCC's recent repeal also purported to preempt states' attempts to fill this vacuum and restore these rights.

The FCC's 2017 abdication puts internet users at risk. It jeopardizes the ability of Massachusetts residents, businesses, educational institutions, elected officials, and other political speakers to participate in the civic and economic life of the country. Net Neutrality is important not only for small businesses and commerce, but also for free speech and democracy. These protections are particularly important for communities of color and other marginalized groups, as they let people make their voices heard on the internet and bypass traditional media gatekeepers.

The fight to restore these protections is gathering momentum, with tens of millions of people organizing to reinstate the rules. We appreciate Senator Markey's and Senator Warren's continued leadership at the federal level, especially with respect to the current effort led in the U.S. Senate by Senator Markey to pass a congressional resolution of disapproval of the FCC's repeal order under what is known as the Congressional Review Act.

We are also thankful for Attorney General Healey's decision to join twenty-one other attorneys general from New York to California, Minnesota to Mississippi, and everywhere in between, in a federal appeal of the FCC's repeal. Free Press will join the Open Technology Institute and several other groups and companies in bringing similar challenges.

States around the country have considered their own responses to the loss of these rights too – just as they did last year, when Congress overturned strong FCC privacy protections for broadband users. Some twenty states and counting have introduced legislation or adopted executive orders in response to the FCC's bad Net Neutrality decision in December.

There is good explanation for all of this energy: Net Neutrality rules are immensely popular. Poll after poll shows strong support for the rules, and opposition to the FCC's repeal decision, with consensus across party lines. This polling even shows strong support for the legal foundation and conceptual framework underpinning those now-repealed rules.

For instance, one poll released in July 2017, conducted by Freedman Consulting and Civis Analytics, shows that 88 percent of respondents in that survey agreed with the statement "when I buy internet service, I am paying to transmit information between my computer and the websites I visit, free from interference."² A second poll, also released in July 2017 and conducted by Republican consulting firm IMGE, found that Trump voters believe by more than a 2 to 1 margin that "Internet should be treated like any other utility such as gas or electric service."³

These surveys also demonstrated tremendous support across the political spectrum for the rules that the FCC subsequently repealed. The IMGE poll told respondents that "Companies like Comcast, AT&T, Charter/Time Warner Cable, and Verizon provide home internet access. Today those internet service providers are prohibited from slowing or blocking websites or video services like Netflix." A full 75 percent of all voters agreed that these rules were necessary, including 72 percent of Republican voters and 75 percent of Trump voters. The Freedman Poll found the same level of support for strong rules, specifically finding that "A strong majority (77 percent) of Americans support keeping the existing net neutrality rules in place," as did 73 percent of Republicans.

Those surveys were conducted prior to the FCC's initial comment deadline in July 2017. Another survey taken just days before the December 2017 vote, and conducted by the nonpartisan University of Maryland's Program for Public Consultation and Voice of the People found that 83 percent of Americans did not approve of the FCC's repeal.⁴ The partisan split in this more recent poll was slightly larger, but the support level for retaining the rules (and thus opposing what this FCC ultimately voted to do) was even higher than it had been in the summer. Making up the 83 percent total of survey respondents supporting the rules were 88 percent of Democrats, 86 percent of Independents, and 75 percent of Republicans.

With polling numbers like that, it is easy to understand the enthusiasm for reinstating the rules at the federal level and for taking action at the state and local level too. My organization would prefer to reinstate strong protections throughout the nation at the federal level. We are working diligently, in coalition with our allies and with millions of activists, to do just that – using all of the appellate litigation and legislative methods at our disposal. Yet we are glad of the energy and initiative that state and municipal leaders alike have shown in responding to constituent outcry over these FCC repeals, in offerings such as Senator Creem's bill S.2062 on broadband privacy, and Senator L'Italien's recent bill to prohibit ISP blocking, throttling, and prioritization schemes in Massachusetts.

² "New Poll: Americans Overwhelmingly Support Existing Net Neutrality Rules, Affordable Access, and Competition Among ISPs," at 2 (July 10, 2017), http://tfreedmanconsulting.com.routing.wpmanagedhost.com/wp-content/uploads/2017/07/Tech-Policy-Poll-Summary_Final_20170710.pdf.

³ "Open Internet Survey: Key Findings," at 3 (July 13, 2017), <http://www.incompas.org/files/IMGEInsights-Presentations-KeyFindings-1c.pdf>.

⁴ Program for Public Consultation, Net Neutrality Survey Questionnaire (Dec. 6 – Dec. 8, 2017), http://www.publicconsultation.org/wp-content/uploads/2017/12/Net_Neutrality_Quaire_121217.pdf.

Net Neutrality Implements Basic and Vital Nondiscrimination Law for Internet Access

Net Neutrality's foundation in nondiscrimination law answers contentions like those made in the ISP "alternative facts" sheet, which falsely suggests the FCC's 2017 repeal merely rescinded rules "only in effect for two years" and unnecessary to protect the open internet in any event. To the contrary, the Net Neutrality rules wrongly struck down by the FCC are based on longstanding nondiscrimination law for communications services; and they are in need of preservation, no matter whether ISPs violate them or promise not to.

Net Neutrality is a rather well-known term at this point in time – perhaps much to the surprise of those who previously criticized the concept as too weedy or obscure for mass appeal, only to see people marching in the streets for it today. But in the end, Net Neutrality is a term of art for rules implementing federal law against unreasonable discrimination by the carriers that operate essential broadband telecommunications networks.

Even if Net Neutrality were not immensely popular – and polls show that it is – it would be worth preserving. People's fundamental communications rights, as granted to them by Congress, do not and must not change simply because our communications technologies evolve and improve. Press and pundits (and ISPs too, conveniently for them) sometimes describe Net Neutrality as a clash between the likes of Comcast and Verizon, Google and Facebook. The impact of communications policy on the fortunes of these hundred-billion-dollar companies is no doubt real (though often exaggerated, as I describe below). Yet the rights enshrined in federal communications law do not exist primarily to protect either ISPs or companies that transmit information to their customers over internet access lines. These rights protect instead broadband internet access users themselves, in their freedom to access the content of their choosing once they have paid for the transmission service that ISPs provide.

Even if ISPs did not routinely interfere with these choices – and history shows that they do, as the Open Technology Institute and others will testify here today⁵ – these rights would remain essential. ISPs over time have blocked access to voice and video communications applications like FaceTime and Skype, blocked access to mobile payment applications that competed with their own applications of this sort, and slowed or blocked access to video content that competed with ISPs' legacy cable television offerings. Yet even were there no such evidence of abuse, a right remains a right. That's true whether or not other actors are presently violating it, threatening to do so in the future (with ISPs' prioritization plans), or conversely promising not to violate it even after the FCC's rules protecting such rights have been repealed.

The law that establishes these rights, as well as the FCC's mandate to protect them, is the Communications Act. It divides communications services into different categories or classifications, including "information services" such as websites, apps or other kinds of content accessed online; and "telecommunications services," which transmit that information to users. Telecom services are governed by Title II of the Communications Act, which applies to telecommunications carriers (also sometimes called "common carriers" as well).

⁵ See, e.g., Tim Karr, "Net Neutrality Violations: A Brief History," Apr. 25, 2017, <https://www.freepress.net/blog/2017/04/25/net-neutrality-violations-brief-history>.

The nondiscrimination principles that apply to these kinds of carriers has evolved over time, but they have been with us in the United States as long as we've had communications networks. ISPs may appear before you and, with a large degree of self-contradiction and hypocrisy, simultaneously criticize the strong Net Neutrality rules just repealed by the FCC as both old-fashioned and untested. The reality is just the opposite: the 2015 rules repealed by the FCC in December are well-tested. They are based on the same foundational nondiscrimination principles that have long governed telephone networks, competitive wireless voice services, and business-grade broadband offerings, as well as residential broadband internet access offered using various technology types at various times over the past two decades.

Yet these principles are also timeless. There is nothing old-fashioned about nondiscrimination law, and it remains essential for broadband internet access as it does is for other telecommunications offerings. Just as the phone company can't tell its customers whom to talk to or what to say on the telephone, broadband internet access providers shouldn't be able to dictate or influence what their customers see or say online. And contrary to the misperceptions that ISPs spread on this topic, such nondiscrimination rules are still quite necessary in non-monopoly settings.

Putting aside for the moment the fact that many broadband subscribers still do face a situation in which they have just one provider of high-speed service available to them, nondiscrimination rules under the Title II framework have remained in place for wireless voice offerings since the inception of cellular service. Even as Congress and the FCC deregulated pricing for wireless voice in the early 1990s, and refused to adopt rate regulations in that relatively competitive market, these lawmakers still rightly understood the need for regulations preserving nondiscriminatory access on wireless telecom networks in competitive markets.

Put even more simply, a modicum of competition does not completely obviate the need for Net Neutrality or other kinds of nondiscrimination rules. It would seem odd indeed to condone blocking of certain phone calls and phone numbers by Verizon Wireless, simply because customers thus blocked might have the option to switch to AT&T, Sprint, or T-Mobile. This is simply not how communications networks are meant to work, and people understand that.

Until the FCC's drastic action last month, the agency seemed to understand it too. Few questioned the wisdom of FCC rules safeguarding these nondiscrimination rights, and the FCC maintained principles and rules prohibiting ISPs from blocking lawful content or otherwise interfering with their customers' content and application choices. The only question, if any, concerned only the proper legal foundation for such rules – and admittedly, that legal foundation did shift over time because the FCC attempted to shift it.

Beginning in the George W. Bush administration between 2002 and 2005, in a misguided attempt to more or less completely deregulate broadband, the FCC started to tinker with its service classifications by deciding that broadband was an information service and not a telecommunications service. In other words, the FCC essentially lumped together (in the same class for regulatory purposes) a website and the wire over which people access that site. Yet even having done that, the Bush FCC and the first FCC Chairman in the Obama administration still tried to retain Net Neutrality rules.

That approach did not stand up in court. As Comcast and Verizon know all too well, the FCC twice tried to argue that it could prevent blocking, throttling, prioritization, and discrimination by broadband providers without treating those companies as telecom carriers under Title II. It lost in court both times, first to Comcast in 2010 and then to Verizon in 2014. Verizon argued in its successful 2014 appeal not only that the legal authority articulated by the FCC for those earlier rules was suspect. Verizon also suggested that “broadband providers possess ‘editorial discretion.’ Just as a newspaper is entitled to decide which content to publish and where, broadband providers may feature some content over others.”⁶

That kind of thinking from Verizon is a danger to the rights enshrined in the Communications Act, and likely shows where ISPs’ true intentions lie more than the marketing materials and talking points they circulate to legislators in the aftermath of this unpopular repeal. That kind of claim from ISPs – that they want the right to edit internet content and online speech, not just transmit it for us – also demonstrates the continuing vitality and need for rights that prevent any unreasonable ISP attempts to do just that.

The question about the legal foundation for rules safeguarding those rights has taken some time to resolve, it is true; but there is a right answer under current law. Prior to the unfounded and ideologically motivated repeal order issued in December, the FCC had finally settled on a very certain and sold approach. On the third time though the rulemaking process in 2015, with President Obama’s second FCC chairman Tom Wheeler in charge, the Commission finally got it right. Thanks to millions of people calling on it to do so, the FCC put rules into place that prevented blocking and discrimination by ISPs, and it put those rules on solid legal footing by restoring the Title II legal classification for broadband.

This time, the FCC’s decision was upheld in court, as it defended the rules and legal framework with help from Free Press, OTI, the ACLU and dozens of intervenors and amici. That decision has proven immensely popular and successful, but these nondiscrimination rights would be essential even if they were unpopular or untested by ISPs’ business plans.

The Net Neutrality Rules and the Title II Legal Framework in Which They Are Grounded Did Not Dampen Broadband Investment and Deployment, Nationally or in Massachusetts

In the face of all those facts – that Net Neutrality rules enshrine essential communications nondiscrimination rights, that they are both necessary and popular, and that the prior FCC had at last set them back on solid legal footing in Title II of the Communications Act before this repeal – the ISPs nonetheless suggest that either the rules themselves or the Title II legal framework for them decreased broadband deployment and investment.

This claim that Title II’s restoration delayed or dampened broadband rollout simply is not true. The ISPs’ own numbers, discussed in greater detail below, prove the ISPs’ lobbying arguments wrong beyond a shadow of a doubt. But before turning to those actual marketplace performance metrics during the period when Title II was back in place (between the Net Neutrality rules’ 2015 restoration and their 2017 repeal), it is important to note that recognizing ISPs’ real progress during that time is not the same thing as arguing that their job is done.

⁶ *Verizon v. FCC*, 740 F.3d 623 (2014), Joint Brief for Verizon and MetroPCS at 43 (filed July 2, 2012).

We know that broadband deployment is not satisfactory in every area in the nation, nor in every part of Massachusetts. We also know that even when and where fast broadband networks are deployed and fully available, not every person can afford to subscribe to them. Free Press understands this in its professional capacity, working as we do to guard the Lifeline low-income broadband adoption subsidy program from attacks by this same FCC, and otherwise advocating for policies that promote universal deployment of robust and affordable services.

We also know it in a somewhat more personal capacity too. Kimberly Longey – one of Free Press’s co-founders and still today our Chief Operating Officer – has been organizing in her home town of Plainfield for almost thirteen years now to overcome the digital divide and deployment gaps facing residents of the Hilltowns and other rural areas of Massachusetts. The story of the remarkable progress that these residents made will be well known to many in this State House. People banded together and eventually formed their own municipal cooperatives and region-wide initiatives to finance and build better broadband networks. Yet even with all of their hard work, the job is not yet done. Well over a decade after they began coming together to solve for the dearth of quality internet access options available to them, some of these communities are just now breaking ground or lighting their new networks.

Ms. Longey has relayed that story to multiple gubernatorial administrations, and no doubt to several dozen state senators and representatives elected to serve these communities. She could tell it to you again now, far better than I ever could. But for the purposes of today’s testimony, there are two important aspects of this history that we must note.

First, the economic and topographic challenges of building essential network infrastructure through rural, rugged, and relatively sparsely populated terrain did not spring into existence with the FCC’s February 2015 vote to place Net Neutrality on a strong legal foundation in Title II of the Communications Act. Those challenges were present even before 2005, when the residents of Plainfield and some two dozen other towns first took steps toward solving that problem for themselves. That’s why it’s frankly rather offensive to read, in the ISP “alternative facts” sheet and other places, that repealing the rules and removing the Title II framework will somehow solve those challenges and encourage broadband deployment where it has always lagged.

Second, the fact that these are not new challenges – and that incumbent ISPs have often failed to meet them in rural and remote areas when their bottom line considerations did not dictate deployment to these locales – is reinforced by Verizon’s deployment decisions evidenced and executed long before the 2015 Net Neutrality rules came into effect. The fact of the matter is that Verizon, the largest legacy telephone company ISP in this state, had by that time long halted its broadband expansions in Massachusetts. It announced its decision to end its major “FiOS” fiber optic deployments in early 2010,⁷ while letting its older DSL networks in many areas languish as it focused on its wireless business.

⁷ See, e.g., Peter Svensson, “Verizon winds down expensive FiOS expansion,” Associated Press, Mar. 26, 2010, http://usatoday30.usatoday.com/money/industries/telecom/2010-03-26-verizon-fios_N.htm.

Despite the longstanding and continuing nature of these challenges, and incumbent ISPs' spotty track record in meeting them, the companies' own deployment data and investment data show that Title II's reinstatement and the 2015 Net Neutrality rules' adoption did not slow down deployment, speed upgrades, or overall investment by ISPs. The data that these companies report to the FCC – and also to their own investors, to Wall Street analysts, and to the U.S. Securities and Exchange Commission – all show that deployment continued apace during the time that Title II was in place.

To reach this conclusion, Free Press analyzed FCC Form 477 deployment data to answer what should be the central question on this topic for bodies like this Special Committee: how did the Massachusetts broadband market's capacity and capability change after the FCC's 2015 Title II reclassification and adoption of Net Neutrality protections?

This self-reported carrier data is a rich source of information on broadband deployment. Every ISP submits to the FCC, on a semi-annual basis, information on the types of technology it offers and the transmission speeds available for every Census Block in which that ISP offers broadband. Free Press analyzed this data for two periods: deployments as of December 31, 2014, just prior to the FCC's adoption of the now-repealed 2015 Net Neutrality order; and deployments as of December 31, 2016, nearly two years after that order issued.

Our analysis of this FCC broadband deployment data shows that, as did the national market, Massachusetts's broadband market continued to thrive after Title II reclassification.

Legacy cable operator ISPs in the state (such as Comcast and Charter) had largely deployed their next-generation broadband standard (called DOCSIS 3.0) prior to the FCC's good 2015 Net Neutrality decision and the rulemaking that led to it. Yet these cable ISPs dramatically increased speeds after the restoration of Title II.

Because of the Verizon decision mentioned above, to essentially halt new FiOS deployments as early as 2010, we did not observe as much new broadband deployment in Massachusetts as the FCC Form 477 data shows in some other states. Put another way, much of the improvement in broadband speeds and capacity in Massachusetts in 2015 and 2016 came from cable ISPs increasing their speeds.

This speed increase is the precise outcome predicted by the FCC's 2015 order adopting strong Net Neutrality rules and restoring the strong legal framework. With the settling of the legal issues surrounding Net Neutrality, ISPs understood that their path to continued prosperity could not be discriminatory schemes that might create profits from the creation of artificial scarcity. With paid prioritization, blocking and throttling off the table, ISPs realized their profit growth would come from selling internet users the capacities they demand, with much of that demand created by the exponential growth in online content and applications that spurred continued broadband deployment and buildout.

Yet the fact that Massachusetts is a relatively densely populated state, with a higher proportion of urban areas than many other states in the nation, helps to explain why new broadband construction was less in Massachusetts than in some other states during this time.

As highlights of our analysis of this FCC broadband deployment data shows:

- Broadband was widely available in Massachusetts prior to the FCC’s restoration of Title II and its adoption of Net Neutrality rules, both in rural and urban areas.
 - Availability is nearly universal even at higher speeds. 98 percent of the state’s inhabitants are served by a wired ISP offering 50 megabits per second (“Mbps”) service, and 95 percent are served by a 100 Mbps carrier.
 - Even 98 percent of persons residing in rural Massachusetts areas live in a location served by one or more wired broadband carrier.
- Availability in rural areas is relatively high, even at higher speeds.
 - 94 percent of the state’s rural inhabitants are served by a wired ISP offering 10 Mbps service, 90 percent are served by a 50 Mbps carrier, and 85 percent are served by a 100 Mbps carrier.
 - Yet as they do elsewhere in the U.S., Massachusetts residents largely face a cable-telephone company duopoly home internet access market.
- As a result, people in rural Massachusetts have some ISP choices at lower speeds, but that choice declines at higher speeds due to Verizon’s decision long ago to not upgrade its rural DSL systems.
 - 82 percent of rural Massachusetts residents have 2 or more wired ISPs.
 - 74 percent have 2 or more wired ISPs offering 3 Mbps broadband service.
 - 57 percent have 2 or more wired ISPs offering 10 Mbps broadband service.
 - 25 percent have 2 or more wired ISPs offering 25 Mbps broadband service.
 - Just 24 percent have 2 or more wired ISPs offering 100 Mbps broadband.

Both urban and rural Massachusetts Internet users saw substantial increases in the speeds and capacities of the services available to them after the FCC’s Net Neutrality order.

- The average maximum available wired downstream speed in rural Massachusetts Census Blocks increased by 90 percent, from 102 Mbps to 193 Mbps.
- The average maximum available wired downstream speed in urban Massachusetts Census Blocks increased by 188 percent, from 139 Mbps to 400 Mbps.
- Overall, the average maximum available wired downstream speed for all Massachusetts Census Blocks with wired service increased by 184 percent, from 139 Mbps to 396 Mbps.

Massachusetts’s top home broadband ISPs (measured by population coverage) are Verizon (96 percent), Comcast (84 percent), cable over-builder RCN (13 percent), and Charter (13 percent).

- Comcast and Charter’s systems were 100 percent DOCSIS 3.0 at the end of 2014. RCNs systems were 97 percent DOCSIS 3.0 at the end of 2014 and nearly 100 percent at the end of 2016.
- As mentioned above, Verizon largely froze its wireline deployments nearly 8 years ago. There were however some small improvements during the two years following Title II’s restoration in 2015.
 - At the end of 2014, 76 percent of persons living in Verizon’s Massachusetts service territory were able to purchase 10 Mbps-level service from the company. By the end of 2016 this had increased to 80 percent.
 - At the end of 2014, no one living in Verizon’s Massachusetts service territory was able to purchase 300 Mbps-level service from the company. By the end of 2016 this had increased to 28 percent.

In sum, the Massachusetts-specific data shows a healthy level of capacity upgrades in Massachusetts during the period following the FCC’s adoption of the now-repealed 2015 rules and legal framework. The data we compiled, in figures illustrating the results excerpted above, appear in Exhibit B to this testimony.

There is no evidence there of any change to the *status quo* buildout trajectory. This strongly suggests that the central premise of the FCC’s repeal was completely wrong. There is simply no evidence that restoration of Title II, and codification of basic Net Neutrality duties, negatively impacted Massachusetts’s (or the nation’s) broadband internet access market.

This picture of broadband deployment and investment in Massachusetts contradicts the ISPs’ story here today, and dispels the supposed “cloud” that ISPs strain to conjure from the 2015 restoration of the Title II legal framework and strong Net Neutrality rules.

In our comments in the FCC’s 2017 rulemaking docket, we documented extensively how the internet access and online content markets continued to thrive after that 2015 FCC’s decision. Broadband access companies large and small increased their capital investments, and uniformly told their investors that Title II reclassification had not impacted their deployment plans. And with the confidence that ISPs would not be allowed to implement discriminatory shakedown schemes, online content and service providers increased their investments too.

In our reports and filings, we also cautioned that what matters most is not the raw dollar amount ISPs invest each year in capital equipment. What matters most is deployment of broadband capacity, and progress in improving on what little competition exists in this highly concentrated industry. The facts and figures recited above show that in Massachusetts, as in the rest of the United States, there was progress in those important areas.

Policymakers and internet users shouldn’t dwell on whether or not an ISP spent more in a given year than it did the prior year; they should care if that ISP and its competitors continued to rollout better quality and more competitive services.

Yet with those caveats in mind, we have also shown in our thoroughly documented and researched comments and reports that aggregate investment by the broadband industry increased during this time period too – again, contrary to the claims made by some of the ISPs’ lobbyists and by the FCC commissioners that voted for this repeal.

Free Press’s compilation of broadband industry investment totals, as publicly traded broadband internet access service providers themselves reported this data for the two years preceding the FCC’s February 2015 vote and the two years following it, conclusively demonstrates that the investment total for all of these publicly traded ISPs together increased by 5.3 percent for the two-year period following the adoption of the 2015 Net Neutrality rules.⁸ (See broadband industry investment totals, tabulating publicly traded companies’ reported capital expenditures, attached as Exhibit C to this testimony.)

Those who still insist on incorrectly claiming some harm to broadband investment from Title II focus on supposed decreases in this aggregate figure, but the manipulated totals they cite stem from vague and unspecified tabulations for the broadband industry as a whole. These commenters also distort the amount invested by certain providers while ignoring freely available public statements explaining individual firms’ decisions.⁹

Even were these manipulated aggregate figures correct (and they are not), a myopic focus on raw dollars spent ignores the Commission’s statutory mandate to promote deployment – as well as the overwhelming evidence that deployment continued (and even improved) in the years following the order.

The blunt measure of an aggregate total is easily swayed by changes in either direction at any large firm, and it obscures changes (if any) in investment decisions, cycles, and strategies by all of the individual firms that make up the aggregate total. Looking at those individual results, the majority of publicly traded broadband providers (in their own financial disclosures) reported investment increases after the vote.¹⁰ This fact alone does much to disprove the fanciful notion that Title II is a systemic threat or source of harm to investment across the entire industry.

Even if we change the timeframe, dropping 2013 from the analysis and comparing only 2014 (the year prior to the 2015 vote) with the two years that followed it, we see that twice as many individual ISPs increased their capital spending as the relative few that decreased it. The figure attached to this testimony as Exhibit D illustrates this fact again, showing that individual ISPs increased their capital spending by as much as 56 percent in one case, and by double digits in several other cases (including Comcast’s), with an average company capital expenditure growth rate of 6.8 percent. To name just a few specific examples, Comcast’s total capital spending for the two years following the 2015 vote increased by 26 percent, Verizon’s by 3 percent, and Charter’s by 15 percent.

⁸ See Free Press Comments at 129–130 & Fig. 24.

⁹ See *id.* at 145–151; see also *id.* at 151 (quoting AT&T’s explanation that the company’s costs were falling due to technological improvements and the efficiencies therefrom, not due to any regulatory concerns, as evidenced by the fact that AT&T was then “going to deploy more fiber next year than we did this year, but the capital requirements are going down”).

¹⁰ See Exhibit C.

As Free Press has copiously documented,¹¹ again relying on broadband providers' own words, there is no reason to think the relatively few individual ISPs reporting less capital spending decreased it due to Title II. In fact, as AT&T itself has made clear in earlier filings, largely explaining long in advance its own temporary decline following the 2015 vote:

[T]here is no reason to expect capital expenditures to increase by the same amount year after year. Capital expenditures tend to be “lumpy.” Providers make significant expenditures to upgrade and expand their networks in one year (*e.g.*, perhaps because a new generation of technology has just been introduced), and then focus the next year on signing up customers and integrating those new facilities into their existing networks, and then make additional capital expenditures later, and so on. Minor variations from year to year thus should not be surprising[.]¹²

Broadband providers have spoken at length since the 2015 vote and reclassification decision about how they are leveraging technological advances to deploy higher capacities at a lower capital cost than was required in prior upgrade cycles. In the few instances when analysts asked these executives how Title II (or its potential repeal) impacted their company's investments, these executives did not say that Title II had a concrete impact on their own numbers, nor quantify how its repeal would impact their spending.

Conducting on a national scale the same type of analysis we outlined above for Massachusetts deployment results, we see in the FCC's Form 477 deployment data a remarkable level of new, higher capacity broadband deployments since the vote, across a range of different service territories and different technological platforms.

While we continue to stress that this does not mean broadband deployment is satisfactory in every area, nor certainly that every person in America has access to affordable service, these kinds of deployment nationwide metrics and milestones in the FCC's own data show yet one more time that the restoration of common sense Net Neutrality rules did not dampen deployment:

- The number of Census Blocks with two or more ISPs offering service with downstream speeds at or above 25 Mbps increased 42 percent following the 2015 Net Neutrality vote.
- At the end of 2014, approximately one-third of the nation's population had access to two or more ISPs offering 25 Mbps or higher-level services. By mid-2016, more than half of the population could purchase broadband at this speed threshold from two or more ISPs.
- At the end of 2014, only 10.5 percent of the population had access to one or more wired ISPs offering services at 300 Mbps downstream or more. By mid-2016, this had more than doubled to nearly 23 percent of the population.
- In Census Blocks where cable DOCSIS 3.0 services are available, the average available speed of this technology increased by nearly 50 percent, from 118 Mbps to 173 Mbps. In blocks with FTTH, the average available speed of this technology increased from 251 Mbps to 380 Mbps (51 percent). And average available VDSL downstream speeds more than doubled, from 24 Mbps to 52 Mbps.

¹¹ See, *e.g.*, Free Press Comments at 209–281.

¹² Comments of AT&T, WT Docket No. 10-133, at 34 (filed July 30, 2010); *see also id.* at 39.

Exhibit A

Verizon's Net Neutrality "Facts" Are Nothing But Fiction The FCC's Repeal Leaves Internet Users Unprotected From ISP Discrimination

Verizon responded to internet users' concerns about the loss of FCC Net Neutrality rules by ignoring the interests of its customers and dressing up its false rhetoric as "facts." Here's the truth you need to know.

Verizon's Alternative "Facts": The FCC merely repealed a "small number of rules," based on "outdated" Title II legal authority, leaving the Federal Trade Commission to protect Net Neutrality.

The Truth: The "small number of rules" this FCC eliminated were in fact the *only* Net Neutrality rules in place, and the *only* Net Neutrality rules that have been upheld in court. And they were working.

By abandoning Title II, the FCC abandoned its legal authority to protect the open internet. Title II is neither an untested legal theory that's only two years old, nor an "outdated" framework from a bygone era. The FCC used Title II authority to regulate residential broadband provided by Verizon and all telephone companies between 1996 and 2005, [when investment hit a record peak](#).

Title II works for Net Neutrality. It's always applied to mobile voice and rural DSL too, as well as business-grade broadband (so successfully that AT&T called it an "[unqualified regulatory success story](#)"). The law provides a light-touch framework for competitive telecom sectors, preserving nondiscrimination rights like those in the repealed rules, without the supposed utility law burdens Verizon vaguely mentions.

Verizon's claims that the FTC can fill the void and protect internet users' rights is not true. The best the FTC might do is prosecute ISP violations of their own terms of service -- *if* customers are able to prove Net Neutrality violations after the fact, which is notoriously difficult. But if ISPs removed Net Neutrality from their terms of service and simply told customers they'd be blocked, the FTC would be toothless.

Verizon's Alternative "Facts": For 20 years prior to the Title II's restoration in 2015, the internet was open and protected without Title II.

The Truth: The FCC applied Title II to Verizon's residential broadband internet access services between 1996 (when Congress overhauled Title II) and 2005. The replacement rules crafted in 2005 didn't work.

There were ten years when Verizon's residential broadband access (and most other ISP broadband lines) were not subject to Title II, after 2005 and prior to Title II's restoration in 2015. At that time the FCC wrongly classified most broadband as Title I information services, putting broadband transmission into the same legal category as websites, applications, and content. During that time, ISPs did indeed begin to stray from Net Neutrality principles that had always governed the internet. [For example, Verizon blocked Google Wallet](#) to protect a competing payment app that Verizon and other ISPs had helped to develop. Verizon also blocked tethering apps that allowed users to circumvent the company's \$20 tethering fee.

The only grain of truth in Verizon's claims today is that the FCC tried during that time period to ground Net Neutrality rules on Title I. But those rules were knocked down in court twice. Verizon is well aware of this history, [because Verizon brought and won the 2014](#) case holding once and for all that real Net Neutrality rules could not be enforced under Title I. That's why Verizon's arguments about there being no need for Title II's solid authority are not just wrong on the law, they're disingenuous too.

Verizon's Alternative "Facts": The FCC's decision to scrap Net Neutrality rules doesn't leave consumers without protection, it merely restores light-touch oversight by both FCC and FTC.

The Truth: Title I can't prevent abuses by ISPs. The 2014 *Verizon* case said Title I rules would have to allow discrimination. That's why internet users demanded real Net Neutrality rules based on Title II.

Verizon's Alternative "Facts": ISPs won't block and throttle content or create internet fast-lanes because anti-competitive behavior is illegal and consumer backlash will prevent it.

The Truth: Verizon suggests that only some blocking, throttling, or fast-lanes are anti-competitive, but degrading users' access to websites and apps is always harmful. This claim is chilling from Verizon, the company that told courts it had a right to exercise "[editorial discretion](#)" [over the internet](#) and to [seek tolls from content providers](#). Cable television tiering is not illegal. But letting ISPs act like cable companies -- deciding what to carry online and who can see it -- would be a radical departure from how the internet works. "Consumer backlash" is not enough, because people have few or no other broadband options.

Verizon's Alternative "Facts": Eliminating Title II rules will encourage competition, lower prices, or spur deployment to rural and underserved areas.

The Truth: Without Title II, the FCC will be powerless to stop ISPs' exploitative business practices -- including even [fraudulent billing practices](#). And [ISPs are already hiking prices this year](#), much as they do every year, [even after the FCC's repeal of Net Neutrality and Title II](#).

Suggesting that protections against discrimination and price-gouging make deployment more expensive is not only immoral, it's also not true. Eliminating these protections will not spur broadband buildout in rural areas or low-income communities. This is the most tired lie in Verizon's playbook.

Title II and strong Net Neutrality rules did not harm broadband investment or deployment in the least. During [the two years with Title II back in place](#), [ISPs deployed next-generation networks](#) at a faster pace. Verizon also increased its investment, rolling out gigabit services at half the price it previously charged for slower speeds, and [buying fiber and spectrum to prepare for the 5G era](#). Rising demand for broadband meant ISPs were thriving and growing their networks, undaunted by Title II. Verizon falsely suggests it can only offer service in poor and rural areas, where it has long refused to upgrade, in exchange for regulatory goodies that have nothing to do with the economics of serving such areas.

Verizon's Alternative "Facts": Consumer privacy, deployment, and universal service are protected.

The Truth: In addition to protecting Net Neutrality, the prior FCC used Title II to fulfill other mandates too. It expanded the Lifeline program to subsidize internet access for low-income families and it enacted [strong broadband privacy rules](#). Congress struck down those immensely popular privacy rules last year, and Lifeline's fate is now uncertain too as the FCC continues its assault on poor folks and people of color. Abandoning Title II means abandoning the FCC's mandate and its best authority for these goals.

Verizon's Alternative "Facts": The FCC's decision to preempt state authority on Net Neutrality will protect consumers from having to navigate a confusing patchwork of different laws across states.

The Truth: It's hypocritical of Verizon to bemoan a "confusing patchwork" of state laws protecting Net Neutrality while lobbying to tear down the successful federal framework we had until the FCC's repeal -- all while supporting the creation of an even more confusing patchwork of constantly shifting voluntary commitments made by various ISPs. In reality, Verizon doesn't care whether Net Neutrality rules are uniform or if they vary from state to state as long as the protections are as weak as possible.

Exhibit B

Figure 1:
Percent of Massachusetts's Population with Access to Wired Broadband by Downstream Speed
(Year-End 2014 vs. Mid-2016)

Downstream Speed	Percent of Massachusetts's 2010 Census Block Population with Access to Wired Broadband by Downstream Speed	
	Dec. 31, 2014	December 31, 2016
Any	98.9%	98.9%
≥3 Mbps	98.8%	98.8%
≥10 Mbps	98.1%	98.3%
≥25 Mbps	97.2%	97.6%
≥50 Mbps	95.5%	97.6%
≥100 Mbps	95.3%	95.1%
≥300 Mbps	0.0%	35.8%

Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of December 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts as reported for the 2010 Census.

Figure 2:
Percent of Massachusetts's Rural and Urban Population with Access to Wired Broadband
by Downstream Speed
(Year-End 2014 vs. Mid-2016)

Wired ISP Downstream Speed	Percent of 2010 Census Rural Population Served		Percent of 2010 Census Urban Population Served	
	Dec. 31, 2014	Dec. 31, 2016	Dec. 31, 2014	Dec. 31, 2016
Any	98.3%	97.7%	99.0%	99.0%
≥3 Mbps	97.9%	97.0%	98.9%	98.9%
≥10 Mbps	94.9%	94.3%	98.4%	98.6%
≥25 Mbps	89.4%	90.4%	97.9%	98.2%
≥50 Mbps	85.0%	90.4%	96.4%	98.2%
≥100 Mbps	84.0%	84.6%	96.2%	96.0%
≥300 Mbps	0.0%	13.5%	0.0%	37.7%

Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of December 31, 2016 (version 1). Values reflect all 2010 populated Massachusetts Census blocks.

Figure 3a:
Percent of Massachusetts's Population by Number of Available Wired ISPs and Downstream Speed
(Year-End 2014 vs. Mid-2016)

Number of Wired ISPs	Percent of 2010 Census Population by Number of Available Wired ISPs and Downstream Speed (Year-End 2014 vs. Year-End 2016)							
	Any Speed		≥3 Mbps		≥10 Mbps		≥25 Mbps	
	12/31/14	12/31/16	12/31/14	12/31/16	12/31/14	12/31/16	12/31/14	12/31/16
0	1.1%	1.1%	1.2%	1.2%	1.9%	1.7%	2.8%	2.4%
1	3.0%	3.7%	4.2%	6.2%	22.6%	20.3%	51.7%	52.0%
2	79.2%	79.6%	78.2%	77.8%	62.7%	64.8%	37.7%	37.3%
3	15.8%	15.1%	15.6%	14.6%	12.8%	13.1%	7.8%	8.3%
4 or More	0.8%	0.5%	0.8%	0.2%	0.0%	0.0%	0.0%	0.0%
One or More	98.9%	98.9%	98.8%	98.8%	98.1%	98.3%	97.2%	97.6%
Two or More	95.9%	95.2%	94.6%	92.6%	75.5%	78.0%	45.5%	45.6%

Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of December 31, 2016 (version 1). Universe is populated 2010 Census blocks in Massachusetts (96,334 blocks containing 6,547,629 persons). Values do not capture population growth, population movement between blocks, or deployment in blocks with zero residents as of the 2010 Census.

Figure 3b:
Percent of Massachusetts's Population by Number of Available Wired ISPs and Downstream Speed
(Year-End 2014 vs. Mid-2016)

Number of Wired ISPs	Percent of 2010 Census Population by Number of Available Wired ISPs and Downstream Speed (Year-End 2014 vs. Year-End 2016)					
	≥50 Mbps		≥100 Mbps		≥300 Mbps	
	12/31/14	12/31/16	12/31/14	12/31/16	12/31/14	12/31/16
0	4.5%	2.4%	4.7%	4.9%	100.0%	64.2%
1	50.0%	52.0%	50.4%	49.7%	0.0%	31.4%
2	37.7%	37.3%	37.1%	37.1%	0.0%	4.3%
3	7.8%	8.3%	7.8%	8.3%	0.0%	0.0%
4 or More	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
One or More	95.5%	97.6%	95.3%	95.1%	0.0%	35.8%
Two or More	45.5%	45.6%	44.9%	45.4%	0.0%	4.3%

Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of December 31, 2016 (version 1). Universe is populated 2010 Census blocks in Massachusetts (96,334 blocks containing 6,547,629 persons). Values do not capture population growth, population movement between blocks, or deployment in blocks with zero residents as of the 2010 Census.

**Figure 4:
Percent of Massachusetts's Rural and Urban Population
with Access to Two Or More Wired Broadband ISPs
by Downstream Speed
(Year-End 2014 vs. Mid-2016)**

Wired ISP Downstream Speed	Percent of 2010 Census Rural Population Served by Two or More ISPs		Percent of 2010 Census Urban Population Served by Two or More ISPs	
	Dec. 31, 2014	Dec. 31, 2016	Dec. 31, 2014	Dec. 31, 2016
Any	86.5%	81.9%	96.7%	96.4%
≥3 Mbps	84.6%	74.3%	95.5%	94.2%
≥10 Mbps	58.2%	56.8%	77.0%	79.8%
≥25 Mbps	25.2%	25.0%	47.2%	47.4%
≥50 Mbps	25.2%	25.0%	47.2%	47.4%
≥100 Mbps	24.9%	24.1%	46.6%	47.3%
≥300 Mbps	0.0%	0.1%	0.0%	4.7%

Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of December 31, 2016 (version 1). Values reflect all 2010 populated Massachusetts Census blocks.

**Figure 5:
Average Maximum Available Wired Downstream Speed (Mbps) by Area Type
(Year-End 2014 vs. Year-End 2016)**

Massachusetts Census Block Type	Average Maximum Available Wired Downstream Speed (Mbps)		
	Dec. 31, 2014	Dec. 31, 2016	% Change
2010 Rural Blocks	101.5	192.9	90.0%
2010 Urban Blocks	138.5	399.5	188.4%
All Massachusetts (population-weighted)	139.4	395.6	183.8%

Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of December 31, 2016 (version 1). Values reflect all 2010 populated Massachusetts Census blocks.

**Figure 6:
Top Massachusetts Cable Company ISPs
(Year-End 2014 vs. Year-End 2016)**

Cable ISP	Date	Percent of ISPs Passed 2010 Census Population Where it Offers Consumer-Class Wired Broadband Service (by Technology and Downstream Speed)								
		DOCSIS 2.0	DOCSIS 3.0	FTTH	≥3 Mbps	≥10 Mbps	≥25 Mbps	≥50 Mbps	≥100 Mbps	≥300 Mbps
Charter	Dec. 31, 2014	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	84.5%	0.0%
Comcast	Dec. 31, 2014	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
RCN	Dec. 31, 2014	74.7%	96.9%	60.5%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
	June 30, 2016	34.9%	99.6%	6.4%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of Dec. 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts for Massachusetts as reported for the 2010 Census and excludes deployments in unpopulated (as of 2010) blocks.

**Figure 7:
Verizon's Massachusetts Wireline Deployment
(Year-End 2014 vs. Year-End 2016)**

Local Exchange Carrier ISP	Date	Percent of ISP's Passed 2010 Census Population Where it Offers Consumer-Class Wired Broadband Service (by Technology and Downstream Speed)									
		ADSL	ADSL2	VDSL	FTTH	≥3 Mbps	≥10 Mbps	≥25 Mbps	≥50 Mbps	≥100 Mbps	≥300 Mbps
Verizon	Dec. 31, 2014	91.9%	0.0%	0.0%	39.4%	98.5%	75.9%	39.4%	39.4%	39.4%	0.0%
	June 30, 2016	88.4%	0.0%	0.0%	40.9%	97.1%	80.0%	40.9%	40.9%	40.9%	27.5%

Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of Dec. 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts for Massachusetts as reported for the 2010 Census and excludes deployments in unpopulated (as of 2010) blocks.

Exhibit C

Capital Expenditures

by Publicly Traded Broadband Providers

(2013–2016)



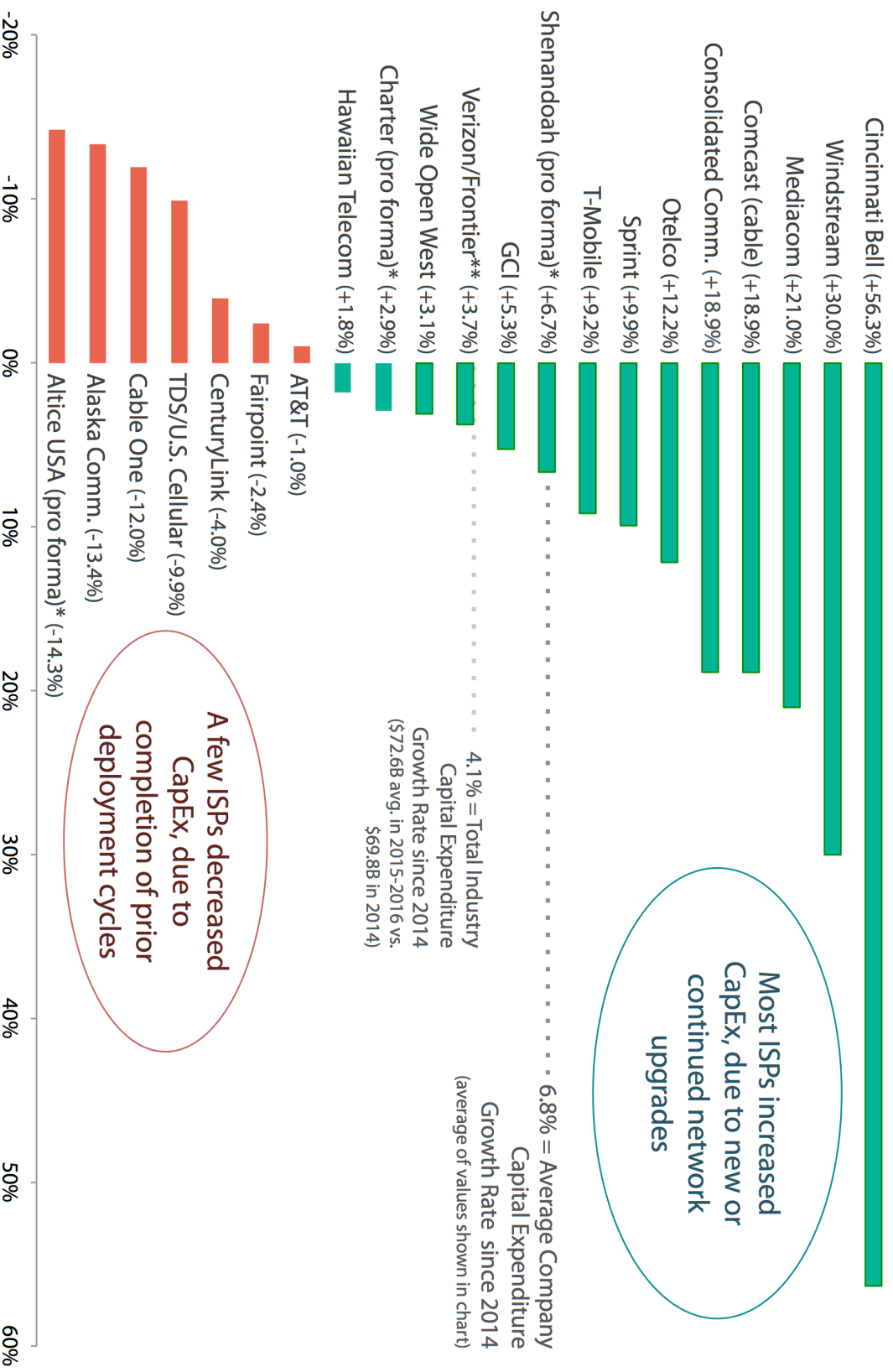
Capital Expenditures (\$ thousands)	2013	2014	2015	2016	2013-2014	2015-2016	Percent Change (2015–2016 vs. 2013–2014)
Comcast (cable)	\$5,403,000	\$6,156,000	\$7,040,000	\$7,596,000	\$11,559,000	\$14,636,000	26.6%
Charter+TWC+BHN (pro forma)	\$5,573,000	\$7,052,000	\$6,969,000	\$7,545,000	\$12,625,000	\$14,514,000	15.0%
Cablevision (excluding Newsday)	\$918,508	\$853,273	\$782,785	\$694,000	\$1,771,781	\$1,476,785	-16.6%
Suddenlink	\$359,307	\$420,605	\$478,446	\$327,184	\$779,912	\$805,630	3.3%
Mediacom	\$264,387	\$257,581	\$288,245	\$335,173	\$521,968	\$623,418	19.4%
Wide Open West	\$221,900	\$251,900	\$231,900	\$287,500	\$473,800	\$519,400	9.6%
Cable One	\$160,245	\$165,787	\$166,361	\$125,534	\$326,032	\$291,895	-10.5%
GCI	\$180,554	\$176,109	\$176,235	\$194,478	\$356,663	\$370,713	3.9%
AT&T	\$21,228,000	\$21,433,000	\$20,015,000	\$22,408,000	\$42,661,000	\$42,423,000	-0.6%
Verizon	\$16,604,000	\$17,191,000	\$17,775,000	\$17,059,000	\$33,795,000	\$34,834,000	3.1%
CenturyLink	\$3,048,000	\$3,047,000	\$2,872,000	\$2,981,000	\$6,095,000	\$5,853,000	-4.0%
Frontier	\$634,685	\$688,096	\$863,000	\$1,401,000	\$1,322,781	\$2,264,000	71.2%
Windstream	\$841,000	\$786,500	\$1,055,300	\$989,800	\$1,627,500	\$2,045,100	25.7%
Cincinnati Bell	\$196,900	\$182,300	\$283,600	\$286,400	\$379,200	\$570,000	50.3%
TDS (excluding US Cellular)	\$172,159	\$213,000	\$226,000	\$184,000	\$385,159	\$410,000	6.4%
Consolidated Communications	\$107,363	\$108,998	\$133,934	\$125,192	\$216,361	\$259,126	19.8%
Fairpoint	\$128,298	\$119,489	\$116,159	\$117,020	\$247,787	\$233,179	-5.9%
Shenandoah Telecom. Co. (pro forma)	\$197,736	\$175,232	\$169,610	\$204,163	\$372,968	\$373,773	0.2%
Hawaiian Telecom	\$86,290	\$96,706	\$99,034	\$97,841	\$182,996	\$196,875	7.6%
Alaska Communications System	\$48,172	\$51,236	\$48,477	\$40,301	\$99,408	\$88,778	-10.7%
Otelco	\$6,229	\$6,015	\$6,612	\$6,881	\$12,244	\$13,493	10.2%
Sprint	\$6,987,000	\$5,445,000	\$7,729,000	\$4,241,000	\$12,432,000	\$11,970,000	-3.7%
T-Mobile	\$4,025,000	\$4,317,000	\$4,724,000	\$4,702,000	\$8,342,000	\$9,426,000	13.0%
US Cellular	\$737,501	\$558,000	\$533,000	\$446,000	\$1,295,501	\$979,000	-24.4%
TOTAL PUBLICLY TRADED ISPs	\$68,129,234	\$69,751,827	\$72,782,698	\$72,394,467	\$137,881,061	\$145,177,165	5.3%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Values are as most recently reported (or restated). Comcast's values exclude NBCU capital expenditures. Charter's results are as-reported pro forma values for legacy Charter with Time Warner Cable and Bright House Networks. Cablevision's values exclude Newsday segment expenses. Shenandoah Telecom's pro forma values include reported values for nTelos. Note on key dates: President Obama publicly stated support for Title II restoration on 11/10/2014; FCC announced its pending vote on 2/4/15; FCC held its vote on 2/26/15; and the FCC's order was effective as of 6/12/15.

Exhibit D

ISP Capital Expenditure Growth Following Title II Open Internet Order

(Percent Change in Capital Expenditures, 2015–2016 average vs. 2014)



Source: Company SEC Filings. See Free Press, "It's Working: How the Internet Access and Online Video Markets Are Thriving in the Title II Era," Figure 1 for details.

* Pro forma values as reported by each company (reflecting mergers of Shenandoah and nTelos; Charter and TWC and BHN; Altice NL acquisition of Cablevision and Suddenlink).

**Value based on Verizon's and Frontier's combined capex, to reflect Verizon's asset sale to Frontier (stand-alone changes were +1.3% and +64.5% respectively; +9.3% average for all companies).