

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

In the Matter of)	
)	
Restoring Internet Freedom)	WC Docket No. 17-108
)	

COMMENTS OF FREE PRESS

Gaurav Laroia, Policy Counsel
Derek Turner, Research Director
Jessica González, Deputy Director & Senior Counsel
Leo Fitzpatrick, Summer Legal Fellow
Matthew F. Wood, Policy Director

Free Press
1025 Connecticut Avenue, N.W.
Suite 1110
Washington, D.C. 20036
202-265-1490

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EXECUTIVE SUMMARY

For the third time in seven years, the Commission seeks comment on the appropriate classification of Broadband Internet Access Service (“BIAS”) in connection with the implementation of Open Internet rules. This time, however, it proposes to dismantle the legally sound Title II classification to which it finally returned in 2015.¹ This would be a mistake of epic proportions, unsettling the legal and economic certainty engendered by restoring this successful framework just two years ago – and all to appease the unfounded ideology and limitless vanity of the newly installed Chairman, his political backers, and his supporters in the broadband industry.

By returning to Title II in 2015, the Commission placed its longstanding Net Neutrality policies and principles on solid legal footing. It returned to the common carriage foundation that has always undergirded the transmission of information (including internet data) over telecom networks, and put to rest more than a decade of wrangling over the appropriate classification of BIAS. The *Open Internet Order* withstood multiple rounds of scrutiny in appellate court, and nothing in the Commission’s 2017 *Notice*² points to any legal or factual defects in that 2015 order that require wholesale reexamination of BIAS’s classification. Yet, as Chairman Pai has made explicitly clear, this is a political fight to see that Title II’s days are numbered. By his own admission it is a fight he intends to win³ – law, facts, policy, and the public interest be damned.

¹ *Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd 5601 (2015) (“*Open Internet Order*”).

² *In the Matter of Restoring Internet Freedom*, Notice of Proposed Rulemaking, WC Docket No. 17-108 (rel. May 23, 2017) (“*Notice*”).

³ See Remarks of FCC Chairman Ajit Pai at the Newseum, “The Future of Internet Freedom” (Apr. 26, 2017), http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0426/DOC-344590A1.pdf (“When the FCC rammed through the *Title II Order* two years ago I voiced my confidence that the *Title II Order*’s days were already numbered. At the FCC’s next meeting on May 18, we will take a significant step towards making that prediction a reality. And later this year, I am confident that we will finish the job. Make no mistake about it: this is a fight that we intend to wage and it is a fight that we are going to win.”).

The problematic nature of Chairman Pai's promise to pre-judge this proceeding, made long before the record had been compiled, is but one of the many procedural flaws besetting the Commission's bumbling efforts in this docket. Before we touch on those missteps, we focus on three fundamental truths about the law and the facts at issue in this proceeding.

First, broadband internet access service clearly fits the definition of a telecom service, as written into law by Congress in 1996 on an overwhelmingly bipartisan basis. Broadband is the essential communications network of our time, providing individual users, organizations, and businesses with the ability to send and receive the information of their choosing on the internet. The common carriage principles safeguarding these communications rights and freedoms are not the least bit outdated, despite the incessant repetition of that facetious talking point in the cable and phone industry's dishonest lobbying assault on Title II.

There is nothing old-fashioned about this nondiscrimination law. The Commission's common carriage mandate, and the safeguards it adopted in 2015 to implement that mandate, are as essential today as ever. They are what made innovation without permission from network gatekeepers possible at the dawn of the internet and before, and what will make it possible in the future too – unless this Commission dismantles them. And the nondiscrimination protections made real by Net Neutrality rules are vital not only for economic opportunity, but for enabling civic participation, disseminating news and information, creating our shared culture, and propagating political speech. Handing cable and phone companies the power to determine who may speak and be heard on the internet – and indeed, the power to edit the speech of the carriers' customers – would be disastrous not only for the businesses that rely on the open internet, but for people of color, political dissidents, independent artists, and others far too often unserved and shut out of the conversation by mainstream media gatekeepers.

Second, there is at present no viable foundation for Open Internet rules without Title II. The *Notice* asks a series of misguided questions purportedly to determine the need for the so-called “bright line rules” against blocking, throttling, and prioritizing internet traffic. These questions are obviously written to undermine those rules, despite broadband providers’ inconsistent and insincere but oft-repeated professions of support for them. Nevertheless, whatever the pre-judged intention to jettison these rules and related Commission authority telegraphed by these inquiries in the *Notice*, any attempt to ground protections on a legal theory devoid of Title II would have the same effect as getting rid of the rules altogether. Those who claim to support Net Neutrality, but oppose either enforceable Commission rules or the recently upheld legal framework for them, are not to be believed. And those who claim that innovation, entrepreneurship, new ideas, competitive choices and independent speech will flourish online in the absence of such protections are either fooling themselves, or trying to fool the public.

Despite the natural focus on Net Neutrality in this proceeding and the political debate surrounding it, the *Notice* rightly – if all too briefly – asks about other ramifications of abandoning the Title II framework for broadband. As we explain below, deserting the proper classification also would jeopardize the Commission’s efforts to promote home-internet adoption and close the digital divide with the Lifeline program (and any other initiatives designed to promote broadband choice and affordability). It also would prevent the Commission from protecting broadband customers’ privacy, abandoning internet users to the outcome of ongoing litigation – brought by AT&T, one of the ISPs that purports to support Net Neutrality almost as much as it values its users’ privacy(!) – over the limits of Federal Trade Commission authority. The Commission’s mandate to ensure protection of broadband telecommunications customers’ privacy would be yet another casualty of returning to the wrong definition of BIAS.

Third, the *Notice*'s claim that the *Open Internet Order* "has put at risk online investment and innovation" is preposterous, and its suggestion that "[i]nvestment in broadband networks declined"⁴ is demonstrably false – to say nothing of woefully misguided in its myopic focus. The *Notice* willfully chooses the wrong metrics for gauging broadband investment, relying on cherry-picked and just plain wrong tabulations. It ignores the increased investment levels for the majority of broadband providers that publicly report their spending, as well as the improved financial performances, increased capabilities, or both for even the relatively few providers that saw spending go down after they completed upgrades. It ignores the clear explanations for their investment decisions that these ISPs give their shareholders, in which they said the return to Title II had no impact on those decisions. And it ignores, despite all of its cost/benefit incantations, the tremendous growth in edge company investment that has occurred since reclassification.

Broadband providers are just one part of the internet economy, and a vital one; but the law makes no mention of their investments or profits when it comes to defining the service they provide. Yet their investments and their profits are great. Also changing for the better is what the Commission actually should care about: the service these broadband providers offer. Much more relevant than the dollars these ISPs spend on deployment is what they produce with that investment. The fact is that the transmission capabilities (a/k/a speeds) of broadband services offered by carriers large and small increased dramatically in the two years under restored common carriage, with additional improvements continuing at an historic pace.

None of this should be read as a claim that all internet users in all parts of the country (either rural or urban) are well served, that their choices are great enough, or that prices are low enough. Our research on the home-internet adoption gap, and on the persistent racial, social, and

⁴ *Notice* ¶ 4.

income-based aspects of the digital divide, shows otherwise. Yet the fact is broadband service is getting faster, whether or not it's effectively competitive or truly affordable for those who purchase it. And broadband providers are reaping the gains of their improved product.

Even if the 2015 order had the negative impact on broadband investment that the *Notice* wrongly imagines but cannot explain, that would do precisely nothing to change the proper legal classification of BIAS. Neither would it change society's need for nondiscriminatory telecommunications networks, affordable broadband, and control of private information. Nor would it lessen the importance of the open internet to every individual, family, community, association, educational institution, and economic endeavor in this country that relies on internet access today. Yet in light of the vital need for these services, and the success of the 2015 order in preserving their availability, the *Notice's* false claims about diminished broadband investment are nothing short of an unconscionable fraud.

Another sad truth about this entire endeavor is that this Commission has failed to meet its duties to conduct this proceeding properly. It has employed irregular tactics and processes, and actively promoted falsehoods both in the public debate and in this very docket. Indeed, as outlined above, Chairman Pai's main reason for repealing the open internet rules – that the *Open Internet Order* allegedly has harmed investment – relies on falsehoods and spin from industry-funded studies that fail to meet Information Quality Act standards. Moreover, the *Notice* seeks comment on a number of questions that the Commission could at least partially answer with evidence it holds in its exclusive possession but has failed to timely produce pursuant to a National Hispanic Media Coalition (“NHMC”) FOIA request.

The Commission must abandon its quixotic quest to dream up problems in the laws, policies, and economic realities in play in this proceeding. The 2015 order clearly was correct to

adopt the now-threatened rules and ground them on Title II. That was the best and only option for putting congressionally granted communications rights back on solid legal footing. It has been a resounding success, keeping broadband and edge investment alike on track. And it is an absolute necessity for keeping the internet open and free from unreasonable interference by the broadband providers that control access to it for hundreds of millions of people and businesses in America.

It didn't have to be this way. Instead of pretending to support the open internet while moving to tear down its legal and economic foundations, Chairman Pai could have looked at the mountains of evidence available to him and admitted the error of his gloomy predictions. He could have worked in better faith on closing the digital divide, rather than attacking the legal basis for Lifeline while proposing tax subsidies for improved networks that broadband providers are already building. He could have recognized that the nondiscrimination principles enshrined in Title II, far from being old-fashioned, are crucial to economic opportunity, racial justice, and social movements of all stripes. They secure people's ability to express themselves without fear of interference by network operators that have the clear ability, obvious financial incentives, and potential political motives to interfere. Chairman Pai could have sided with the public he's supposed to serve, secure in the knowledge that these rules are good for the business of broadband providers – along with the hundreds of millions of other companies and people that rely on their networks.

But because Chairman Pai couldn't leave well enough alone, he wastes taxpayers' time and money with this frivolous re-do, as he wages his lonely "fight" against the communications rights that Congress commanded the Commission to uphold.

Free Press won't back down from the misguided fight he started.

I. Background.

A. The *Notice* Displays a Gross Misunderstanding of the History of the Telecommunications Act of 1996.

As the *Notice* makes painfully clear, this Commission’s understanding of the history of common carriage, Net Neutrality, and the Telecommunications Act of 1996 (the “1996 Act”) are grossly mistaken. The application of common carriage principles to communications networks like those utilized to provide BIAS is not novel, and the *Open Internet Order* itself was a return to those longstanding principles – not the imposition of “utility-style regulation” leading to “government control of the Internet” that the *Notice* foolishly pretends.⁵

Even framing the issue this way betrays a fundamental misunderstanding of the Commission’s role and its statutory mandate, or an attempt to mislead the public, or both. The Commission has never regulated “the Internet,” and nothing in the 2015 order changed that. But it always has been and remains charged with ensuring that communications services are provided on terms that are just, reasonable, and nondiscriminatory.⁶ As we have explained on occasions almost too numerous to count, “[t]he internet is a communications platform. It is an interconnected system of computers[.] Broadband internet access providers are not ‘the internet’; they sell, as their name indicates, access to it.”⁷ In short, the content on the internet is not the same thing as the access lines that deliver that content. Properly understood, the Commission does not and should not regulate “the internet” under Title II, but it is charged with ensuring the openness of the telecommunications network that provides access to it.

⁵ *Id.* ¶ 3.

⁶ See 47 U.S.C. §§ 201(b), 202(a).

⁷ S. Derek Turner, Free Press, *It’s Working: How the Internet Access and Online Video Markets Are Thriving in the Title II Era*, at 44 (May 15, 2017), <https://www.freepress.net/sites/default/files/resources/internet-access-and-online-video-markets-are-thriving-in-title-II-era.pdf> (“*It’s Working*”).

Free Press has written at length about the history of common carriage and the 1996 Act in the Commission’s earlier open internet dockets and elsewhere.⁸ We write once again to remind the present Commission of this history regarding common carriage, the purpose of the 1996 Act, and the reasons for the return to Title II classification for BIAS providers.

1. The History of Common Carriage.

The *Notice* summarily dismisses the correct finding in the 2015 order that BIAS is plainly a telecommunications service, and in so doing turns its back on the common carriage laws and principles that have allowed the internet to thrive.⁹ As we have explained throughout the course of these past several proceedings that it took to restore the Commission’s proper interpretation of the law, there is no viable alternative to Title II when it comes to classifying BIAS. That is the right read of the law, and it also provides the essential legal grounds on which to build open internet protections. If the Commission wishes to preserve a free and open internet for all who enjoy access to it today and for generations to come, then it has no choice but to abandon this ill-advised rulemaking and uphold its 2015 decision.

Blithely walking past these realities, the *Notice* disparages the common carrier framework’s historical underpinnings as well as the Commission’s practice with respect to oversight of Title II telecommunications services for the past quarter century. In light of that rich history, the present Commission must understand the concept of common carriage as applicable to more than just “heavily regulated”¹⁰ services. Instead, it must understand that the *Notice*’s much-praised “light-touch” regulatory framework is precisely what the 2015 order landed on for broadband, with its return to Title II with appropriate forbearance.

⁸ See, e.g., Comments of Free Press, GN Docket No. 14-28, at 13–16 (filed July 17, 2014) (“Free Press 2014 Comments”).

⁹ See *Notice* ¶¶ 25–41.

¹⁰ *Id.* ¶ 6.

We began our explanation of the proper framework for broadband in our 2014 open internet comments by looking to the origins of common carriage in U.S. statute, to explain not just the rich lineage but the continued vitality of the doctrine – and its importance not just for industries characterized by monopoly, but for any other networked industry.

Common carriage was and is central to the economic and societal development of the United States. Congress’s first statutory application of the principle came in 1887 with the Interstate Commerce Act (“ICA”).¹¹ Although this law and its associated nondiscriminatory duties were in part motivated by monopoly concerns, the legislative history details other public interest considerations too.¹² Congress applied common carriage principles to emerging telecommunications services when it brought telegraph and telephone carriers under the ICA’s jurisdiction.¹³

Following the rapid growth of telephony, and AT&T’s attempts to monopolize it, Congress adopted the Communications Act of 1934 (the “1934 Act”) and created the Federal Communications Commission to oversee all communications by wire or radio. Yet the centerpiece of that law was continued application of common carrier duties to all providers of public two-way communications services, regardless of any such individual providers’ market power or monopoly status.

Thus, as we explained in our 2014 comments,¹⁴ it is a pernicious myth that common carriage in general and Title II in particular are relics of the monopoly telephone era. The text of Title II and its history show otherwise. There is no requirement in the law of a finding of market power before the application of Title II common carrier duties. Furthermore, Section 10

¹¹ See Free Press 2014 Comments at 17 (citing Interstate Commerce Act, 24 Stat. 379 (1887)).

¹² See *id.*

¹³ Mann-Elkins Act, ch. 309, 36 Stat. 539 (1910).

¹⁴ See Free Press 2014 Comments at 19 n.18.

forbearance is predicated on the preservation of the nondiscriminatory outcomes secured by Sections 201 and 202.¹⁵

Common carriage duties, as applied to communications networks by Title II of the 1934 Act and then as amended but retained by the 1996 Act, promoted economic growth by ensuring universal access to a nationwide, fully interconnected infrastructure. People and businesses utilized common carrier networks to access other essential services, first confined to plain old telephone service but eventually including a whole host of information processing capabilities that likewise ran over that same telecommunications network.

The nondiscrimination obligations attached to these networks kept them open for innovation without prior approval, and for free expression too, without the threat of unreasonable interference by the carrier. The Commission's enforcement of nondiscrimination protections, along with the limited liability concept embodied in common carriage, protect commercial freedoms for network users to be sure; but they are also essential to personal freedoms and the exercise of our basic free speech rights.

This is a point that often gets lost in the debate, which too often fixates on the notion of telecom monoliths battling Silicon Valley giants; but common carriage facilitates free speech. The doctrine insulates the carrier from any responsibility for the content that it transports. This duty to carry messages without regard for their content means that carriers cannot act as censors, and are immune to political pressure not to serve parties transmitting controversial content.

¹⁵ See, e.g., J.B. Speta, "A Common Carrier Approach to Interconnection," 54 Fed. Comm. L.J. 225, 264 (2001). ("Of course, the 1934 Act does not include any explicit monopoly test before applying common carrier obligations. And, while the 1996 Act does give the FCC expansive power to forbear from applying the 1934 Act where competition has taken root, even this provision declares that regulation may be eliminated only where nondiscriminatory service will continue in its absence. In other words, the common carrier obligations of the Communications Act were motivated by (and continued to be motivated by) concerns over both monopoly and discrimination.") (emphasis in original).

To say that this requirement has served our democracy well would be an understatement. Abandoning it (yet again, as discussed below) would come with great peril. Broadband providers have suggested in the all-too-recent past that we do just that. In its brief successfully challenging the 2010 version of the open internet rules (struck down based on their insufficient Title I legal basis, not this claim), Verizon boldly argued “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.”¹⁶ The brief suggested that broadband providers should be allowed to edit the speech and information they carry, arguing that it was only at such providers’ “discretion” that they deigned “to allow all content” on their networks.¹⁷

We focus for the moment not on the fact that these types of First Amendment challenges to Net Neutrality rules have failed time and again. We describe the settled nature of this constitutional question in greater detail below, in response the *Notice*’s rote recitation of the same question. Nevertheless, in light of such ominous statements by broadband providers, preserving common carriage is an absolute necessity if we are to maintain freedom of expression. Without common carriage, there’s nothing preventing a broadband provider from deciding on its own – or bowing to pressure to do so – to cut off or degrade service to any individual or group that engages in political activities.

Unfortunately, violations of Net Neutrality principles and other unreasonable broadband provider practices we many during the course of the Commission’s decade-plus detour away from Title II. These harmful practices often involved commercial disputes motivated by a

¹⁶ *Verizon v. FCC*, 740 F.3d 623 (2014), Joint Brief for Verizon and MetroPCS at 43 (filed July 2, 2012) (“Verizon Brief”).

¹⁷ *Id.*

broadband provider’s anticompetitive animus.¹⁸ Less frequent, but perhaps even more disturbing were broadband providers’ and other common carriers’ decisions to block content for political reasons,¹⁹ or to block messages in situations that might be described as carriers improperly substituting their own social and moral judgments for their customers’ choices.²⁰

There is even danger of politically motivated blocking when common carriage principles, or “no-blocking” rules modeled on such principles, are in place but go unheeded or unenforced. The activists of the 1960s recognized this reality, when they secured WATS Lines rather than risk blocking by local switchboard operators hostile to the causes of racial justice and civil rights.²¹ So too do activists and organizers today, still fighting to make it known that black lives matter, or to communicate any political point whatsoever to individuals and mass audiences alike

¹⁸ See, e.g., Timothy Karr, “Net Neutrality Violations: A Brief History,” *Free Press Blog* (Apr. 25, 2017), <https://www.freepress.net/blog/2017/04/25/net-neutrality-violations-brief-history> (detailing blocking of websites, apps, and services that competed with broadband providers’ legacy voice, messaging, and video services, as well as proprietary mobile payment services launched by numerous mobile carriers); Open Technology Institute, “*Beyond Frustrated*”: *The Sweeping Consumer Harms as a Result of ISP Disputes* at ii (Nov. 2014), https://static.newamerica.org/attachments/386-beyond-frustrated-the-sweeping-consumer-harms-as-a-result-of-isp-disputes/OTI_Beyond_Frustrated_Final.pdf (“In 2013 and 2014, the policies implemented by some of the nation’s largest communications companies led to significant, months-long degradation of a consumer product for millions of people without explanation or compensation.”).

¹⁹ See, e.g., Karr, “Net Neutrality Violations,” *supra* note 18 (describing Canadian telecom company Telus’s blocking of a union’s website during a labor dispute).

²⁰ See, e.g., Nancy Keenan and Roberta Combs, “Can You Hear Us Now?” *Wash. Post* (Oct. 17 2007), <http://www.washingtonpost.com/wp-dyn/content/article/2007/10/16/AR2007101601536.html> (detailing Verizon Wireless refusal to approve NARAL’s application for a text-messaging short code because the “carrier initially claimed the right to block any content ‘that, in its discretion, may be seen as controversial or unsavory.’”).

²¹ See Bijan Stephenson, “Get Up, Stand Up: Social Media Helps Black Lives Matter Fight the Power,” *Wired* (Nov. 2015), <https://www.wired.com/2015/10/how-black-lives-matter-uses-social-media-to-fight-the-power/> (“From an office or a phone booth in hostile territory, you would place a call to one of the major national civil rights organizations. But you wouldn’t do it by dialing a standard long-distance number. That would involve speaking first to a switchboard operator – who was bound to be white and who might block your call.”).

online.²² Compromised, watered-down, or otherwise inadequate protections that merely discourage harmful practices without prohibiting them will not keep the internet free from unreasonable discrimination by broadband providers.

In sum, the ability to access an open communications network, and the enforcement of rules that make openness a reality, form the basis for one of the greatest economic success stories in all of history. But the civic corollary to innovation without permission over telecom networks is just as important, and that is the right to speak freely without permission from the phone or cable companies that own these networks. Diffused control over the pace of innovation means that technological advances occur not just at the center of the network, but also at its edge. All of this increased autonomy afforded to speakers and businesses that rely on that network – who exchange goods, services, and ideas over it – are a product of common carriage laws that must be applied and properly administered for the networks over which information flows.

The *Open Internet Order* recognized that common carriage was the DNA of the network revolution, not something that can be tossed aside in hopes that the positive outcomes it ensured will continue in its absence. Yet, this *Notice* forgets this lesson and buys the incumbent snake oil suggesting that changes in communications technologies somehow mean we should abandon these successful principles. The text of the law makes it clear that this is not the case.²³

Abandoning the common carrier model and Title II, as the instant *Notice* suggests, would be a disaster for the open internet, for investment in the edge, for innovation in the economy, and

²² See Malkia Cyril, “Only net neutrality can protect the internet from becoming like TV: white, middle-class and exclusive,” *The Guardian* (Feb. 26, 2015), <https://www.theguardian.com/commentisfree/2015/feb/26/only-net-neutrality-can-protect-the-internet-from-becoming-like-tv-white-middle-class-and-exclusive> (“The net neutrality rules proposed by FCC Chairman Tom Wheeler would not only protect those organizing for change, but also help close long-standing equity and wealth gaps that disadvantage communities of color and America’s poor.”).

²³ See 47 U.S.C. § 153(53) (defining telecommunications service as an “offering” of transmission “directly to the public, . . . regardless of the facilities used.”) (emphasis added).

for the right of people to generate and access information of their choosing. The *Notice* proposes a model of the internet in which BIAS providers who sell access to the internet would be free to discriminate. They would pick and choose not just the commercial content, but even the political speech and information their broadband customers can access and create.

The Commission's decision in 2015 comported with the sentiment of Congress, the beliefs of consumers, the needs of businesses large and small, and now the judgments of the courts to. Open communications networks protected by common carriage principles are fundamental to the well-being of our society, and should be preserved. As the Commission has already found, the market alone will not preserve the open and nondiscriminatory outcomes our country needs. If the Commission's goal in this proceeding is to preserve openness and internet freedom, it must abandon its wrongheaded classification proposals and preserve the *Open Internet Order* in full.

2. The Purpose of the Telecommunications Act of 1996.

The *Notice's* discussion of the history and purpose of the 1996 Act is seriously flawed. That recitation is plagued with errors, leading to the incorrect conclusion that Title II and common carriage were never meant to apply to broadband internet access providers. The *Notice* confuses or purposefully conflates the terminology it uses to conjure up this conclusion, ignoring both what has and what has stayed the same in terms of internet access since the time of the 1996 Act's passage, as more fully discussed in the next subsection of these comments. But the *Notice* also swings and misses at the history and the thinking that led to the passage of the 1996 Act in the first place.

In reality, that law's drafters knew quite well about the internet and what that act subsequently classified as information services. They also understood the role that policies governing telecom services had played and would continue to play in promoting the internet's

advancement. The Commission first dealt with the same kind issue in its *Computer I* decision, and later settled on a firm demarcation between “basic” and “enhanced” services in *Computer II*, a distinction that Congress codified with its adoption of the definitions of “telecommunications services” and “information services” in the 1996 Act.²⁴ Historically, the Commission developed a successful framework from which Congress took its cues in crafting that law.

The Commission today must not abandon Title II, as amended and modernized by the 1996 Act. It should abandon instead the outlandish notion in the instant *Notice* that this successful legal framework is confined in any way to certain modes of technology. Congress purposefully wrote the 1996 Act to be technology-neutral, a fact made clear by its definitions. Title II is about two-way communications services. It is not a regulatory silo applicable only to copper wires, voice services, local exchange carrier business models, or any combination thereof. And its obligations do not switch off in the absence of any of these non-dispositive factors.

In sum, as we explained more than a year before the Commission rightly reclassified BIAS in 2015, “Congress was clear: the physical networks of the 21st century would provide telecommunications services. Congress gave the Commission wide latitude in applying Title II to those networks [] that clearly provide common carriage[.]”²⁵ The 1996 Act was written to achieve Congress’s overarching goal of ensuring “a world of big open telecom services that could connect Americans to the Internet, or to whatever information service. That goal requires telecom services that function to deliver whatever applications our innovators think of next.”²⁶

In the years following the Bell breakup, there was a marked shift in how members of Congress in both parties approached the issue of communications regulation. But while

²⁴ See Letter from Derek Turner, Free Press, to Hon. Tom Wheeler, Chairman, Federal Communications Commission, GN Docket Nos. 13-5, 10-127, 09-191, at 5 (filed Feb. 7, 2014).

²⁵ *Id.*

²⁶ *Id.*

deregulation was a central theme for sure, it was not an unthinking and sweeping departure from the central tenets of common carriage and communications law. These lawmakers understood the need to keep in place laws, policies, and principles that would promote competition. They did not intend to clear-cut the rules that had maintained the availability of nondiscriminatory networks and open communications channels for the better part of a century. While a few Members of Congress prior to the passage of the 1996 Act may have felt that government should play no role in the telecommunications and cable markets, the overwhelming majority of both Republicans and Democrats embraced a “competition-then-deregulation” philosophy that retained the core components of Title II .

The driving forces behind this shift were the dawn of the broadband telecommunications era in the mid-1990s and the big promises that cable, phone company, and other executives were making about the future of competition. All of these factions told Congress that open telecommunications networks would solve any market-power problems in the services offered over those networks. If every home and business in America were offered reasonably priced, fast and open advanced telecommunications services, there would no longer be any concern about competition in the local toll, long-distance, information service, and multichannel video markets. The thinking was that so long as the underlying telecommunications service was a neutral distribution platform, and new entrants could get into the business of offering these other services over that platform, there would be (for example) no concern about the Bells entering the long distance markets and no need to regulate cable rates.

The plan’s linchpin was cable’s promise to become a telecommunications service provider, not merely as an alternative for narrowband voice service but as an open and nondiscriminatory broadband telecommunications service capable of delivering high-quality

voice, video and data communications.²⁷ For most members of Congress, the entire point of the 1996 Act was the creation of such robust and open telecommunications platforms that could deliver competitive voice, video and data services. The theory Congress operated on in 1996 was that having more distribution mediums (whether copper, coaxial cable, fiber, terrestrial wireless or satellite) would produce competition in the markets for the services delivered over those distribution mediums.

But despite all their promises, the Bells did not enter the video markets for another decade. The cable industry also broke its promise to become the competing nondiscriminatory broadband platform. Cable instead pressured the Powell-era Commission to create a loophole in the regulatory structure by defining cable's two-way telecommunications platform as an information service and not a telecommunications service. The Powell Commission complied, even though Congress clearly stated that "telecommunications services [include] the transport of information or cable services" whether delivered over "a twisted pair wire, coaxial cable, fiber optic cable, wireless, or satellite system"²⁸ when it adopted the 1996 Act.

²⁷ See Telecommunications Competition and Deregulation Act of 1995, Report of the Committee on Commerce, Science, and Transportation on S. 652, S. Rpt. 104-23, 104th Congress, First Session, at 13 (1995) ("*Senate Committee Report on S. 652*") ("Decker Anstrom testified that NCTA supports telecommunications legislation because the cable industry is ready to compete, and legislation must include rate regulation relief for cable. He said that cable will be the competing wire to the telephone industry, and cable's coaxial cable carries 900 times more information than telephone's twisted copper pair.").

²⁸ See *id.* ("[T]elecommunications services' includes the transport of information or cable services, but not the offering of those services. . . . [W]hat is included is that level of telecommunications services that . . . allow all Americans access to information, cable, and advanced telecommunications services that are an increasing part of daily life in modern America. Put another way, the Committee intends the definition of universal service to ensure that the conduit, whether it is a twisted pair wire, coaxial cable, fiber optic cable, wireless, or satellite system, has sufficient capacity and technological capability to enable consumers to use whatever consumer goods that they have purchased, such as a telephone, personal computer, video player, or television, to interconnect to services that are available over the telecommunications network." (emphases added)).

Congress also wrote a forbearance mechanism into the 1996 Act, to be sure, allowing for greater tailoring and flexibility of the legal and regulatory structures Congress applied to all such telecom services on a technology neutral basis. The *Notice*'s inane suggestion that the use of forbearance in the *Open Internet Order* demonstrates the “poor fit” of Title II²⁹ is either yet another illustration of this Commission's bad-faith interpretation of the law, or an illustration of the *Notice* authors' incompetent lawyering.

This through-the-looking-glass assumption, that proper use of the very mechanism Congress created somehow demonstrates the inadequacy of that mechanism, is but the first problem. The second is the backwards and entirely illogical conception that forbearing from certain statutes or rules (that are otherwise applicable to telecom services) magically changes the legal definition or the functions of the service. For example, could the *Open Internet Order*'s understandable decision to forbear from Section 226 (the Telephone Operator Consumer Services Improvement Act)³⁰ somehow render broadband internet access not a transmission service that enables users to send and receive information of their choosing? Of course it couldn't. There are no kind words to describe the incompetence and chicanery on display in the *Notice*, but the term “malpractice” does leap to mind now and then.

No, a telecommunications service remains a telecommunications service, no matter what the present Commission seeks to wish away in the statutory text and definitions. And returning to the 1996 Act drafters' intentions and the will of the Congress that ultimately passed that law, they too understood that certain core legal duties should remain in place for telecom service providers even in relatively competitive product markets and geographic markets.

²⁹ *Notice* ¶ 33.

³⁰ *See Open Internet Order* ¶ 520.

As we described in great detail in our 2014 initial comments (filed three years ago to the day, but who’s counting?): “Title II and common carriage have absolutely no relation to a market’s level of competition. This is an obvious and well-established truth. Those who should know better yet insist on suggesting otherwise are either shockingly misinformed or downright disingenuous.”³¹ But what Congress insisted on keeping as obligations for competitive services is just as important as the fact that it decided to keep them. As we also explained in those comments, the Congress just prior to the one that adopted the 1996 Act amended Section 332 of the underlying Communications Act. In doing so, it “specifically chose to apply the three core sections of Title II (Sections 201, 202 and 208)” to wireless carriers “despite their non-monopoly status, and did not allow the Commission to deviate from that core.”³²

When the 1996 Act expanded forbearance to all telecom carriers not just wireless ones, it allowed forbearance even from those three statutes; but it allowed so only so long as the telecom services and carrier practices in question remained “just and reasonable and [] not unjustly or unreasonably discriminatory.”³³ And as the Commission explained just a few years after the 1996 Act created this forbearance test, “Sections 201 and 202, codifying [] bedrock consumer protection obligations . . . were enacted in a context in which virtually all telecommunications services were provided by monopolists, [but] they have remained in the law over two decades during which numerous common carriers have provided service on a competitive basis.”³⁴ (That remains true to this day, almost two more decades further on, as described below.)

³¹ Free Press 2014 Comments at 28–29.

³² *Id.* at 29 (citing 47 U.S.C. § 332(c)(1)(A)).

³³ 47 U.S.C. § 160(a)(1).

³⁴ *Personal Communications Industry Association’s Broadband Personal Communications Services Alliance’s Petition for Forbearance for Broadband Personal Communications Services*, WT Docket No. 98-100, Memorandum Opinion and Order and Notice of Proposed Rulemaking, 13 FCC Rcd 16857, ¶ 15 (1998).

This same Commission decision concluded that even with the power to forbear from these statutes, “this would be a particularly momentous step” precisely because “sections 201 and 202 lie at the heart of consumer protection under the Act.”³⁵ That is what the Congress that passed the 1996 Act understood too, as it adopted the law with a vote count that is almost impossible to believe in our own contentious, partisan times. The 1996 Act, applied to all broadband telecommunications services regardless of the technological platform used, and done so not in ignorance of the internet revolution and but indeed to spur that revolution on, passed the House of Representatives by a margin of 414 to 16, and the Senate by a count of 91 to 5.³⁶ When participants in the current debate say that Congress “needs to act” to settle the Net Neutrality matter, the only proper answer is that Congress already did.

This history is important – whether the present Commission chooses to recognize it or not. Congress created the correct framework to promote competition in the voice, video, data and information services markets. But the Commission under both Presidents Bush and Obama (prior to 2015) had abandoned this framework. By tossing aside the congressional roadmap, the Commission’s choices led us to a situation in which most of the country has at-best a duopoly for wired high-speed broadband telecommunications and for high-speed access to the internet provided over those wires.

The Commission went some way towards remedying these mistakes in the 2015 order, yet the present *Notice* seeks to go backwards yet again: proposing to redefine BIAS as an information service once more, and bringing to an end the entire concept of a public

³⁵ *Id.*

³⁶ *See* S. 652, H. Rep. Recorded Vote, Roll Call No. 25 (Feb. 1, 1996); S. 652 Conference Report, Sen. Recorded Vote, Roll Call No. 8 (Feb. 1, 1996).

telecommunications service network.³⁷ Contrary to the *Notice*, nothing in the law or legislative history even remotely suggests this was the path Congress intended for the Commission to follow, nor the outcome it desired. If the Commission's *Open Internet Order* stands, the internet will remain an open and nondiscriminatory platform, like it always has been. Then anyone can be an information service provider, broadcaster, publisher or video distributor – not just the incumbents that own the physical infrastructure. But with this *Notice*'s suggestion of a return to the Commission's earlier misguided classification decisions, there is no guarantee under the law that the internet will remain a viable delivery platform for information services.

When the owners of the physical infrastructure can prevent anyone else from being a speaker, publisher, or service provider, that's a problem – and it's the exact problem the 1996 Act was designed to solve.³⁸ After the Commission's 2015 return to Title II, we've seen robust innovation and investment by broadband providers as well as edge providers that require an open delivery platform. But this investment and innovation on the edge will not continue apace if there is renewed uncertainty about the openness of the delivery platform. In short, it will not continue if Verizon is allowed to make good on its 2012 threat to exercise “editorial discretion” over internet content.

³⁷ See Comments of Free Press, *In the Matter of AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition; Petition of the National Telecommunications Cooperative Association for a Rulemaking to Promote and Sustain the Ongoing TDM-to-IP Evolution*, GN Docket No. 12-353 (filed Jan. 28, 2013).

³⁸ It was also a problem that Judge Greene recognized in overseeing the breakup of the Bell monopoly, when he explained that “information in general and news in particular are by definition especially sensitive to even small impediments or delays. Information is only valuable if it is timely; by and large it is virtually worthless if its dissemination is delayed.” *United States v. American Tel. & Tel. Co.*, 552 F. Supp. 131, 182 (1982) (noting further that any delays in information delivery, let alone outright blocking of such delivery, “would quickly cause subscribers to desert their unreliable publishers and thus cripple AT&T's competitors in that business”).

We must keep the telecommunications networks open, using Title II and its nondiscrimination protections that Congress intended for these services, if we want freedom of expression and innovation too. The suggestion in the *Notice* that Title II does not apply to broadband internet access service is dangerous, and – as further discussed in the next section – ahistorical too.

3. The *Stevens Report* Only Makes Sense for 90s Era ISPs.

The *Notice*, in its laborious effort to sow confusion about the history of the 1996 Act, leans on agency pronouncements made in the late 1990s after that act’s passage. The *Notice* uses these as a basis for its (false) claim that BIAS should be classified as an information service today.³⁹ Findings like those in the 1998 *Stevens Report*⁴⁰ were indeed correct for the time, as they came when common carriage existed for both narrowband and broadband transmission. The Commission then certainly did not anticipate that common carriage would disappear for non-narrowband transmission, nor with it the third-party ISP market on which the Commission based these early pronouncements. That vertically integrated ISP offerings were possible at the time did not matter: because of common carriage and other Commission policies, such offerings were just expected to be one among many, the way they continue to be around the world today.

In the *Stevens Report* (which mainly dealt with the agency’s implementation of Section 254), the Commission stated that “[Internet] Access providers, more commonly known as Internet service providers, combine computer processing, information storage, protocol conversion, and routing with transmission to enable users to access Internet content and services,” and were thus considered information services under the Communications Act.⁴¹

³⁹ *Notice* ¶ 10.

⁴⁰ See *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Report to Congress, 13 FCC Rcd 11501 (1998) (“*Stevens Report*”).

⁴¹ *Id.* ¶ 63.

In making this observation, however, the Commission explained what it meant by reference to the ISPs depicted in the report. It noted the characteristics of late-1990s ISPs, features that are anachronistic today.⁴² Moreover, the Commission observed then that “Internet service providers themselves generally do not provide telecommunications,”⁴³ something that is 100 percent opposite of today’s reality.

Indeed, consider the section of the *Stevens Report* where the term “inextricably intertwined” was first introduced, before it became the subject of the *Brand X* line of cases:

The provision of Internet access service involves data transport elements: an Internet access provider must enable the movement of information between customers’ own computers and the distant computers with which those customers seek to interact. But the provision of Internet access service crucially involves information-processing elements as well; it offers end users information-service capabilities inextricably intertwined with data transport. As such, we conclude that it is appropriately classed as an “information service.”

An Internet access provider, in that respect, is not a novel entity incompatible with the classic distinction between basic and enhanced services, or the newer distinction between telecommunications and information services. . . . Internet access providers, typically, own no telecommunications facilities. Rather, in order to provide those components of Internet access services that involve information transport, they lease lines, and otherwise acquire telecommunications, from telecommunications providers . . .⁴⁴

⁴² *Id.* ¶¶ 76-77 (“Internet access providers typically provide their subscribers with the ability to run a variety of applications, including World Wide Web browsers, FTP clients, Usenet newsreaders, electronic mail clients, Telnet applications, and others. . . . Its function seems indistinguishable from that of the database proprietor offering subscribers access to information it maintains on-site.”). This analysis illustrates the substantially changed circumstances of today. Not only was this a discussion of a third-party ISP that offered its service via common carrier facilities, but today it would be completely incorrect to characterize a broadband access provider as “indistinguishable” from other web services and applications because the broadband provider also transmits information to and from information services via their broadband connections.

⁴³ *Id.* ¶ 55 (further noting that in the then-rarer cases of an ISP that did own its own transmission facilities, “and engages in data transport over those facilities . . . it would appear in such a case that the Internet service provider is furnishing raw transmission capacity to itself.”). *See Open Internet Order* ¶ 315 (adopting this reasoning and recognizing these distinctions between third-party ISPs of the 1990s and today’s broadband internet access providers).

⁴⁴ *Stevens Report* ¶¶ 80–81 (internal citations omitted; emphases added).

As we have written previously, the “inextricably intertwined” doctrine was based on a view of ISPs that is anachronistic today – and on a type of “internet access” market that quite simply does not exist anymore. The passage above described third-party ISPs, whose entire existence was due to the *Computer II* obligations of common carriers.⁴⁵ This description, and similar ones contained in the *Stevens Report* do not apply today.⁴⁶ It is clear that the *Stevens Report* conclusions were based on, and meant for 1998-era third-party dial-up ISPs that reached their customers via common carrier facilities typically owned and operated by another entity – not the vertically integrated broadband internet access services of the carriers themselves today. This likewise explains the letter signed by Senators Ron Wyden and John Kerry, among others,

⁴⁵ Even in the *Stevens Report*, the Commission suggested that this analysis did not map cleanly onto vertically integrated facilities-based ISPs. So subsequent actions to import this analysis wholesale are the demarcation point for the Commission’s original errors made in the Powell era. *See id.* ¶ 60 (“We recognize that the question may not always be straightforward whether, on the one hand, an entity is providing a single information service with communications and computing components, or, on the other hand, is providing two distinct services, one of which is a telecommunications service. It is plain, for example, that an incumbent local exchange carrier cannot escape Title II regulation of its residential local exchange service simply by packaging that service with voice mail. Since *Computer II*, we have made it clear that offerings by non-facilities-based providers combining communications and computing components should always be deemed enhanced. But the matter is more complicated when it comes to offerings by facilities-based providers.”) (emphasis added).

⁴⁶ *See, e.g., id.* ¶ 105 (“Internet service providers and other information service providers also use telecommunications networks to reach their subscribers, but they are in a very different business from carriers. Internet service providers provide their customers with value-added functionality by means of computer processing and interaction with stored data. They leverage telecommunications connectivity to provide these services, but this makes them customers of telecommunications carriers rather than their competitors.”) (emphasis added). This is an assumption and conclusion that shows the Commission’s thinking in 1998 is completely inapt for today’s market, as facilities-based broadband access services have obliterated the need for LEC connectivity to reach a third-party ISP. There is no such thing anymore, something that shows they were in fact competitors to telecommunications carriers; *see also id.* ¶ 102 (“‘Telecommunications services’ provide the basic transmission functionality that enables customers in rural and high-cost areas to connect to the rest of America. These services also enable users to reach Internet access providers[.]”). This clearly shows the difference between what the Commission was considering in 1998 – dial-up ISP services reached via the PSTN – and today’s broadband access market.

which the *Notice* foolishly portrays as supporting Chairman Pai’s positions.⁴⁷ That letter’s reference to ISPs obviously specified the same third-party providers that were far and away the predominant internet access portals of the day.

This is all made even more clear by another Commission opinion that came a few months later than the *Stevens Report*. The 1998 *Advanced Services Order* shows that the Commission had not in fact reversed its prior findings in the *Frame Relay Order*, and that it still viewed broadband transmission and information services as extricable offerings when provided by a facilities-based carrier. As the Commission noted:

Incumbent LECs have proposed, and are currently offering, a variety of services in which they use xDSL technology and packet switching to provide members of the public with a transparent, unenhanced, transmission path. Neither the petitioners, nor any commenter, disagree with our conclusion that a carrier offering such a service is offering a “telecommunications service.” An end-user may utilize a telecommunications service together with an information service, as in the case of Internet access. In such a case, however, we treat the two services separately: the first service is a telecommunications service (e.g., the xDSL-enabled transmission path), and the second service is an information service, in this case Internet access.⁴⁸

Despite having concluded in these early analyses that broadband internet access offered by a facilities-based DSL provider constituted two separate services (a telecommunications service along with an information service or suite of information services), the Commission reversed this conclusion in the 2002 *Cable Modem Order*⁴⁹ when it decided that cable broadband was a unitary information service. It was that 2002 order that represented a departure from the Commission’s past theory and practice – not the 2015 *Open Internet Order*, which returned to

⁴⁷ *Notice* ¶ 9.

⁴⁸ *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, CC Docket No. 98-147, Memorandum Opinion and Order and Notice of Proposed Rulemaking, 13 FCC Rcd 24011, ¶ 60 (1998) (“*Advanced Services Order*”).

⁴⁹ *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities*, GN Docket No. 00-185 & CS Docket No. 02-52, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798 (2002) (“*Cable Modem Order*”).

earlier precedent from the 1990s – and it was likewise the *Cable Modem Order* that departed from Congress’s functional approach to categorizing communications and information services.

For much of its history, the cable industry received vastly different regulatory treatment than the wireline telecommunications industry did, because cable historically offered a one-way communications technology similar to over-the-air broadcasting. But by 1999, there were 1.4 million cable modem lines in the United States.⁵⁰ Clearly, these systems offered two-way communications, and nothing in the Act suggested that they should be treated differently simply because the transmission medium used packet-switching rather than circuit-switching or because the operator transmitted data over cable facilities rather than traditional telephone networks. In fact, as we indicated above and return to below, the 1996 Act defines a telecommunications service as the offering of telecommunications “regardless of the facilities used.”⁵¹ Thus, the 1996 Act clearly demonstrates an awareness of convergence. Congress expected that the cable plant would be used for common carrier services, and it provided common carriers a less regulatory method for entering the pay-TV market. The 1996 Act focuses on the nature of the service at issue rather than the physical facility, and it suggests that like services should be treated alike.⁵²

Somehow the Commission lost track of all of this history and common sense when it adopted the *Cable Modem Order*⁵³ and *Wireline Broadband Order*.⁵⁴ Both of those orders, like

⁵⁰ See Federal Communications Commission, Wireline Competition Bureau, *High-Speed Services for Internet Access as of June 30, 2000*, Table 1 (2000).

⁵¹ 47 U.S.C. § 153(53).

⁵² See “Telecommunications Act of 1996,” Conference Report, Rpt. No. 104-230, at 169 (1996) (“*Conference Report*”) (“This amendment is not intended to affect Federal or State regulation of telecommunications service offered through cable system facilities, or to cause dial-up access to information services over telephone lines to be classified as a cable service.”).

⁵³ Commissioner Copps’ Dissenting Statement on the *Cable Modem Order* illustrates the predetermined nature of that ruling, which he called “uneasy with its own conclusions.” As Commissioner Copps noted, “Just in case we are wrong, and access requirements were to apply, they are waived, on the Commission’s own motion, with neither notice nor comment. And . . .

the current *Notice*, ignore or misstate the history of the 1996 Act and the state of the industry when it was adopted. So the *Notice* rather comically bases its improper conclusions on aspects of internet access service that have changed completely since the 1990s; but conveniently ignores the parts of the analysis that were consistent in the 1998 report and again in the 2015 order about facilities-based providers. Chairman Pai adopts this backward approach because he made up his mind – long before the present docket opened and this record was compiled – not to listen to statements regarding the proper classification of telecommunications carriers and services.

In both the *Cable Modem Order* and *Wireline Broadband Order*, the Commission improperly claimed the average user at the time saw broadband as a functionally integrated information service with no telecom service component.⁵⁵ It said the data transmission component of this service was typically accompanied by services like email, newsgroups, and webpage creation.⁵⁶ Focusing on these latter services, it argued that when consumers buy internet access they purchase the ability to “run a variety of applications”⁵⁷ not connectivity to the Internet. Indeed, it posited that broadband subscribers “usually d[id] not need to contract separately with another Internet access provider to obtain discrete services or applications, such as an e-mail account.”⁵⁸ It made these findings in 2002 when it issued the *Cable Modem Order*,

the NPRM adopted today also takes steps to ensure that these services remain deregulated in the face of any court opinion to the contrary. Even if cable modem services are found by the courts to be subject to regulation, the Commission would forbear from enforcing those obligations.”

⁵⁴ *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, CC Docket No. 02-33, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853 (2005) (“*Wireline Broadband Order*”).

⁵⁵ *Cable Modem Order* ¶ 39; *Wireline Broadband Order* ¶ 14.

⁵⁶ *Cable Modem Order* ¶¶ 36–38.

⁵⁷ *Id.* ¶ 36.

⁵⁸ *Id.* ¶ 11.

and subsequent orders did not revisit them or seek new evidence.⁵⁹ Yet the record on which the *Cable Modem Declaratory Ruling* rested was largely developed in late 2000.⁶⁰

And though the 2005 *Wireline Broadband Order* came nine years after adoption of the 1996 Act, it still came at a time when dial-up was the main internet access technology.⁶¹ As detailed above, each of these findings is inapplicable to today's services, and the *Open Internet Order* was right to reverse them – consistent with, rather than despite, the findings and the terminology utilized in the *Stevens Report*. In these Title I decisions, the Bush FCC also predicted that classifying broadband internet access as an integrated information service would promote both inter- and intramodal competition,⁶² and that third-party ISPs would continue to gain access to last-mile facilities not via a regulatory obligation but thanks to the facilities owner's economic self-interest.⁶³

⁵⁹ *Wireline Broadband Order* ¶¶ 5, 12–17 & nn.32, 36–44; *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, WT Docket No. 07-53, Declaratory Ruling, 22 FCC Rcd 5901, ¶¶ 25–26 & n.68 (2007) (“*Wireless Broadband Order*”); *id.* ¶ 31 (citing only the *Cable Modem Order* in support of its claim that wireless broadband access service is an integrated information service, and asserting without support that users do not pay for “a distinct transmission service”).

⁶⁰ See, e.g., *Inquiry Concerning High Speed Access to the Internet over Cable and Other Facilities*, GN Docket. No. 00-185, Public Notice, 15 FCC Rcd 19730 (2000).

⁶¹ Approximately 32 percent of Americans had broadband access, but 38 percent had dial-up. And the 2005 framework came from the 2002 decision, when half the people in America had Internet at home, but only one-fifth of those (or 10 percent of the total) had broadband. That decision in turn was based on a record established when only 5 percent had broadband. See John B. Horrigan, “Home Broadband Adoption 2006,” Pew Internet & American Life Project, (May 28, 2006); U.S. Census Bureau “Computer and Internet Use in the United States” (May 2013).

⁶² See, e.g., *Wireline Broadband Order* ¶ 61 (“As any provider increases its market share or upgrades its broadband Internet access service, other providers are likely to mount competitive challenges, which likely will lead to . . . more choices, and better terms.”).

⁶³ See, e.g., *Wireline Broadband Order* ¶ 63 (“[T]he record shows that incumbent LECs would and indeed already do provide such access, albeit through arrangements other than a mandatory tariff regime”); *id.* ¶ 64 (“[W]e expect that facilities-based wireline carriers will have business reasons to continue making broadband Internet access transmission services available to ISPs The record makes clear that such carriers have a business interest in maximizing the traffic on their networks, . . . [C]able operators, which have never been required to make Internet

These predictions were both completely wrong, in spectacular fashion. So too were the *Cable Modem Order*'s predictions that there would be no concerns about open Internet violations on the cable modem platform,⁶⁴ and that if there were, ancillary authority would be enough to stop bad practices.⁶⁵ The *Comcast v. FCC* case shortly proved these predictions to be wrong as well – both in terms of the wishful suggestion that no cable operator would ever slow

access transmission available to third parties on a wholesale basis, have business incentives similar to those of incumbent LECs to make such transmission available to ISPs We believe that [market factors] will sustain and increase competitive choice among broadband providers and Internet access products.” (emphases added); *id.* ¶¶ 74-75: (“[W]e expect that wireline broadband transmission will remain available to [third-party] ISPs Incumbent LECs have represented that they not only intend to make broadband Internet access transmission offerings available to unaffiliated ISPs . . . , but that they have business incentives to do so. . . . We find[] these incentives significant, and therefore disagree with the contention of some commenters that a mandatory common carrier broadband transmission requirement is essential for independent ISPs to obtain wireline broadband transmission that meets their needs at reasonable prices.”) (emphases added).

⁶⁴ See *Cable Modem Order* ¶ 87 (“We note that we are unaware of any allegation that a cable operator has denied ‘click through’ access to other ISPs[.] Moreover, although it is technically feasible for a cable operator to deny access to unaffiliated content, or to relegate unaffiliated content to the ‘slow lane’ of its residential high-speed Internet access service, we are unaware of a single allegation that a cable operator has done so.”)

⁶⁵ See *Cable Modem Order*, Separate Statement of Chairman Michael K. Powell (“The Commission is not left powerless to protect the public interest by classifying cable modem service as an information service. Congress invested the Commission with ample authority under Title I. That provision has been invoked consistently by the Commission to guard against public interest harms and anti-competitive results. It was this Commission that promulgated *Computer I*, *Computer II* and, *Computer III*, (all under Title I) in an effort to protect against public interest harms, all with the blessing of judicial review and court sanction of its ancillary authority. Additionally, Title VI is a direct progeny of the Commission’s assertion of jurisdiction over cable services under its Title I authority and has regulated cable extensively for a number of years under that authority. This exercise, too, was approved by the Supreme Court as within the congressional scheme. There is no basis to conclude that Title I is inadequate to strike the right regulatory balance. The Commission’s willingness to ask searching questions about competitive access, universal service and other important policy issues demonstrates its commitment to explore, evaluate and make responsible judgments about the regulatory framework.”).

down or block a service like BitTorrent, and the hope that ancillary authority would be enough.⁶⁶

It was, therefore, the Bush-era Commission that changed course in its 2002 and 2005 rulings, based on the foolish expectation that the provision of basic transmission would continue to be available to over-the-top third-party ISPs like AOL or EarthLink. That simply did not happen, and it took until the 2015 *Open Internet Order* to set the framework right again.

Despite cable and phone company promises in the mid-2000s not to kill off an adjacent market for over-the-top ISPs, which relied on access to broadband facilities to reach their own customers, the cable and phone companies moved swiftly to cut them off. The Bush-era Commission's fanciful predictions of nondiscriminatory carriage under Title I did not come true. Instead of the robust consumer choice predicted by the three main Title I classification orders, internet users faced (and still today face) painfully limited options. Typically they have at most two facilities-based options, and too often only one option at the fastest speeds (though that situation has improved since 2015); and no real choices among non-facilities-based providers.

The Commission's mid-200s policy mistakes, which the Pai Commission now rushes to repeat, helped incumbents break their promises and kill off an entire industry in order to favor their own vertically integrated broadband internet access businesses. Why should we believe that in the absence of a strong, legally sustainable nondiscrimination obligation set back in place by the *Open Internet Order*, these same incumbents won't do the same to other online services that threaten their legacy businesses? We've got all the evidence we need that before the 2015 *Order*,

⁶⁶ *Comcast Corp. v. FCC*, 600 F.3d 642 (D.C. Cir. 2010); *Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* WC Docket 07-52, Memorandum Opinion and Order, 23 FCC Rcd 13028, ¶¶ 41–53 (2008) ("*BitTorrent Complaint Order*").

with the disappearance of the third-party ISP services described by the *Stevens Report* in the absence of common carrier protections. Yet despite this knowledge, the Commission is once again proposing to adopt a legal standard that would actually permit and encourage discriminatory treatment against online content companies.

The Commission remedied these mistakes in the *Open Internet Order*, and must not reverse course with the tentative proposal in the *Notice*. Sticking with Title II will provide certainty both to carriers and online content providers, retaining clearer boundaries for these industry participants than any *ad hoc* or alternative theory of broadband classification could.

4. Title II Reclassification Did Not Place ISPs Under “Utility-Style” Regulation Nor Give the Government Control over the Internet.

The *Notice*'s hyperbolic claim that the 2015 order “decided to apply utility-style regulation to the Internet,” which “represented a massive and unprecedented shift in favor of government control of the Internet” is further evidence of the purely political nature of Chairman Pai's project.⁶⁷ This lie rests on than deceptive word-games that this Chairman or any self-respecting lawyer should refuse to play. As Free Press has demonstrated in prior submissions, and as the actions of the Commission have shown in the two years since the 2015 order, Title II reclassification did not touch content, applications, services, and speech on the internet. It merely reestablished a light-touch framework for protecting broadband users' access to it.

“Utility-style” regulation appears nowhere in the Communications Act. Whatever that made-up term is supposed to mean in the context of federal communications law, the agency does not set broadband rates, does not require carriers to file either pricing plans or terms of

⁶⁷ *Notice* ¶ 3.

service in advance, does not require Section 251 unbundling,⁶⁸ and does not require BIAS providers to serve all customers within their territories.

The FCC rightly returned to Title II because broadband internet access service is what the Communications Act defines as a “telecommunications service.” As explained above, in the discussion of forbearance under Section 332 and then Section 10 of the Act, that classification properly recognizes the nature of the service and the importance of preventing unreasonable discrimination by entities that provide it. No other obligations attach automatically; and the Commission knows full well that the *Open Internet Order* with its extensive forbearance simply allowed internet users to access sites, applications, and content of their choosing without undue interference from broadband providers.

It is important to pause here, and explain what the Commission has not used Title II to do with respect to BIAS. Its practice since 2015 matched the Commission’s practice in the context of overseeing many (relatively) competitive telecom service markets during the past quarter century. As it has with a wide slate of wireless voice (or “CMRS”) services, enterprise broadband services, and retail rural DSL services that remained voluntarily under Title II even before the 2015 reclassification, the Commission did not impose on broadband providers any rate regulations, tariff requirements, resale obligations, or other such supposed (but misnamed) “utility” rules. The results for broadband providers matched exactly what the Commission promised with the *Open Internet Order*’s forbearance.⁶⁹ They also matched exactly what Free Press explained was the likely outcome, based on the application of Title II to what obviously

⁶⁸ See *Open Internet Order* ¶ 37.

⁶⁹ See *id.*

remain telecom services (like wireless voice calling) but that have been largely deregulated now for decades.⁷⁰

We return once more below to Chairman Pai’s sham notion that Title II regulates “the internet.” His subterfuge is distressing in its deceit, but it’s ultimately ineffective. In Part III(A), we explain that the people and enterprises offered broadband internet access understand that service to be transmission, hence, telecommunications service. They also understand, across party lines and the political spectrum, that nondiscrimination rules keeping the internet free from cable gatekeepers’ interference are a boon not a burden for free speech and commerce online. And they even understand broadband internet service to be as essential as other traditional utilities in the modern world. Yet whatever internet users understand and want the service to be, there is zero support for the *Notice*’s dishonest claim that Title II regulates BIAS – let alone “the internet” itself – as a utility.

5. The *Notice* Mischaracterizes the Net Neutrality Line of Cases in the DC Circuit.

A line of D.C. Circuit cases show that Title II is the only sound authority upon which to build effective Net Neutrality rules. The *Notice* glosses over the string of failed attempts by the Commission to defend Net Neutrality rules absent Title II.⁷¹ We defend the application of and the need for Title II below, but will briefly recount the cases here.

The Commission’s decision to reclassify broadband internet access as a Title I information service opened the door for cable companies to begin experimenting with throttling and blocking websites and other online content and applications. Without the proper legal

⁷⁰ See Free Press 2014 Comments at 43–46; see also Reply Comments of Free Press, GN Docket No. 14-28, at 4 n.2, 28–30 (filed Sept. 15, 2014) (“Free Press 2014 Reply Comments”).

⁷¹ *Notice* ¶¶ 6-22.

authority to enact strong and clear rules, the Commission floundered in its attempts to protect broadband customers from these ISP excesses.

In 2005 the FCC adopted the “Internet Policy Statement” which among other things committed the FCC to protecting consumers’ ability to “access the lawful internet content of their choice.”⁷² This policy statement was grounded on merely the Commission’s ancillary authority – which proved hardly a solid foundation for the rules – and broadband companies took advantage. The new *Notice* glosses over Comcast’s subsequent contravention of this policy in 2007 when it began blocking its subscribers’ access to peer-to-peer networking applications.⁷³

After a period of public comment the Commission found that Comcast was indeed engaged in blocking peer-to-peer networking applications, and ordered the company to make disclosures to the Commission regarding how it would manage its network going forward. Comcast complied and stopped its blocking, but challenged the order. And as the *Notice* acknowledges, the shaky foundation of the Internet Policy Statement collapsed at the D.C. Circuit in 2010.⁷⁴

The Commission’s second attempt to promulgate Net Neutrality rules without Title II also failed. The 2010 edition of the open internet rules attempted to use the Commission’s Section 706 authority to adopt rules against blocking and unreasonable discrimination (or at least, discrimination by wired broadband providers). The *Notice* calls the Commission’s reliance on Section 706 authority a rejection of “more heavy-handed” regulation.⁷⁵ Yet, with their reliance on Section 706, the D.C. Circuit vacated the no-blocking rule, reasoning that since “the

⁷² *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, CC Docket No. 02-33, Policy Statement, 20 FCC Rcd 14986 (2005) (“*Internet Policy Statement*”).

⁷³ See generally *BitTorrent Complaint Order* ¶¶ 2–11.

⁷⁴ See *Comcast Corp. v. FCC*, 600 F.3d at 644.

⁷⁵ *Notice* ¶ 19.

Commission has chosen to classify broadband providers in a manner that exempts them from treatment as common carriers, the Communications Act expressly prohibits the Commission from nonetheless regulating them as such.’’⁷⁶

This is an eminently logical proposition – that the Commission may only treat BIAS providers as common carriers if it classifies them as such. Attempting to hold BIAS providers to anything like real Net Neutrality rules without grounding them on Title II is doomed to fail. So when finally, in 2015, the Commission restored the rule of law and returned BIAS to its rightful Title II classification, the Open Internet rules won the day in court. By treating broadband once again as the essential telecommunications service it is, the Commission was able to adopt effective Net Neutrality protections. Despite the *Notice*’s attempt to downplay the DC Circuit’s subsequent ratification of the *Open Internet Order*, that court ratified it again *en banc* in 2017.⁷⁷

This history is vital to understanding what the Commission is attempting to do in this *Notice*. At best, the Commission is engaged in a pointless and likely fruitless attempt to refashion open internet rules under Section 706 or a different authority. Or, as we suspect, the Commission is well aware of the limits to its authority for such rules without Title II, and it wants to fail in its efforts to preserve any rules whatsoever while professing admiration for the vague concept of an open internet. The Pai Commission wants to turn its back entirely on a wide range of internet user protections and communications rights, including but not limited to Net Neutrality and nondiscrimination on the telecommunications network. That is the *Notice*’s clear intent, and the only possible outcome if the Commission once again abandons reason and Title II along with it.

⁷⁶ *Verizon v. FCC*, 740 F.3d 623, 628 (D.C. Cir. 2014) (vacating the “anti-discrimination and anti-blocking rules” because “the Commission has failed to establish that the[serules] do not impose *per se* common carrier obligations”).

⁷⁷ *US Telecom Ass’n. v. FCC*, 825 F.3d 674 (D.C. Cir. 2016), *reh’g en banc denied*, No. 15-1063 (D.C. Cir. May, 1 2017) (“*US Telecom Ass’n En Banc Denial*”).

II. Net Neutrality Rules Depend on Common Carriage Because Net Neutrality Is an Outcome of Common Carriage Law.

The debate the *Notice* lays out around Title II reclassification, however, begins on a contrary and disingenuous note. Boosters of the plan outlined in the *Notice*, like Comcast⁷⁸ and Chairman Pai himself, have attempted to make the case that something like Net Neutrality is possible without Title II, and that an agency like the Federal Trade Commission might sufficiently control the harmful behavior of the broadband ISPs.⁷⁹ This is fundamentally mistaken. There is no Net Neutrality in present law outside of Title II's common carrier framework, and there is no need to look for or invent some other foundation for these rules.

Network Neutrality is an outcome produced in part by common carriage; in part by abundance; and in part by competition. This outcome flows from common carriage's core principle of nondiscrimination. Public policy, guided by the Communications Act, is the tool to implement this principle. Therefore, the Commission's proposal to turn away from common carriage once again means it would never be able to preserve the open internet until it corrects the classification mistake it now pledges to repeat. There is no longer any gray area. There is common carriage under Title II, and its standard of no unjust or unreasonable discrimination; and there is private carriage, and its standard of allowing what the *Verizon* court called "substantial room for . . . discrimination in terms."⁸⁰

As documented above, facilities-based providers of two-way communications services have always been thought of as common carriers, whether they were transporting voice or data

⁷⁸ See David L. Cohen, "Comcast Supports Net Neutrality and Reversal of Title II Classification. Title II is Not Net Neutrality" (Apr. 26, 2017), <http://corporate.comcast.com/comcast-voices/comcast-supports-net-neutrality-and-reversal-of-title-ii-classification-title-ii-is-not-net-neutrality>.

⁷⁹ See Jon Brodtkin, "'Unenforceable': How voluntary net neutrality lets ISPs call the shots" *Ars Technica* (Apr. 11, 2017), <https://arstechnica.com/tech-policy/2017/04/unenforceable-how-voluntary-net-neutrality-lets-isps-call-the-shots/>.

⁸⁰ See *Verizon v. FCC*, 740 F.3d at 652.

communications. Indeed, the *Verizon v. FCC* decision speaks of “the Commission’s long history of subjecting to common carrier regulation the entities that controlled the last-mile facilities over which end users accessed the Internet.”⁸¹ But this all changed with the *Cable Modem Order*, and the subsequent *Wireline Broadband Order* and *Wireless Broadband Order*.

With its decision in *Verizon v. FCC*, the court did not find that broadband providers are not common carriers. What it ruled is that the Commission had to stop pretending it could regulate broadband providers as common carriers without first reclassifying them as such. But with this *Notice*, it appears that pretending is what the Commission proposes to do, yet again.

Any controversy ought to have been settled by the 2015 *Open Internet Order*. The “roadmap” set out by *Verizon v. FCC* is clear. A prohibition on unreasonable discrimination that applies to a broadband carrier’s transmission of any and all content, and to its interactions with its actual end-user customers, is a prohibition that can only be applied to common carriers. The *Verizon* court in 2014, writing before reclassification the following year, had “little hesitation in concluding that the anti-discrimination obligation imposed on fixed broadband providers has ‘relegated [those providers] . . . to common carrier status.’”⁸²

The court merely confirmed what we’ve known all along to be true: nondiscrimination, which is the entire point of Net Neutrality, is a common carrier obligation. This means that the Commission cannot adequately protect Net Neutrality without using Title II authority. Preventing blocking or discrimination after the fact still would be the imposition of a common carrier duty on an entity that the Commission had (wrongly) called a non-common carrier.

⁸¹ *Id.* at 638.

⁸² *Id.* at 655.

III. Broadband Internet Access Services are Telecommunications Services that should be Governed Under Title II.

To the extent that there could be any factual and legal basis for the Commission to reverse course on the *Open Internet Order's* Title II classification, it rests on the *Notice's* claim that BIAS is in fact an information service. *The Notice* bends over backwards attempting to substantiate this claim, leaning on old and debunked lines of reasoning wisely discarded in the Commission's last open internet proceeding. It notably falls back on the *2002 Cable Modem Order's* argument that for cable internet providers the "telecommunications component is not, however, separable from the data-processing capabilities of the service," and is therefore an information service, "regardless of whether subscribers use all of the functions provided as part of the service, such as e-mail or web-hosting, and regardless of whether every cable modem service provider offers each function that could be included in the service."⁸³ *The Notice* even dredges up the argument that since broadband customers may not know the precise geographic "points" or locations of the servers with which they are communicating, BIAS simply cannot be a telecommunications service.⁸⁴

The Commission then asserts, without evidence that "[w]e believe that consumers want and pay for these functionalities that go beyond mere transmission – and that they have come to expect them as part and parcel of broadband Internet access service."⁸⁵ Recently completed surveys show that this does not fit the reality of consumer expectations for their broadband providers. The truth is that broadband providers hold themselves out as conduits to the internet; users see their broadband internet access service as an offer of transmission; and this service fits squarely within the Communications Act's definition of a telecommunications service.

⁸³ *Notice* ¶ 11.

⁸⁴ *Id.* ¶ 29.

⁸⁵ *Id.*

Free Press has addressed all these points in detail in our prior filings on Net Neutrality. We reiterate them below for the current Commission's edification.

A. Broadband Providers Hold Themselves Out to Offer Transmission Services, and the Public Likewise Understands Them to Provide Transmission That Must Be Protected by Rule from Undue Interference.

As Public Knowledge, the Benton Foundation, and Access Sonoma Broadband catalogued in their 2014 open internet comments. ISPs, “advertise their services primarily in terms of the speed and reliability with which they can transmit data to and from third parties.”⁸⁶

Nothing has changed in the three years since those comments were filed. Broadband providers still sell transmission to the wider internet without interference, and customers expect to receive that service. Broadband providers' current offerings and the marketing pitches for them make this abundantly clear: Comcast's Xfinity in its current campaign advertises the fact that users can “[e]njoy consistently fast speeds even during peak hours, when everyone's online.”⁸⁷ AT&T's internet service page solely advertises its various download speed tiers and its “blazing fast fiber internet.”⁸⁸ Verizon Fios centers its campaign on messages about its “revolutionary speed at a revolutionary price.”⁸⁹ It is undeniable that these companies hold themselves out as selling transmission, and a connection to the internet. Again, these companies are not “the internet,” they sell access to it. Regulating their practices is common-sense regulation of that access; it is not “regulating the internet,” as the *Notice*'s propaganda pretends.

Internet users agree with the ISPs' ads, not the *Notice*'s claims. They certainly perceive the offering as one of telecommunications, which is “transmission, between or among points

⁸⁶ See Comments of Public Knowledge, the Benton Foundation, and Access Sonoma Broadband, GN Docket No. 14-28, at A-1 (filed July 15, 2014).

⁸⁷ Comcast Xfinity advertisement, <https://www.xfinity.com/locations/internet-service/district-of-columbia/washington.html> (last visited July 10, 2017).

⁸⁸ AT&T advertisement, <https://www.connecttoatt.com/internet.html> (last visited July 10, 2017).

⁸⁹ Verizon advertisement, <http://fios.verizon.com/> (last visited July 10, 2017).

specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received" – and that is true "regardless of the facilities used."⁹⁰ A poll released on July 10, 2017, conducted by Freedman Consulting and Civis Analytics, shows that internet users understand BIAS in just this way. A full 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."⁹¹

A second poll, released on July 13, 2017 and conducted by Republican consulting firm IMGE, found that by more than a 2 to 1 margin, Trump voters believe that "Internet should be treated like any other utility such as gas or electric service."⁹² Now, as explained above, Title II is not "utility regulation," as that term has no meaning in this context or in the relevant portions of the federal communications law. But apparently, Trump voters are studying neither the legislative history and textual niceties of the 1996 Act, nor the relentless – and ridiculous – talking points created by the cable industry and so warmly embraced by Chairman Pai. When poll respondents indicate that they believe broadband is essential and "should be treated like any other" essential service, they must understand that to mean universal service and nondiscriminatory access offered on just and reasonable terms.

These surveys, released in the week before these initial comments were due, also demonstrate tremendous popular support across the political spectrum for the current rules that

⁹⁰ See 47 U.S.C. § 153(50), (53).

⁹¹ Freedman Consulting, LLC, "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 ("Freedman Poll") (emphasis added).

⁹² IMGE, "Open Internet Survey: Key Findings," at 3 (July 13, 2017), <http://www.incompas.org/files/IMGEInsights-Presentations-KeyFindings-1c.pdf> ("IMGE Poll"). The IMGE poll revealed that more than 70 percent of voters agree that "Internet service is a necessity like water or power at your home." *Id.* The breakdown on the "utility" question was 58 percent of Trump voters agreeing, with just 28 percent disagreeing.

Ajit Pai proposes to tear down. Both the numbers and the questions that generated them are of tremendous importance, politically but also legally, because these poll participants did not merely espouse support for vague principles and voluntary commitments. 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.”⁹³ It then asked respondents: “Do you agree that it is necessary for internet service providers to continue to follow these rules?”⁹⁴ Not only did 75 percent of all voters agree that these rules are necessary, but so did 72 percent of Republican voters and 75 percent of Trump voters.⁹⁵ 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 do 73 percent of Republicans.⁹⁶

The strong bipartisan support for Net Neutrality rules, and a deep understanding that likewise crosses party lines about the nature of the telecommunications services on offer, may shock some lobbyists and lawmakers hiding inside the beltway. It certainly should serve as wake-up call to the authors of the spectacularly out-of-touch *Notice* in this docket. But in reality, it comes as no surprise. It’s not just the Members of Congress who passed the 1996 Act on an overwhelmingly bipartisan basis that understood the essential nature of broadband telecom services, and the need to ensure nondiscriminatory outcomes regardless of the technology used to deliver such services. It was the leaders of organizations on the right and the left alike, who joined together when Verizon Wireless blocked text messages from a pro-choice group, agreeing

⁹³ *Id.* at 2.

⁹⁴ *Id.* (emphasis added).

⁹⁵ *Id.*

⁹⁶ Freedman Poll at 1 (emphasis added).

that “[i]f corporations can't tell Americans what to say on a phone call, they shouldn't be able to control content or tell us what to say in a text message, an e-mail or anywhere else.”⁹⁷

Just as the leaders of these organizations inherently understood, Net Neutrality on broadband access networks is not government regulation of “the internet,” any more than nondiscrimination laws for the telephone network are government regulation of what people say on the phone. If only the great legal minds and decision-makers currently running the Commission into the ground had the same innate understanding of the law they are charged to implement, we’d be in a far better place now.

The heads of the Christian Coalition and NARAL both understood “the potential for discrimination in communications and [] the impact it could have on how we engage in political advocacy in an ever-evolving technological world.”⁹⁸ The surveys released last week show that outsized majorities still understand the need for Commission rules, grounded on the nondiscrimination law in Title II and backed by the principles of common carriage – whether or not they know and cite by name the laws on which they have come to depend.

B. Broadband Access Providers Offer A Transmission Service to the Public That Transmits Information of the Users’ Choosing Among Points of Their Choosing Without Change in the Form or Content of that Information.

In the *Notice*, the Commission stipulates that broadband providers offer services “beyond mere transmission” and that consumers demand those services.⁹⁹ They may in fact do so, but the point is that any information services they may offer are not inextricably intertwined with the transmission service that BIAS clearly offers. As we have stated in our prior submissions, that broadband internet access service itself does not in fact change the form or content of the information that broadband users send to and receive from each other. For if it did, many of the

⁹⁷ See Keenan and Combs, “Can You Hear Us Now?” *supra* note 20.

⁹⁸ *Id.*

⁹⁹ *Notice* ¶ 30.

online services that are widely used would not function properly. The claim that “protocol-processing for internetworking”¹⁰⁰ turns what is a transmission service into an information service is as wrong now as it was in 2014 and before.

The Commission knows better. As we explained in our 2014 comments, proper analysis of the issue begins with an application of the *NARUC I* test to demonstrate that broadband access services are common carrier services, not private carrier services. As established by *NARUC I*, and affirmed in subsequent cases, “common carrier status turns on: (1) whether the carrier ‘holds himself out to serve indifferently all potential users’; and (2) whether the carrier allows ‘customers to transmit intelligence of their own design and choosing.’”¹⁰¹

As to the first prong, from the perspective of the public, the service is held out for a fee indifferently to all potential users. You only need to look at the broadband providers’ websites, commercials, spam, and junk mail that fills your mailbox to see that this is the case. These offerings are made and marketed in the same exact fashion that other common carrier offerings are made. There’s no “call us to discuss terms” clause in these websites, commercials, or flyers: just the rates, terms, and conditions listed for any and all takers.¹⁰²

As to the second prong, which this *Notice* seems determined to twist into a pretzel, the service that broadband access providers offer does allow the user to transmit information of her own design and choosing. Comcast does not pick the information that its broadband customers transmit in the same way that it selects the channels to put on its pay-TV cable service. The

¹⁰⁰ *Id.*

¹⁰¹ See *U.S. Telecom Ass’n v. FCC*, 295 F.3d 1326, 1329 (D.C. Cir. 2002); *Virgin Islands Tel. Co. v. FCC*, 198 F.3d 921 (D.C. Cir. 1999); *Nat’l Ass’n of Regulatory Utility Comm’rs v. FCC*, 533 F.2d 601, 608-09 (D.C. Cir. 1976) (“*NARUC IP*”); *Nat’l Ass’n of Regulatory Utility Comm’rs v. FCC*, 525 F.2d 630, 642 (D.C. Cir. 1976) (“*NARUC F*”).

¹⁰² See generally Eli M. Noam, “Beyond Liberalization II: The Impending Doom of Common Carriage,” 18 *Telecomm. Pol’y* 435 (1994).

broadband customer is in complete control of what information she transmits over the service. An AT&T U-Verse subscriber does not rely on AT&T to select which websites he may visit, or what videos he can upload to YouTube; the customer is in control of those transmissions, by his own design and choosing. In other words, mass-market broadband access is not private telecommunications carriage (prong 1) and it is not a cable or broadcasting service (prong 2).

Broadband internet access is thus a common carrier service. From a non-technical perspective, of course the service transmits information without a change in the form or content of the information as sent and received. If a consumer subscribes to a cloud storage service, the photos and files she uploads and downloads to and from her computing device and her cloud storage provider are transmitted without change in form or content. If this was not the case, and her broadband carrier transformed this information, she would find no value in the service – and no likeness in her photos. Indeed, in this case, it is clear that the cloud company is the information service provider, offering the capability to store and retrieve information via telecommunications, while the broadband provider simply carries that information between points selected by the user.

This is true of any other situation. Your broadband provider doesn't modify the form or content of Amazon's web page when you shop for a birthday present for your best friend. Your broadband provider doesn't alter the content of the Gmail message you send to your neighbors alerting them of your upcoming yard sale, nor does it store the message on its servers: Google does. If you want to listen to your favorite album on Spotify, you use your broadband service to send a message to Spotify's servers requesting the music stream, and Spotify transmits it back to you. Your broadband carrier just transmits your request and transmits the music stream back to you. Want to take a selfie at your favorite watering hole and post it to Facebook? You use your

smartphone to take the picture, open up a photosharing app, and your mobile carrier transmits that photo just as you requested, without needing to alter it in any fashion or store the photo on its servers.¹⁰³ Want to use an over-the-top app to call your friend in Brazil, so you don't have to pay international long-distance charges? You can, and when you do, your broadband carrier does nothing more than transmit your data.

From a more technical perspective, if a broadband carrier did use protocols that modified the content or format of a customer's data, this would break the Internet and make it completely insecure. As we detailed in 2014, encryption protocols like HTTPS and IPSEC, which are critical to online commerce, would not work.¹⁰⁴ Network protocols are "transparent" by design.¹⁰⁵ They transmit information without modification, for if they did not, the applications that utilize these protocols would need to know this and act on that knowledge. Otherwise, applications would need to be rewritten any time a new implementation of a protocol that changed the data had been

¹⁰³ As we noted in our 2014 open internet comments too, whether or not the carrier works with the NSA and decides to store your information is not relevant to the Commission's determination of the appropriate classification of broadband access services.

¹⁰⁴ See Kendall J. Konig, "The Internet is a Packet-Switched Telecommunications Network," at 11 (June 27, 2013) ("The transparency of network protocols – that they transmit user-specified data without modification – is a central feature of their design, and the manifestation of a layer-driven design philosophy nearly as old as packet-switched networking itself.").

¹⁰⁵ See *id.* As Konig continued: "If protocols did modify the content or format of user data, applications using them [would] need to be aware of these changes and specifically account for them. They would also need to be redesigned whenever a new technology was used which changed the data in a different way. This would be a major impediment to the development of both new network protocols and applications; new network protocols (e.g., MPLS) could not be implemented without breaking applications, and applications would require constant maintenance to account for changes to the network. With the vast number of independently developed applications and networks, this would be a virtually impossible task. Fortunately, the Internet does not work this way. Its transparency in transmitting user data allows a wide variety of applications to be designed and implemented without the network even being aware of their existence, and innovation without coordination with, or permission from, the network provider. In fact, without this transparency widely used encrypted application protocols (e.g., HTTPS and IPSEC) would not be possible.").

deployed. If this were the case, “innovation without permission” would not be possible.¹⁰⁶

A broadband provider performs one main function: transmitting Internet Protocol (“IP”) packets between the addresses of the user’s choosing. One of the main points behind the development of the IP protocol is its separation from the application layer.¹⁰⁷ It is not enough that there is some protocol processing involved in the broadband transmission. If it were, then the PSTN would be an information service. This is why the Commission has identified three types of protocol processing¹⁰⁸ that are used for the “management, control, or operation of a telecommunications system or the management of a telecommunications service,”¹⁰⁹ and involve no net protocol conversion.¹¹⁰ When a user connects a computing device to her broadband access network, she is able to send information in the IP format to any other computer connected to the Internet. The carrier (and those carriers with which it interconnects) looks at the IP packets’ address headers and routes them on their way. This is a basic service, not an enhanced service.¹¹¹

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at 2 (“At the root of this problem is the assertion that the Internet is fundamentally an inexorably integrated information service. To a former network engineer, this claim is absurd. In fact, the separation of concerns and transparency to applications is the central architectural principle of the Internet Protocol; the Internet’s transparency to user information can be demonstrated by any competent network engineer with an Internet connection and a protocol analyzer. Of course, it is true that Internet Protocol packets contain protocol information that is processed, but this is true of any telecommunications network, including the legacy PSTN.”) (internal citations omitted).

¹⁰⁸ *In the Matter of Amendment of Sections 64.702 of the Commission’s Rules and Regulations (Third Computer Inquiry)*, Phase II Report and Order, 104 F.C.C.2d 958 (1986) (*Computer III Phase II Order*).

¹⁰⁹ 47 U.S.C. § 153(24).

¹¹⁰ See Koning, “Packet-Switched Telecommunications Network,” at 7-10.

¹¹¹ See *id.* at 11 (“The Internet Protocol is not used just for interconnecting existing provider networks; it extends all the way to the end-users of these networks. Put another way, end user devices use the Internet as a packet switched network directly; unless blocked by a firewall or similar device, every Internet connected computer can send messages to every other Internet connected computer in the same native, Internet Protocol format. More technically, the Internet is the packet switched network that receives Internet Protocol formatted packets from connected users and delivers them, immediately and unmodified, to the computer specified by the sender in

The *Notice* brings up the fatally flawed notion that since customers rely on DNS and caching when accessing the internet, broadband internet access cannot be a telecommunications services. The Commission rightfully abandoned this notion in the 2015 *Open Internet Order*. As we have previously discussed, the findings of the *Stevens Report* were largely correct but from a different era, and the shift in the common meaning of the term “ISP” since 1998 renders its pronouncements insufficient for the facilities-based broadband ISPs of today. Likewise, the faulty analyses and predictions in the *Cable Modem Order* and *Wireline Broadband Order*, that lead to the invention and embrace of this concept, are no more accurate for today’s broadband service offerings than they were then. Broadband access providers are not inextricably intertwining any information service with their telecommunications offerings.

Consider the *Wireline Broadband Order*’s finding that “where wireline broadband Internet access service enables an end user to retrieve files from the World Wide Web, the end user has the capability to interact with information stored on the service provider’s facilities.”¹¹² This finding, which serves as a major basis for the mid-2000s Title I classification decisions, is simply false. It was the case perhaps with the old walled gardens known as “Online Services,” when non-facilities-based Internet service providers such as AOL did provide a true information service over the networks of common carriers with whom those online service providers were

the destination IP address field. This is exactly the type of protocol processing *Computer III Phase II* and subsequent decisions have found constitute basic or telecommunications services, and it is in many ways indistinguishable from those which came before it. The differences, primarily that the Internet is connectionless, globally addressable, and agnostic as to the specific underlying physical transport, are not significant under the rules of the *Computer Inquiries* or therefore the 1996 Act.”).

¹¹² *Wireline Broadband Order* ¶ 9; see also *In the Matter of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, CC Docket No. 02-33, Notice of Proposed Rulemaking, 17 FCC Rcd 3019, ¶ 21 (2002) (“*Wireline Broadband NPRM*”).

not affiliated. But it certainly is not true of today's broadband access providers.¹¹³ The Commission rightly abandoned this notion in 2015, realizing that its rationale about homepages, email services, newsgroups and DNS services were all incorrect when applied to today's broadband internet access services.¹¹⁴ The developments surrounding the use of proxy caching do not in anyway alter the fundamental conclusion¹¹⁵ that the service broadband providers offer is a common carrier broadband telecommunications service.¹¹⁶ The D.C. Circuit also ratified the Commission's 2015 assessment noting, "the record contains extensive evidence that consumers perceive a standalone offering of transmission, separate from the offering of information services

¹¹³ See Koning, "Packet-Switched Telecommunications Network," at 15 ("Given the functionality of the Internet itself as a simple packet switched network, the FCC's regulatory classification of Internet access as an information service is puzzling. In its *Wireline Broadband* and related proceedings, the Commission has repeatedly stated that Internet service 'always and necessarily combines computer processing, information provision, and computer interactivity with data transport, enabling end users to run a variety of applications such as e-mail, and access web pages and newsgroups' and that they are 'inextricably intertwined[d]' It argues this is so because end users 'must have the capability to interact with information stored on the facilities of the provider of the Wireline broadband Internet access service' to use the Web. This claim, at least applied to ISPs as opposed to their market predecessors [] is demonstrably false.").

¹¹⁴ See Comments of Free Press, GN Docket No. 10-127, at 108-120 (filed July 15, 2010); see also Koning, "Packet-Switched Telecommunications Network," at 18 ("Not only is it technically possible to access websites by specifying a destination IP address rather than an Internet hostname, DNS service is itself provided using the Internet Protocol network and therefore can be provided by any third party."); see also *US Telecom Ass'n. v. FCC*, 825 F.3d at 705-06.

¹¹⁵ See Koning, "Packet-Switched Telecommunications Network," at 15 ("Nevertheless, intercepting proxy caches do not alter the fundamental nature of Internet service overall. Intercepting proxies are, by their very nature, not explicitly requested by end-users; they are operated by the ISP for its own benefit to reduce usage of its congestible network resources. This means that caching servers must impersonate remote servers as closely as possible to avoid myriad issues that can otherwise arise from this invisible and unrequested intermediation. . . . [I]ntercepting proxy servers are not inextricably intertwined with the network; they are an optional addition, operate only with the implicit consent of users, and have largely been supplanted by CDNs[.]").

¹¹⁶ Even if for some reason the Commission cannot or will not find that the access service is a telecommunications service, it still has the legal authority to require that the underlying transmission component be offered on a common carrier basis. See *Southwestern Bell Tel. Co. v. FCC*, 19 F.3d 1475, 1481 (D.C. Cir. 1994); *AT&T-SSI*, Memorandum Opinion and Order, 13 FCC Rcd 21585, ¶¶ 8-9; *NORLIGHT Request for Declaratory Ruling*, 2 FCC Rcd 132, ¶ 14 (1987); *NARUC II*, 533 F.2d at 608-09; *NARUC I*, 525 F.2d at 640.

like email and cloud storage.”¹¹⁷ Returning to a factually incorrect assessment of these services is further evidence of the current Commission’s politically motivated reasoning for this do-over.

Despite these technical and legal realities outlined above, the *Notice* entertains the ludicrous proposition that broadband is an information service because it allows internet users to access other information services.¹¹⁸ To quote one of the main characters in that beloved family comedy film “The Hangover,” this idea is “literally too stupid to insult.” First, it reads right out of the statute the fact that “information services” must by definition be obtained “via telecommunications.”¹¹⁹ One might quibble, as litigants in *Brand X* and its progeny did, over whether broadband providers make an offer of telecommunications (and hence provide a telecom service). But there is no rational basis to pretend that every transmission of information becomes an information service. It is obvious that this Commission wishes to make nondiscriminatory telecommunications services disappear, but it’ll need a better magic trick than this amateur ruse to obliterate the distinction between these congressionally created service categories.

In the end, the *Notice*’s farcical suggestion on this score is akin to claiming that a telephone network is an information service because it allows “a [telephone] user . . . to generate and make available information [on the telephone].”¹²⁰ Or that the telephone network is an information service because “reading a newspaper’s website” aloud over the phone line allows users “to acquire and retrieve information [on the phone].”¹²¹ The *Notice*’s legal and technical arguments, here as elsewhere, are laughable.

¹¹⁷ See *US Telecom Ass’n v. FCC*, 825 F.3d at 704–05.

¹¹⁸ See *Notice* ¶ 27.

¹¹⁹ See 47 U.S.C. § 153(24).

¹²⁰ *Notice* ¶ 27 (substituting the terms “telephone user” and “on the telephone” for the *Notice*’s language regarding “a broadband Internet user” and “online”).

¹²¹ See *id.*

C. That the Physical “Points” Between Which a Transmission Occurs May Be Unknown in the Internet Context Has No Bearing on the Proceeding.

The *Notice* raises another defunct argument about the obscurity of physical locations on the internet. It argues that because telecommunications is defined by statute as “the transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received,”¹²² and that since “consumers are often unaware of where online content is stored,”¹²³ this means those the “points” are obscure. So when they deliver content to and from particular addresses on the internet, that means broadband providers cannot be providing a telecommunications service by definition, Q.E.D. – according to the *Notice*’s illogic, at least.

This was the same argument made by Cisco in 2014, and it was just as easily dismissed then as it is now.¹²⁴ As we noted in that docket,¹²⁵ this is like saying that mobile voice is not a telecom service because the caller has no way of knowing the location of the person she is calling; or that her dialing a customer service line involves no telecom service because she doesn’t know the precise identity of the person who will answer; or that during her interconnected VoIP call she has no idea who she is calling because the packets she sends may travel using different routes.

The Commission, writing in the 2015 order, agreed.¹²⁶ Nowhere is the term “points” defined as a physical or knowable location in the Communications Act. If it were, then cellular

¹²² See 47 U.S.C. § 153(50).

¹²³ *Notice* ¶ 29.

¹²⁴ See Comments of Cisco Systems, Inc., GN Docket No. 14-28, at 26 (filed July 17, 2014).

¹²⁵ See Free Press 2014 Reply Comments at 17.

¹²⁶ See *Open Internet Order* ¶ 361 (concluding that “uncertainty concerning the geographic location of an endpoint of communication is irrelevant for the purpose of determining whether a broadband Internet access service is providing ‘telecommunications’” and explaining that “[a]lthough Internet users often do not know the geographic location of edge providers or other users, there is no question that users specify the end points of their Internet communications”).

services and toll-free 800 numbers would fall outside the telecommunications definition. The Commission has never understood or defined “points” in this manner, and it would be foolish to do so in this proceeding.

D. Title II is the Law that Properly Governs Telecommunications Services such as Broadband Internet Access.

With the current *Notice*, the Commission is seeking to reverse course and abandon the appropriate Title II legal framework for the oversight of broadband internet access. In that vein, it could at most re-establish some weakened variety of the rules vacated in *Verizon v. FCC*, and at worst abandon not just Net Neutrality but the common carriage framework entirely too. The Commission is engaged in a destructive shell game in this proceeding. It knows well that no Net Neutrality rules with any real force can be promulgated on any other authority other than Title II.

That the Commission spent such considerable resources and more than fifteen years ambling back towards the proper classification of broadband, which it finally realized in 2015, militates strongly in favor of not continuing down the path set out in the *Notice*. There is no good reason to once again ask the same questions the Commission posed in 1998,¹²⁷ 2000,¹²⁸ 2002,¹²⁹ 2007,¹³⁰ 2009,¹³¹ 2010,¹³² and 2014,¹³³ especially after the Commission returned to a legally supportable framework for the open internet ratified multiple times by the D.C. Circuit.

¹²⁷ See *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*, CC Docket No. 98-146, Notice of Inquiry, 13 FCC Rcd 15280, 15308-11 (1998).

¹²⁸ *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities*, GN Docket No. 00-185, Notice of Inquiry, 15 FCC Rcd 19287 (2000).

¹²⁹ *Wireline Broadband NPRM*.

¹³⁰ *In the Matter of Broadband Industry Practices*, WC Docket No. 07-52, Notice of Inquiry, 22 FCC Rcd 7894 (2007).

¹³¹ *In the Matter of Preserving the Open Internet*, GN Docket No. 09-191, Notice of Proposed Rulemaking, 24 FCC Rcd 13064 (2009).

¹³² *In the Matter of Framework for Broadband Internet Service*, GN Docket No. 10-127, Notice of Inquiry, 25 FCC Rcd 7866 (2010).

The Commission is explicit in this – that it intends to return to a legally unsupportable framework for broadband providers nonetheless, and to reclassify fixed and mobile broadband as information services.¹³⁴ To understand just how badly the Commission erred in the past, it is necessary to further unpack the history of the Communications Act and what a Republican-led Congress did in amending it with the 1996 Act.

Congress specified that the purpose of these substantial amendments to the 1934 Act was to “provide for a pro-competitive, de-regulatory national policy framework designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies and services to all Americans by opening all telecommunications markets to competition.”¹³⁵ The amendments to the 1934 Act were largely confined to Title II, and the 1996 Act made much less substantial adjustments to Titles III and VI. When it amended the 1934 Act, Congress did not create new titles or definitions in the law for “Internet service providers” or “broadband,” but this was not an oversight. All of the references to “information services” in the 1996 Act are contained in amendments to Title II. Congress took this approach to distinguish common carrier services from the information services that are provided via common carrier facilities but that are not themselves subject to any regulation. Congress added definitions for “telecommunications service” and “telecommunications carrier,” that apply “regardless of the facilities used” to any entity that provides telecommunications to the public for a fee. If Congress had not intended for these definitions to apply to cable modem offerings, for example, it certainly could have said as much. But the use of the term “regardless,” and the lack of a

¹³³ See *Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Notice of Proposed Rulemaking, 29 FCC Rcd 5561 (2014).

¹³⁴ Notice ¶ 55 (“We propose to classify all broadband Internet access services – both fixed and mobile – as information services.”).

¹³⁵ See *Conference Report* at 1.

limitation of the term to telephone company offerings, is suggestive (as is the Congressional record on this point).¹³⁶

Congress added Sections 251 through 260 to Title II for the purpose of promoting competition and universal service in telecommunications services. With Section 253, Congress granted the Commission affirmative preemption authority to deal with inconsistent state regulation of telecommunications services.¹³⁷ Congress however did not grant the Commission preemption authority over state regulation of information services. Section 254 directs the Commission to advance universal service through an “evolving level of telecommunications services,” which this section says will provide access to “advanced telecommunications and information services.”¹³⁸ Congress limited Universal Service Fund support to “eligible telecommunications carriers.”¹³⁹ In order to replace the Modified Final Judgment, Congress crafted sections 271 through 275, in order to open the market for existing services to greater competition. To facilitate greater competition in the pay-TV markets, for example, Congress amended Title VI so that potential pay-TV providers that were already local exchange carriers might offer pay-TV without a local cable franchise.¹⁴⁰ In amending Title VI and the definitions in the Act, Congress did not alter the definition of a cable service. It chose not to amend this

¹³⁶ See, e.g., *Senate Committee Report on S. 652*, at 27 (“As defined under the 1934 Act [as amended by this bill], ‘telecommunications services’ includes the transport of information or cable services, but not the offering of those services.”); see also *id.* at 18 (noting that the definition of telecommunications “excludes those services, such as interactive games or shopping services or other services involving interaction with stored information, that are defined as information services. The underlying transport and switching capabilities on which these interactive services are based, however, are included in the definition of ‘telecommunications services.’”) (emphasis added).

¹³⁷ 47 U.S.C. § 253.

¹³⁸ *Id.* § 254.

¹³⁹ *Id.* § 214(e).

¹⁴⁰ See *id.* § 573.

definition knowing full well that cable intended to offer Internet access over the cable plant.¹⁴¹ This choice kept the original distinction first adopted in the 1984 Cable Act, which made clear that cable would be considered a common carrier when providing non-cable services that allowed users to control the content being sent and received.¹⁴² And Congress in 1996 also left in place the 1993 Amendments to Title III that required the Commission to treat CMRS providers as common carriers under the core of Title II.¹⁴³

Lastly, in 1996 Congress also gave the Commission forbearance authority, but only for telecommunications services or telecommunications carriers.¹⁴⁴ And it chose to continue requiring nondiscriminatory access to public rights of way at regulated rates only for common carriers¹⁴⁵ or cable operators (the latter for the provision of cable services only).¹⁴⁶ This is important, as it suggests that Congress did not envision unregulated information service providers offering transmission facilities, even though the explicit purpose of the Act is to promote competition and market entry both in the market for advanced telecommunications and the market for information services.

¹⁴¹ See *Senate Committee Report on S. 652*, at 13 (relating NCTA testimony).

¹⁴² See, e.g., 47 U.S.C. § 522(6) (“the term “cable service” means – (A) the one-way transmission to subscribers of (i) video programming, or (ii) other programming service, and (B) subscriber interaction, if any, which is required for the selection or use of such video programming or other programming service”).

¹⁴³ *Id.* § 332(c)(1)(A).

¹⁴⁴ *Id.* § 160(a).

¹⁴⁵ *Id.* § 224. The 1996 Act amendments to Section 224 (pole attachments) reveal that Congress clearly viewed the then-nascent broadband Internet access services offered by cable companies as telecommunications services. See *Conference Report* at 205–06 (“Section 204 of the Senate bill amends section 224 of the Communications Act. Section 204 requires that poles, ducts, conduits and rights-of-way controlled by utilities are made available to cable television systems at the rates, terms and conditions that are just and reasonable regardless of whether the cable system is providing cable television services or telecommunications services.”) (emphasis added). Congress could have said “telephone exchange services,” “local exchange services,” “exchange access” or simply “telephony” had it intended this section to only apply to cable’s provision of voice services, but it did not.

¹⁴⁶ See 47 U.S.C. § 224(d)(3); see also *id.* § 541.

In sum, Congress' actions in 1996 were clear and deliberate. In 1993 it affirmatively applied common carriage to the emerging and weakly competitive mobile market. In 1996 it applied common carriage to new entrants as well as incumbents offering of telecommunications to the public, regardless of facilities used. Congress also deregulated entry into the pay-TV market, but only for common carriers subject to Title II. And the resulting Open Video Systems were supposed to be "open"; they were intended to make pay-TV more like common carriage.¹⁴⁷

The 2015 *Open Internet Order* resolved any lingering ambiguities about the proper classification for broadband. This indignant *Notice* is entirely a product of a political disagreement that the current Commission majority has with members of the last administration – but with no factual, legal, or economic backing for the new Chairman's position. In other words, it stems only from the present Commission's own willful ignorance. Indeed, in recounting the history of the regulatory regime that has governed broadband services, the court in *Verizon v. FCC* observed that when the 1996 Act passed the Commission had already been subjecting broadband providers to common carrier regulations, and that "one might have thought, as the Commission originally concluded, that Congress clearly contemplated that the Commission would continue regulating Internet providers in the manner it had previously."¹⁴⁸

Indeed, the *Senate Committee Report on S.652* removes all ambiguity. Section 8 of this report, explaining the Act's definitions, noted "Telecommunications service" does not include information services, cable services, or 'wireless' cable services, but does include the

¹⁴⁷ See, e.g., *id.* § 573(b)(1) (directing the Commission to prescribe regulations that "prohibit an operator of an open video system from discriminating among video programming providers with regard to carriage on its open video system, and ensure that the rates, terms, and conditions for such carriage are just and reasonable, and are not unjustly or unreasonably discriminatory" and to prohibit operators "from unreasonably discriminating in favor of the operator or its affiliates with regard to material or information (including advertising) provided by the operator").

¹⁴⁸ *Verizon v. FCC*, 740 F.3d at 638–39.

transmission without change in the form or content, of such services.”¹⁴⁹ The Committee noted:

This means that information or cable services are not included in the definition of universal service; what is included is that level of telecommunications services that the FCC determines should be provided at an affordable rate to allow all Americans access to information, cable, and advanced telecommunications services that are an increasing part of daily life in modern America. Put another way, the Committee intends the definition of universal service to ensure that the conduit, whether it is a twisted pair wire, coaxial cable, fiber optic cable, wireless, or satellite system, has sufficient capacity and technological capability to enable consumers to use whatever consumer goods that they have purchased, such as a telephone, personal computer, video player, or television, to interconnect to services that are available over the telecommunications network.¹⁵⁰

There’s simply nothing in the law or the legislative history to suggest that Congress erred by omission, or that it desired its substantial amendments to the Act to be easily evaded through vertical integration and definitional trickery. At the time, the substantial majority of mass-market Internet access services were offered by third parties over common carrier networks. Congress certainly anticipated and provided a framework for facilities owners to enter the information services market, including by provisioning Internet access services over their own facilities. But it is absurd to think that Congress wanted the then-highly competitive market for provision of non-facilities-based internet service (an information service) to be destroyed simply by the transmission facility owners deeming their transmission facilities to be information services.

Congress adopted the 1996 Act against the backdrop of the *Computer Inquires*, and the Commission’s consistent enforcement of the policies developed in those proceedings. Indeed, the Commission’s actions in the 1995 *Frame Relay Order* were fresh and certainly well understood

¹⁴⁹ See *Senate Committee Report on S. 652*, at 18.

¹⁵⁰ See *id.* at 27. Though these are the findings of the Senate Report and not the Conference Report, the latter indicates that on these definitions the House had “receded” to the Senate’s terminology. See *Conference Report* at 116 (“The House recedes to the Senate with respect to the definitions of ‘affiliate’ and ‘cable service.’ The House recedes to the Senate with amendments with respect to the definitions of ‘number portability,’ ‘telecommunications,’ ‘telecommunications carrier,’ and ‘telecommunications service.’”).

by Congress.¹⁵¹ In the *Computer Inquiries*, the Commission contrasted “basic” transmission services (telecommunications services in today’s vocabulary) with “enhanced services” (now information services).¹⁵² Basic services were “common carrier offering[s] of transmission capacity for the movement of information,” and they provided “a communications path for the analog or digital transmission of voice, data, [and] video.”¹⁵³ The Commission distinguished basic services from “enhanced services,” which were offered over common carrier services but employed “computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber’s transmitted information; provide the subscriber additional, different, or restructured information, or involve subscriber interaction with stored information.”¹⁵⁴

After establishing these definitions, the Commission was consistent in refusing to allow the carriers that offered transmission services to escape the reaches of the law through vertical integration. For example, in 1988, the Commission concluded that “[s]ince the *Computer II* regime, we have consistently held the addition . . . of enhancements . . . to a basic service [does not] change[] the nature of the underlying basic service when offered by a common carrier[.]”¹⁵⁵ And in the *Frame Relay Order*, the Commission rejected the notion that a facilities-based carrier could bundle its common carrier and enhanced services offerings into one completely unregulated enhanced services offering. The Commission stated that this approach “would allow

¹⁵¹ *Independent Data Manufacturers Ass’n*, Memorandum Opinion and Order, 10 FCC Rcd 13717 (1995) (“*Frame Relay Order*”).

¹⁵² *Section 64.702 of the Commission’s Rules and Regulations*, Docket No. 20828, Final Decision, 77 F.C.C.2d 384, ¶¶ 93, 97-98 (1980).

¹⁵³ *Id.* ¶ 93.

¹⁵⁴ *Id.* ¶ 86.

¹⁵⁵ *Filing and Review of Open Network Architecture Plans*, CC Docket No. 88-2, Memorandum Opinion and Order, 4 FCC Rcd 1, ¶ 274 (1988) (footnotes omitted).

circumvention of the [*Computer Inquiries*] basic-enhanced framework. . . . This is obviously an undesirable and unintended result.”¹⁵⁶

Similarly, in its first analysis of broadband Internet access over DSL, the Commission concluded:

An end user may utilize a telecommunications service with an information service, as in the case of Internet access. In such a case, however, we treat the two services separately: the first service is a telecommunications service (e.g., the xDSL-enabled transmission path), and the second service is an information service, in this case Internet access.¹⁵⁷

Thus, the FCC’s early treatment of DSL followed its traditional treatment of facilities-based providers of enhanced services: a facilities-based provider offering an enhanced service always offers both a basic service and that enhanced service.¹⁵⁸

However, whether or not a service is a telecommunications service (formerly, a basic service) or an information service (a/k/a., an enhanced service) depends on nothing more than whether or not the service is offered to the public, and enables end-users to transmit the information of their choosing between points of their choosing, without change in the form or content of the information as sent and received. As we detailed above, while at one time the information services designation may have been appropriately applied to “Internet Access Services” generally, it is clear that the product offered today by BIAS providers is and can only be considered a telecommunications service, per the definitions of the Act.

¹⁵⁶ *Frame Relay Order* ¶ 44; see also *United States v. Western Elec. Co.*, 907 F.2d 160, 163 (D.C. Cir. 1990) (characterizing the same approach as creating “an enormous loophole”).

¹⁵⁷ *Advanced Services Order* ¶ 36 (1998); see also *id.* ¶¶ 3, 11, 35 (noting that packet-switched services are “basic services” and characterizing advanced services as “wireline broadband telecommunications services”).

¹⁵⁸ See, e.g., *Frame Relay Order* ¶ 41 (“The assertion by AT&T and other commenters that the enhanced protocol conversion capabilities associated with AT&T’s InterSpan service bring it within the definition of an enhanced service is beside the point. Under the Commission’s *Computer II* and *Computer III* decisions, AT&T must unbundle the basic frame relay service, regardless of whether the [service] offering also provides a combined, enhanced protocol conversion and transport service for those customers who require it.”).

E. There is no First Amendment Bar to the Net Neutrality Rules.

The D.C. Circuit has more than adequately addressed the *Notice's* alleged concern that that the principles of common carriage, and the effect of not allowing BIAS providers to exercise editorial discretion over the sites, apps and services they permit their customers to use, might violate the First Amendment.¹⁵⁹ As the *Notice* recognizes, the panel in *US Telecom Ass'n v. FCC* found that “the First Amendment poses no bar to the rules.”¹⁶⁰ Sitting *en banc*, the full court went on to add that a provider offering neutral and indiscriminate access to the internet has no right under the First Amendment to then throttle or block access to particular site based on their views, explaining that “[n]o Supreme Court decision suggests otherwise.”¹⁶¹

On the contrary, the Supreme Court has recently acknowledged the importance of access to the internet for an individual’s ability to exercise their First Amendment rights.¹⁶² The Court recognized that the First Amendment protects the right of individuals to “access to places where they can speak and listen, and then, after reflection, speak and listen once more.”¹⁶³ And that one of the most important of these places is the internet.¹⁶⁴ In the 21st century, access to the internet and particularly social media is the principle source for “current events, checking ads for employment, speaking and listening in the modern public square, and otherwise exploring the vast realms of human thought and knowledge.”¹⁶⁵ We agree and believe that nondiscriminatory access to the internet is vital to healthy civic life in the United States for the reasons the Court stated above.

¹⁵⁹ *Notice* ¶ 104.

¹⁶⁰ *Id.* (citing *US Telecom Ass'n*, 825 F.3d at 739).

¹⁶¹ *US Telecom Ass'n En Banc Denial* at *13.

¹⁶² *See* *Packingham v. North Carolina*, 582 U.S. ____ (June 19, 2017).

¹⁶³ *Id.* at *4.

¹⁶⁴ *Id.* at *5.

¹⁶⁵ *Id.* at *8.

F. The Cost Benefit Analysis in the *Notice* is Fatally Flawed.

The *Notice* recommends that the Commission engage in a cost-benefit analysis regarding the effects of maintaining the current Title II classification for BIAS and “maintaining the internet conduct rule; maintaining the no blocking rule; maintaining the no throttling rule; maintaining the ban on paid prioritization; maintaining the transparency rules” and for acting to change those rules.¹⁶⁶ We believe the cost-benefit analysis model proposed in the *Notice* is fatally flawed in its construction and in its myopic focus on broadband infrastructure investment and related costs.¹⁶⁷

The *Notice* argues that as the outcome of this proceeding will have “an annual effect on the economy of at least \$100 million”¹⁶⁸ a cost-benefit analysis should be conducted as it meets the government’s threshold for requiring an analysis for the agencies covered by Executive Order 12866 (the “E.O.”), which does not in fact even apply to the Commission. Without commenting on the *Notice*’s estimated economic effect of the outcome of this proceeding, we do note that the scope of the analysis called for by the E.O. is, rightfully, far broader than the *Notice*’s singular focus on broadband investment. The E.O. mandates a cost-benefit analysis that should, “include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider (emphasis added).” That E.O. goes on to note that in crafting a regulation, agencies should consider both distributive impacts and equity in their approach.

The *Notice*’s vision of a cost-benefit analysis speaks to none of these principles. It makes no mention of the broader costs of abandoning the Title II framework, whether to an individual’s or a group’s right to speak; to the ability of people of color and other historically marginalized

¹⁶⁶ *Notice* ¶ 105.

¹⁶⁷ *See id.* ¶¶ 110–13.

¹⁶⁸ *Id.* ¶ 106.

groups' ability to organize and engage with media that speaks to them; or to the costs that start-ups and other non-incumbent firms will face trying to navigate the additional barriers to entry posed by a non-neutral broadband service.

Within the scope even of its proposed economic analysis, the *Notice's* model poses other problems. First, it begins with the presumption that maintaining Title II classification “would depress investment.” As we have shown in our prior filings and publications, and will yet again show in voluminous detail below, reclassification has had little to no impact on the investment decisions made by broadband providers in the two years since reclassification. In addition the *Notice* is completely silent on the D.C. Circuit-ratified theory of the “virtuous circle” from an open internet, “in which innovations at the edges of the network enhance consumer demand, leading to expanded investments in broadband infrastructure that, in turn, spark new innovations at the edge.”¹⁶⁹ Abandoning Title II would have economic effects far beyond investment projects by the incumbent telecom companies – for which investments on the whole, individual company investments, revenues, profits, and capabilities alike have increased since the 2015 order issued.

We can only conclude that the *Notice's* suggestion that the Commission engage in a formal cost-benefit analysis is not serious. The *Notice* contemplates no real standards for how it would be conducted, offers no metrics for how it would be evaluated, and gives the public no opportunity to independently evaluate how sound either the methodology or analysis would be.

IV. Title II Provides the Correct, Light-Touch Legal Framework to Protect Net Neutrality and Other Communications Rights, But the *Notice* Attacks These Rules As Well As the Authority for Them.

Though the *Notice* feigns concern over finding alternate authority for Net Neutrality rules,¹⁷⁰ its proposal to abandon the Title II classification is a direct attack on those rules that

¹⁶⁹ *Open Internet Order* ¶ 7.

¹⁷⁰ *Notice* ¶ 103.

have kept the internet an open platform for speech, innovation, organizing, and participation in the nation’s civic life. The *Notice* proposes killing the current bright-line rules against throttling, blocking, and paid prioritization and moving towards a “self-governance” regime for ISPs or towards “*ex-post* enforcement.”¹⁷¹ These bright-line rules, and the FCC’s ability to enforce them and adapt them over time, are what keep the internet open and free – not empty promises from cable and phone companies.

There’s no good reason for the Commission to return to this issue now. The 2015 reclassification of broadband internet access service providers as Title II common carriers in the *Open Internet Order* is the right reading of the law, and provides the desired “light-touch” framework that the Commission and broadband providers too profess to want. It’s also key to maintaining any effective open internet rules. Going back to the wholly insufficient Title I classification for broadband as the *Notice* suggests is a recipe for failure.¹⁷²

If this is not obvious already, we have serious doubts that this *Notice* is intended to do anything other than undermine the entire basis and legal foundation for any open internet rules – and for other communications rights as well. Yet we will briefly explain not just the benefits of the rules and rights the *Notice* threatens, but the nature of those misguided threats as well.

A. The Commission Should Not Eliminate the General Conduct Rule.

The Commission’s 2015 *Open Internet Order* protects a broadband user’s right to communicate over the network without undue interference from the broadband provider.¹⁷³ This “general conduct” standard is a catch-all intended to prevent unreasonable discrimination by

¹⁷¹ *Id.* ¶ 70.

¹⁷² See Gaurav Laroia, “Make No Mistake: Chairman Pai Wants to Roll Back the Net Neutrality Rules. Here’s What You Need to Know,” *Free Press Blog* (May 31, 2017) <https://www.freepress.net/blog/2017/05/31/make-no-mistake-chairman-pai-wants-roll-back-net-neutrality-rules>.

¹⁷³ *Open Internet Order* ¶ 138.

ISPs, even if and when that interference (arguably) falls outside of the three bright-line rules the 2015 order adopted against blocking, throttling and paid prioritization.

As the *Open Internet Order* makes clear, this flexible approach was not a novel invention of the Wheeler Commission. It simply articulates the Commission’s ability – and indeed its duty – to protect internet users from unanticipated harms, including any unreasonable discrimination that might fall outside of the 2015 bright-line rules yet violate the protections required by Section 202(a).¹⁷⁴ Retaining the Commission’s ability to enforce the law in this way is essential to preserving Net Neutrality. To keep the internet open for free expression and economic innovation, the agency must be able to at least assess broadband provider practices that don’t fit neatly within the categories the bright-line bans lay out.

This *Notice* proposes “not to adopt any alternatives to the Internet conduct rule” and asks, “Is there a need for any general non-discrimination standard in today’s Internet marketplace?”¹⁷⁵ We answer with a resounding yes. Cable and phone companies that sell access to the internet have the ability and the incentive to devise new methods of discrimination that favor their own services. The *Notice*’s questioning of the need for such vital protections suggests that it desires mainly to open the door to broadband provider interference with how their customers access the open internet.

B. The Commission Should Not Eliminate the No-Blocking Rule

The *Notice* asks “whether a codified no-blocking rule is needed to protect such freedoms.”¹⁷⁶ The answer, once again, is yes. Examples of the need for such a rule abound: broadband providers have been caught blocking competitors’ applications like Google Wallet in

¹⁷⁴ *See id.*

¹⁷⁵ *Notice* ¶ 75.

¹⁷⁶ *Id.* ¶ 80.

favor of their own mobile-payment services.¹⁷⁷ Comcast has been caught blocking peer-to-peer video services. AT&T blocked FaceTime, Google Voice and Skype. The list goes on.¹⁷⁸

The elimination of this rule would drastically change the nature of the service that customers have come to expect from broadband providers. The no-blocking rule explicitly prohibits broadband providers from “blocking lawful content, applications, services, or non-harmful devices.”¹⁷⁹ This means that phone and cable companies can’t block online applications from their rivals (like Amazon, Hulu, Netflix, or the smallest video start-up) that might want to deliver video content competing against the ISPs’ own legacy cable-TV offerings.

It also means that broadband providers cannot block applications merely to exact a toll from an app maker, even if it doesn’t compete with the broadband provider’s legacy voice or video offerings. These providers also cannot block their customers’ access to news websites showcasing viewpoints the company may not like, nor otherwise prevent their customers from reaching websites and accessing lawful content on the internet. This is a necessity, not an outcome we reasonably could or should expect based on nothing more than carriers’ voluntary commitments to behave.¹⁸⁰ It is also a rule that requires a foundation in Title II, for reasons that we explained in our 2014 comments and incorporate here.¹⁸¹

¹⁷⁷ See David Goldman, “Verizon Blocks Google Wallet,” *CNN* (Dec. 6, 2011), http://money.cnn.com/2011/12/06/technology/verizon_blocks_google_wallet/.

¹⁷⁸ See Karr, “Net Neutrality Violations: A Brief History,” *supra* note 18.

¹⁷⁹ *Open Internet Order* ¶ 5.

¹⁸⁰ *Id.* ¶ 80.

¹⁸¹ Free Press 2014 Comments at 129–34; *id.* at 129 (“The majority opinion in *Verizon v. FCC* suggests the Commission might at least be able to justify a ‘no blocking’ rule, but . . . asserts [] that the Commission might guarantee edge providers an ‘effectively usable’ or ‘minimum’ carriage service that could survive under Section 706, so long as broadband providers had license to ‘charge an edge provider . . . for high-speed, priority access’ or ‘negotiate separate agreements with each individual edge provider.’”).

C. The Commission Should Not Eliminate the No-Throttling Rule.

As the *Notice* states, “the no-throttling rule mirrors the no-blocking rule and bans the impairment or degradation of lawful Internet traffic.”¹⁸² Despite the rule’s clear merits the *Notice* contemplates its elimination, asking whether this rule prevents ISPs’ “future innovative, pro-competitive business deals that would not by themselves run afoul of merger conditions or established antitrust law?”¹⁸³

Just like outright blocking of content, slowing down a customer’s access to a particular website or service would gravely inhibit that person’s access to the content of their own choosing. We see no benefit in the elimination of the rule. On the contrary, it serves to entrench the ISP’s position as a gatekeeper to the internet and awards them editorial control over access to certain kinds of content.

The *Notice* asks if an antitrust regime could mitigate the harms from the elimination of this rule. The answer is no. There are many practices that don’t run afoul of antitrust law – think of the cable-TV business model, for example – yet severely limit user choice, or drive up the price to access particular types of content. Antitrust enforcement is an exceedingly expensive and time-consuming undertaking at best, in which the operator of the throttled website or app would have to show that it was a competitor to the ISP’s own service offerings. With all of those hurdles to surmount, most startups and new applications would have no chance to save themselves from throttling.

As with other rules it puts on the chopping block, the *Notice* half-heartedly asks whether any no throttling rule could survive in the absence of Title II.¹⁸⁴ The easy answer, once again, is no. There is no plausible way to maintain that the Commission could prohibit degradation of

¹⁸² *Notice* ¶ 83.

¹⁸³ *Id.* ¶ 84.

¹⁸⁴ *Id.* ¶ 83.

service to websites, apps, or other internet services when the *Verizon* court clearly required “substantial room” for discrimination¹⁸⁵ by broadband providers not classed as common carriers.

D. The Commission Should Not Eliminate the No-Paid Prioritization Rule.

In the *Open Internet Order*, the Commission banned broadband providers from favoring the internet traffic of websites or applications willing to pay for such prioritized treatment. It also banned them from prioritizing the delivery of their own traffic or that of their affiliates, meaning that Comcast can’t prioritize the delivery of NBC content it owns.

This is the rule that keeps the internet a level playing field. It allows a small Spanish-language online video service to compete for viewership with the likes of the broadcast networks (Comcast also owns Telemundo) or YouTube. Being able to prioritize their own content over anything else available online would allow cable companies and other incumbents to reap huge dividends at internet users’ expense. Yet the *Notice* asserts that this ban “address[es] an apparently nonexistent problem,”¹⁸⁶ failing to recognize that rules preventing this kind of behavior are the only reason the problem hasn’t manifested as it would under the *Notice*’s framework.

In fact, in its 2013 court challenge to the Net Neutrality rules,¹⁸⁷ Verizon admitted that “but for” the existence of those protections, the company would explore the very kind of paid arrangements that the current rules likely ban.¹⁸⁸ In the end, while the *Notice* resorts time

¹⁸⁵ See *Verizon v. FCC*, 740 F.3d at 652.

¹⁸⁶ *Notice* ¶ 85.

¹⁸⁷ Marvin Ammori, “We’re About to Lose Net Neutrality – and the Internet as we Know It,” *Wired* (Nov. 4, 2013), <https://www.wired.com/2013/11/so-the-internets-about-to-lose-its-net-neutrality/>.

¹⁸⁸ See Karr, “Net Neutrality Violations: A Brief History,” *supra* note 18; see also Verizon Brief at 44 (“In fact, some types of speech, such as live streaming high-definition video, could benefit from (or may only be available with) differential treatment, such as prioritization. Broadband providers could also give differential pricing or priority access to their over-the-top video services or other applications they provide, or otherwise feature that content.”).

and again to suggesting that there's no proof of harm from internet blocking, throttling and slow lanes, it is the proposal that lacks proof and real-world examples. The *Notice* muses about hypothetical "pro-competitive or pro-consumer paid prioritization arrangements" but is silent when it comes to providing examples of such practices.¹⁸⁹

E. The Commission Should Not Eliminate the Enhanced Transparency Rule and All Transparency Rules.

In the *Open Internet Order*, the Commission bolstered its existing transparency rules for broadband providers and mandated additional disclosures on prices, data caps, network performance characteristics and other information.¹⁹⁰ Though the *Notice* acknowledges that the transparency requirements are "were among some of the least intrusive regulatory measures imposed by the *Title II* Order" it still asks if they "remain[] necessary in today's competitive broadband marketplace."¹⁹¹

First, we disagree with the Commission's assessment that the broadband marketplace is very competitive. In fact, just over a year ago, when he was still in the minority at the Commission, now-Chairman Pai suddenly admitted that broadband providers weren't deploying broadband in a timely fashion to everyone in the United States.¹⁹² Now that he's been the chairman for four months, the *Notice* in this passage would have us believe that everyone suddenly has lots of choices when they look for options other than the local cable monopoly.

The current Chairman's flip-flopping aside, it's a big problem that the Commission has seriously proposed eliminating not just the so-called "enhanced transparency" rules that require

¹⁸⁹ See *Notice* ¶ 88.

¹⁹⁰ See *Open Internet Order* ¶ 23.

¹⁹¹ *Notice* ¶ 90.

¹⁹² See Concurring Statement of Commissioner Pai, *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 Docket No. 15-191, 2016 Broadband Progress Report, 31 FCC Rcd 699 (2016).

disclosure of information on promotional rates, hidden fees and other limitations. This *Notice* proposes eliminating any transparency rules whatsoever, trusting that cable and telephone companies' legendary customer service will give people all the information they need.

We maintain that baseline transparency rules are essential to internet users at the point of sale and during the lifetime of the customer contract. But these rules serve other purposes too. Consumer advocates and watchdogs cannot file complaints if they do not have access to information about broadband provider practices. (In fact, they cannot even assess the efficacy of the challenged rules, thanks to the Commission's FOIA failures described below.) Without the Commission guaranteeing the availability of this information to internet users, consumers and their advocates would be left in the dark about the nature of the services they purchase.

F. There Are Benefits to Title II Outside of Net Neutrality.

1. The Commission May Jeopardize Lifeline for Broadband By Rejecting the Clear Authority It Has for the Program Under Title II.

Abandoning Title II for broadband internet access service could undermine important programs that help connect poor people to the internet. In chief, the *Notice* threatens to undermine the Commission's Lifeline broadband program by undoing the classification decision in the *Open Internet Order*. In 2016, the Commission modernized Lifeline for the digital age by allowing the discount to be applied towards standalone broadband service.¹⁹³ This modification, which is still in the implementation phase, has created and will continue to create opportunities for millions of poor people, who are disproportionately people of color, to access the internet at a reduced cost. This is indispensable to bridging the divide.¹⁹⁴

¹⁹³ *Lifeline and Link Up Reform and Modernization*, WC Docket No. 11-42, Third Report and Order, Further Report and Order, and Order on Reconsideration, 31 FCC Rcd 3962 (2016) ("*Lifeline Modernization Order*").

¹⁹⁴ See generally S. Derek Turner, Free Press, *Digital Denied*, at 8–16 (Nov. 2016) ("*Digital Denied*").

The 2016 *Lifeline Modernization Order* relied on the agency’s authority to treat broadband internet access providers as telecom service providers subject to Title II of the Act,¹⁹⁵ as re-established in the 2015 *Open Internet Order*. Before moving forward, the Commission should carefully study how its proposals in the *Notice* would affect standalone Lifeline broadband service, and ensure that it does not introduce further uncertainty in the implementation of the *Lifeline Modernization Order*. The few throwaway lines about Lifeline in paragraph 68 of the *Notice* suggest that the Commission understands the instant proceeding impacts Lifeline broadband, yet does little to protect it.¹⁹⁶

According to one of the recent polls cited above, a strong majority of people in the United States (75 percent) agree that “internet access is essential, and everyone needs it in the 21st century economy.”¹⁹⁷ Even federal subsidies to make internet affordable for low-income people are popular. “There is bipartisan agreement that the federal government should provide funding to help low-income people afford internet access: 70 percent support such a policy, including 86 percent of Democrats, 52 percent of Republicans, 51 percent of 2016 Trump voters and 85 percent of Clinton voters.”¹⁹⁸ Based on Chairman Pai’s frequent claims to care about closing the digital divide, he should heed the support for programs like Lifeline before taking any step that may undermine the program’s foundation or its implementation in the digital age.

¹⁹⁵ *Lifeline Modernization Order* ¶ 39 (“The BIAS that we define as a supported service for the Lifeline broadband program is a telecommunications service that warrants inclusion in the definition of universal service in this context.”).

¹⁹⁶ *Notice* ¶ 68 (“We also seek comment on any rule changes necessary to effectuate this change in our underlying authority to support broadband for low-income individuals and families.”).

¹⁹⁷ See Freedman Poll at 2 (“This view is broadly shared across party lines: 84 percent of Democrats, 67 percent of Republicans, and 68 percent of Independents agree.”).

¹⁹⁸ *Id.*

2. The Commission Should Not Eliminate the Broadband-Privacy Authority.

Earlier this year, Congress passed and President Trump later signed a bill that dismantles the Commission's 2016 broadband-privacy rules.¹⁹⁹ Those rules prevented ISPs from using, selling or sharing personal information like web-browsing histories without first getting their customer's consent. Even without those rules in place, the responsibility to protect the privacy of broadband customers remains with the Commission under Title II. And Chairman Pai himself, in yet another insincere flip-flop, even has suggested that after Congress overturned those rules the Commission still had the statutory mandate to enforce broadband privacy.²⁰⁰

He never intended to act on that mandate. It was a convenient excuse for the Chairman in the moment, as he and members of Congress in his party rightly took the heat for eliminating those privacy rules. But now the Commission proposes in this *Notice* abandoning that mandate altogether, and letting other agencies police the practices of companies that carry internet traffic, by abandoning Title II and the Commission's duties under Section 222 specifically.²⁰¹ This proposal in the *Notice* would punt all internet privacy oversight to the FTC, an agency with limited resources and no rulemaking authority. What's more, the FTC can only respond to a company's violations of its own tailor-made privacy policies. That's a recipe for dismantling privacy protections, not enhancing them. That's exactly Chairman Pai's plan, even as his hypocritical excuses about fulfilling the Commission's duties (offered up just before and just after the CRA vote) continue to ring as hollow as ever they did.

¹⁹⁹ See Li Zhou, "Trump makes it official and signs broadband privacy CRA," *Politico* (Apr. 4, 2017).

²⁰⁰ See Amir Nasr, "Pai: FCC Required to Ensure Internet Privacy Even Without Agency Rules," *Morning Consult* (Mar. 8, 2017).

²⁰¹ *Notice* ¶ 67.

V. **Widespread Process Irregularities Plague This Proceeding.**

The Commission has failed to meet its procedural duties in this proceeding. It has employed irregular tactics and processes, and has actively promoted falsehoods both in the public debate and in this docket. Indeed, Chairman Pai's main reason for repealing the Net Neutrality rules – that the *Open Internet Order* supposedly harmed investment – relies on falsehoods and spin in industry-funded “studies” that fail to meet Information Quality Act standards. Moreover, the *Notice* seeks comment on a number of questions that the Commission could at least partially answer with evidence that it holds in its exclusive possession, but has failed to produce in response to a National Hispanic Media Coalition FOIA request.²⁰²

A. **The Commission's Publication and Reliance on Misleading, Non-Peer Reviewed Studies Violates the Information Quality Act.**

Per Office of Management and Budget (“OMB”) guidelines, information on which federal agencies rely and that is subject to the guidelines of the Information Quality Act (“IQA”) consists of “any communication or representation of knowledge such as facts or data, in any medium or form,” including “information that an agency disseminates from a web page,” but not “opinions, where the agency's presentation makes it clear that what is being offered is someone's opinion rather than fact or the agency's views.”²⁰³ Information is disseminated when an “agency initiate[s] or sponsor[s] distribution of information to the public.”²⁰⁴ The OMB commentary notes that “if an agency, as an institution, disseminates information prepared by an outside party in a manner that reasonably suggests that the agency agrees with the information, this appearance of having the information represent agency views makes agency dissemination of the

²⁰² See National Hispanic Media Coalition, Motion for Extension of Time, WC Docket No. 17-108 (filed Jul. 6, 2017) (“NHMC Motion”). Free Press is co-counsel on this Motion.

²⁰³ Office of Mgmt. and Budget, Exec. Office of the President, “Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies,” 67 Fed. Reg. 8452, 8460 (Feb. 22, 2002) (“OMB Guidelines”).

²⁰⁴ *Id.*

information subject to these guidelines.”²⁰⁵ Here, the Commission disseminated various investment analyses and claims by Hal Singer,²⁰⁶ the Phoenix Center,²⁰⁷ and USTelecom,²⁰⁸ in the draft and final version of the *Notice*. The authors of these studies are outside parties. However, the Commission distributed their information in a manner that reasonably suggests that the Commission agrees with it. The *Notice* begins with the Commission making an unsupported statement regarding a supposed decline in broadband industry investment.²⁰⁹ Later, the Commission restates the claim and cites Singer, Phoenix Center, and USTelecom.²¹⁰ These assertions are declarative and observational statements which suggest the Commission cites to the studies in support of its factual finding. Further, the *Notice* does not mark these analyses as opinions of the respective authors. This gives the appearance that the Commission presents this information as fact or as its own views, and is sufficient to subject this information to the Commission’s guidelines for complying with data quality requirements.

The Commission fails to meet its requirements under the IQA by disseminating information so lacking in quality. The Commission’s own IQA guidelines clearly demand specific minimum elements be present in the information, namely “the incorporation of a methodological section or appendix that describes, at a minimum, the design and methods used during the creation, collection, and processing of the data; the compilation and/or analysis of the

²⁰⁵ *Id.* at 8454.

²⁰⁶ See Hal Singer, “2016 Broadband Capex Survey: Tracking Investment in the Title II Era” (Mar. 1, 2016), <https://haljsinger.wordpress.com/2017/03/01/2016-broadband-capex-survey-tracking-investment-in-the-title-ii-era/> (“Singer Study”).

²⁰⁷ See George S. Ford, “Net Neutrality, Reclassification and Investment: A Counterfactual Analysis,” Phoenix Center for Advanced Legal & Economic Public Policy Studies, at 2 (Apr. 25, 2017), <http://www.phoenix-center.org/perspectives/Perspective17-02Final.pdf>.

²⁰⁸ See Patrick Brogan, USTelecom, “Utility Regulation and Broadband Network Investment: The EU and US Divide,” Research Brief (Apr. 25, 2017), <https://www.ustelecom.org/sites/default/files/documents/Utility%20Regulation%20and%20Broadband%20Investment.pdf>.

²⁰⁹ *Notice* ¶ 4.

²¹⁰ *Id.* ¶ 46 (citing Singer Study).

data.”²¹¹ While each piece on which the *Notice* relies is problematic, the dissemination of the Singer Study is especially troubling. In its *Notice*, the Commission declares “[a] recent study indicates that capital expenditure from the nation’s twelve largest Internet service providers has fallen by \$3.6 billion, a 5.6% decline relative to 2014 levels.”²¹² To support this finding, the Commission disseminated a link to a web page containing the Singer Study.²¹³

The disseminated information is scant, to be charitable. Singer provides no methodological section or appendix, and no readily available dataset (providing only a screenshot). It is an incomplete analysis – at best. See Part VI below, explaining Singer’s incompetence and ineptitude. The author admits that his analysis leave “a lot more to say” and presents the information as “takeaways.”²¹⁴ Yet the Commission cites these cursory thoughts and describes them as a “study.” The other disseminated information fares no better. All three studies echo the data and estimates in each others’ work, in perfectly circular and navel-gazing fashion. None provide the data in a readily accessible manner, and all rely on inexact estimates that do not include other statistical information such as the margin for error.²¹⁵

Further, while the sources did not contain the necessary elements required by FCC Guidelines, the Commission was still obligated to perform “robust[] checks and [] document

²¹¹ *Implementation of Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Pursuant to Section 515 of Public Law No. 105-554*, Notice of Information Quality Guidelines, 17 FCC Rcd 19890, App. A § III, ¶ 3(a) (2002), (“*FCC Guidelines*”).

²¹² *Notice* ¶ 46.

²¹³ *Id.*

²¹⁴ See Singer Study.

²¹⁵ See, e.g., USTelecom, “Broadband Provider Capital Expenditures Methodology,” <https://www.ustelecom.org/broadband-industry-stats/investment/historical-broadband-provider-capex/methodology> (noting figures based on “approximate industry aggregates” without describing the methodology for these approximations). This methodological section does not even appear in the material the *Notice* disseminates, and we cite it to demonstrate the twice-removed nature of any methodological explanations. This hidden and inadequate explanation from USTelecom only serves to obscure, not satisfy, the Commission’s IQA obligations.

what checks were undertaken as part of the required methodological section or appendix.” The Commission does not correct the deficiencies in the original industry-provided analyses with its own methodological section or appendix to bring them into compliance with the IQA. The Commission does not even describe its own methodology in selecting these sources in the first place before it chose to disseminate this information. (Purely political motives are likely the only answer.) Yet the Commission cannot elude its obligations under the IQA because it chose to distribute original sources that omitted required quality elements. Such a scenario was contemplated by the OMB when it determined the reasonable appearance of agency sponsorship or initiation. If the Commission choose to disseminate information, it must complete the information to meet its minimum quality standards.

Moreover, that this information was disseminated with such glaring omissions suggests the Commission failed to conduct a pre-dissemination review entirely, even with two bites at the apple when it first released a draft of the *Notice* before voting on it and then released the final item. The lack of a review is troubling because the Commission was warned in the interim that the information it had disseminated was incomplete, contested, and in need of a more searching review.²¹⁶ The similarity between the draft and final Notices suggests that the Commission did not adhere to its guidelines on two separate occasions.

The Commission disseminated information that does not satisfy its objectivity requirements.²¹⁷ Objectivity, as defined by both the OMB and FCC Guidelines, “involves two distinct elements, presentation and substance.”²¹⁸ Disseminated information must be presented in

²¹⁶ See, e.g., Dana Floberg, “Sorry, Chairman Pai: Your Investment Numbers Don't Add Up,” *Free Press Blog* (May 17, 2017), <https://www.freepress.net/blog/2017/05/17/sorry-chairman-pai-your-investment-numbers-dont-add>.

²¹⁷ FCC Guidelines § II, ¶ 11.

²¹⁸ *Id.*

“an accurate, clear, complete, and unbiased manner” and the agency must determine “whether the information is presented within a proper context.”²¹⁹ Further, “the agency needs to identify the sources of the disseminated information . . . and, in a scientific, financial, or statistical context, the supporting data and models, so that the public can assess for itself whether there may be some reason to question the objectivity of the sources.”²²⁰ The “data should have full, accurate, transparent documentation, and error sources affecting data quality should be identified and disclosed to users.”²²¹ “In a scientific, financial, or statistical context,” the agency must generate the original and supporting data and develop analytic results “using sound statistical and research methods.”²²²

The Commission instead accepted demonstrably false factual claims made in a blog post by an author with extensive industry ties, a report containing an absurd counterfactual analysis on a limited time series by an industry-funded think-tank, and a research brief by an interested trade association. In the *Notice* itself, the Commission disseminates the studies with no disclaimer distinguishing fact from opinion and no disclosure of potential conflicts by the studies’ authors. The Singer Study is especially problematic because it includes no opinion disclaimer and no disclosure of potential conflicts in either the *Notice* or the disseminated source.²²³ The *Notice* also fails to disclose that USTelecom is the “leading trade association

²¹⁹ *Id.*

²²⁰ *Id.*

²²¹ *Id.*

²²² *Id.*

²²³ See, e.g., Dwayne Winseck and Jefferson Douglas Pooley, *A Reply to Faulhaber, Singer, and Urschel’s Curious Tale of Economics and Common Carriage (Net Neutrality) at the FCC*, 11 *International Journal of Communication* 2702, 2709 (2017) (“Readers of the IJoC paper would have no way to know that in all the regulatory proceedings the authors . . . research and white papers have been appended to, or cited extensively in, submissions to the public record by industry players (e.g., AT&T, Charter, Comcast, and Verizon on the telecom/ISP side and CBS, Disney, 20th Century Fox, Time Warner, and Viacom in the corporate media arena), trade

representing and promoting the interests of . . . broadband service providers and suppliers for the telecom industry”²²⁴ or that the Phoenix Center has deep ties to the telecom industry.²²⁵ These disclosures are necessary for the public to assess whether there is some reason to question the distribution of this information.²²⁶

Contrast the industry analyses with Free Press’s copious research published previously, and now submitted in this docket in Part VI and the Appendix that follows. All of our data, statistical assumptions, methodologies, and other information is extensively documented in our contributions to the discussion. However, the Commission summarily dismisses the conclusions in our research.²²⁷ Ironically, our data is open and available, but the same cannot be said of the studies the *Notice* cites positively.

The Commission’s dissemination of false and inadequate investment information has a clear and substantial impact on the important public policy decision because the Commission has centered its inquiry on this measure. The OMB Guidelines require the agency to submit all influential information to heightened scrutiny, and suggests that influential scientific information

associations (such as USTelecom, the Internet and Television Association [NCTA], and the National Association of Broadcasters), and think tanks (including the American Enterprise Institute and the Competitive Enterprise Institute). The authors, in other words, have been in the very thick of the action, which . . . they fail to disclose.”)

²²⁴ Who We Are, USTelecom, <https://www.ustelecom.org/who-we-are>.

²²⁵ Jason Koebler, “How Big Telecom Gets Away With Rewriting America’s Laws,” *Vice* (Apr. 6 2016), https://motherboard.vice.com/en_us/article/z43493/how-the-telecom-lobby-rewrites-americas-laws. The Center, which is a 501(c)(3), is not required to disclose its funding sources; however, its staff and work products have extensive connections to industry.

²²⁶ FCC Guidelines § II, ¶ 6; App. A § II, ¶ 6 (the Commission does “not elaborate on terms such as ‘influential’” from the OMB Guidelines. The FCC Guidelines only defines influential as what “the Commission can reasonably determine that dissemination of the information will have or does have a clear and substantial impact on important public policies or important private sector decisions.”),

²²⁷ *Notice* ¶ 46.

receive peer review “by qualified specialists before it is disseminated.”²²⁸ In its *Notice*, the Commission suggests that “[i]nvestment in broadband networks declined,” and “Internet service providers have pulled back on plans to deploy new and upgraded infrastructure.”²²⁹ Its justification for the proposed rule changes is, in part, “to reverse the decline in infrastructure investment . . . put into motion by the FCC in 2015.”²³⁰ The Commission distributed the studies to support its patently absurd and utterly unsupported belief that “that these reduced expenditures are a direct and unavoidable result of Title II reclassification.”²³¹ It should have reasonably determined that dissemination of the information will have or does have a clear and substantial impact on the important public policies concerning broadband investment and online innovation.

Further, the Commission identifies its prior decision to implement Title II regulations as having a substantial impact on important private sector decisions regarding investment, and claims the proposals in the *Notice* would address this impact. But because the proffered “evidence” does not meet its basic obligations under the IQA, the Commission needed to apply a heightened standard – not merely copy and paste Phoenix Center theories and Hal Singer guesswork.

The Commission’s failure to satisfy its obligations under the IQA and its own guidelines, while troubling in its own right, raises other concerns too. If it were to rely on this information to support the present rulemaking, the failure to include certain elements of that information, *e.g.* disclosures, methodological sections or data sets in the disseminated information, would violate the Commission’s notice-and-comment obligations under the APA. The APA commands an

²²⁸ Office of Mgmt. and Budget, Exec. Office of the President, Final Information Quality Bulletin for Peer Review, at 2 (Dec. 16, 2004), http://www.cio.noaa.gov/services_programs/pdfs/OMB_Peer_Review_Bulletin_m05-03.pdf.

²²⁹ *Notice* ¶ 4.

²³⁰ *Id.*

²³¹ *Id.* ¶ 46.

agency to “give interested persons an opportunity to participate in rule making through submission of written data, view, or arguments with or without opportunity for oral presentation.”²³² This allows the agency to “have before it the facts and information relevant to a particular administrative problem.”²³³ The public cannot meaningfully comment on the methodologies or data sets in the disseminated information, nor the Commission’s findings based on this information, because the information is inadequate or entirely missing. “[P]ublic notice and comment regarding relied-upon technical analysis . . . are the safety valves in the use of . . . sophisticated methodology.”²³⁴ Methodological information permits commenters “to point out where . . . information is erroneous or where the agency may be drawing improper conclusions from it.”²³⁵ “[T]he notice requirement is the agency’s duty to identify and make available technical studies and data that it has employed in reaching the decisions to propose particular rules. . . . An agency commits serious procedural error when it fails to reveal portions of the technical basis for a proposed rule in time to allow for meaningful commentary.”²³⁶ A finding based on an unsupportable factual premise “provides neither assurance that the Commission considered the relevant factors nor a discernable path to which the court may defer.”²³⁷

Here, as the Commission repeated throughout the *Notice*, the alleged harm to investment is a key rationale predicated the need for this proceeding. The Commission rationalizes this

²³² 5 U.S.C. § 553(c).

²³³ *American Hosp. Ass’n v. Bowen*, 834 F.2d 1037, 1044 (D.C.Cir.1987).

²³⁴ *Am. Radio Relay League v. FCC*, 524 F.3d 227, 236 (D.C. Cir. 2008). (quoting *Sierra Club v. Costle*, 657 F.2d 298, 334 (D.C. Cir. 1981)).

²³⁵ *Id.* (quoting *Nat’l Ass’n of Regulatory Util. Comm’rs v. FCC*, 131 F.2d 1095, 1121 (D.C. Cir. 1984)).

²³⁶ *See id.* at 232 (internal quotations omitted) (citing *Connecticut Light and Power Co. v. NRC*, 673 F.2d 525, 530-31 (D.C. Cir.), *cert. denied*, 459 U.S. 835 (1982)); *see also Owner-Operator Indep. Drivers Ass’n v. Fed. Motor Carrier Safety Admin.*, 494 F.3d 188, 193 (2007); *Solite Corp. v. EPA*, 952 F.2d 473, 499 (D.C. Cir. 1991).

²³⁷ *Am. Radio Relay League v. FCC*, 524 F.3d at 241.

connection when it requests comments on the alleged decline.²³⁸ Elsewhere, USTelecom has correctly conceded that “[m]any factors affect capital spending, such as competition, financial markets, project timelines, and regulation.”²³⁹ Even Singer noted in a separate post, in reference to his information disseminated by the Commission, that his analysis suggests other ways to analyze the question of causation.²⁴⁰

The disseminated studies do not rigorously control for these other factors that even their authors acknowledge in order to isolate the supposed detrimental impacts of Title II. (And there are none, as we explain yet again below.) The *Notice* simultaneously disseminated and relied upon incomplete information that does not satisfy its own information quality standards and the Commission rests the proposed need for the rule changes on back-of-the-envelope calculations.

The public cannot meaningfully comment on this inference or the information disseminated by the Commission in support of it. Without quality and objective information in the *Notice*, the public cannot even comment on the defects in the Commission’s conclusory statements.

B. The Commission Has Exclusive Possession of Relevant Evidence That It Has Not Allowed the Public to See or Analyze Prior to Commenting.

The *Notice* seeks comment on numerous claims and questions that can be answered with evidence the Commission holds in its exclusive possession. The National Hispanic Media Coalition filed FOIA requests with the Commission over two months ago – seeking access to all

²³⁸ *Notice* ¶ 47.

²³⁹ Patrick Brogan, “Broadband Investment Ticked Down in 2015,” USTelecom (2016), <https://www.ustelecom.org/sites/default/files/Broadband%20Investment%20Down%20in%202015.pdf>.

²⁴⁰ See Hal Singer, “Tales from Econ Cloud Cuckoo Land” (June 12, 2016), <https://haljsinger.wordpress.com> (“With respect to causation . . . , I’ve said repeatedly that comparing 2014 ISP investment levels to those in 2015 or 2016 is not a proof of regulatory impact. Shall I say it again? Other things may have changed during the experiment that affect capital formation in the sector.”).

47,000+ consumer complaints about Net Neutrality violations, and all public interactions with the Commission’s Open Internet Ombudsperson.²⁴¹ So far, these requests have gone largely unfulfilled.²⁴² Commission FOIA officers have explained that the document production will take a long time because of “the overwhelming number of responsive documents.”²⁴³ These same officers have provided inconsistent timelines for document production, with periods ranging from six months to two years.²⁴⁴ NHMC filed a Motion for Extension of Time in this proceeding to allow time for the Commission to produce evidence germane to questions the *Notice* squarely poses,²⁴⁵ but the Commission denied it on the very same day that initial comments were originally due. This failure to ensure that all relevant evidence is available for public inspection and comment prior to the comment period violates the Administrative Procedure Act.²⁴⁶

As the NHMC Motion indicates:

The Commission’s NPRM ignores a substantial amount of data that is critical to evaluating the success of the *Open Internet Order*, and willfully neglects to mention or mischaracterizes two years of enforcement that occurred under the rules. For example, the NPRM asks “what, if any, changes have been made as a result of Title II reclassification that have had a positive impact on consumers?...Is there any evidence, for example, that consumers’ online experiences and Internet access have improved due to policies adopted in the Title II Order?” The NPRM also proposes eliminating the ombudsperson role and asks, “is the role of an ombudsperson necessary to protect consumers, businesses and other organizations’ interests.” These questions seek evidence that the Commission holds in its exclusive possession, while astonishingly, failing to even acknowledge the 47,000+ consumer complaints or the thousands of documents illustrating interactions between the ombudsperson and internet users.

²⁴¹ NHMC Motion at 2-3.

²⁴² *Id.* at 3-4.

²⁴³ *Id.* at 3.

²⁴⁴ *Id.* at 1.

²⁴⁵ *See, e.g., id.* at 6-8 (listing various questions from the *Notice* and explaining that the 47,000+ unavailable open internet complaints and the ombudsperson documents would provide answers to those questions and support reasoned rulemaking).

²⁴⁶ *See* 5 U.S.C. § 706(2)(A).

Under the APA, the Commission cannot ignore evidence out of convenience. In a rulemaking proceeding an “agency must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between facts found and the choice made.” An agency may not “entirely fail[] to consider an important aspect of the problem.” Additionally, “[i]t is not consonant with the purpose of a rule-making proceeding to promulgate rules on the basis of inadequate data, or on data that, [to a] critical degree, is known only to the agency.” In this case, the Commission has the data critical to the proceeding, but such information is ignored in the NPRM and has not been made publicly available for comment. Just as the Commission is not allowed to cherry-pick data, it cannot ignore data that does not support the outcome proposed in the NPRM.²⁴⁷

Remarkably, the Commission not only failed to rule on NHMC’s Motion until the last minute, it has routinely changed its tune on what information it can produce and when,²⁴⁸ leaving us to wonder: is the Commission trying to hide something? First, a FOIA officer informed NHMC that the contents of its request are accessible through FOIA but that document production would take six to nine months to complete. At a later date, that same FOIA officer said that document production could take one year to eighteen months, and later in that same phone conversation the same FOIA officer stated that document production could take up to two years.²⁴⁹ Commission FOIA officers attempted to get NHMC to accept less information, and to receive only a very small sample of the complaints.²⁵⁰ In exchange, they offered to provide an “enhanced summary” of the complaints in an Excel sheet able to be cross-referenced with publicly-available data.²⁵¹ Ultimately, the FOIA officers failed to fulfill even this portion of NHMC’s request: sample complaints were incomplete and the Commission provided no enhanced, cross-referenceable summary.

²⁴⁷ NHMC Motion at 5-6 (internal citations omitted).

²⁴⁸ *See, e.g., id.* at 3.

²⁴⁹ *Id.* at 3 & n.12.

²⁵⁰ *Id.* at 3.

²⁵¹ *Id.*

Under the APA, “[i]t is not consonant with the purpose of a rule-making proceeding to promulgate rules on the basis of inadequate data, or on data that, [to a] critical degree, is known only to the agency.”²⁵² Here, not only is relevant data wholly unavailable to the public, the Commission is actively opposing production of it and cannot even provide a comprehensive summary – perhaps for years to come.

This begs an important question: did the Commission even read and analyze the 47,000+ open internet complaints prior to commencing this proceeding, which seeks to gut these rules based on a theory that no one made use of them? If so, is the Commission’s analysis available offline? If it is, can we see it? And if there is no such analysis, can this hasty dash to repeal rules that allow the Commission to protect internet users from violations survive judicial scrutiny? How will the court view a slapdash *Notice* so intent on telling a one-sided story that it fails to mention 47,000+ complaints? And can a *Notice* that offhandedly suggests that the ombudsperson role is useless – while failing to mention the thousands of pages of public correspondence with said ombudsperson lying in the Commission vault – earnestly be considered the basis for reasoned decision-making? It should not take a FOIA request to expose secrets and truths known only to the FCC that are germane to a rulemaking proceeding: that’s the entire purpose of established statutes governing administrative procedure that ensure transparency and public participation in agency rulemaking.

²⁵² See *Am. Radio Relay League, Inc. v. FCC*, 524 F.3d at 237 (internal citation and quotations omitted). In that case, the Amateur Radio Relay League had requested through FOIA five studies gathered from field tests performed by the Office of Engineering and Technology. See *id.* However, certain portions of the studies were redacted, and an *in camera* review of the documents revealed staff summaries of test data, scientific recommendations, and test analysis and conclusions regarding the methodology. The court noted that when “an agency’s determination is based upon a complex mix of controversial and uncommented upon data and calculations, there is no APA precedent allowing an agency to cherry-pick a study on which it has chosen to rely in part.” See *id.* (internal citations and quotations omitted).

VI. Broadband Deployment and Investment Increased to Historic Levels Following the Commission’s Restoration of Common Carriage in the 2015 Order.

There should be no doubt: the Commission’s 2015 *Open Internet Order* is a smashing success, as measured by its stated goal of preserving and promoting the online ecosystem’s “virtuous cycle of investment,”²⁵³ and as measured by the Commission’s statutory obligations to “encourage the deployment [of] broadband telecommunications capability”²⁵⁴ and to promote “improved access to broadband service to consumers residing in underserved areas of the United States.”²⁵⁵ Broadband provider company investments, particularly those in core network services, accelerated following the Commission’s vote. And much more relevant than the dollars these ISPs spent is this encouraging fact: the transmission capabilities of broadband services offered by carriers large and small increased dramatically in the two years under restored common carriage, with additional improvements continuing at an historic pace.

Broadband providers are clearly thriving in the Title II era, as we copiously demonstrate herein. But they represent just one portion of the overall internet ecosystem, the entirety of which is experiencing historic growth, competition, and innovation in recent months. Investments in the network edge, including those by online video providers and edge computing firms, are up

²⁵³ See *Open Internet Order* ¶ 7; *US Telecom Ass’n. v. FCC*, 825 F.3d at 707 (“In any event, the Commission found that the virtuous cycle – spurred by the open internet rules – provides an ample counterweight, in that any harmful effects on broadband investment ‘are far outweighed by positive effects on innovation and investment in other areas of the ecosystem that [its] core broadband polices will promote.’”).

²⁵⁴ 47 U.S.C. § 1302(a) (“The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans . . . by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.”); see also *id.* § 706(d) (“The term ‘advanced telecommunications capability’ is defined, without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.”).

²⁵⁵ *Id.* § 1305(b)(2).

sharply. Each sector of the internet economy is responding to demand, and that demand is the direct result of continued access to an open, nondiscriminatory telecommunications service transmission pathway.

For example, more new U.S. “over-the-top” video services launched in the two years following the Commission’s 2015 vote than in the seven years prior. And the certainty that the Commission’s action created spurred the entry of numerous entities offering a full replacement to pay-TV, with vertical carriers such as AT&T now distributing (and others poised to distribute) their pay-TV services via other ISPs’ last mile networks. These online video providers are reaching customers who have increased access to higher-capacity transmission services, and who are purchasing them so they can transmit and receive high-capacity edge content. The ISPs offering higher-capacity transmission services are deploying improved products in response to higher demand for such transmission, driven by the explosion in innovative high-bandwidth edge services. This is the virtuous cycle at work, just as the Commission predicted in the 2015 order.

In sum, the *Open Internet Order* and accompanying legal classification decision settled the prior uncertainty about open, nondiscriminatory broadband telecom service access. What followed that decision was a historic period of U.S. investment and innovation. But judging by the *Notice*, the new Commission is staggeringly and willfully ignorant of its own policy successes, not to mention basic facts about developments in the markets it oversees. The Commission, apparently motivated by rigid ideological beliefs, has given its imprimatur to flimsy analysis that claims to demonstrate causal harms from Title II to broadband investment.

To do so, the *Notice* must flippantly dismiss not only much more rigorous analysis²⁵⁶ and

²⁵⁶ See *Notice* ¶ 45 n.116 (referring obliquely to Free Press as an “interested part[y],” but failing to explain how our interest is anything but the truth of the matter evident from unmanipulated data).

the Commission's own data,²⁵⁷ but also any semblance of logical analysis and critical thought. The "facts" the *Notice* offers as proof of Title II harm are nothing more than a single aggregate capital expenditure tally. That aggregate sum was not only built using manipulated data, but it completely ignores the truth within its own tally: investment is up at many ISPs, even though it is down at some few others. Instead of this being merely a starting point for analysis, the *Notice* treats the manipulated aggregate total as causal proof of Title II's odious nature.

But not only is the *Notice's* central and sole data point inaccurate, it is offered up as "proof" of an entirely implausible theory: that the mere possibility of future Commission intervention in the broadband internet access market would overcome all other positive market forces and create a systemic industry-wide decline in capital investment. Apparently, these mystical powers of Title II are surgically precise: this elusive future investment-crushing intervention, though presently forborne from in the *Open Internet Order*, must go beyond the specific open internet rules that all major ISPs loudly proclaim no desire to violate. That is, the *Notice* views a single manipulated source of aggregate capital industry investment as proof of something downright unbelievable: that restoration of the same highly deregulatory framework long applied to the thriving CMRS and enterprise broadband sectors created such fear about some future regulatory intervention that the industry's rational firms curtailed spending on broadband deployment and upgrades. This supposition is absurd, even in the absence of any contrary evidence. But when viewed in the context of the actual totality of the evidence herein, the *Notice's* central premise is not just absurd in theory but completely wrong in reality.

In this Part VI(A) we present irrefutable evidence that demonstrates the U.S. broadband economy is thriving. Because the central policy concern is broadband capabilities and not

²⁵⁷ See discussion below of FCC Form 477 Deployment data that the *Notice* failed to study.

arbitrary changes in the total dollars spent in aggregate on capital equipment, we begin by summarizing how consumer access to broadband services has changed since the beginning of 2015. In Part VI(B) that follows, we summarize the key financial and operational metrics of the U.S. broadband industry and the U.S. online video industry, comparing those statistics from time periods preceding and following the *Open Internet Order* vote. In the Appendix at the end of these comments, we also present voluminous statements made by cable- and telephone-company ISP executives to investors concerning the lack of any appreciable negative impact that Title II had on their broadband deployments.

Part VI(B) and that Appendix largely recapitulate and repeat the findings published in our May 2017 report on this topic,²⁵⁸ so as to ensure that these facts are in the record of this docket. What the Commission then chooses to do with those facts is its own business, but will likely be of great interest to the courts too – not because these investment realities bear on the legal definitions explained above, but because of the Commission’s reliance on investment claims to justify its abrupt and seemingly arbitrary policy changes proposed in the *Notice*.

If the Commission’s intent with this new proceeding is to respond to this evidence, within the four corners of policymaking that is bound by logic, facts, the law, and promotion of the public interest, then the only plausible conclusion would be that the restoration of common carriage for broadband transmission had no negative impact on the broadband market’s trajectory. In the two years since the 2015 vote, we’ve seen an explosion in online video competition as well as a dramatic increase in deployment of next-generation broadband-network capabilities. The Commission’s 2015 order is working as intended and creating incentives for growth, not scarcity. There’s simply no good reason for the agency to return the internet

²⁵⁸ *It’s Working*, *supra* note 7.

economy to the era of uncertainty that preceded the Title II decision.

A. Broadband Deployment Increased at a Historic Pace Following The 2015 Restoration of Common Carriage.

The data is clear: the restoration of Title II common carriage and the adoption of basic open internet rules did not negatively impact the broadband market's trajectory. In fact, the data provides evidence supporting the argument that settling the controversy about whether broadband providers could discriminate against streaming video (by blocking, throttling, or discriminating through paid-priority arrangements) produced a positive response from those broadband providers. Many or all of them apparently sought to gain share in a market where internet users demand transmission capacities that can adequately support streaming video.

The story told, by both the deployment data presented in this section and the investment data in the following section, should come as no surprise to anyone that closely follows this market: cable company ISPs have always had the easier upgrade path relative to telephone company ISPs, due to the inherent advantages of coaxial cable systems over traditional copper systems. Cable company ISPs were initially reluctant to make substantial capacity upgrades in the infancy of the streaming media era nonetheless, primarily due to concerns about cannibalization of their pay-TV services. But as the streaming media industry and underlying technologies evolved, cable company ISPs eventually accepted that systemic change was happening, and they were better off pursuing a business strategy that embraced streaming video as a complementary service for the majority of customers. Cable company ISPs also came to understand that whatever revenues they might lose in TV, they would more than offset through gains in broadband market share addition, knowing that their legacy telephone company ISP competitors had a much more expensive upgrade path. This is the story of the market during the

first phase of the “streaming video era,” roughly covering late 2010 through the end of 2014.²⁵⁹

However, the demand for streaming-capable broadband is still growing fast enough to drive additional expansions. And the settling of the Net Neutrality controversy by the 2015 order helped clarify the best path forward for legacy telephone companies as well as cable companies. The entire industry has benefited from advances in technologies that have increased the efficiency of online video transmission.

The old view, that broadband providers would need to implement discriminatory routing business models in order to compete or even survive in a streaming video world, was proven definitively wrong both for cable and telephone company ISPs. Cable’s incremental upgrade path was and continues to be very low-cost, as industry representatives have made explicitly clear.²⁶⁰ And historical phone companies now understand that if they push fiber deep enough, with minimal step-wise additional investments, they can offer services that are competitive with those marketed by cable company ISPs.

²⁵⁹ See Petition to Deny of Free Press, *In the Matter of Applications of Comcast Corp. and Time Warner Cable Inc. For Consent to Assign or Transfer Control of Licenses and Authorizations*, MB Docket No. 14-57, at 29–66 (filed Aug. 25, 2014).

²⁶⁰ See Karl Bode, “DOCSIS 3.0 Can Be Funded By ‘Couch Change’,” *DSL Reports* (May 9, 2007) (quoting a Comcast executive stating “Cable can go deploy DOCSIS 3.0 for a couple billion dollars – It’s the kind of money we can find in the sofa cushions.”).

It would be a grave mistake to reject the lessons of history and return to the demonstrably wrong thinking that without discrimination, upgrades won't happen.²⁶¹ Giving ISPs the legal right to gate-keep, and not offer telecommunications service, would reverse the proven incentives for growth. It would instead encourage broadband provider attempts to profit from artificial scarcity.

In this section we present analysis of deployment data collected by the Commission semiannually on Form 477. We compare the status of broadband deployment as of December 31, 2014, with the status as of June 30, 2016 (the most recent publicly available information).²⁶²

²⁶¹ For an example of pro-ISP analysis rolled out to encourage policymakers to allow discrimination, *see, e.g.*, Hal J. Singer, "Net Neutrality: A Radical Form of Non-Discrimination," *Regulation* (Summer 2007) ("With the advent of streaming video and other bandwidth-intensive applications, the demand for bandwidth is projected to overtake the existing supply quickly. Regulators and legislators should not interfere with a broadband service provider's ability to manage this 'coming exaflood' with intelligent networks. At best, the price of Internet service will skyrocket if broadband service providers can meet the coming traffic using only expanded infrastructure. At worst, the Internet experience for all users will deteriorate."). Of course, broadband providers of all types have dramatically expanded capacities and continue to meet demand – all without the need for discriminatory routing, without "skyrocketing" prices, and without a deteriorating user experience.

²⁶² The Commission began collecting Census Block-level deployment data on Form 477 for deployment as of December 31, 2014. Prior to this, the NTIA produced data collected pursuant to the State Broadband Initiative ("SBI"), a temporary project funded by the American Recovery and Reinvestment Act. Though the NTIA's SBI data and the FCC's 477 Deployment are similar, they were collected using differing methodologies, which makes accurate time-series analysis difficult. For example, while all ISPs report in the same fashion directly to the Commission, the SBI is the product of 50-plus different state initiatives, which introduces the significant possibility of reporting errors and differences. Also, there are differences in how the data is reported. The Commission simply asks the ISP to report for each Census Block the technology offered; whether it is offered to consumers, businesses, or both; and the maximum offered downstream and upstream speed for the given technology in each block. In contrast, the SBI collected 5 categories of customer type, with acknowledged categorization errors in reporting by numerous ISPs. The SBI also collected transmission speeds in ranges, which makes it difficult to measure certain changes (*e.g.*, if an ISP increased speeds from 12 to 18 Mbps, this would remain in the same SBI bin of 10 Mbps to 25 Mbps). For these reasons, our analysis focuses on a simple pre-/post approach that compares the status of deployment on the eve of the February 2015 vote to the most recent data, a total window of 18 months.

Form 477 deployment data is reported at the Census Block level, the most granular geographic level classified by the Commerce Department. This level of granularity is critical to any analysis of broadband deployment, as it greatly reduces the likelihood of over-counting the number of available carriers. At less granular geographic levels, the data will indicate that non-overlapping carriers serve the same territory when they actually do not.

Our analysis tracks changes in broadband deployment at the Census Block level (*e.g.*, the number of blocks with access to wired broadband). We also utilize Census Bureau demographic information in combination with Form 477 data to present the changes in broadband deployment at the individual person level (*e.g.*, the percent of U.S. population with access to wired broadband) and other demographic levels (*e.g.*, the percent of rural blocks with wired broadband). We note however that the Census Bureau only produces block-level population counts (including rural vs. urban population counts) in the decennial Census, last reported in 2010. Thus, some of the data presented below that incorporates demographic information is not reflective of the actual values as of the dates analyzed. This is for several reasons. First, there are more than 3 million blocks that recently reported having one or more fixed ISPs offering consumer class services that were unpopulated blocks as of the 2010 Census. Further investigation indicates that most of these blocks were undeveloped or commercial blocks as of the 2010 Census, which are now populated. Thus any block-level analysis presented below that utilizes the population counts specifically omits all such blocks that were unpopulated as of 2010. Second, because the same population counts are used for both the year-end 2014 and mid-2016 deployment data, this analysis does not capture the potential population movement in and out of these blocks. For these reasons, we present simple block-level count analyses, along with population-weighted and rural/urban analyses, which are informative but not definitive.

1. After the *Open Internet Order*, The Number of Available ISPs at Higher-Level Transmission Speeds Increased Dramatically, Largely Reflecting Widespread Upgrades by Telephone Company ISPs Made to Narrow the Capacity Gap with Cable Company ISPs.

Broadband deployment in unserved areas continued at a healthy pace from the end of 2014 to the middle of 2016. The number of unserved Census Blocks (those with no wired ISPs) decreased by 7 percent during this 18-month period (*see* Figure 1). A similar rate of decline occurred in terms of blocks unserved at higher speed thresholds. Measured in the raw number of blocks added, the largest deployments into previously unserved areas occurred at the very highest speeds. For example, between the end of 2014 and the middle of 2016, ISPs deployed 300 Mbps and higher level service in more than 737,000 previously unserved blocks (*see* Figure 1). Of these, nearly 70 percent gained service at this threshold from an ISP using DOCSIS 3.0 technology, with the rest newly served by a fiber-to-the-home ISP.

While the growth in newly served areas is encouraging and reflects a continuation of the industry's *pre-Open Internet Order* investment trajectory, the most impressive growth came in the deployment of higher-speed broadband services in monopoly service areas. The number of Census Blocks with two or more ISPs offering service with downstream speeds at or above 25 Mbps increased by 42 percent following the *Open Internet Order* (*see* Figure 1). This represents a net change of nearly 630,000 blocks that were previously unserved or underserved gaining a modicum of competition at this critical speed threshold.

The data indicates that the overwhelming majority of this competitive deployment at higher speeds is due to telephone company ISPs upgrading their networks in areas where cable ISPs already offered 25 Mbps and faster services. Less than 10 percent of the blocks that went from one or fewer ISPs at the 25 Mbps threshold to two or more such carriers were blocks that made this transition due to a cable company ISP increasing its speeds.

**Figure 1:
Census Blocks by Number of Available Wired ISPs and Downstream Speed
(Year-End 2014 vs. Mid-2016)**

Number of Wired ISPs	Total Number Census Blocks by Number of Available Wired ISPs and Downstream Speed (Year-End 2014 vs. Mid-2016)											
	Any Speed			≥3 Mbps			≥10 Mbps			≥25 Mbps		
	12/31/14	6/30/16	Percent Change	12/31/14	6/30/16	Percent Change	12/31/14	6/30/16	Percent Change	12/31/14	6/30/16	Percent Change
0	3,893,301	3,630,545	-7%	4,208,993	3,939,900	-6%	4,680,721	4,443,782	-5%	5,460,537	5,268,160	-4%
1	2,941,006	3,088,161	5%	3,012,102	3,118,822	4%	3,274,258	3,440,883	5%	4,209,632	3,774,266	-10%
2	3,765,024	3,790,238	1%	3,460,221	3,570,796	3%	2,881,550	2,920,255	1%	1,391,977	1,924,328	38%
3	504,003	587,124	16%	432,305	482,190	12%	295,395	325,338	10%	85,674	177,984	108%
4 or More	52,152	59,418	14%	41,865	43,778	5%	23,562	25,228	7%	7,666	10,748	40%
One Or More	7,262,185	7,524,941	4%	6,946,493	7,215,586	4%	6,474,765	6,711,704	4%	5,694,949	5,887,326	3%
Two or More	4,321,179	4,436,780	3%	3,934,391	4,096,764	4%	3,200,507	3,270,821	2%	1,485,317	2,113,060	42%

Number of Wired ISPs	Total Number Census Blocks by Number of Available Wired ISPs and Downstream Speed (Year-End 2014 vs. Mid-2016)								
	≥50 Mbps			≥100 Mbps			≥300 Mbps		
	12/31/14	6/30/16	Percent Change	12/31/14	6/30/16	Percent Change	12/31/14	6/30/16	Percent Change
0	6,001,152	5,501,280	-8%	7,205,117	6,607,332	-8%	10,686,475	9,949,357	-7%
1	4,155,325	4,132,752	-1%	3,268,071	3,776,909	16%	459,427	1,142,943	149%
2	953,260	1,393,968	46%	649,352	720,765	11%	8,986	61,527	585%
3	44,700	120,219	169%	32,249	46,286	44%	596	1,607	170%
4 or More	1,049	7,267	593%	697	4,194	502%	2	52	2500%
One Or More	5,154,334	5,654,206	10%	3,950,369	4,548,154	15%	469,011	1,206,129	157%
Two or More	999,009	1,521,454	52%	682,298	771,245	13%	9,584	63,186	559%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in all Census Blocks, including those with zero population in the 2010 Census.

Legacy telephone ISPs made this competitive push into higher speeds with a mix of technologies, primarily VDSL and fiber-to-the-home (“FTTH”). The number of blocks with VDSL offering speeds above 25 Mbps increased by nearly 700,000 (a 109 percent increase) and the number with FTTH technology offering speeds above that threshold increased by nearly 250,000 (23 percent; *see* Figure 2). Cable also continued to rollout higher speeds, and the number of blocks with DOCSIS 3.0 service increased by approximately 250,000 as well.²⁶³

²⁶³ The net number of new DOCSIS 3.0 Census Blocks was 247,499 (a 5.1 percent increase). The net number of new DOCSIS 3.0 blocks at speeds at or above 25 Mbps was 263,943 (a 5.5 percent increase). The net number of new FTTH Census Blocks was 189,246 (a 15.2 percent increase). The net number of new FTTH blocks at speeds at or above 25 Mbps was 249,961 (a 23.4 percent increase).

**Figure 2:
Census Blocks with ≥ 25 Mbps Service by Technology Type
(Year-End 2014 vs. Mid-2016)**

Technology	Number of Census Blocks Where Technology Is Available at ≥ 25 Mbps		
	Dec. 31, 2014	June 30, 2016	% Change
ADSL	312,722	253,425	-19.0%
ADSL2/2+	237,613	293,679	23.6%
VDSL	621,258	1,297,188	108.8%
FTTH	1,068,702	1,318,663	23.4%
DOCSIS 3.0	4,798,781	5,062,724	5.5%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect consumer broadband services in all Census Blocks, including those with zero population in the 2010 Census.

2. Available Transmission Capacities Increased Dramatically After the *Open Internet Order*, Reflecting ISPs Response to Increased Demand for Streaming Video-Capable Telecommunications Services.

Internet users are seeing substantial increases in the capacities of the services available to them following adoption of the *Open Internet Order*. For example, in blocks where DOCSIS 3.0 services are available, the average available speed of this technology increased by nearly 50 percent, from 118 Mbps to 173 Mbps (*see* Figure 3). Other technologies saw similar transmission capacity increases. Census Blocks with FTTH service saw the average available speed of this technology jump from 251 Mbps to 380 Mbps, a 51 percent increase. The average available VDSL downstream speed more than doubled, from 24 Mbps to 52 Mbps. While the average available speed in blocks with ADSL service declined, this simply reflects the upgrading of many of these lines to ADSL 2/2+, VDSL, or FTTH technologies.

We also present the change in median available downstream speeds for each technology type in Census Blocks where these services were deployed. The results are similar to the changes in average available speeds, with VDSL, DOCSIS 3.0, and Fixed Wireless median speeds all seeing sharp increases since the Commission restored Title II (*see* Figure 4).

**Figure 3:
Average Available Downstream Speed by Technology Type
(Year-End 2014 vs. Mid-2016)**

Technology Type	Technology's Average Maximum Available Speed (Mbps) in Census Blocks Where Technology is Deployed		
	Dec. 31, 2014	June 30, 2016	Percent Change
ADSL	11.1	8.6	-22.4%
ADSL2/2+	12.6	13.2	4.8%
VDSL	24.2	52.4	116.4%
FTTH	251.2	380.3	51.4%
DOCSIS 3.0	117.8	172.8	46.7%
Fixed Wireless	20.2	24.6	21.8%
Any Wired	117.2	182.0	55.3%
Any Terrestrial	103.1	159.0	54.2%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect consumer broadband services in all Census Blocks, including those with zero population in the 2010 Census.

**Figure 4:
Median Available Downstream Speed by Technology Type
(Year-End 2014 vs. Mid-2016)**

Technology Type	Technology's Median Maximum Available Speed (Mbps) in Census Blocks Where Technology is Deployed		
	Dec. 31, 2014	June 30, 2016	Percent Change
ADSL	6.0	6.0	0.0%
ADSL2/2+	10.0	12.0	20.0%
VDSL	18.0	45.0	150.0%
FTTH	100.0	100.0	0.0%
DOCSIS 3.0	105.0	150.0	42.9%
Fixed Wireless	10.0	15.0	50.0%
Any Wired	100.0	100.0	0.0%
Any Terrestrial	50.0	100.0	100.0%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect consumer broadband services in all Census Blocks, including those with zero population in the 2010 Census.

3. The Percent of the Population Living in High-Speed Broadband Monopolies Declined Sharply following Restoration of Title II, Reflecting Telephone Company ISP Deployments.

We now turn to analysis focused on the changes in broadband availability to individuals rather than Census Blocks. As discussed above, this analysis merges the block-level Form 477 deployment data for year-end 2014 and mid-2016 with block-level population data from the 2010 Census. Because of this, the following analysis excludes all Census Blocks that were unpopulated in 2010, including blocks where ISPs offered service in 2014 and 2016 (*i.e.*, blocks that became populated subsequent to the 2010 Census). Also, the analysis does not reflect the impact of population movement in and out of these Census Blocks. However, we do believe that the population-level analysis is instructive, as it gives a reasonable approximation of the changes in broadband availability to the average person.

The population-level analysis reflects the same trends seen in the block-level data presented in Figures 1–4. While there was little to no change in the percent of the population with access to wired broadband merely measured at any downstream speed whatsoever, there were large increases in the percent of the population with access to two or more ISPs offering downstream transmission speeds above the 25 Mbps threshold. For example, at the end of 2014 approximately one-third of the population had access to two or more ISPs offering 25 Mbps or higher level services. By mid-2016, more than half of the population were able to purchase broadband at this speed threshold from two or more ISPs (*see* Figure 5).

A similar large jump occurred in the percent of population able to access two or more wired ISPs at the 50 Mbps threshold (27 percent at the end of 2014, 41 percent by mid-2016). However, no such increase in the availability of competitive alternatives arose at the 100 Mbps or 300 Mbps thresholds. This reflects the legacy telco ISP strategy of incremental upgrades to their low-capacity ADSL lines, moving to fiber-fed ADSL2/2+ and VDSL lines in large portions

of their service area, with targeted FTTH in select locations.²⁶⁴ This incremental upgrade strategy is less capital intensive and can deliver upgraded services to far more locations in a shorter time period than a full FTTH upgrade. Carriers like AT&T, CenturyLink, Windstream and most other LECs are apparently satisfied with this approach, as it enables customers to access transmission speeds capable of supporting robust applications such as streaming video, including these companies' own IPTV services.

**Figure 5:
Percent of U.S. Population by Number of Available Wired ISPs and Downstream Speed
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)**

Number of Wired ISPs	Percent of 2010 Census Population by Number of Available Wired ISPs and Downstream Speed (Year-End 2014 vs. Mid-2016)							
	Any Speed		≥3 Mbps		≥10 Mbps		≥25 Mbps	
	12/31/14	6/30/16	12/31/14	6/30/16	12/31/14	6/30/16	12/31/14	6/30/16
0	4.0%	3.5%	5.1%	4.5%	6.7%	6.3%	10.6%	9.5%
1	11.1%	11.7%	15.2%	16.6%	23.0%	26.6%	54.6%	38.9%
2	70.8%	68.7%	67.5%	66.4%	61.7%	58.6%	32.2%	46.0%
3	12.5%	14.2%	10.9%	11.3%	7.9%	7.8%	2.4%	5.2%
4 or More	1.6%	1.9%	1.2%	1.3%	0.7%	0.7%	0.2%	0.3%
One or More	96.0%	96.5%	94.9%	95.5%	93.3%	93.7%	89.4%	90.5%
Two or More	84.9%	84.8%	79.6%	78.9%	70.3%	67.2%	34.8%	51.6%

Number of Wired ISPs	Percent of 2010 Census Population by Number of Available Wired ISPs and Downstream Speed (Year-End 2014 vs. Mid-2016)					
	≥50 Mbps		≥100 Mbps		≥300 Mbps	
	12/31/14	6/30/16	12/31/14	6/30/16	12/31/14	6/30/16
0	14.6%	10.7%	28.5%	22.5%	89.5%	77.5%
1	58.3%	48.7%	51.6%	57.2%	10.0%	20.6%
2	25.5%	36.4%	18.6%	18.8%	0.5%	1.8%
3	1.6%	4.0%	1.2%	1.4%	0.0%	0.0%
4 or More	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%
One or More	85.4%	89.3%	71.5%	77.5%	10.5%	22.5%
Two or More	27.1%	40.6%	19.9%	20.3%	0.5%	1.9%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.

²⁶⁴ See Appendix for discussion of company-specific LEC deployments in recent years.

At the very highest speeds –meaning 300 Mbps and above – most of the population remains unserved. This is changing rapidly, however, as cable ISPs begin to increase the capacities of their DOCSIS 3.0 systems through investments in new customer premise equipment (*e.g.*, DOCSIS 3.0 modems), higher capacity headend equipment (*e.g.*, CMTS upgrades), and deeper fiber deployment in their service areas. These investment drive the results seen in Figures 5–6. At the end of 2014, only 10.5 percent of the population had access to one or more wired ISPs offering consumer services above the 300 Mbps downstream threshold. But just 18 months later, this had more than doubled to nearly 23 percent of the population able to access this level of broadband service (*see* Figure 5).

These changes mean that while the average person saw no change in the number of wired ISPs available to them during this 18-month period (2.0 ISPs, at the beginning and end of the period alike; *see* Figure 6 below), there was indeed an increase in the average number of available wired ISPs at the mid-level speeds. For example, at the end of 2014 the average number of available wired ISPs offering 25 Mbps or higher level service was 1.3, increasing to 1.5 by mid-2016. These are meaningful improvements for most internet users, but are by no means good enough when it comes to assessing the level of competition and the number of real choices people have for high-speed broadband. However, the reality of duopoly and incrementalism was well established long before the Commission even opened a Net Neutrality docket. What has changed in recent years is the willingness of cable and telephone company ISPs to more quickly invest in higher capacities, that are still even greater than what most users currently require. This willingness to invest is a direct consequence of the ISPs’ understanding that their path to continued prosperity is through capacity expansion, not the artificial capacity restriction required by discriminatory business models like paid-prioritization.

**Figure 6:
Average Number of Available Wired ISPs by Downstream Speed
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)**

Downstream Speed	Average Number of Wired ISPs (2010 block population-weighted)	
	Dec. 31, 2014	June 30, 2016
Any	2.0	2.0
≥3 Mbps	1.9	1.9
≥10 Mbps	1.7	1.7
≥25 Mbps	1.3	1.5
≥50 Mbps	1.1	1.3
≥100 Mbps	0.9	1.0
≥300 Mbps	0.1	0.2

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.

4. ISPs Accelerated Deployment of Faster Broadband Following Restoration of Title II and Adoption of Open Internet Rules.

The data presented thus far indicates continued and robust broadband deployment after the 2015 order, if we measure deployment (as we should) in terms of capacity upgrades and not just dollars spent. Telco ISPs invested in higher capacities to close the gap with cable ISPs, and cable ISPs rolled out even higher speeds to maintain their dominance. Yet, in our comprehensive discussion below and in the Appendix, we also present investment data from publicly traded ISPs conclusively showing that their broadband businesses were not negatively impacted in any manner by the restoration of Title II. Most companies increased their capital spending, and the few that didn't were simply in the midst of a temporary trough in a typical capital deployment cycle. Where possible, we present each ISP's actual capital spending that went to network infrastructure. We also present relevant SEC and investor disclosures from ISP executives that reflect their continued investment in broadband, and their complete dismissal of the notion that restoring Title II had any negative impact on their outlook for this extremely profitable business.

As we noted at the start of this Part VI, the Commission’s primary statutory concern is not the total dollars spent by telecom carriers on capital equipment; the law directs the Commission to focus its attention on the capacities and competitive choices these carriers deploy to the public. The evidence of aggregate improvements in this regard, presented in Figures 1–6, strongly indicate the 2015 order’s policy framework is working as intended. And when we examine the capacity upgrades at the nation’s top ISPs, we see a similar pattern of growth and investment.²⁶⁵

Figure 8 presents the percent of each top cable company ISP’s census blocks in which it offers consumer-class broadband – by technology type and downstream speed – as of the end of 2014 and the middle of 2016. This data indicates that by the end of 2014, cable companies had covered the near entirety of their footprints with DOCSIS 3.0 technology. None had yet deployed DOCSIS 3.1 by the end of 2014, and none had done so by mid-2016 either – but not because of any regulatory fears. DOCSIS 3.1-capable modems were not yet commercially available at the time. Yet, as the investment data and company narrative information presented below indicates, these cable companies still increased their capital spending in order to offer higher transmission speeds and prepare for the symmetrical multi-gigabit world made possible by DOCSIS 3.1.

For example, as Figure 7 indicates, most of the cable company ISPs offered speeds at 50 Mbps or higher at the end of 2014, and did so throughout the near entirety of their footprint. But in the subsequent months, many of these ISPs began rolling out even faster speeds. Consider mid-sized cable ISP Armstrong. At the end of 2014, none of its customers had access to 300 Mbps or higher-level service. But by mid-2016, Armstrong offered this level of transmission

²⁶⁵ We note that certain ISPs’ data is greatly impacted by transactions conducted between the end of 2014 and the middle of 2016. For example, Verizon sold its Florida, Texas and California assets to Frontier. And Consolidated Communications sold off some of its systems.

capacity in 95 percent of its Census Blocks. Cox went from offering 300 Mbps and higher-level service in none of its blocks to 68 percent in the period following the *Open Internet Order*. Atlantic Broadband saw a similar jump in its 100 Mbps offerings (from 17 percent of its Census Blocks at the end of 2014 to 100 percent by mid-2016). Even General Communications, which operates in a remote and costly service territory in Alaska, went from offering 300 Mbps service in none of its blocks to doing so in 82 percent of its territory in just 18 months.

Even this level of detailed deployment information doesn't capture the full deployment story. Comcast was fully DOCSIS 3.0-capable by the end of 2014, and offered 100 Mbps and higher levels service in nearly all of its blocks at that time. It subsequently started offering very high speeds (above 300 Mbps) to a small percentage of its blocks, but the data in Figure 7 indicates little change.

However, Comcast's SEC filings indicate that its capital spending was up 19 percent on an annualized basis since the *Open Internet Order*, with its core network investments up more than 33 percent on average in those two years when compared to its similar investments in 2014 (see Figure 26). Based on Comcast's own statements to investors, these increases are due to the company's preparation for the next phase of its technology upgrades, DOCSIS 3.1 (see Appendix). And though Comcast didn't rollout speeds above 300 Mbps, it did sharply increase the speeds of its offerings in the months following the *Open Internet Order*, from a block-average of 129 Mbps to 191 Mbps (see Figure 11 below).

**Figure 7:
Top Cable Company ISPs – Deployment by Technology and Downstream Speed
(Year-End 2014 vs. Mid-2016)**

Cable ISP	Date	Percent of ISP's Census Blocks Where it Offers Consumer-Class Broadband Service (by Technology and Downstream Speed)								
		DOCSIS 2.0	DOCSIS 3.0	F'TTH	≥3 Mbps	≥10 Mbps	≥25 Mbps	≥50 Mbps	≥100 Mbps	≥300 Mbps
Abry (i.e. RCN)	Dec. 31, 2014	42.3%	93.4%	37.3%	100.0%	99.1%	99.1%	98.0%	97.9%	4.5%
	June 30, 2016	28.1%	97.9%	6.9%	99.9%	99.9%	99.9%	99.9%	99.9%	33.1%
Acquisitions (i.e. Atlantic)	Dec. 31, 2014	9.9%	90.1%	0.0%	100.0%	100.0%	90.1%	90.1%	16.7%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	99.9%	99.9%	99.9%	99.8%	0.0%
Altice (pro forma)	Dec. 31, 2014	0.1%	99.8%	0.0%	94.9%	94.6%	93.2%	90.7%	84.5%	13.4%
	June 30, 2016	0.0%	100.0%	0.0%	99.2%	97.3%	94.6%	92.4%	91.7%	26.7%
Armstrong	Dec. 31, 2014	0.0%	94.6%	0.0%	100.0%	96.8%	94.6%	94.6%	94.6%	0.0%
	June 30, 2016	0.0%	94.8%	0.0%	100.0%	97.2%	94.8%	94.8%	94.8%	94.8%
Block Comm.	Dec. 31, 2014	2.3%	97.8%	0.0%	100.0%	100.0%	97.8%	97.8%	54.7%	0.0%
	June 30, 2016	0.0%	99.2%	0.8%	100.0%	100.0%	100.0%	100.0%	100.0%	0.8%
Cable One	Dec. 31, 2014	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	99.8%	99.8%	99.8%	99.8%	22.5%
Charter (pro forma)	Dec. 31, 2014	9.5%	90.5%	0.0%	100.0%	100.0%	99.7%	90.5%	49.6%	8.4%
	June 30, 2016	0.4%	99.6%	0.0%	100.0%	100.0%	99.6%	99.5%	60.3%	18.4%
Comcast	Dec. 31, 2014	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	99.2%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	99.9%	99.0%	2.0%
Cox	Dec. 31, 2014	0.0%	100.0%	0.0%	100.0%	100.0%	99.8%	99.8%	99.8%	0.0%
	June 30, 2016	0.0%	99.8%	3.3%	100.0%	100.0%	99.8%	99.8%	99.8%	67.9%
General Comm.	Dec. 31, 2014	5.7%	90.8%	0.0%	99.2%	91.8%	81.5%	81.5%	81.5%	0.0%
	June 30, 2016	6.1%	90.2%	0.0%	98.9%	91.3%	90.0%	90.0%	90.0%	81.6%
Mediacom	Dec. 31, 2014	5.4%	94.7%	0.0%	100.0%	100.0%	94.7%	94.7%	94.7%	1.7%
	June 30, 2016	1.9%	98.2%	0.0%	100.0%	100.0%	98.2%	98.2%	98.2%	3.1%
Midcontinent	Dec. 31, 2014	48.6%	97.5%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
	June 30, 2016	34.1%	98.8%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
Pencor (i.e. Blue Ridge)	Dec. 31, 2014	0.0%	99.8%	99.8%	100.0%	100.0%	99.8%	99.8%	99.8%	99.8%
	June 30, 2016	0.0%	99.8%	99.8%	100.0%	100.0%	99.8%	99.8%	99.8%	99.8%
Shenandoah	Dec. 31, 2014	2.3%	75.6%	11.6%	100.0%	97.7%	87.2%	86.6%	86.6%	0.0%
	June 30, 2016	0.0%	84.6%	10.1%	100.0%	100.0%	92.4%	91.9%	91.9%	0.0%
Wave	Dec. 31, 2014	1.1%	98.6%	0.0%	99.8%	99.8%	98.9%	98.9%	98.9%	0.6%
	June 30, 2016	1.1%	98.4%	0.0%	100.0%	99.8%	98.9%	98.9%	98.9%	1.0%
WOW!	Dec. 31, 2014	4.6%	95.1%	0.0%	100.0%	99.7%	95.1%	95.1%	0.0%	0.0%
	June 30, 2016	4.6%	95.1%	36.5%	100.0%	99.7%	95.1%	95.1%	0.0%	0.0%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect each ISP's total number of Census Blocks where it offers wired consumer broadband services, including those with zero population in the 2010 Census.

The results for the nation's top telephone company ISPs tells a different type of success story, one similar to the aggregate telco results discussed above. Most legacy LECs rolled out higher-level speeds to a substantial number of new Census Blocks following the *Open Internet Order*, using a variety of technologies. Consider AT&T, the nation's largest ILEC, and a company that had completed an expensive upgrade cycle known as "Project VIP" prior to the Commission's February 2015 vote. At the end of 2014, AT&T offered 25 Mbps and higher-level downstream speeds to consumers in only 5 percent of its Census Blocks. But by mid-2016,

AT&T offered this level of service in nearly 40 percent of its territory, a massive increase (see Figure 8). Similarly, AT&T went from offering 50 Mbps and higher downstream speeds in virtually none of its blocks to offering this capacity in nearly one-quarter of its territory.²⁶⁶

**Figure 8:
Top Telephone Company ISPs – Deployment by Technology and Downstream Speed
(Year-End 2014 vs. Mid-2016)**

Local Exchange Carrier ISP	Date	Percent of ISP's Census Blocks Where it Offers Consumer-Class Broadband Service (by Technology and Downstream Speed)									
		ADSL	ADSL2	VDSL	FTTH	≥3 Mbps	≥10 Mbps	≥25 Mbps	≥50 Mbps	≥100 Mbps	≥300 Mbps
Alaska Comm.	Dec. 31, 2014	0.0%	38.8%	61.2%	0.0%	100.0%	99.6%	14.8%	3.5%	0.0%	0.0%
	June 30, 2016	0.0%	32.6%	67.4%	0.0%	100.0%	98.9%	33.2%	3.7%	0.0%	0.0%
AT&T	Dec. 31, 2014	14.7%	11.9%	72.5%	0.8%	84.1%	67.7%	5.3%	0.2%	0.2%	0.2%
	June 30, 2016	78.1%	44.5%	46.8%	1.4%	86.9%	55.8%	38.4%	23.9%	1.1%	1.1%
CenturyLink	Dec. 31, 2014	19.3%	70.9%	47.2%	1.0%	89.4%	72.7%	38.8%	15.1%	9.5%	0.7%
	June 30, 2016	8.7%	66.4%	37.1%	3.9%	90.5%	75.3%	43.0%	22.3%	11.6%	3.5%
Cincinnati Bell	Dec. 31, 2014	39.4%	47.3%	26.7%	27.1%	100.0%	82.7%	49.2%	27.1%	27.1%	27.1%
	June 30, 2016	32.4%	33.2%	23.0%	50.6%	100.0%	83.8%	65.4%	49.5%	49.5%	49.4%
Consolidated Comm.	Dec. 31, 2014	15.8%	49.6%	0.0%	26.7%	99.5%	94.7%	36.6%	35.0%	22.2%	22.1%
	June 30, 2016	16.9%	57.7%	1.3%	25.5%	99.5%	93.8%	27.8%	27.8%	25.9%	21.0%
Fairpoint	Dec. 31, 2014	26.6%	90.0%	4.7%	5.1%	93.1%	67.7%	13.8%	5.7%	2.8%	0.0%
	June 30, 2016	26.7%	93.3%	10.9%	5.1%	96.2%	78.8%	47.7%	16.4%	2.9%	0.5%
Frontier	Dec. 31, 2014	55.6%	67.2%	10.3%	4.4%	82.2%	42.1%	13.3%	10.5%	3.3%	3.3%
	June 30, 2016	93.9%	82.8%	19.1%	14.0%	87.8%	76.2%	17.0%	3.1%	3.1%	0.0%
Google	Dec. 31, 2014	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	June 30, 2016	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Hawaii Telcom	Dec. 31, 2014	78.7%	96.2%	53.1%	21.6%	99.9%	70.6%	32.2%	21.6%	21.6%	21.6%
	June 30, 2016	94.9%	82.6%	48.6%	30.5%	100.0%	65.8%	37.7%	30.5%	30.5%	30.5%
Otelco	Dec. 31, 2014	85.5%	0.0%	0.0%	0.0%	92.7%	63.7%	13.3%	1.0%	0.9%	0.0%
	June 30, 2016	81.2%	0.0%	0.0%	5.6%	97.8%	84.3%	55.7%	9.2%	5.8%	0.0%
TDS	Dec. 31, 2014	62.2%	27.0%	12.1%	4.0%	86.9%	47.4%	28.6%	17.5%	17.5%	3.4%
	June 30, 2016	60.9%	24.5%	13.5%	6.9%	87.2%	48.6%	34.2%	30.3%	22.0%	9.5%
Verizon	Dec. 31, 2014	79.6%	0.0%	0.0%	44.8%	95.0%	71.2%	44.8%	44.8%	44.8%	0.0%
	June 30, 2016	82.9%	0.0%	0.0%	44.6%	94.9%	72.0%	44.6%	44.6%	44.6%	0.0%
Windstream	Dec. 31, 2014	99.9%	0.0%	0.0%	0.0%	95.4%	95.4%	95.4%	0.0%	0.0%	0.0%
	June 30, 2016	98.4%	0.0%	0.0%	1.7%	94.6%	76.1%	46.6%	30.2%	11.1%	0.8%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect each ISP's total number of Census Blocks where it offers wired consumer broadband services, including those with zero population in the 2010 Census.

Other LEC's deployed similarly impressive capacity upgrades, and many of them are more geographically challenged than AT&T. Otelco – a very small rural LEC, 87 percent of its

²⁶⁶ The changes in technology coverage for AT&T and Windstream presented in Figure 8 may seem counterintuitive, but each has a plausible explanation. AT&T's results reflect the fact that many of its 2014 VDSL blocks were reported as ADSL or ADSL2/2+ blocks in 2016. It's unclear if this reflects an actual change in service availability in these blocks (due for example to AT&T's pulling back U-Verse TV services, and/or the company's shift to an IP-DSLAM architecture in many areas) or a reporting error. Windstream's reduction in 25 Mbps availability reflects the fact that the company reported that the near-entirety of its ADSL blocks offered 40Mbps services in 2014, but changed these to more realistic ADSL speeds in 2016. This suggests Windstream's 2014 reporting was inaccurate.

blocks classified as rural – saw the percentage of its Census Blocks where it offers 25 Mbps and higher-level speeds increase from 13 percent to 56 percent in the period following restoration of common carriage. Fairpoint – a company with nearly half of its footprint in rural areas – increased its offering of 25 Mbps service from 14 percent of its blocks at the end of 2014 to 48 percent by mid-2016.

5. Cable Companies Saw A Weakening of their High-Speed Monopolies Following the *Open Internet Order*, as Telephone Company ISPs Accelerated their Fiber-Enabled Broadband Deployments.

The data presented in Figure 5 above shows that the percentage of the population living in Census Blocks with two or more ISPs offering downstream speeds above 25 Mbps increased sharply following the *Open Internet Order*, from 35 percent at the end of 2014 to 52 percent by mid-2016. This data is a consequence of telephone company ISPs upgrading their networks to narrow the capacity gap with their cable company ISP competitors. The company-specific data reflects this development too. For example, at the end of 2014 Comcast was the only provider of 25 Mbps service in 64 percent of the blocks where it offered this level of service. By the mid-2016, Comcast’s 25 Mbps monopoly had shrunk to 45 percent of those blocks (*see* Figure 9).

We can also see this growth in competition by looking at the ISPs that are “overbuilders,” (companies like RCN, WOW! and Google), and that are not traditional incumbent phone or cable companies but entered the market as a third facilities-based provider. At the end of 2014, WOW! faced 25 Mbps-level competition from two or more other ISPs in 11 percent of its Census Blocks, which increased to 49 percent by mid-2016 (*see* Figure 9). Google went from competing with two or more 25 Mbps-level ISPs in 27 percent of its Census Blocks at the end of 2014 to doing so in 55 percent of its blocks by mid-2016 (*see* Figure 10).

**Figure 9:
Top Cable Company ISPs – Percent of Blocks by Number of Competitors
(Year-End 2014 vs. Mid-2016)**

Cable ISP	Date	Percent of ISP's Census Blocks Where it Faces Competition From:			Percent of ISP's ≥25 Mbps Census Blocks Where it Faces Competition From:		
		No Other Wired ISP	One Other Wired ISP	Two or More Other Wired ISPs	No Other ≥25 Mbps Wired ISP	One Other ≥25 Mbps Wired ISP	Two or More Other ≥25 Mbps Wired ISPs
Abry (i.e. RCN)	Dec. 31, 2014	1.1%	4.5%	94.4%	3.6%	43.1%	53.3%
	June 30, 2016	1.1%	5.0%	93.9%	3.2%	31.2%	65.6%
Acquisitions (i.e. Atlantic)	Dec. 31, 2014	19.3%	73.3%	7.4%	84.4%	14.4%	1.2%
	June 30, 2016	14.8%	79.5%	5.7%	80.1%	17.8%	2.1%
Altice (pro forma)	Dec. 31, 2014	18.6%	76.1%	5.3%	60.7%	37.5%	1.8%
	June 30, 2016	16.5%	78.3%	5.2%	59.4%	38.9%	1.6%
Armstrong	Dec. 31, 2014	25.6%	67.9%	6.5%	76.0%	22.9%	1.2%
	June 30, 2016	22.6%	70.2%	7.2%	79.0%	19.8%	1.3%
Block Comm.	Dec. 31, 2014	10.1%	82.5%	7.4%	89.7%	9.2%	1.1%
	June 30, 2016	13.4%	79.0%	7.6%	72.4%	24.0%	3.6%
Cable One	Dec. 31, 2014	14.4%	75.3%	10.2%	74.2%	24.7%	1.2%
	June 30, 2016	11.8%	68.2%	20.0%	66.4%	29.5%	4.1%
Charter (pro forma)	Dec. 31, 2014	31.5%	56.9%	11.6%	78.2%	20.2%	1.6%
	June 30, 2016	25.7%	62.7%	11.6%	65.9%	31.0%	3.0%
Comcast	Dec. 31, 2014	7.5%	79.6%	12.9%	63.9%	33.7%	2.4%
	June 30, 2016	7.3%	78.3%	14.4%	45.4%	48.6%	6.0%
Cox	Dec. 31, 2014	6.8%	84.7%	8.5%	60.6%	38.8%	0.6%
	June 30, 2016	7.4%	80.1%	12.5%	45.3%	53.4%	1.4%
General Comm.	Dec. 31, 2014	42.4%	57.6%	0.0%	82.5%	17.5%	0.0%
	June 30, 2016	40.9%	59.0%	0.0%	75.3%	24.7%	0.0%
Mediacom	Dec. 31, 2014	12.1%	71.0%	16.8%	67.7%	29.6%	2.7%
	June 30, 2016	10.9%	69.0%	20.1%	65.0%	32.0%	3.0%
Midcontinent	Dec. 31, 2014	8.2%	64.5%	27.3%	47.0%	48.9%	4.1%
	June 30, 2016	7.6%	61.9%	30.5%	44.7%	48.9%	6.3%
Pencor (i.e. Blue Ridge)	Dec. 31, 2014	12.0%	32.2%	55.8%	29.4%	40.0%	30.6%
	June 30, 2016	9.0%	33.4%	57.6%	29.1%	42.6%	28.3%
Shenandoah	Dec. 31, 2014	63.4%	34.8%	1.8%	93.3%	6.6%	0.1%
	June 30, 2016	41.0%	56.5%	2.5%	90.7%	9.1%	0.2%
Wave	Dec. 31, 2014	8.0%	51.6%	40.4%	48.5%	38.9%	12.6%
	June 30, 2016	5.9%	53.5%	40.6%	40.3%	32.1%	27.6%
WOW!	Dec. 31, 2014	3.9%	17.9%	78.2%	11.3%	77.7%	11.0%
	June 30, 2016	3.4%	19.5%	77.1%	5.7%	45.1%	49.3%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect each ISP's total number of Census Blocks where it offers wired consumer broadband services, including those with zero population in the 2010 Census.

**Figure 10:
Top Telephone Company ISPs – Percent of Blocks by Number of Competitors
(Year-End 2014 vs. Mid-2016)**

Local Exchange Carrier ISP	Date	Percent of ISP's Census Blocks Where it Faces Competition From:			Percent of ISP's ≥25 Mbps Census Blocks Where it Faces Competition From:		
		No Other Wired ISP	One Other Wired ISP	Two or More Other Wired ISPs	No Other ≥25 Mbps Wired ISP	One Other ≥25 Mbps Wired ISP	Two or More Other ≥25 Mbps Wired ISPs
Alaska Comm.	Dec. 31, 2014	16.5%	83.4%	0.0%	2.7%	97.3%	0.0%
	June 30, 2016	17.3%	82.6%	0.1%	6.0%	94.0%	0.0%
AT&T	Dec. 31, 2014	14.7%	71.4%	13.8%	13.4%	75.0%	11.6%
	June 30, 2016	14.8%	70.3%	14.9%	6.4%	81.2%	12.4%
CenturyLink	Dec. 31, 2014	25.9%	63.9%	10.3%	18.2%	78.1%	3.7%
	June 30, 2016	26.4%	58.6%	15.0%	19.6%	74.4%	6.0%
Cincinnati Bell	Dec. 31, 2014	2.1%	96.2%	1.7%	0.8%	99.2%	0.1%
	June 30, 2016	2.3%	82.7%	15.0%	0.9%	94.9%	4.1%
Consolidated Comm.	Dec. 31, 2014	22.7%	39.9%	37.4%	1.6%	75.1%	23.3%
	June 30, 2016	23.2%	46.8%	30.0%	3.5%	39.5%	57.0%
Fairpoint	Dec. 31, 2014	28.0%	61.4%	10.6%	26.8%	66.4%	6.8%
	June 30, 2016	28.5%	60.5%	11.0%	31.6%	63.9%	4.5%
Frontier	Dec. 31, 2014	24.8%	65.6%	9.6%	6.0%	90.1%	3.9%
	June 30, 2016	35.9%	56.8%	7.2%	7.7%	86.7%	5.5%
Google	Dec. 31, 2014	0.1%	2.4%	97.5%	0.5%	72.2%	27.4%
	June 30, 2016	1.4%	6.0%	92.6%	3.9%	40.9%	55.1%
Hawaii Telcom	Dec. 31, 2014	1.3%	98.2%	0.5%	0.0%	100.0%	0.0%
	June 30, 2016	8.5%	90.9%	0.6%	0.7%	99.1%	0.2%
Otelco	Dec. 31, 2014	46.3%	32.7%	21.0%	90.5%	7.6%	1.9%
	June 30, 2016	53.1%	41.8%	5.1%	57.3%	39.7%	3.0%
TDS	Dec. 31, 2014	32.6%	36.2%	31.2%	49.4%	49.2%	1.4%
	June 30, 2016	31.5%	35.9%	32.6%	52.1%	46.0%	1.9%
Verizon	Dec. 31, 2014	12.5%	78.3%	9.1%	6.6%	87.2%	6.2%
	June 30, 2016	12.0%	79.4%	8.6%	6.2%	87.9%	5.9%
Windstream	Dec. 31, 2014	37.6%	50.9%	11.5%	46.3%	49.8%	4.0%
	June 30, 2016	43.4%	48.1%	8.6%	41.9%	53.6%	4.5%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect each ISP's total number of Census Blocks where it offers wired consumer broadband services, including those with zero population in the 2010 Census.

6. ISPs Continued to Deploy Faster Broadband Services Following Title II Reclassification, Including in Rural Areas.

The Commission's 2015 order removed the market's uncertainty about whether ISPs could discriminate to control the growing online video market. With that issue settled correctly, and several types of such unreasonable discrimination prohibited by rule and by law, ISPs

understood their future growth would come from meeting consumer demand for fast, reliable broadband telecommunications services – not from extorting payments from edge companies or discriminating against online video in hopes of propping up the ISPs’ own legacy pay-TV businesses.

The deployment data reflects this strategy of revenue growth through deploying higher-capacity offerings. Consider Cable One: at the end of 2014, the company’s block-level average downstream speed was 75 Mbps. By mid-2016, Cable One’s average downstream speed offering had increased to 379 Mbps. In the company’s rural blocks, its offered speeds increased from an average of 75 Mbps to 325 Mbps (*see* Figure 11). Alaska-based cable company General Communications realized massive speed increases, from a block-level average of 206 Mbps at the end of 2014 to 781 Mbps by mid-2016 (*see* Figure 11).

Even cable companies that didn’t show much change in crossing the 300 Mbps barrier in Figure 8 above did utilize the headroom in their DOCSIS 3.0 infrastructure to rollout faster speeds. Consider cable provider Wave, which saw its block-level average speed offering more than double from 115 Mbps at the end of 2014 to 240 Mbps by mid-2016, a capacity increase also enjoyed by the company’s rural customers (*see* Figure 11).

Telephone company ISPs don’t have the same room for capacity growth that cable company ISPs do, thanks to DOCSIS 3.0 technology. But many of these telco ISPs did deploy meaningfully higher capacities, in both their urban and rural territories. AT&T’s block-level average downstream speed more than doubled from 15 Mbps at the end of 2014 to 40 Mbps by mid-2016. In AT&T’s rural blocks, its average available downstream speed went from 9 Mbps to 18 Mbps during the period following the Commission’s adoption of the *Open Internet Order* (*see* Figure 12). CenturyLink’s block-level average speed offering nearly doubled during this 18-

month period too, from 33 Mbps to 63 Mbps (*see* Figure 12). Even largely rural LECs like Fairpoint and Otelco managed to deploy impressive capacity upgrades. In Otelco’s rural blocks, its average downstream speed offering increased by 140 percent, from 12 Mbps to 28 Mbps (*see* Figure 12).

**Figure 11:
Top Cable Company ISPs – Average Maximum Available Downstream Speed
by Block Type (Year-End 2014 vs. Mid-2016)**

Cable ISP	Date	ISP's Average Maximum Available Downstream Speed (Mbps) by Census Block Type		
		All the ISP's Census Blocks	All the ISP's Rural Census Blocks*	All the ISP's Urban Census Blocks*
Abry (i.e. RCN)	Dec. 31, 2014	121.0	85.0	121.4
	June 30, 2016	252.0	288.6	246.6
Acquisitions (i.e. Atlantic)	Dec. 31, 2014	75.8	67.7	81.0
	June 30, 2016	119.8	119.5	120.0
Altice (pro forma)	Dec. 31, 2014	189.2	193.0	178.8
	June 30, 2016	339.6	357.2	350.6
Armstrong	Dec. 31, 2014	95.0	91.0	99.8
	June 30, 2016	379.8	364.7	399.2
Block Comm.	Dec. 31, 2014	81.9	56.2	93.5
	June 30, 2016	112.2	105.9	114.3
Cable One	Dec. 31, 2014	75.0	75.0	75.0
	June 30, 2016	379.3	325.1	391.4
Charter (pro forma)	Dec. 31, 2014	92.4	74.2	101.6
	June 30, 2016	120.6	99.7	129.6
Comcast	Dec. 31, 2014	129.4	128.5	129.6
	June 30, 2016	191.2	177.0	193.0
Cox	Dec. 31, 2014	149.8	149.9	149.8
	June 30, 2016	290.9	250.9	292.9
General Comm.	Dec. 31, 2014	206.3	119.6	234.2
	June 30, 2016	781.0	431.0	891.8
Mediacom	Dec. 31, 2014	143.9	134.1	149.7
	June 30, 2016	164.3	146.9	173.8
Midcontinent	Dec. 31, 2014	199.7	199.1	200.0
	June 30, 2016	199.8	199.3	200.0
Pencor (i.e. Blue Ridge)	Dec. 31, 2014	997.5	999.1	1,000
	June 30, 2016	997.8	999.2	1,000
Shenandoah	Dec. 31, 2014	88.8	86.3	95.6
	June 30, 2016	93.7	92.1	100.8
Wave	Dec. 31, 2014	114.8	105.8	116.8
	June 30, 2016	239.8	212.7	243.6
WOW!	Dec. 31, 2014	48.2	26.8	49.4
	June 30, 2016	48.3	26.8	49.4

*Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values in first column reflect the average of each ISP's total number of Census Blocks where it offers wired consumer broadband services, including those with zero population in the 2010 Census. *Blocks are classified as rural or urban based on 2010 Census, therefore the values in second and third columns exclude blocks with zero population as of that date.*

**Figure 12:
Top Telephone Company ISPs – Average Maximum Available Downstream Speed
by Block Type (Year-End 2014 vs. Mid-2016)**

Local Exchange Carrier ISP	Date	ISP's Average Maximum Available Downstream Speed (Mbps) by Census Block Type		
		All the ISP's Census Blocks	All the ISP's Rural Census Blocks*	All the ISP's Urban Census Blocks*
Alaska Comm.	Dec. 31, 2014	15.8	12.8	16.8
	June 30, 2016	18.4	14.1	19.7
AT&T	Dec. 31, 2014	15.2	8.8	16.7
	June 30, 2016	39.6	18.1	46.3
CenturyLink	Dec. 31, 2014	33.0	15.3	44.5
	June 30, 2016	63.0	21.0	93.5
Cincinnati Bell	Dec. 31, 2014	282.0	73.9	326.9
	June 30, 2016	501.9	148.4	581.0
Consolidated Comm.	Dec. 31, 2014	239.5	19.4	334.6
	June 30, 2016	229.3	31.5	314.7
Fairpoint	Dec. 31, 2014	17.4	13.5	25.1
	June 30, 2016	29.1	21.2	44.5
Frontier	Dec. 31, 2014	32.9	8.9	53.9
	June 30, 2016	19.8	13.9	27.4
Google	Dec. 31, 2014	1,000	1,000	1,000
	June 30, 2016	1,000	1,000	1,000
Hawaii Telecom	Dec. 31, 2014	117.7	16.4	137.9
	June 30, 2016	313.2	31.6	386.9
Otelco	Dec. 31, 2014	11.8	11.8	11.5
	June 30, 2016	28.1	28.3	26.4
TDS	Dec. 31, 2014	52.3	42.3	68.9
	June 30, 2016	91.3	85.7	110.1
Verizon	Dec. 31, 2014	49.6	18.8	57.3
	June 30, 2016	49.4	18.7	57.9
Windstream	Dec. 31, 2014	38.2	39.9	36.4
	June 30, 2016	37.8	30.5	53.2

*Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values in first column reflect each ISP's total number of Census Blocks where it offers wired consumer broadband services, including those with zero population in the 2010 Census. *Blocks are classified as rural or urban based on 2010 Census, therefore the values in second and third columns exclude blocks with zero population as of that date.*

7. Rural Broadband Deployment Gaps Remain, but the Size of this Digital Divide Continued to Shrink Following the 2015 Order.

Broadband deployment in rural areas²⁶⁷ has been robust following the adoption of the *Open Internet Order*, most notably in terms of deployment of next-generation speeds. The number of unserved rural blocks (as classified by the 2010 Census) declined by 17 percent

²⁶⁷ The Census Bureau defines an urban area in a very detailed manner. See 79 Fed. Reg. 164 (Aug. 25, 2014). Block-level data from the 2010 Census reports the number of persons in each block that are classified as residing in urban or rural areas or clusters.

between the end of 2014 and mid-2016.²⁶⁸ This corresponds to a decline in the percentage of unserved rural blocks from 16 to 13 percent. While broadband deployment in unserved areas continues, as it must, the largest source of growth in rural areas comes from upgrades of existing networks to next-generation level transmission speeds. For example, the total number of rural blocks with access to 100 Mbps or higher downstream speeds increased by nearly 165,000, a 29 percent rate of growth (*see* Figure 13).

Figure 13:
Number of Rural and Urban Census Blocks
With Access to Wired ISPs by Downstream Speed
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)

Wired ISP Downstream Speed	Total Number of 2010 Rural Census Blocks			Total Number of 2010 Urban Census Blocks		
	Dec. 31, 2014	June 30, 2016	% Change	Dec. 31, 2014	June 30, 2016	% Change
Any	1,825,610	1,919,043	5.1%	3,551,660	3,563,414	0.3%
≥3 Mbps	1,670,964	1,783,001	6.7%	3,535,188	3,549,717	0.4%
≥10 Mbps	1,438,974	1,539,068	7.0%	3,501,023	3,507,447	0.2%
≥25 Mbps	1,067,943	1,131,254	5.9%	3,378,065	3,421,993	1.3%
≥50 Mbps	874,392	1,027,158	17.5%	3,216,165	3,374,349	4.9%
≥100 Mbps	577,682	742,618	28.6%	2,662,323	2,915,262	9.5%
≥300 Mbps	65,165	201,713	209.5%	292,533	724,112	147.5%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.

As of the middle of 2016, nearly half of the rural population (as classified in the 2010 Census) had access to one or more wired ISPs offering downstream speeds of 100 Mbps or higher, with more than three quarters of the rural population able to subscribe to wired services

²⁶⁸ Because classification of blocks as either urban or rural is based on 2010 population counts, this growth figure excludes blocks that were uninhabited as of the 2010 Census. There were 2.61 million blocks classified as rural in the 2010 Census. As of the end of 2014, 2.19 million of these blocks were served by a terrestrial ISP, with 1.83 million having one or more wired ISPs. By mid-2016, 2.26 million of these 2010-Census classified rural blocks were served by a terrestrial ISP, with 1.92 million having one or more wired ISP. Thus, the number of 2010-classified rural blocks unserved by a terrestrial ISP declined from 417,029 at the end of 2014 to 345,372 rural blocks by June 30, 2016. *See* Figure 14 herein for analysis of wired deployment at various downstream speed thresholds.

at the Connect America Fund minimum downstream speed threshold of 10 Mbps (*see* Figure 14). In urban areas, growth in the availability of slower speeds was less robust, simply due to the fact that these areas already enjoyed widespread cable ISP deployment. But growth in the availability of higher speeds in urban areas was impressive, with 85 percent of 2010-classified urban population able to purchase 100 Mbps and higher-level services by the middle of 2016.

**Figure 14:
Percent of Rural and Urban Population
With Access to Wired ISPs by Downstream Speed
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)**

Wired ISP Downstream Speed	Percent of 2010 Census Rural Population Served		Percent of 2010 Census Urban Population Served	
	Dec. 31, 2014	June 30, 2016	Dec. 31, 2014	June 30, 2016
Any	84.7%	86.4%	98.6%	98.8%
≥3 Mbps	79.9%	82.5%	98.4%	98.6%
≥10 Mbps	73.2%	75.7%	98.0%	98.0%
≥25 Mbps	59.9%	62.9%	98.0%	97.1%
≥50 Mbps	52.5%	62.9%	93.2%	96.4%
≥100 Mbps	36.3%	45.3%	79.8%	85.0%
≥300 Mbps	3.8%	11.7%	12.1%	25.0%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.

The broadband market overall remains a cable-LEC duopoly. But in rural areas, even this amount of “competition” is rare: only 28 percent of rural blocks have two or more wired ISPs, compared to 87 percent of urban blocks.²⁶⁹ This corresponds to about half of the rural population having access to two or more wired ISPs, while more than 93 percent of the urban population does (*see* Figure 15). But as in the overall market, it appears that in the months following the restoration of Title II to broadband access services, the lagging ISP in both rural and urban

²⁶⁹ Of the 2,608,017 blocks classified as rural in the 2010 Census, only 725,741 blocks had two or more wired ISPs as of mid-2016. In contrast, of the 3,649,930 blocks classified as urban in the 2010 Census, 3,180,446 blocks had two or more wired ISPs in this most recent reporting.

duopoly territories tended to invest in deploying faster speeds. The percent of rural persons served by two or more wired ISPs offering 25 Mbps and higher-level services increased from 13 percent to 16 percent. This increase, while impressive for these sparse areas, was nowhere near the jump seen in urban communities. At the end of 2014, 40 percent of the urban population had access to two or more ISPs at this threshold, and that increased sharply to 60 percent by the middle of 2016 (*see* Figure 15).

Figure 15:
Percent of Rural and Urban Population
With Access to Two or More Wired ISPs by Downstream Speed
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)

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	June 30, 2016	Dec. 31, 2014	June 30, 2016
Any	48.6%	49.7%	93.4%	93.1%
≥3 Mbps	42.9%	43.8%	88.3%	87.3%
≥10 Mbps	32.7%	33.5%	79.2%	75.1%
≥25 Mbps	12.9%	16.8%	40.0%	59.9%
≥50 Mbps	6.5%	12.3%	32.0%	47.3%
≥100 Mbps	4.1%	6.1%	23.6%	23.6%
≥300 Mbps	0.0%	0.4%	0.7%	2.3%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.

This means that rural and urban communities have seen dramatic increases in the maximum downstream speeds available to them in the two years following the Commission’s restoration of common carriage. At the end of 2014, the average top speed available in a Census Block was 103.1 Mbps, and that increased to 159 Mbps by mid-2016. In the average urban block, this maximum available speed increased from 149 Mbps to 229.3 Mbps. The average rural block saw its maximum available speed increase from 72.2 Mbps to 119.8 Mbps (*see* Figure 16).

**Figure 16:
Average Maximum Available Downstream Speeds in Rural and Urban Blocks
by Technology Type (Year-End 2014 vs. Mid-2016)**

ISP Type	Date	Maximum Available Downstream Speed (Mbps) by Census Block Type		
		Average Census Block	Average Rural Census Block*	Average Urban Census Block*
Any Technology	Dec. 31, 2014	103.1	72.2	149.0
	June 30, 2016	159.0	119.8	229.3
Wired ISPs	Dec. 31, 2014	117.2	82.8	147.1
	June 30, 2016	182.0	135.1	228.7
Cable ISPs	Dec. 31, 2014	121.7	106.2	130.4
	June 30, 2016	182.8	154.6	200.2
LEC ISPs	Dec. 31, 2014	51.8	40.9	58.2
	June 30, 2016	85.8	77.8	90.3
Fixed Wireless ISPs	Dec. 31, 2014	20.2	12.5	28.6
	June 30, 2016	24.6	18.9	32.1

*Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values in first column reflect the average of each technology's total number of Census Blocks where it is used by an ISP to offer consumer broadband services, including those with zero population in the 2010 Census. *Blocks are classified as rural or urban based on 2010 Census, therefore the values in second and third columns exclude blocks with zero population as of that date.*

The values presented in Figure 16 were calculated by first determining each Census Block's maximum available downstream speed (in blocks where at least one terrestrial broadband ISP reported offering service), then averaging these values. However, because outlier blocks can greatly impact the average values, we also investigated the change in downstream speeds for the median Census Block. At the end of 2014, the maximum available downstream speed in the median Census Block served by any terrestrial ISP was 50 Mbps. That had doubled to 100 Mbps by mid-2016. This market-wide change was largely driven by large increases in the cable ISP speeds, but LECs and WISPs also saw large increases (*see* Figure 17).

**Figure 17:
Median Available Maximum Downstream Speed
(Year-End 2014 vs. Mid-2016)**

ISP Type	Date	Maximum Available Downstream Speed (Mbps) by Census Block Type		
		Median Census Block	Median Rural Census Block*	Median Urban Census Block*
Any Technology	Dec. 31, 2014	50	25	105
	June 30, 2016	100	30	150
Wired ISPs	Dec. 31, 2014	100	40	105
	June 30, 2016	100	50	150
Cable ISPs	Dec. 31, 2014	101	100	105
	June 30, 2016	150	100	150
LEC ISPs	Dec. 31, 2014	15	10	18
	June 30, 2016	20	12	25
Fixed Wireless ISPs	Dec. 31, 2014	10	7	12
	June 30, 2016	15	10	15

*Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). *Because values are population-weighted, blocks with zero population in the 2010 Census are excluded.*

Just as outlier blocks can impact average values, so too can uneven population distribution between blocks. Blocks with higher populations tend to have better quality broadband, something that is true for both rural and urban areas. Thus, we present population-weighted values that represent the changes in the maximum downstream speeds available to the average and median person, rural person, and urban person. These results presented in Figures 18 and 19 reflect large increases in downstream speeds for both rural and urban residents. For example, the average person living in a rural area saw their maximum available downstream speed increase from 96.9 Mbps at the end of 2014 to 157 Mbps by the middle of 2016 (*see* Figure 18). The median rural resident saw their available downstream speed increase from 50 Mbps at the end of 2014 to 80 Mbps by mid-2016 (*see* Figure 19).

Figure 18:
Rural and Urban Population’s Average Available Maximum Downstream Speed
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)

ISP Type	Date	Maximum Available Downstream Speed (Mbps) by Census Block Type		
		Population- Weighted Average Census Block*	Population- Weighted Average Rural Census Block*	Population- Weighted Average Urban Census Block*
Any Technology	Dec. 31, 2014	156.4	96.9	169.5
	June 30, 2016	234.5	157.0	251.7
Wired ISPs	Dec. 31, 2014	150.7	102.9	160.4
	June 30, 2016	229.8	165.0	243.2
Cable ISPs	Dec. 31, 2014	137.0	119.0	139.4
	June 30, 2016	204.9	177.4	208.5
LEC ISPs	Dec. 31, 2014	67.9	40.8	73.2
	June 30, 2016	102.1	75.5	107.4
Fixed Wireless ISPs	Dec. 31, 2014	46.3	13.8	54.5
	June 30, 2016	51.4	22.1	59.1

*Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). *Because values are population-weighted, blocks with zero population in the 2010 Census are excluded.*

Figure 19:
Rural and Urban Population’s Median Available Maximum Downstream Speed
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)

ISP Type	Date	Maximum Available Downstream Speed (Mbps) by Census Block Type		
		Population- Weighted Median Census Block*	Population- Weighted Median Rural Census Block*	Population- Weighted Median Urban Census Block*
Any Technology	Dec. 31, 2014	105	50	105
	June 30, 2016	150	80	150
Wired ISPs	Dec. 31, 2014	105	50	105
	June 30, 2016	150	100	150
Cable ISPs	Dec. 31, 2014	105	100	105
	June 30, 2016	150	150	150
LEC ISPs	Dec. 31, 2014	18	12	18
	June 30, 2016	40	15	45
Fixed Wireless ISPs	Dec. 31, 2014	15	8	15
	June 30, 2016	20	10	20

*Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). *Because values are population-weighted, blocks with zero population in the 2010 Census are excluded.*

The reason rural areas lag urban areas in broadband is simply that the same fixed cost to serve a given area is spread across fewer customers in lower population-density locations. This basic economic fact existed long before the 2015 restoration of common carriage. Indeed, most rural LECs voluntarily chose to keep their DSL and FTTH services classified under Title II when given the option to change them to information services following the *Wireline Broadband Order*. Thus the notion in the *Notice*, that reversal of the 2015 order’s reclassification decision would somehow promote deployment in rural areas, is particularly incongruous with the history and data. Furthermore, the appeal of discriminatory business models like paid prioritization to rural carriers is questionable, because it is unlikely that any edge company willing to enter into such arrangements (if any) would bother with the small addressable market in rural areas – particularly considering the transaction costs of arranging such deals with the numerous small ISPs serving these areas. These economic realities are the reason that rural broadband deployment and capacity upgrades continued apace following the *Open Internet Order*, and why there will still be a need for a strong universal service broadband program regardless of the outcome of this proceeding.

8. Deployment of Fixed Wireless Broadband Was Robust Following Adoption of the *Open Internet Order*, Particularly in Rural Areas.

Fixed Wireless ISPs continued to expand their offerings in the wake of the *Open Internet Order*, with the companies offering this technology largely expanding their offerings in rural areas. When we examine blocks that were populated as of 2010, we see that nearly 80 percent of the blocks that added fixed wireless service were in rural areas (*see* Figure 20).

Figure 20
Number of Census Blocks with Access to Fixed Wireless Internet Access Service
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)

Location	Total Number of 2010-Populated Census Blocks with Fixed Wireless Service	
	Dec. 31, 2014	June 30, 2016
Rural	1,084,860	1,157,854
Urban	1,392,833	1,411,429
Percent of New Fixed Wireless Blocks that are Rural		79.7%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.

The values presented in Figure 20 are restricted to blocks that were populated as of the 2010 Census. When examining all Census Blocks, we see that fixed wireless services were in 4.37 million blocks as of mid-2016, up from 4.17 million at the end of 2014 (a block growth rate of 4.9 percent).²⁷⁰ Thus, 4 out of every 10 blocks with fixed wireless service (1.8 million out of 4.37 million total) are blocks that gained population since 2010. Though we do not know from the available information what proportion of these newly populated blocks are in rural or urban areas, the data strongly suggests that the substantial majority of these 1.8 million fixed wireless blocks are rural.²⁷¹

²⁷⁰ The total number of Census Blocks with available fixed wireless consumer internet access service grew by 204,328 blocks between the end of 2014 and mid-2016, a 4.9 percent growth rate. The number of Census Blocks with LEC technology consumer internet access service (defined as ADSL, ADSL2/2+, VDSL, SDSL, FTTH, or other copper technologies) increased from 6.25 million to 6.62 million, a 5.9 percent rate of growth. In contrast, the number of Census Blocks with available cable modem technology consumer internet access service (defined as any DOCSIS or other cable modem technology) decreased by 0.5 percent, from 5.25 million to 5.22 million blocks. Examination of the data suggests this slight decline was due to some mixed technology ISPs (those offering LEC, cable and fixed wireless technologies) replacing their cable services with fiber-to-the-home services.

²⁷¹ Approximately 0.31 million of the 1.8 million blocks with fixed wireless service as of mid-2016 that were unpopulated blocks in 2010 also have one or more wired ISP offering

In sum, the Commission's deployment data indicates a very healthy WISP market, which is growing largely in rural areas. This data directly contradicts the story depicted in the *Notice*, which based on limited anecdotal information portrays small rural wireless ISPs in crisis because of the restoration of common carriage.

Indeed, when we examine the technologies of unique ISP holding companies, we see that those offering fixed wireless service accounted for the substantial majority of holding company growth since the end of 2014. The net number of unique ISP holding companies increased by 57 between the end of 2014 and mid-2016. Fixed wireless-only ISPs accounted for 50 of these.²⁷²

9. After the *Open Internet Order*, Many Rural Areas Previously Served Only by Fixed Wireless Technology Saw New Wired Deployments, Primarily from Telephone Company ISPs.

Fixed wireless internet access services are often the only available option for people living in rural areas. Many of these areas never saw cable TV deployment, and the central offices of local incumbent phone companies are often too far from the customer's home to offer DSL service. Fixed Wireless ISPs – some of which are rural phone companies unable to offer DSL – have stepped in to fill the void, bringing rural families quality internet access services without the cost and capacity limitations inherent to satellite and mobile wireless service.

But after the *Open Internet Order*, many of these areas that were fixed wireless-only are seeing wired deployments as LECs expand their DSL and FTTH service. Figure 22 below shows that the number of Census Blocks served by a fixed wireless ISP and a LEC ISP increased by 24

downstream speeds above 100 Mbps. Among 2010-populated blocks that had one or more wired ISPs offering downstream speeds above 100 Mbps, 80 percent were urban blocks. This suggests that the substantial majority of the 1.8 million 2010-unpopulated blocks with fixed wireless service are located in rural areas.

²⁷² Because of mergers and acquisitions, we cannot identify actual market entry and exit. For example, the mid-2016 data contains 185 new holding companies that were not in the 2014 data, and there were 128 holding companies in the 2014 data that are not in the most recent reporting. This is a net change of plus-57 holding companies, some of which are due to mergers, some of which are due to market entry, and possibly some due to non-acquisition market exit.

percent, from nearly 834,000 blocks at the end of 2014 to more than a million by mid-2016. When we look at rural blocks with fixed wireless service, we see that the number of these blocks served by a WISP and LEC increased from nearly 760,000 at the end of 2014 to nearly one million by mid-2016, a 25 percent increase (see Figure 23). The data again reflects the overarching story of the post-*Open Internet Order* market: telephone company ISPs investing in higher capacities, and expanding their services into new areas, in order to compete for customers who want broadband telecommunications services capable of transmitting streaming video and a wide variety of high-bandwidth communications.

**Figure 22:
Fixed Wireless-Served Census Blocks by Type of Available Technology
(Year-End 2014 vs. Mid-2016)**

ISP Availability	Total Number of Census Blocks	
	Dec. 31, 2014	June 30, 2016
Fixed Wireless Only	1,387,040	1,384,660
Fixed Wireless and LEC Tech	833,851	1,036,811
Fixed Wireless and Cable Tech	365,606	312,898
Fixed Wireless, LEC and Cable Tech	1,583,219	1,639,675

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect consumer broadband services in all Census Blocks, including those with zero population in the 2010 Census.

**Figure 23:
Fixed Wireless-Served Rural Census Blocks by Type of Available Technology
(Year-End 2014 vs. Mid-2016; Populated 2010 Census Blocks-Only)**

ISP Availability	Total Number of Rural Census Blocks*	
	Dec. 31, 2014	June 30, 2016
Fixed Wireless Only	1,346,567	1,350,930
Fixed Wireless and LEC Tech	759,369	950,661
Fixed Wireless and Cable Tech	290,595	235,168
Fixed Wireless, LEC and Cable Tech	380,352	425,856

*Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). *Values reflect consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.*

In sum, the data shows a remarkable level of deployment and capacity upgrades in the period following the Commission's adoption of the *Open Internet Order*. Much of the new deployment came from Local Exchange Carrier ISPs, who face a much more costly upgrade path than do cable company ISPs. These LEC upgrades are bringing nominal competition to many areas that were higher-speed monopolies prior to the Commission's Title II restoration. For example, the number of census blocks with 2 or more wired ISPs offering 25 Mbps or faster downstream services increased by 42 percent between the end of 2014 and mid-2016. The LECs are making these strides by deploying newer, higher-capacity technologies. The number of Census blocks with ADSL2+ technology increased 59 percent between the end of 2014 and mid-2016, while the number of blocks with FTTH technology increased by 15 percent. And while LECs are investing in order to recapture some of cable's monopoly share of the higher-speed market, cable ISPs are busy rolling out the next-generation of their technology which should produce another round of LEC upgrades as the market continues to evolve.

To be sure, duopoly is not the desired competitive outcome, and many people do not have enough choices – or any affordable choices – but it is better than a pure monopoly. The data demonstrates that the nation's cable ISPs are facing more competition since the 2015 vote. Consider Comcast. At the end of 2014 it faced 25 Mbps and faster competition in only 36 percent of its blocks. By July 2016, this was 55 percent of its blocks. Comcast didn't stand pat in the face of this new competition; it increased speeds by an average of 48 percent (from a block-average of 129 Mbps at the end of 2014 to 191 Mbps in mid-2016; *see* Figure 12 above).

The fact that competition, deployment, and capacities all increased in Comcast's and other dominant ISP's markets following the *Open Internet Order* shows that the market's virtuous-cycle driven status quo continues unhindered in any manner by the restoration of Title

II. This evidence strongly suggests that the central premise of the new Commission’s push to remove common carrier authority is completely wrong. There is simply no evidence that restoration of Title II and codification of basic Net Neutrality rules negatively impacted the U.S. internet access market.

B. ISP Industry Capital Investments, Network Investments, and Deployment of Next-Generation Access Technologies Accelerated Following the Commission’s 2015 Open Internet Order.

One of the oldest tropes in regulatory policy debates is that regulation creates uncertainty, which in turn reduces the regulated industry’s investment. While there could be a plausible theoretical basis for this claim in some circumstances, it is rarely ever translated into reality. That’s because regulation and regulatory uncertainty are just two among many factors impacting investment and overall market performance, and those other factors are actually more important.²⁷³ If the economy is booming, consumer confidence is gaining, and interest rates are declining, then the presence of investment and growth is a given.

The data from the past quarter century bears this out in the telecom sphere. Regulation does not as a rule cause uncertainty or dampen investment in telecommunications infrastructure. There’s no valid data to support this claim, nor any valid theory to suggest how it would operate. But policymakers whose actions are guided by anti-regulatory ideology continue making the claim that regulation – and even regulatory authority – harm investment. They hang onto their platitude, evidence be damned.

A key supposition of the instant *Notice* is that the 2015 reclassification harmed ISP industry investment, and did so primarily because of carrier fear of future regulation beyond the

²⁷³ See, e.g., Free Press 2014 Comments at 94 n.200 (“[T]he five primary factors influencing the decision by an operator to invest as well as its ability to access debt capital are: 1) expectations about demand [. . .] 2) supply costs [. . .] 3) competition [. . .] 4) interest rates and corporate taxes [. . .] and 5) general economic confidence.”).

scope of the no-blocking, no-throttling and no-paid prioritization rules. The *sole* evidence the *Notice* provides as proof of this harm is industry-sponsored and manipulated aggregate capital investment data. There's no attempt whatsoever to reconcile these industry sponsored aggregate totals with other facts, such as massive increases in capital spending by numerous ISPs large and small. Nor is there any attempt to reconcile the underlying theory of harm with the numerous statements from the ISPs themselves that reclassification had no impact on their confidence in this market.

So, we pose the question to which the Commission apparently believes it knows the answer, evidence be damned: does the mere existence of core Title II authority curtail investment? This is a question that cannot be answered absent evidence, nor answered with a single data point. It is a question that must be evaluated against the broadest set of facts, and considered using logic. For this premise to have validity, there would need to be a reasonable mechanism that translates regulated entities' fear of such authority into a systemic effect. Because we are evaluating a large market with informed firms, highly motivated by their bottom lines, this fear could not be theoretical and irrational. That would not sustain a negative market-wide impact, because it would create arbitrage opportunities for rational actors. For example, a rational and practical fear would be firms worrying about pending interest rate increases or a collapsing housing bubble when those events were likely. A theoretical and irrational fear would be collective worry about a pending global pandemic or nationalization of infrastructure when such events were highly unlikely.

There should be no doubt: the fears about a negative impact from Title II on the successful trajectory of the U.S. broadband market are wholly irrational. That is why such fears are not actually held by the broadband market's firms collectively, nor by this market's

individual firms. They are simply impractical fears espoused largely by third party agitators in service of these parties' larger goal of unthinking deregulation.

To illustrate this irrationality and impracticality, all stemming from false claims about Title II's alleged negative impact on investment from indeterminate further regulations or restrictions, consider the following basic truths – all of which the is ignored in the *Notice*:

- 1) The Commission has applied a “light-touch” Title II approach to cellular services for a quarter century now, forbearing from several provisions of Title II and thus never regulating rates or requiring wholesale access of cellular voice providers.
- 2) The Commission never regulated the retail rates of DSL services prior to 2005 when it could have under Title II, before the agency (incorrectly) classified wireline broadband offerings as Title I information services.
- 3) Many Rural Local Exchange Carriers (“RLECs”) voluntarily kept their own DSL services under Title II following that 2005 classification change for DSL, and even then the Commission never dictated the retail rates of those RLECs' monopoly Title II broadband services.
- 4) The Commission does not regulate the retail rates of the Baby Bells' Title II enterprise broadband services (*e.g.*, Ethernet), despite (correctly) keeping those services under Title II and applying the same “light-touch” Title II approach for more than a decade now.
- 5) In the 2015 *Open Internet Order* and accompanying Declaratory Ruling, the Commission applied a similar Title II light-touch framework to mass market broadband internet access services, mirroring the generally successful and now widely accepted approaches described above for CMRS, pre-2005 DSL, RLECs' DSL, and enterprise services.
- 6) When the Commission adopted the 2015 *Open Internet Order*, it forbore from all of Title II's open access provisions, interconnection provisions for arrangements among telecommunications carriers, prohibitions on cross-subsidization and numerous other provisions.
- 7) In the same order and declaratory ruling, the Commission explicitly stated it was not going to engage in *ex ante* rate regulation or otherwise prescribe broadband internet access service rates.
- 8) In sum, thanks in large part to the Commission's extensive forbearance for broadband internet access, and its quarter-century of market experience with a highly deregulatory application of Title II to other market segments, the broadband status quo was undisturbed by the Commission's February 2015 Open Internet vote.

As we document in the Appendix to these comments, discussion of the possible impact of Title II on ISP investment completely disappeared as a topic on investor calls following the Commission's February 2015 vote, returning only after the November 2016 election. And even

though the surprise result revived the topic, numerous ISP statements since then still reflect the reality that reclassification did not negatively impact broadband investments.

These facts alone strongly indicate that any supposed fear of regulatory “overhang” is nothing more than a fiction. The additional facts in this report demonstrate that these fears never diminished investment. Instead, the Commission’s framework cemented incentives for ISPs to grow through expansion, not profit from scarcity.

But the anti-Title II preachers are undaunted by reality. They manufacture evidence of a recent capital investment decline – while blaming it on the Commission’s 2015 vote – to support their belief system. That evidence is completely bogus, as we describe below. But even if it were valid in a vacuum, it is offered in support of a fantastical scenario: that the mere possibility of future Commission intervention in the broadband access market (beyond the specific Open Internet rules, which all ISPs claim to support) is enough to overcome all other positive market forces and create a decline in capital investment. This is a bold proclamation, and one that would require a plausible mechanism to cause that effect, plus supporting evidence too. This proclamation has neither.

The anti-Title II ideology leads its adherents to ignore not only to the successes of the broadband market in the two years since the Commission’s vote, but also the historic investment and competition happening on the Open Internet – growth that is only possible with the continued existence of nondiscriminatory telecommunications services. Any honest analysis of the impact of the Commission’s policy must consider all markets (edge, core, last mile) and all metrics (capital investment, non-capital investment, consumer surplus, producer surplus, job growth, etc.). Any appraisal of the 2015 decision solely focused on one aggregate metric from

the ISP industry, and not the myriad industries conducting commerce over broadband infrastructure, is incomplete.

Title II's restoration and the Open Internet rules brought certainty to all participants in the broadband market. Carriers have clarity about their legal obligations. The people and businesses using broadband to conduct commerce, to communicate their ideas, and to produce and consume media, all have certainty that carriers will transmit their data in a reasonably nondiscriminatory manner. That certainty is what the investment and broadband deployment data reflects.

1. Aggregate Telecommunications Industry Capital Investments Increased In the Wake of the *Open Internet Order*.

Below we summarize the key financial and operational metrics of the U.S. broadband and online video industries, preceding and following the February 2015 *Open Internet Order*. We present these results as the companies reported them – unlike those in the *Notice*, which are based on manipulated and completely opaque figures.²⁷⁴

In this section we discuss aggregate results for the ISP industry. We also subsequently discuss results and developments at edge network firms, focusing on the online video market. Finally, in the Appendix, we analyze all publicly traded ISPs individually, providing the

²⁷⁴ The *Notice* falsely accuses Free Press of presenting investment figures that are not prepared in accordance with Generally Accepted Accounting Principles (“GAAP”), because our tallies did not attempt to present a *pro forma* accounting of AT&T's capital expenditures in the absence of its acquisition of DirecTV. However, AT&T itself does not present this *pro forma* data, primarily because it would be misleading given the fact the merger was horizontal in nature. The Commission should understand that the presentation of such *pro forma* accounting is by definition not in compliance with GAAP, and that the figures the *Notice* clings to as evidence of Title II's harm are themselves not GAAP-compliant. Nonetheless, this clinging onto an aggregate industry investment tally that can be swung in a different direction based on one company alone (include one that had merely entered a trough in its normal investment cycle) shows exactly why the Commission should consider the broad array of evidence concerning broadband deployment, and not rely on a single aggregate total. *See, e.g.,* Scott Rothbort, “GAAP vs. Pro-Forma: For Income Insights,” *The Street* (Aug. 14, 2008).

necessary facts and context for their respective performances before and after the Commission's action – and relying on those ISPs' own explanations to their investors.

We begin with the metric that garners the most headlines: the ISP industry's aggregate capital investments. We caution however that focusing on aggregate industry changes in capital spending is at best mildly informative. Aggregate capital spending is just one piece of data that must be considered alongside the developments at individual firms. This is especially the case in this industry, which is so concentrated that cyclical changes at just one large firm could shift the direction of any change in the industry's aggregate capital spending.

Moreover, capital spending is only one element of contribution to economic activity. That is, capital spending is investment in future growth; but consumer spending is current growth, meaning that hypothetical present declines in capital spending but hypothetical growth in revenues could still be a very positive indicator. If the gains in revenue were due to increased consumer surplus, generated by the demand for networks constructed with prior capital investments and the services those networks already enable, this could produce a net growth in the sector's and any adjacent sector's contributions to overall GDP growth.

Thus, even if and when ISP industry capital spending declines – and we expect that it will at some point in the near- to medium-term future, as cable ISPs reach the end of the DOCSIS3.1 deployment cycle – it does not automatically follow that the mere existence of the Commission's congressionally granted legal authority is the cause of such a hypothetical decline. Nor is it remotely likely that the fantastical fears we describe above, supposedly stemming from the possibility that the Commission might exercise that authority in the future in ways that are out of step with the past two decades of reality, would be responsible for that eventual decline.

Capital investments are by their very nature cyclical: they are purchases of durable goods, which depreciate in value and utility over time. As technology improves in the ISP industry, the shelf-life of capital equipment lengthens, its productivity increases, and the cost of this equipment declines. What really matters is not just the raw total spent on network technology, but the progress in making that technology available to users and the total value of economic activity that the technology then enables.

Those fundamental truths notwithstanding, it is indeed possible to measure with some degree of accuracy the ISP industry's aggregate capital investments before and after the *Open Internet Order* and reclassification vote. While the result is only moderately informative without this other context, it is a metric capable of careful and honest assessment.

The *Notice* peddles the demonstrably false claim that ISP industry investment declined following the Commission's 2015 *Open Internet Order*. This claim is sourced to two similar analyses by ISP industry defenders, both of which selectively and improperly discount the spending of two firms (AT&T and Sprint) in order to manufacture a false net decline larger than the collective ramp-up in spending at most other ISPs. Even if these figures weren't manipulated, the theory would be hollow. It would be ridiculous to suggest a systemic effect if the aggregate decline stemmed completely from two firms, masking the growth at most others. But as we explain below, the figures and the narratives that these two ISP industry "studies" use for AT&T and Sprint are indeed manipulated and just plain wrong.

Looking to results for the individual firms tracked to compile the industry total, note in particular how many individual ISPs increased their capital expenditures. This alone does much to disprove the *Notice's* fanciful "threat" from Title II to investment across the entire industry. In Figure 24, we present the total capital expenditures for publicly traded retail Internet Service

Providers, as they reported or restated this data for the two years preceding the Commission’s February 2015 vote (2013–2014) and the two years following it (2015–2016).

**Figure 24:
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.

This data indicates that ISP industry aggregate capital investments actually increased following the Commission’s 2015 vote and reclassification decision. Specifically, the data shows:

- Capital investments at publicly traded ISPs were 5 percent higher during the two-year period following the Commission’s Open Internet vote than during the two-year period before it.
- Capital investments were higher at 16 of the 24 publicly traded ISP firms (or units) following the Commission’s vote. These increases were due primarily to continued core network expansion and also to investments in capital equipment needed to expand lines of business that utilize the network (e.g., customer premises equipment such as modems or IP set-top boxes).
- As we document in the Appendix, the reasons for any increase or decrease in capital spending by each firm were clearly explained by each company before, during, and after those decisions were made. None of the firms that saw declines attributed these to any change in Commission policy. They uniformly attributed any declines to completion of prior cyclical upgrades, with the expectation that most of these firms would increase capital spending again in future years.
 - For example, Comcast’s cable segment capital investments rose sharply following the Commission’s 2015 vote, continuing a trend begun during 2013’s heavy rollout of the firm’s X1 platform.²⁷⁵ This investment ramped up sharply in 2015, driven by that rollout and Comcast pushing fiber closer to its customers.²⁷⁶ It is noteworthy that before this acceleration in investment that began in 2013 and carried through the two years following the Commission vote, Comcast’s capital expenditures had actually declined during earlier years (from 2008 to 2011) when it was upgrading its network to an all-digital, DOCSIS3.0 system.²⁷⁷ This

²⁷⁵ See, e.g., Comments of Michael Angelakis, CFO & Vice Chairman, Comcast Corporation, Q4 2013 Comcast Corporation Earnings Conference Call (Jan. 28, 2014) (“At Cable Communications, 2013 capital expenditures increased 9.8% to \$5.4 billion equal to 12.9% of cable revenue. This capital plan primarily reflects higher spending on CPE, including our new X1 boxes and wireless gateways, our continued investments in network infrastructure to ensure our leadership in video and high-speed Internet, as well as the expansion of new services such as Business Services and Xfinity Home.”).

²⁷⁶ See, e.g., Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corporation, Q4 2015 Comcast Corporation Earnings Conference Call (Feb. 3, 2016) (“At Cable Communications, capital expenditures increased 10.2% to \$2.1 billion for the fourth quarter and 14.3% to \$7 billion for the year. This growth reflects higher spending on our customer premises equipment, including X1 and wireless gateways, increased investment in network infrastructure to increase network capacity, as well as the continued investment to expand Business Services. In 2016, we will continue to invest in each of these areas as they are driving positive results in our business.”); see also Sean Buckley, “Comcast: DOCSIS 3.1 acceleration is being driven by new broadband competition,” *FierceTelecom* (Oct. 14, 2015) (quoting Comcast VP of access Jorge Salinger’s comments that Comcast is deploying “fiber deep technologies that makes the service groups smaller”).

²⁷⁷ Comcast’s all-digital and DOCSIS 3.0 rollout started in 2008, with this next-generation cable modem standard reaching 30 percent of Comcast’s footprint at the end of that year. Comcast had deployed DOCSIS 3.0 to 75 percent of its footprint by the end of 2009, 85 percent by 2010, and

illustrates the fallacy of using raw capital expenditure totals as the sole metric for progress, even for an individual ISP let alone across the entire industry.

- In contrast, cable segment capital expenditures declined at Cablevision during the two years following the Commission's February 2015 vote. But this was due to Cablevision's 2014 completion of its initial purchases of customer premises equipment ("CPE") related to its all-digital and DOCSIS 3.0 upgrades. Was the 2014 end of this CPE purchase cycle due to Title II? Of course not. In fact, though the CPE purchasing declines more than offset them, Cablevision actually increased its core network investments after the Commission's 2015 vote (*see* Figure 26).²⁷⁸

completed the deployment in 2011. During this time (2008–2011) Comcast's cable segment capital expenditures were \$5.5 billion, \$5.0 billion, \$4.9 billion, and \$4.8 billion. *See* Comments of Brian Roberts, Chairman and CEO, Comcast Corporation, on Q4 2007 Comcast Corporation Earnings conference call (Feb. 14, 2008) ("In high-speed data we have DOCSIS 3.0 or wideband which we'll begin to offer to millions of our 48 million homes later this year."); Comments of Steve Burke, COO & President, Comcast Cable Communications, on Q4 2008 Comcast Corporation Earnings conference call (Feb. 18, 2009) ("We are moving rapidly with all-digital. That rollout is not constrained by capital. That is constrained by just the human side of making that happen and DOCSIS 3.0, we are rolling out quite quickly. We have about 30% of the Company with DOCSIS 3.0. That number should double by the end of the year."); Comments of Brian Roberts, Chairman and CEO, Comcast Corporation, on Q4 2008 Comcast Corporation Earnings conference call (Feb. 18, 2009) ("Now we expect capital expenditures to decline in 2009 both in absolute dollars and as a percentage of revenue, even as we take the opportunity to make the investments that I described in the all-digital and the DOCSIS 3.0 transitions. We believe these investments put us in a strong position for when the economy recovers and supports the long-term growth and competitive positioning of the Company."); Comments of Steve Burke, COO & President, Comcast Cable Communications, on Q4 2009 Comcast Corporation Earnings conference call (Feb. 3, 2010) ("Moving on to DOCSIS 3.0, or Wideband, we've deployed this technology to over 75% of our footprint and plan to complete our DOCSIS 3.0 deployment in early 2010."); Comments of Brian Roberts, Chairman and CEO, Comcast Corporation, on Q4 2010 Comcast Corporation Earnings conference call (Feb. 16, 2011) ("Our key technical initiatives, All-Digital and DOCSIS 3.0, are nearing completion with All-Digital in 75% of our markets and DOCSIS 3.0 deployed in more than 85% of our footprint."); Comments of Brian Roberts, Chairman and CEO, Comcast Corporation, on Q4 2011 Comcast Corporation Earnings conference call (Feb. 15, 2012) ("Our major technical initiatives of DOCSIS 3.0, All-Digital, a content delivery network that works on all platforms is now complete and we have leveraged these investments to deliver more innovation faster than ever before."); *see also* Financial Supplements, Comcast Corporation, for periods ending 12/31/2008, 12/31/2009, 12/31/2010, and 12/31/2011.

²⁷⁸ As Cablevision explained on its fourth quarter 2014 investor call, "[w]e had an increase in CPE in the fourth quarter, but a lot of what happens with CPE, as you know, is timing of expenditures. We ended up with additional purchases of boxes, of managed routers, some remotes in the fourth quarter. But it's not necessarily CPE that will keep capital expenditures roughly these levels. We continue to invest in WiFi. We continue across-the-board to invest in

The data summarized in Figure 24 above shows the capital expenditures at publicly traded U.S. Internet Service Providers. But there are a few large, privately held ISPs (*e.g.*, Cox Communications, RCN Corporation, C-Spire) and numerous medium- and small-sized privately held carriers that do not publicly disclose their financial results. Figure 24 also does not include capital expenditures by companies whose primary business is reselling telecommunications services purchased on a wholesale basis (including, in part, services purchased at wholesale from some of the publicly traded ISPs tracked above). To get an even more complete picture of how telecom industry capital spending is changing over time, therefore, we present the information published by the U.S. Census Bureau (the “Bureau”) in its Annual Capital Expenditures Survey (“ACES”). This survey collects data from nearly 45,000 enterprises with employees, to project total capital expenditures for the nearly 6 million such U.S. businesses.²⁷⁹ The Bureau presents this data by industry category, based on the North American Industry Classification System

our network, and we’re going to continue those efforts.” See Comments of Gregg Seibert, Vice Chairman & CEO, Cablevision Systems Corporation, Q4 2014 Cablevision Systems Corp. Earnings Call (Feb. 25, 2015) (emphasis added). On Cablevision’s final investor call, for second quarter 2015 and thus the quarter immediately following the FCC’s vote, the company stated that “cable capital spending in the second quarter was \$186 million, a \$21 million decrease from the same period in 2014. This primarily reflects lower year-over-year spending on set-top box and modem purchases, as well as the timing of certain video-related projects. These declines were partially offset by higher project spending to support broadband and WiFi expansion. We expect increased CapEx spending in the back half of 2015 as we continue to invest in the evolution of our product offerings and ensure a quality service experience.” Comments of Brian Sweeney, President & CFO, Cablevision Systems Corporation, Q2 2015 Cablevision Systems Corp. Earnings Call (Aug. 7, 2015) (emphasis added). As Cablevision stated in its 2015 10-K report to the SEC, “[c]apital expenditures for 2015 decreased \$75,282,000 -8% as compared to 2014. This decrease was due primarily to a decrease in purchases of customer equipment and network equipment, partially offset by increases in spending related to cable plant upgrades.” Finally, as Cablevision’s new owner Altice noted when explaining 2016’s declines in capital investment at Cablevision, the prior owner had “already made a lot of investments in its network, as you can see on the left-hand side. It’s 100% digital, almost wholly encrypted with an average of 300 homes per node.” Comments of Dexter Goei, President, Altice NV, Q3 2016 Altice NV & SFR Group SA Earnings Call (Nov. 10, 2016).

²⁷⁹ See United States Census Bureau, Annual Capital Expenditures Survey (“ACES”), Survey Description (Jan. 5, 2016).

(“NAICS”). There are three categories that encompass the U.S. internet access services market: wired telecommunications carriers; wireless telecommunications carriers (except satellite); and telecommunications resellers, satellite and other telecommunications.²⁸⁰

The results from the Bureau’s ACES are typically published and revised one and two years following the end of the prior year (*e.g.*, the Bureau published its 2015 results and its

²⁸⁰ See Executive Office of the President, U.S. Office of Management and Budget, “North American Industry Classification System” (2017) (“OMB NAICS 2017”). These industry sectors are defined as follows:

Wired Telecommunications Carriers: “This U.S. industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services; wired (cable) audio and video programming distribution; and wired broadband Internet services. By exception, establishments providing satellite television distribution services using facilities and infrastructure that they operate are included in this industry.”

Wireless Telecommunications Carriers (except Satellite): “This U.S. industry comprises establishments primarily engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular phone services, paging services, wireless Internet access, and wireless video services.”

Satellite Telecommunications: “This industry comprises establishments primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.”

Telecommunications Resellers: “This U.S. industry comprises establishments engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling wired and wireless telecommunications services (except satellite) to businesses and households. Establishments in this industry resell telecommunications; they do not operate transmission facilities and infrastructure. Mobile virtual network operators (MVNOs) are included in this industry.”

Other Telecommunications: “This U.S. industry comprises establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or Voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.”

revised 2014 results in February 2016). Thus, we now have ACES data for the first year following the *Open Internet Order* and reclassification decision. The results are clear:

- Census data indicates that total U.S. telecom industry capital investments during 2015 were \$87.184 billion, more than \$553 million higher than in 2014 (*see* Figure 25).
- Capital investments by wired telecom carriers (which includes cable modem, fiber-to-the-home, and DSL ISPs) were up nearly \$2.7 billion during 2015, nearly 6 percent over 2014.
- Capital spending was down in the wireless telecom carrier sector. However, the amount of this decline is almost identical to the estimated decline at AT&T's wireless segment during 2015, which AT&T directly attributed to the 2014 completion of its nationwide 4G LTE deployment (*see* discussion of AT&T results in Part III). Data from CTIA, the wireless industry's trade association, indicates the sector's capital expenditures peaked in 2013, slowly declining through 2016.²⁸¹

As the Census data shows, capital spending rose in aggregate following the Commission's Open Internet vote. The data also reflects the industry reality that anti-Title II ideologues never acknowledge: capital investments are cyclical, and not all industry sectors (much less all individual companies) are on the same investment cycle. For example, capital spending by wired carriers boomed during 2015, after a slight decline during 2014 – the year prior to the Commission's vote. Meanwhile, capital investment in the wireless sector peaked in 2014 when many U.S. carriers completed their nationwide 4G LTE deployments. The slight decline in wireless in 2015 simply reflects an aggregate ramp down of spending²⁸² prior to the upcoming 5G and small cell densification investment cycles.

²⁸¹ *See* CTIA Annualized Wireless Industry Survey Results 2000–2016, CTIA Annual Wireless Survey (May 9, 2017). CTIA's capital expenditure data indicates carriers invested \$27.9 billion in 2004, declining to \$20.2 billion in 2008. Capital expenditures then increased annually until 2013, peaking at \$33.1 billion. CTIA shows subsequent annual declines, with \$26.4 billion invested in capital during 2016. CTIA's data reflects the 2010–2014 LTE deployment cycle, which peaked in 2013–2014 as AT&T's Project VIP's expenditures peaked.

²⁸² We note that 2015's aggregate wireless decline was primarily driven by AT&T's completion of its Project VIP upgrades. Verizon's wireless segment spending actually increased by \$1.2 billion during 2015 (a 12 percent increase). Sprint's total capital spending was also substantially higher in 2015 than 2014 (a 42 percent, \$2.3 billion increase). T-Mobile's capital expenditures

This data also lays bare the hollowness of the “Title II harms investment” hypothesis. The Commission reinstated Title II in February 2015. The Census data indicates that during 2015, wired ISP capital investments rose in the aggregate while wireless ISP capital investments declined in the aggregate, even as capital investment by three of the country’s four largest wireless ISPs increased. If the anti-Title II ideologues’ theory were plausible, it would produce a systemic response. Plainly put, it did no such thing. The best that the anti-Title II crowd can point to is a decline solely at AT&T. This strongly suggests that their theory of harm is completely wrong. Combined with the totality of the evidence (*e.g.*, statements made by the companies themselves on their investment plans ahead of and following the vote, and actual responses to the Commission’s policy change) it is clear that restoration of Title II and the adoption of basic Open Internet rules that depend on that legal framework had no negative impact on broadband industry investments.

rose by \$400 million in 2015 to \$4.72 billion, a 9 percent increase. Offsetting these increases were declines at AT&T Mobility (which we must estimate, because AT&T no longer reports wireless segment capital expenses separately, as approximately \$2.3 billion lower in 2015), at U.S. Cellular, and potentially at non-publicly traded companies like C-Spire, all of which had completed LTE deployments during 2014. *See, e.g.*, Verizon Communications Inc., Financial and Operational Supplements, for periods ending 12/31/2013, 12/31/2014, 12/31/2015, and 12/31/2016.

**Figure 25: Capital Expenditures by All U.S. Telecommunications Firms
(U.S. Census Bureau Annual Capital Expenditures Survey, 2008–2015)**

Industry Sector	Capital Expenditures for Structures and Equipment for Companies with Employees (\$ millions, nominal)							
	2008	2009	2010	2011	2012	2013	2014	2015
Wired telecommunications carriers, cable and other program distribution, broadband internet services providers	\$51,892	\$43,851	\$42,971	\$44,508	\$43,661	\$49,848	\$48,496	\$51,178
Wireless telecommunications carriers (except satellite)	\$25,272	\$20,651	\$23,052	\$25,283	\$32,949	\$34,040	\$35,046	\$32,794
Telecommunications resellers, satellite, and other telecommunications	\$3,487	\$2,760	\$4,200	\$3,740	\$4,428	\$3,352	\$3,089	\$3,212
TOTAL	\$80,651	\$67,262	\$70,223	\$73,531	\$81,038	\$87,240	\$86,631	\$87,184

Source: U.S. Census Bureau Annual Capital Expenditures Survey (“ACES”), Tables 4a (2015) and 4b (revised values for 2008–2014). Note: ACES data prior to 2008 represents different industry sectors and is not comparable to values from subsequent survey years.

2. Investments in Core Network Infrastructure Boomed Following the FCC’s Title II Vote.

The data presented above for company-specific capital expenditures, and the U.S. Census Bureau’s Annual Capital Expenditure Survey results, reflect the telecom industry’s investments in all durable goods used in these companies’ business operations. But only a portion of these expenditures are for the core, natural monopoly network infrastructure required to transmit data between a customer’s location and an ISP’s interexchange points with other carriers.

Capital investments in non-core network assets are critical to broadband providers’ overall business success, but such expenditures do not necessarily reflect the trajectory for commercial availability of improved access services. For example, most ISPs operate in multiple lines of business. Incumbent Local Exchange Carriers (“ILECs”) also serve large enterprises with managed voices services. The installation of a new Private Branch Exchange (“PBX”) in an

office building is a non-core capital expenditure that doesn't reflect positively on the status of the broadband market, just as a decline in such PBX expenditures doesn't reflect poorly on it.²⁸³

What's more, non-core network capital expenditures might decline because of the efficiency gains produced by past network investments. ISPs incur a capital expense when they purchase service vehicles. But if the need for large fleets of trucks declines due to growth in customer self-installation or advances in software defined networking ("SDN"), any commensurate declines in capex would not reflect negatively on overall broadband market development.²⁸⁴ Indeed, the primary way wireless carriers will increase capacity ahead of 5G and small cell densification is using software to aggregate spectrum.²⁸⁵ Spectrum can act as a substitute for capital spending, which is in part how Sprint could deploy its LTE network while lowering its network investment.²⁸⁶

²⁸³ See, e.g., Nick Ismail, "Shift from premise telephony to the cloud to accelerate significantly in 2017," *Information Age* (Dec. 21, 2016); Sean Buckley, "Level 3 discontinues more TDM-based voice services in Idaho and Washington, but supports hybrid environments," *FierceTelecom* (Sept. 26, 2016).

²⁸⁴ See Iain Morris, "Don't Count on 5G for a Capex Boost," *Light Reading* (Feb. 24, 2017) ("Networks have also become far more software-based in the last 15 years, allowing operators to make upgrades more easily and cost-effectively than when they were moving from 2G to 3G."); see also Comments of John Stephens, Senior EVP & CFO, AT&T Inc., Q2 2015 AT&T Inc. Earnings Call (July 23, 2015) ("I think there's a real opportunity with some of the activities that are going on in software-defined networks on a longer-term basis to actually bring that capital intensity to a more modest level.").

²⁸⁵ See, e.g., Mike Dano, "Verizon, Sprint, others turn to carrier aggregation, small cells for remainder of 2015 capex," *FierceWireless* (Aug. 5, 2015) ("The nation's wireless carriers are expected to put the finishing touches on their respective LTE coverage buildouts, and then will use techniques including small cells and carrier aggregation to add density and capacity to their networks, according to industry experts. Specifically, Sprint [] and Verizon Wireless [] have pointed to both small cells and carrier aggregation as elements of their respective network buildout strategies for the remainder of this year.").

²⁸⁶ See, e.g., Sarah Thomas, "Sprint Promises Better LTE on Lower Capex," *Light Reading* (Aug. 4, 2015) ("Sprint shed more light on its 'Next-Generation Network' Tuesday, promising it would significantly densify its network across all of its various spectrum bands via thousands of new macro sites, tens of thousands of new small cells and further 2.5GHz expansion. And it doesn't plan to spend more to make it happen. . . . Sprint also recently began using 2x20MHz

Similarly, not all increases in capital outlay are an indicator of increased broadband infrastructure availability. A cable company multiple system operator's ("MSO") purchase of new satellite dishes for its headends arguably impacts its broadband business because the company almost certainly sells services in bundles, but such a purchase doesn't indicate how that MSO's broadband offerings are progressing. Cable company expenditures on new set-top boxes likewise may not seem directly relevant to its network capacity; yet purchasing the latest generation of all-digital, MPEG-4 capable set-top boxes enables an MSO to expand its plant capacity dedicated to broadband services by reducing the bandwidth requirements for pay-TV services.²⁸⁷

Fortunately, most cable MSOs report their capital expenditures in a manner that separates out network and non-network spending.²⁸⁸ The segments most directly related to the last mile are

carrier aggregation to improve capacity and speeds in its 2.5GHz spectrum on select sites across the country. It also called out its use of antenna beamforming to improve performance at the cell edge.").

²⁸⁷ See, e.g., comments of Tom Rutledge, Chairman and CEO, Charter Communications Inc., Q4 2016 Charter Communications Inc. Earnings Call (Feb. 16, 2017) ("We manage our network for the future based on the actual load on the network, as opposed to some theoretical issue, and there are other ways of getting capacity out of all-digital networks. Like for instance, most of our set top boxes now are capable of IP delivery. They're also capable of MPEG4 delivery, which means that we can squeeze the capacity out of our video business, and get more DOCSIS capability in our network, which means we can do more virtual or electronic node splitting than we might have done a couple of years ago. And that's a function of our CPE strategy. So we're managing all of those things together to get capacity.").

²⁸⁸ Charter defines these five capital expenditure segments as follows: "Customer premise equipment includes costs incurred at the customer residence to secure new customers and revenue generating units. It also includes customer installation costs and customer premise equipment (e.g., set-top boxes and cable modems). Scalable infrastructure includes costs not related to customer premise equipment, to secure growth of new customers and revenue generating units, or provide service enhancements (e.g., headend equipment). Line extensions include network costs associated with entering new service areas (e.g., fiber/coaxial cable, amplifiers, electronic equipment, make-ready and design engineering). Upgrade/rebuild includes costs to modify or replace existing fiber/coaxial cable networks, including betterments. Support capital includes costs associated with the replacement or enhancement of non-network assets due

“line extensions” (the network costs incurred from entering a new service area) and “upgrades/rebuilds” (replacement capital expenditures for improving the existing last mile lines). Capital investments in “scalable infrastructure” are also core-network investments, as they involve expenditures for items such as converged cable access platform (“CCAP”) equipment (which is, like wireless networks, becoming increasingly virtualized as a way of increasing bandwidth).²⁸⁹ The other two segments of cable capex are critical to the business, but aren’t “core” network investments (customer premise equipment spending for set-top boxes and even modems are external to the core, as is capital investment in non-network assets such as office buildings).

The data reveals a huge increase in cable ISPs’ core network spending following the FCC’s February 2015 Open Internet vote (*see* Figure 26). During the two years after that vote, the U.S. cable industry’s core network infrastructure investments increased 48 percent compared to the amount invested during the two years preceding the vote. Cable’s core network investments accelerated dramatically during 2016 (a \$2.1 billion increase over 2015, compared to 2015’s \$0.8 billion increase over 2014). The one-year increase in cable industry core network investments during 2016 was the highest single year jump since 1999,²⁹⁰ when the cable industry like the telecom industry was expanding rapidly during the “fiber bubble.”²⁹¹ It is important to note that this historic one-year jump in 2016 came after cable companies had ample time to

to technological and physical obsolescence (e.g., non-network equipment, land, buildings and vehicles).” *See* Charter Communications Inc., 2016 10-K, at 50.

²⁸⁹ *See, e.g.*, Mari Silbey, “Cable’s DAA Moment Is Here,” *Light Reading* (Mar. 27, 2017); Alan Breznick, “Big Year Ahead for Cable Network Capex,” *Light Reading* (Jan. 13, 2017); *see also* Karthik Sundaresan, “Evolution of CMTS/CCAP Architectures,” Cable Labs, 2015 Spring Technical Forum Proceedings (2015).

²⁹⁰ *See* Ian Olgeirson and Paul Lauermann, “Spending on set-tops leads cable’s \$200B investment since 1996,” *SNL Kagan* (July 24, 2013).

²⁹¹ *See, e.g.*, Jeff Hecht, *City of Light: The Story of Fiber Optics* 249–56 (1999).

digest the actual and potential impacts of Title II restoration and the FCC's Open Internet rules, which were adopted a full year earlier in February 2015.

This cable industry core network investment rose substantially in the aggregate following the 2015 vote because most MSOs were either pushing fiber deeper into their networks in preparation for DOCSIS 3.1; expanding their enterprise services; replacing headends with the latest converged platform infrastructure; or engaging in a combination of all of these activities. But individual companies each had different experiences and trajectories (see Part III for a discussion of each company). Comcast continued its ramped-up spending driven by increases in both fiber deployment and headend upgrades.²⁹² Charter's increase was mostly related to scalable infrastructure increases, but all network-related capital expenses (and CPE expenses) are expected to rise in 2017 yet again as Charter resumes its pre-planned efforts to convert the approximately 40 percent of TWC systems that are not yet all-digital.²⁹³ By contrast, Cablevision's core-network spending declined from 2015 to 2016, after increasing in 2015 after the FCC's vote. The 2016 decline was largely due to Cablevision completing prior upgrade projects,²⁹⁴ with its new owner's shift in strategy towards eventual (but not immediate) full fiber-to-the-home network architecture.²⁹⁵

²⁹² See Comcast Corp. 2016 Financial Supplement, at 5.

²⁹³ See, e.g., Comments of Tom Rutledge, Chairman and CEO, Charter Communications Inc., Q4 2016 Charter Communications Inc. Earnings Call (Feb. 16, 2017) ("In the second quarter, we'll restart our all-digital deployment, featuring fully two-way advanced set top boxes to video customers in the approximately 40% of TWC and 60% of Bright House that are not yet all-digital, which allows us to offer more HD, interactivity on every video outlet, faster data speeds, and reduced operating costs. We should be 100% all-digital in less than two years.").

²⁹⁴ See, e.g., comments of Dexter Goei, Chairman and CEO, Altice USA, Q3 2016 Altice NV & SFR Group SA Earnings Call (Nov. 10, 2016) ("Optimum has already made a lot of investments in its network, as you can see on the left-hand side. It's 100% digital, almost wholly encrypted with an average of 300 homes per node."). Comments of Dexter Goei, Chairman and CEO, Altice USA, Full Year 2016 Altice NV & SFR Group SA Earnings Call (Mar. 9, 2017) ("[Y]ou

The network investments by other, smaller MSOs (and by non-publicly traded companies like Cox) jumped sharply in 2016. This result reflects the economic reality of a market with a few very large companies and many smaller ones: smaller operators are not first-movers; they wait to see how larger MSOs fare when deploying new technologies, with those larger operators benefiting from their scale (*i.e.*, because equipment costs decline over time and with scale), and then the smaller operators learn from the bigger companies' experiences.

**Figure 26:
Cable ISP Network Investment, Publicly Reported
and Estimated Totals (2013–2016)**

Network Investment* (\$ thousands)	2013	2014	2015	2016	2013-2014	2015-2016	Percent Change (2015–2016 vs. 2013–2014)
Comcast (cable)	\$1,324,000	\$2,048,000	\$2,425,000	\$3,035,000	\$3,372,000	\$5,460,000	61.9%
Charter+TWC+BHN (pro forma)**	\$2,568,654	\$3,002,000	\$3,273,000	\$3,624,000	\$5,570,654	\$6,897,000	23.8%
Cablevision***	\$374,000	\$296,478	\$312,711	\$241,204	\$670,478	\$553,915	-17.4%
Suddenlink	\$44,000	\$89,577	\$127,532	\$83,565	\$133,577	\$211,097	58.0%
Mediacom****	N/A	\$95,663	\$98,258	\$150,867	\$191,326	\$249,125	30.2%
Cable One	\$68,204	\$91,952	\$91,529	\$69,062	\$160,156	\$160,591	0.3%
Other MSOs (SNL Kagan-estimated)	\$90,849	\$157,613	\$239,889	\$1,438,513	\$248,462	\$1,678,402	575.5%
Total US Cable Companies*****	\$4,469,707	\$5,781,283	\$6,567,919	\$8,642,211	\$10,250,990	\$15,210,130	48.4%

* Includes capital expenditures for line extensions, upgrades/rebuilds, and scalable infrastructure

** Pro forma results reported by Charter for combined companies for full year 2014, 2015 and 2016. 2013 values are as reported separately by Charter and TWC, with estimated values for BHN

*** Cablevision 2016 results are based in part on SNL Kagan estimates

**** Mediacom did not report network investment for 2013; 2013-2014 results are based on 2014. Mediacom's final 2016 results are based on an estimation of Mediacom LLC's portion of the total company's 4Q 2016 expenditures, as the LLC deregistered on Feb. 16, 2017

***** Total values are as estimated by SNL Kagan for U.S. cable MSOs; Values in table for Other MSOs are this total less the publicly reported amounts indicated for the companies as shown

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements); SNL Kagan Estimates.²⁹⁶

can see that our initial upgrade to Optimum's network has led to a significantly higher number of customers taking higher speeds, from just 12% before Altice's control to about 60% today.”)

²⁹⁵ See, e.g., Jeff Baumgartner, “Altice USA to Skip DOCSIS 3.1, Roll Out All-Fiber Network,” *Multichannel News* (Nov. 30, 2016); see also Altice USA, Press Release, “Altice USA Unveils ‘Generation Gigaspeed,’ A Full-Scale Fiber-to-the-Home Network Investment Plan to Enable 10 Gigabit Broadband Speeds” (Nov. 30, 2016).

²⁹⁶ See Ian Olgeirson, “2016 spending surge punctuates US cable CapEx forecast,” *SNL Kagan* (Nov. 4, 2016) (showing total industry estimates for each capital spending segment); see also

Unfortunately, phone company ISPs do not provide details on their allocation of capital investments to core network spending. However, SNL Kagan recently published data that tracks spending on telco networking components (such as fiber ports, optical network terminals, and telco ISP equipment revenues).²⁹⁷ These telco data points, while not as comprehensive as the MSO data, are a reliable marker (along with FCC data and other available data) for how ILECs are investing in their core network. Kagan’s analysis indicates that U.S. telco spending for DSL ports was down more than 20 percent during 2016, continuing a longstanding trend. But telecom company spending on fiber-to-the-home network terminals and terminal ports rose nearly 50 percent in 2016. In its analysis, SNL Kagan specifically noted the well understood reality that ISP investment is cyclical, that it’s driven largely by broader market conditions, and that it “will occur whether net neutrality is in place or not.”²⁹⁸

Kamran Asaf, “Flat Q4 spending restricts FY 2016 cable CaEx to 5% YOY growth,” *SNL Kagan* (Mar. 31, 2017) (recounting historical capital spending by segment at six MSOs).

²⁹⁷ See Jeff Heynen, “Alternative facts on broadband investments threaten net neutrality,” *SNL Kagan*, Mar. 10, 2017 (title later changed to “FCC concern over broadband investments threatens net neutrality”).

²⁹⁸ *Id.* We quote from Heynen’s article at length because it summarizes so well the attitude of real-world ISPs, factoring competition and demand into their investment decisions – not overreacting to longstanding FCC policies and principles.

The long-held argument by Pai and the country’s largest ISPs is that, by forcing network operators to open up their broadband pipes equally to competitive application and content providers, the network operators have no incentive to invest in upgrading and expanding their broadband networks. But the equipment and CapEx results from 2016 prove that is not the case at all. The biggest driver for ongoing investments in broadband infrastructure is competition. Network operators, faced with competitors upping the ante with DOCSIS 3.1, FTTH and high-speed copper deployments, must meet or exceed those offers in order to prevent customer defections, especially when other services in the standard bundle don’t hold the same allure among consumers as they once did. Broadband speeds and customer service are the measures by which consumers make their choice among service providers these days. . . . [T]here is an ongoing cycle of investment in infrastructure required to ramp up the throughput offered to end consumers. Each network operator has approached this realization with a different philosophy. Verizon, for example, bit the bullet early with a high-cost rollout of FTTH infrastructure. That initial investment effectively lasted for over a decade. Meanwhile, AT&T chose to follow a less costly route of pushing fiber into neighborhoods,

Below in Part III we report on and analyze the deployments for each publicly traded telephone company. The trend following the FCC's vote is essentially more of the same, with a ramp-up in targeted fiber-to-the-home deployments. The FCC's vote had zero impact on the underlying economic realities faced by Local Exchange Carriers: ("LECs") they compete with cable companies that only need to spend a couple of hundred dollars per passing to offer gigabit services, while the cost to upgrade LECs' copper last mile networks are five times that or higher. The simple fact that anti-Title II ideologues never acknowledge about LECs is that no discriminatory business model would increase cash flows enough to overcome these natural monopoly economics. This is why LECs target their fiber-to-the-home upgrades to dense multi-tenant developments or areas with aerial lines in which high-income customers reside. This is why LECs like AT&T pursued VDSL deployments in lieu of full fiber upgrades. And it's why the twin Bells (AT&T and Verizon) have adopted similar long-term strategies based on moving more into wireless and into content.

but continuing to rely on copper-based VDSL for the final connection to subscribers' homes, sparing them the high cost of trenching fiber through subscribers' yards. However, that investment lasted only five years, as the company's strategy shifted to focus on FTTH. Now, all network operators are in the middle of network upgrades to ensure their competitiveness with cable operators' DOCSIS 3.1 rollouts, which will push speeds to 1 Gbps and beyond. Those upgrades will occur whether net neutrality is in place or not, as reflected by the shipment numbers and revenue for broadband access equipment in 2016.

3. Claims of ISP Industry Capital Decline After Reclassification Are Based on Manipulated Data, and are Disproven by Company-Specific Disclosures and the U.S. Census Bureau’s Findings.

Numerous times during the past year, Chairman Pai has repeated the demonstrably false assertion that U.S. ISP industry capital investments have “declined”²⁹⁹ or “flatlined.”³⁰⁰ Chairman Pai’s falsehoods are based on inaccurate analysis by the USTelecom Association (“USTA”)³⁰¹ and by industry consultant Hal Singer³⁰² (who received “three Pinocchios” from the *Washington Post* for his falsehoods concerning the tax impacts of Title II).³⁰³

Both Singer’s and USTA’s analyses and their shared conclusion that ISP industry capital investment declined following the FCC’s February 2015 vote are demonstrably false as we describe herein. First we consider USTA’s analysis of 2014 vs. 2015 ISP industry capital investments. USTA, like the Bureau’s ACES, purports to cover the entire industry – including

²⁹⁹ See Remarks of Federal Communications Commission Chairman Ajit Pai at the Mobile World Congress, Barcelona, Spain (Feb. 28, 2017). In this speech Chairman Pai falsely claimed that “after the FCC embraced utility-style regulation, the United States experienced the first-ever decline in broadband investment outside of a recession. In fact, broadband investment remains lower today than it was when the FCC changed course in 2015.” As we showed in 25, the gold standard for aggregate capital spending data (the Census Bureau’s Annual Capital Expenditures Survey) shows that investment increased following the FCC’s vote. The Census data also shows ISP industry capital investment declined slightly from 2013 to 2014, prior to the FCC’s vote, and outside of a recession.

³⁰⁰ See Remarks of FCC Commissioner Ajit Pai before the Heritage Foundation, “The FCC and Internet Regulation: A First-Year Report Card” (Feb. 26, 2016).

³⁰¹ See Brogan, “Broadband Investment Ticked Down in 2015,” *supra* note 239.

³⁰² For example, Singer’s “Bad Bet by FCC Sparks Capital Flight From Broadband,” *Forbes* (Mar. 2, 2017), is a continuation of his selective editing also on display in his summary of 2015 investments. For an explanation of why his prior 2015 analyses were completely wrong, see Free Press, Fact Sheet, “The Truth About ISP Industry Investment After the FCC Net Neutrality Vote” (Sept. 10, 2015), <https://www.freepress.net/resource/107129/truth-about-isp-industry-investment-after-fcc-net-neutrality-vote>; Free Press, Fact Sheet, “Singer’s Scare Quotes and Scare Tactics Can’t Hide the Truth on Title II and Investment” (Sept. 15, 2015), <https://www.freepress.net/resource/107138/scare-quotes-and-scare-tactics-cannot-hide-truth-on-title-ii-and-investment>; see also Timothy Karr, “The Internet Investment ‘Meltdown’ That Isn’t” *Free Press Blog* (Sept. 16, 2015).

³⁰³ See Michelle Ye Hee Lee, “Will the FCC’s net neutrality decision cost Americans \$15 billion in new taxes? Nope,” *Wash. Post* (Jan. 16, 2015).

both publicly traded and non-publicly traded firms. USTA claims a \$1 billion decline from 2014 to 2015. But this analysis is both wrong (contradicted by the U.S. Census Bureau's analysis) and misleading.

First, USTA's methodology is opaque. It claims to capture the entire industry, but does not indicate how it estimated results for non-publicly traded companies nor what those estimates were. Second and most important, USTA's analysis by its own admission manipulated and reduced the publicly reported investments of two companies: Sprint and AT&T.

Sprint's 2015 capital spending was up sharply from 2014, and this was due in large part to the company's new strategy of purchasing smartphones and then leasing them to its customers. USTA simply excluded the capital Sprint spent to purchase these leased devices. But this is highly improper for an analysis that purports to present an apples-to-apples comparison of the amount of capital risked in the ISP industry. In 2015, Sprint shook up the industry's status quo by offering customers "forever free" smartphones. It wanted to attract customers to its largely-built but underutilized LTE network. It was able to do this by purchasing the smartphones and then leasing them to subscribers (as opposed to the normal approach of offering device financing to customers, who then own the device). This change in Sprint's handset approach represents a very risky capital investment scheme. Furthermore, purchasing equipment to lease is a real capital expense, recognized under Generally Accepted Accounting Principles ("GAAP"). Sprint, not its customers, owns these devices, and is on the hook for selling them on the secondary market if it wishes to recover the remaining capital value of these assets. Sprint's capital spending for leased devices is no different than a cable company's spending on set-top boxes it then leases. Therefore, by excluding Sprint's equipment purchases from its analysis

while including all other companies' CPE capital spending, USTA produced a manipulated and biased result.

USTA's other manipulation involved artificial reductions to AT&T's 2015 capital investments. USTA claims it needed to do this in order to account for AT&T's mid-2015 acquisition of DirecTV. But USTA's removal of a portion of AT&T's capital investments in this manner is invalid, because the merger with DTV was a horizontal one. There's no way of producing an after-event *pro forma* estimate of what AT&T's capital investments would have been, because of the synergies from such a horizontal combination.³⁰⁴ In other words, AT&T would have spent a substantial amount of capital on its standalone U-Verse business if it had not acquired DTV. (And since AT&T touted these savings as major reason justifying the merger, it is strange to suggest that AT&T's investment numbers must be further discounted in order to penalize the company for what it considered a smart business decision to achieve any such savings.) USTA's analysis also appears to incorrectly assume that DTV's 2015 capex would be equal to or higher than what the standalone company expended during 2014. The realization of these capital savings from its horizontal merger is, in part, the reason that AT&T has not reported and will not report *pro forma* results for 2015 (*i.e.*, results assuming DTV was acquired as of January 1, 2015, and not mid-2015 when it actually was). Any attempt to estimate what AT&T's spending would have been in the absence of the merger is analytically suspect.

³⁰⁴ See Comments of John Stephens, Senior EVP & CFO, AT&T Inc., AT&T Inc. Analyst Conference (Aug. 12, 2015) ("Other synergies include capital spending savings. Just one example. Today we have about 70 million set-top boxes in the market between our two platforms. That creates a need for two sets of engineering standards, two roadmaps for planning and two refurbishment groups to support customer needs. As we move to a single set-top box environment we can be much more efficient in these areas. Our new scale will also provide us the capital efficiency opportunity. On average we purchase about 25 percent of that embedded base for replacements in new sale ads.").

USTA's analysis relied on these manipulated figures for Sprint and AT&T to manufacture lower investment totals for those two companies. But we also must examine the changes in investment at all other companies. Indeed, if there was an impact from Title II, that impact should have been felt not by AT&T and Sprint alone, but across the entire industry. As the data from Figure 24 above indicates, excluding AT&T and Sprint, capital investments at all other publicly traded ISPs increased by \$2.2 billion from 2014 to 2015, and the two year post-vote aggregate total for these other companies was nearly 10 percent higher than their total from the preceding two years. This alone strongly suggests the absence of any systemic negative effect from Title II. And when combined with the copiously documented fact that AT&T's post-2014 wireless capex decline was planned years before the FCC's vote, and the copiously documented fact that Sprint's non-handset capital declines were also pre-planned (and temporary), the evidence is overwhelming: USTA's analysis is irresponsible and demonstrably false.

AT&T alone typically accounts for nearly 30 percent of all publicly traded ISPs' capital expenditures, meaning any cyclical change at this one company could swamp the overall industry trend. For this reason alone, it is clear that we must treat aggregate industry results with caution, examining them only alongside individual company results and the reasons for them that each company gives investors. In AT&T's case, the company's overall decline in capital investment during 2015 was a result that it repeatedly told Wall Street to expect, as AT&T completed its so-called "Project VIP" DSL and wireless upgrades. With its nationwide 4G LTE coverage completed in 2014, there was simply no need for AT&T to maintain that same level of capital spending immediately after the project ended. (*See* discussion of AT&T in the Appendix to these comments).

Singer's analysis of 2015 results, and now his 2016 ISP industry investment recap too, suffers from the same two flaws as USTA's piece. Singer manipulated AT&T's and Sprint's publicly reported capital investments, and he doesn't include publicly available data from numerous other ISPs.³⁰⁵ Singer directly blames the FCC's 2015 vote for his invented aggregate investment declines, while conceding that numerous companies invested more after the vote than they did before the vote in the presence of the exact same (fictional) "threat" from Title II. But lest he acknowledge that these increases reflect the absence of a negative Title II impact, Singer argues that these companies would have invested even more in the alternative. Of course, he never explains how large this delta might be, because he cannot possibly do so. Nor does he explain how it would be possible for a company like Mediacom, which upgraded its entire footprint to gigabit service in less than a year's time, to go even faster. Singer's logic is no more sound than a man's who thinks the sun rose in the morning because he opened his eyes.

³⁰⁵ Singer and USTA manipulate AT&T's published capital spending data, which they claim is necessary to produce the "right" analysis. But as we've explained previously, because of the horizontal nature of this pay-TV company merger, it is analytically inappropriate to imagine some dollar amount for investment that would have occurred if not for the merger. AT&T explicitly states that it does not report segment capital expenditures due to the integrated nature of its businesses. *See* AT&T Inc. Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 (Form 10-K), for the fiscal year ending December 31, 2016, at 51 ("We manage our assets to provide for the most efficient, effective and integrated service to our customers, not by segment, and, therefore, asset information and capital expenditures by segment are not presented."). If an analyst starts manipulating the company's reported results nonetheless, then the entire exercise loses meaning, as it is no longer an apples-to-apples comparison. The proper approach is to present the results as reported, and note the possible caveats. Before drawing any conclusions, the responsible analyst should then proceed to examine all available information, examining trends at other companies, looking at all the explanations of why spending at any particular company changed. The responsible analyst would then use reason and logic to reach a conclusion about the systemic impact of any one single factor on the broader market. This is the approach we took in this report, and the only logical conclusion from the wealth of available information is that Title II did not negatively impact ISP company investments – and may have possibly encouraged more rapid deployment of higher capacities, in response to increasing consumer demand for the exact type of content that ISPs had previously expressed interest in blocking or controlling (online video).

This totally unsupported claim – that fears about potential future Title II-based rules (beyond the immediate Open Internet rules) caused an industry-wide reduction in investment – simply cannot be squared with the observed, large increases in network spending at most ISPs. AT&T’s supposed declines (exclusive of the impact of DirecTV) were planned well ahead of the FCC’s February 2015 vote, as were the increases at other ISPs. To assume Title II had a negative impact at all would require that the law uniquely impacted AT&T’s business, in a way that the company then blamed on cyclical project completion and productivity gains, and thus would assume that AT&T’s (and Sprint’s non-CPE capex) business is different from other similarly situated ISPs. This is an absurd proposition in light of voluminous statements to the contrary made by ISPs during 2015 and 2016, and it ignores the massive increase in deployment by other companies large and small during that time.

But even if we entertain the hypothetical that AT&T’s capital spending was “really” lower in 2015–2016, this still doesn’t prove in any way an impact from Title II. Because AT&T represents such a large percentage of the U.S. telecommunications market, any cyclical change in its spending can have an outsized impact on the overall industry’s aggregate result. Contrary to Singer’s assertion that “something happened” in 2015, and his strange attribution of that something to Title II, nothing out of the ordinary happened that year.³⁰⁶ AT&T completed a period of accelerated investment, just as many other ISPs were beginning to ramp up their own investments.

AT&T’s CEO flatly stated in December 2015 that the year prior to the FCC’s vote was “the monster of all years,” and said that with the completion of Project VIP’s LTE and IP-DSLAM upgrades that “capex has come down rather dramatically.” He went on to list numerous

³⁰⁶ See Mike Snider, “Do net-neutrality rules hurt the poor?,” *USA Today* (May 5, 2017).

ways in which productivity gains from these prior deployments would allow AT&T to continue expanding capacities but do so with lower total investment. As he put it, “we are going to deploy more fiber next year than we did this year, but the capital requirements are going down.”³⁰⁷ Finally, when asked if Title II or the Open Internet rules impacted AT&T’s business plans, AT&T’s CEO said “no,” and assured investors that “everything that we are planning on doing fits within those rules.”³⁰⁸

³⁰⁷ See Comments of Randall Stephenson, Chairman & CEO, AT&T Inc., at UBS Global Media and Communications Conference (Dec. 8, 2015) (“Yes, so capex, I have been saying for the last year and a half kind of pre-conditioning people that there is – I use the word downward bias on our capital spending and there’s a downward bias for a lot of reasons. Mainly 2014 was like the monster of all years. We finished off our VIP project, so the LTE deployment largely wrapped up in 2014. Our broadband expansion, we went out and deployed 57 million IP broadband homes and finished that in 2014. All of that stuff tailed off in 2014 and so our CapEx has come down rather dramatically. Now going forward, software-defined networking, this is not an inconsequential impact on capital requirements. It is a rather significant effect on our capital spend. So there’s going to be a continual downward pressure on our capital spending just by virtue of SDN, virtualizing the core network. Think about the cloud moves out of the data center into the core network, so all of the economics that we’ve experienced in the data center by cloud computing is moving into the big iron core network at AT&T. That’s consequential. That’s significant. And we are experiencing those effects right now. Also LTE. We are now at a place where the LTE conversion is done and so we are adding capacity. LTE capacity runs about 30 percent to 40 percent cheaper than traditional UMTS capacity, downward bias on capital requirements. Rather than laying up T1s, DS1s and so forth, we are laying up Ethernet. The capital requirements of Ethernet versus a T1? About 40 percent lower. And I could just keep going on and on, but everything about this industry, we are actually starting to get on Moore’s Law in this big iron telecom business. We are not quite on Moore’s Law, but we are experiencing some of Moore’s Law in the big iron and this is a really exciting deal. Now move into fiber deployment. We are going to deploy more fiber next year than we did this year, but the capital requirements are going down. It continues to get cheaper to deploy fiber, pre-spliced fiber and so forth. It is all getting cheaper. Now, once again, later on, 40 megahertz of fallow spectrum on top of the wireless spectrum. We were at dinner last night and somebody said so I should think of spectrum as just prepaid capital. That’s exactly what it is. It is capital avoidance. The guy with the best spectrum position has the best cost position in terms of deploying capital in the network. So everything about how this is stacking up is lending ourselves to using this language downward bias. Our capital requirements are getting more and more efficient all the time.”) (emphasis added).

³⁰⁸ See *id.* When asked, “So given that backdrop and the plans you’ve talked today about putting content together with wireless potentially as early as January, can you do everything that you’ve planned to do with that kind of ambiguity out there? Are these net neutrality or Title II rules an

The data shows that ever since AT&T closed on its DTV deal, its capital investments are trending higher. Yes, had the FCC rejected AT&T's takeover of DTV instead, then AT&T's capital expenditures still would likely have been slightly lower during 2015–2016 than they were during the peak years of Project VIP (2013–2014). But there's a reason that AT&T had a special investor meeting to announce Project VIP, and why the company called it a "project." It was an extraordinary period of accelerated investment. AT&T massively increased its capital spending to complete its nationwide 4G LTE rollouts (which, it had previously told the Commission would never happen without the agency's approval of its T-Mobile merger plans). It also accelerated IP-DSLAM deployments to give additional life to its otherwise dying DSL business. The data clearly shows that AT&T's capital expenditures peaked in the second quarter of 2014 and then started to decline during the third quarter of 2014, well ahead of the FCC's vote, as Project VIP wound down (see Appendix, Figure A9). And this was something AT&T made explicitly clear on its 2014 investor calls.³⁰⁹

impediment to you moving forward with these products?" Stephenson replied, "No, we don't think so. In fact, there are two layers of what I will call regulations that constrain us right now in terms of things we – what can we do and what can't we do. Obviously, the net neutrality order that is currently before the courts, that is still the law of the land and so we need to comply with that. Everything that we are planning on doing fits within those rules and then we also agreed to some merger concessions in the DirecTV deal and all of this complies with that as well. So we think we are fine there and what is really to us interesting is what happens if the courts do invalidate a couple of pieces of this order. It seems to us it's not inconceivable that we end up at a worse place if you are the FCC than what we have with the 2010 agreement that we all signed that was invalidated by the Verizon case. So anyway stay tuned. This is going to be interesting.")

Id. (emphases added).

³⁰⁹ See Comments of Randall Stephenson, Chairman & CEO, AT&T Inc., at the Morgan Stanley Technology, Media & Telecom Conference (Mar. 6, 2014). Stephenson was asked, "Randall, just from the standpoint of cash management, could you talk about – a little bit about 2015? It sounds like you are accelerating the spend a little bit more this year. Does that mean that next year could be a down year for capex and if so, could you give us a sense?" Stephenson replied, "So 2014 is the peak year, as I've said, so you would expect capex to move down in 2015 and I don't think we've characterized a quantification of that. But we do expect it to move down. People try to model out capex in our business and the industry and I just tell people, if you take your model

Furthermore, if we look at AT&T's capital expenses for the period after the company closed the DTV acquisition, we see that investments are trending upwards (see Appendix, Figure A10). AT&T's explanation for this uptick? It is in part due to increased fiber investments, which AT&T is making as it expands its FTTH service to 12.5 million locations (3.8 million reached as of the end of 2016) and as it densifies its cellular network with greater fiber backhaul capacity. Indeed, the Form 477 deployment data we presented in Figure 8 shows AT&T's number of FTTH-enabled Census Blocks increased from approximately 17,000 at the end of 2014 to 30,000 by mid-2016, a period when the company's 25 Mbps coverage increased from 5 percent of its Census Blocks to 38 percent. (When measured in terms of 2010 Census households, AT&T's 25 Mbps coverage increased from 3 percent of the households in its footprint to 52 percent).

These are knowable facts. Anyone pretending that the truth about AT&T spending is unknowable is either lazy, dishonest, or both. And anyone like Chairman Pai who claims that Title II led to a decline in investment, and who points to the manipulated AT&T data as "proof" while ignoring all other information, is simply acting in bad faith.

In sum, both Singer and USTA manipulated evidence to support a false assertion that ISP capital investments declined following the FCC's 2015 vote. But even if aggregate capital spending does go down in the future, it would not logically follow that such a decline is due to fears of unspecified FCC market intervention. It especially would not follow in the face of

and take revenues and multiply it by 15 percent or 16 percent and do a click and drag out as far as you want to go, that is kind of telecom. And I don't envision that changing radically. Although I think we are kind of at a peak end of that range right now." *Id.* (emphases added). Nearly a year and a half later, AT&T's CFO noted that the company expects capital intensities to be below the 15 percent level going forward. *See* Comments of John Stephens, Senior EVP & CFO, AT&T Inc., AT&T Inc. Analyst Conference (Aug. 12, 2015) ("Capital intensity will remain unchanged in the 15% of revenue range or lower as we get the efficiencies from the software defined networks and the capital spending opportunities we've outlined.").

copious amounts of evidence about each company’s reasons for changes in its capital spending – evidence that is freely available to anyone interested in the truth.

4. Business is Booming: Improved Capacity and Edge Innovation Results in Higher ISP Revenues.

Wireless and wired internet access services are in high demand. This is because broadband is an essential means for two-way communications, as well as a conduit to an almost unlimited variety of media and entertainment content. This is why the service is present in three-quarters of U.S. homes, with non-adoption driven largely by income inequalities and racial inequalities.³¹⁰

Broadband access is also a service offered in a marketplace with very little competition, particularly for wired home internet.³¹¹ This combination of high demand for an essential service that is evolving at technology’s rapid pace, in combination with suboptimal competition, means that broadband carriers have substantial pricing power. This pricing power exists at both the high- and low-ends of the market.

Thus it should come as no surprise that the ISP industry’s aggregate revenues continue to grow at a rapid pace. As the data in Figure 27 below shows, total revenues for publicly traded ISPs grew at a compound annual growth rate (“CAGR”) of 5 percent during 2013–2016.

But as with investment numbers, the industry’s aggregate revenue data does not tell the whole story: some companies are generating higher revenue growth than others, and these differences are largely a reflection of each company’s overall business strategy, their competitive position and market power, their adjacent-market lines of business (such as cable TV service or switched voice access), and their underlying technology. For example, over the past four years

³¹⁰ See generally *Digital Denied*.

³¹¹ See Figure 5 (showing that even with the large improvements since the end of 2014, approximately half the population still has one choice or no choices for a wired home internet service provider at speeds above 25 Mbps).

legacy cable company ISPs saw their revenues increase at a CAGR of 5.6 percent, more than three times the revenue growth rate of 1.8 percent for legacy LEC ISPs.

Figure 27: Total Revenues at Publicly Traded Broadband Providers (2013–2016)

Revenues (\$ thousands)	2013	2014	2015	2016	2013-2014	2015-2016	Percent Change (2015–2016 vs. 2013–2014)	Compound Annual Growth Rate (2013–2016)
Comcast (cable)	\$41,836,000	\$44,165,000	\$46,928,000	\$50,048,000	\$86,001,000	\$96,976,000	12.8%	6.2%
Charter+TWC+BHN (pro forma)	\$33,864,653	\$35,610,000	\$37,394,000	\$40,023,000	\$69,474,653	\$77,417,000	11.4%	5.7%
Cablevision (excluding Newsday)	\$5,908,620	\$6,137,909	\$6,308,300	\$6,466,300	\$12,046,529	\$12,774,600	6.0%	3.1%
Suddenlink	\$2,183,301	\$2,330,697	\$2,420,312	\$2,573,160	\$4,513,998	\$4,993,472	10.6%	5.6%
Mediacom	\$1,617,475	\$1,660,081	\$1,721,072	\$1,810,255	\$3,277,556	\$3,531,327	7.7%	3.8%
Wide Open West	\$1,199,700	\$1,264,300	\$1,217,100	\$1,217,100	\$2,464,000	\$2,434,200	-1.2%	0.5%
Cable ONE	\$825,707	\$814,812	\$807,266	\$819,625	\$1,640,519	\$1,626,891	-0.8%	-0.2%
GCI	\$811,648	\$910,198	\$978,534	\$933,812	\$1,721,846	\$1,912,346	11.1%	4.8%
TOTAL PUBLICLY TRADED CABLE MSOs	\$88,247,104	\$92,892,997	\$97,774,584	\$103,891,252	\$181,140,101	\$201,665,836	11.3%	5.6%
AT&T (consolidated)	\$128,752,000	\$132,447,000	\$146,801,000	\$163,786,000	\$261,199,000	\$310,587,000	18.9%	8.4%
Verizon (consolidated)	\$120,550,000	\$127,079,000	\$131,620,000	\$125,980,000	\$247,629,000	\$257,600,000	4.0%	1.5%
AT&T (excl. video & mobility)	\$86,699,000	\$88,852,000	\$91,464,000	\$94,126,000	\$175,551,000	\$185,590,000	5.7%	2.8%
Verizon (wireline)	\$32,993,000	\$32,793,000	\$32,094,000	\$31,345,000	\$65,786,000	\$63,439,000	-3.6%	-1.7%
CenturyLink	\$18,095,000	\$18,031,000	\$17,900,000	\$17,470,000	\$36,126,000	\$35,370,000	-2.1%	-1.2%
Frontier	\$4,762,000	\$4,772,000	\$5,576,000	\$8,896,000	\$9,534,000	\$14,472,000	51.8%	23.2%
Frontier (excluding VZ 2016 acq.)	\$4,762,000	\$4,772,000	\$5,576,000	\$5,274,000	\$9,534,000	\$10,850,000	13.8%	3.5%
Windstream	\$5,988,100	\$5,829,500	\$5,765,300	\$5,387,000	\$11,817,600	\$11,152,300	-5.6%	-3.5%
TDS Telecom (ex. US Cellular)	\$982,400	\$1,116,691	\$1,179,388	\$1,165,352	\$2,099,091	\$2,344,740	11.7%	5.9%
Fairpoint	\$939,354	\$901,396	\$859,465	\$824,443	\$1,840,750	\$1,683,908	-8.5%	-4.3%
Cincinnati Bell	\$1,256,900	\$1,161,500	\$1,167,800	\$1,185,800	\$2,418,400	\$2,353,600	-2.7%	-1.9%
Consolidated Comm. (pro forma)	\$790,777	\$790,745	\$775,700	\$743,200	\$1,581,522	\$1,518,900	-4.0%	-2.0%
Shenandoah Telecom Co. (pro forma)	\$668,708	\$687,080	\$678,475	\$646,769	\$1,355,788	\$1,325,244	-2.3%	-1.1%
Hawaiian Telecom	\$391,150	\$390,739	\$393,413	\$392,963	\$781,889	\$786,376	0.6%	0.2%
Alaska Comm. System (wireline)	\$199,237	\$215,093	\$219,802	\$226,866	\$414,330	\$446,668	7.8%	4.4%
Otelco	\$78,972	\$73,870	\$71,102	\$68,944	\$152,842	\$140,046	-8.4%	-4.4%
TOTAL PUBLICLY TRADED LOCAL EXCHANGE CARRIERS	\$153,844,598	\$155,614,614	\$158,144,445	\$162,478,337	\$309,459,212	\$320,622,782	3.6%	1.8%
AT&T (consumer mobility)	\$36,243,000	\$36,769,000	\$35,066,000	\$33,200,000	\$73,012,000	\$68,266,000	-6.5%	-2.9%
Verizon (wireless)	\$81,203,000	\$87,646,000	\$91,680,000	\$89,186,000	\$168,849,000	\$180,866,000	7.1%	3.2%
Sprint	\$35,493,000	\$35,125,000	\$32,391,000	\$32,879,000	\$70,618,000	\$65,270,000	-7.6%	-2.5%
T-Mobile	\$24,420,000	\$29,564,000	\$32,053,000	\$37,242,000	\$53,984,000	\$69,295,000	28.4%	15.1%
US Cellular	\$3,918,836	\$3,892,747	\$3,996,853	\$3,938,899	\$7,811,583	\$7,935,752	1.6%	0.2%
TOTAL PUBLICLY TRADED WIRELESS CARRIERS	\$181,277,836	\$192,996,747	\$195,186,853	\$196,445,899	\$374,274,583	\$391,632,752	4.6%	2.7%
TOTAL PUBLICLY TRADED ISPs	\$435,533,538	\$454,970,358	\$479,222,882	\$504,724,488	\$890,503,896	\$983,947,370	10.5%	5.0%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Note: Verizon Wireline revenues for 2014–2016 are as reported in its 2016 10-K; 2013 revenues are restated to reflect impact of divested operations, as described in Verizon's 2015 10-K. Shenandoah Telecom's revenues are pro forma with nTelos (with the latter's 2013 pro forma values reflecting divestitures). The total shown for publicly traded local exchange carriers uses AT&T's reported total revenues less reported video entertainment and consumer mobility revenues (AT&T no longer reports both wireline and wireless segment results separately). The total for all publicly traded ISPs uses AT&T's total consolidated revenues.

The cable ISPs' inherent business advantages, both in terms of the strength of their legacy businesses and their current broadband platforms, show up in the revenue growth data. While revenue is growing at both cable companies and LECs, that growth is much more pronounced at the former. Cable company revenues were 11.3 percent higher during the two-year post-Open Internet vote period compared to the two years prior to that vote. The LECs' growth rate for those periods was just 3.6 percent. Sequential annual revenue growth for the cable companies we cover was 5.3 percent, 5.3 percent, and 6.3 percent for 2014–2016. At the LECs we cover, the sequential annual revenue growth rates were 1.2 percent, 1.6 percent, and 2.7 percent during those years.

Revenue growth at wireless companies is on the same trajectory, but the growth is less pronounced than it is for cable companies. Post-Open Internet vote revenue growth was 4.6 percent at the five publicly traded wireless carriers, with a four-year CAGR of 2.7 percent during 2013–2016. But revenue growth in the wireless sector is slowing, largely due to the consumer benefits of increased competition from T-Mobile and Sprint. From 2013 to 2014, wireless industry revenues grew by 6.5 percent, declining to 1.1 percent growth the following year, and just 0.6 percent growth from 2015 to 2016.³¹²

As one should expect, revenue growth is not uniform from one company to the next within these industry sectors. For example, T-Mobile's pro-competitive moves let it gain market share from all other carriers. As a result, its four-year revenue CAGR was 15.1 percent during

³¹² We emphasize that these are the publicly reported wireless segment revenues at the four national carriers (AT&T, Verizon, T-Mobile, and Sprint) along with US Cellular (a subsidiary of TDS). These data do not include wireless segment revenues at multi-platform carriers such as Shenandoah Telecom, GCI, or Alaska Communications System.

2013–2016, while AT&T’s mobility segment revenues declined by a CAGR of -2.9 percent.³¹³ Cable ONE’s strategy of de-emphasizing video resulted in flat revenues during the past four years, an anomaly amongst its MSO peers. And numerous LECs continued to feel the impact of their declining business in legacy residential voice, residential DSL, and enterprise voice.³¹⁴ Indeed, the LECs that invested in higher-capacity data services and other growth services are faring far better than those that chose to do nothing but squeeze as much as they could out of their legacy copper networks.³¹⁵ Verizon’s segment results offer an instructive example. Its

³¹³ In AT&T’s 2016 10-K SEC report, it described its recent revenue trajectory as a reflection of “declines in postpaid service revenues due to customers migrating to our Business Solutions segment and choosing Mobile Share plans, partially offset by higher prepaid service revenues. Our business wireless offerings allow for individual subscribers to purchase wireless services through employer-sponsored plans for a reduced price. The migration of these subscribers to the Business Solutions segment negatively impacted our consumer postpaid subscriber total and service revenue growth. The shutdown of our 2G network also resulted in higher overall churn as subscribers in our reseller and connected device categories upgraded their devices at lower rates than postpaid and prepaid subscribers.” Needless to say, these changes in AT&T service plans and customer behavior are tied to competitive forces in the market, as spurred on by federal regulators’ 2011 decision to reject AT&T’s bid for T-Mobile. Only a biased analyst would look at this evidence and conclude that T-Mobile’s rapid growth or AT&T’s slight decline in revenues stems from Title II reclassification.

³¹⁴ See, e.g., Consolidated Communications Holdings Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 (Form 10-K), for the fiscal year ending Dec. 31, 2016 (“Operating revenues also continue to be impacted by the anticipated industry wide trend of a decline in voice services, access lines and related network access revenue.”); CenturyLink Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 (Form 10-K), for the fiscal year ending Dec. 31, 2016 (“Our total operating revenues decreased by \$430 million, or 2%, for the year ended December 31, 2016 as compared to the year ended December 31, 2015 and decreased by \$131 million, or 1%, for the year ended December 31, 2015 as compared to the year ended December 31, 2014. The decline in operating revenues for both periods was primarily due to lower legacy services revenues, which decreased by \$666 million, or 8%, and \$695 million, or 8%, for the respective periods. . . . Legacy services [] include primarily local and long-distance voice services, including the sale of UNEs, private line (including special access), Integrated Services Digital Network (‘ISDN’) (which use regular telephone lines to support voice, video and data applications), switched access and other ancillary services.”).

³¹⁵ See, e.g., Windstream Holdings Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 (Form 10-K), for the fiscal year ending December 31, 2016 (“Our consolidated operating results during 2016 were favorably impacted by revenue growth in

“premium” wireless network continued to deliver (until very recently) revenue and subscriber growth even in the face of T-Mobile’s growth.³¹⁶ Verizon’s wireline revenues are in a perpetual slow decline, but that situation would be worse if not for the company’s growing home internet and pay-TV revenues.³¹⁷

The data in Figure 27 captures all the revenues for the companies shown, including revenues generated from product lines that are perhaps impacted by developments in the consumer broadband market but that are not themselves consumer broadband revenues. To get a

consumer high-speed Internet and enterprise data and integrated services, primarily due to continued migration of customers to higher speeds and increased demand, respectively. Additionally, reductions in interconnect expense, enterprise salaries and other benefits, and depreciation and amortization expense positively contributed to the year ended December 31, 2016. Operating results for 2016 also includes a net gain on the disposal of our investment in CS&L common stock and discrete income tax benefits associated with the disposition of this investment. Conversely, the year ended December 31, 2016 was adversely impacted by reductions in small business, wholesale, and switched access revenues due to customer losses from business closures and competition, declining demand for copper-based circuits to towers and the adverse effects of inter-carrier compensation reform, respectively.”)

³¹⁶ From 2013–2016, Verizon’s wireless segment revenues grew at a CAGR of 3.2 percent, with large gains from 2013 through 2015. The segment’s revenues declined during 2016. The trajectory of Verizon’s wireless revenues offers evidence of how important T-Mobile and Sprint’s competitive pressures have been. For example, Verizon described its 8.2 percent increase in wireless revenues during 2014 as “a result of growth in service revenue and equipment revenue.” The company described its 4.6 percent increase in wireless revenues during 2015 as “a result of growth in equipment revenue.” And it attributed its 2.7 percent decline in wireless revenues during 2016 to “a decline in service revenue driven by customer migration to plans with unsubsidized service pricing, including our new price plans launched during 2016.” See Verizon Communications Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 (Form 10-K), for the fiscal years ending December 31, 2014, December 31, 2015, and December 31, 2016.

³¹⁷ See *id.* (10-Ks for 2014, 2015, and 2016). Verizon’s explanations for its recent wireline declines all attribute them to declines in legacy LEC business lines, offset by gains in its Fios unit. Verizon described its 0.5 percent wireline revenue decline during 2014 as “a result of declines in Global Enterprise Core and Global Wholesale, partially offset by higher Mass Markets revenues driven by Fios services and increased Strategic services revenues within Global Enterprise.” The company attributed 2015’s 1.8 percent decline in wireline revenues to “declines in Global Enterprise, partially offset by higher Mass Markets revenues driven by Fios services.” And Verizon blamed 2016’s 2.3 percent wireline declines again on “declines in Global Enterprise and Global Wholesale,” but also indicated the 6-week work stoppage during Spring 2016 impacted Fios growth.

better sense of how these companies' broadband businesses are faring in isolation, we examined their reported residential high-speed Internet (or data) revenues during the 2013–2016 period. Not all of the companies we track report data revenues, however, and not all that do report such data revenues then go on to report this information separately for residential and enterprise subscribers (see notes to Figure 28). The results presented in Figure 28 indicate that high-speed Internet revenues grew at a CAGR of over 12 percent during 2013–2016, more than two times the rate of overall revenue growth for these companies. The data also reflects the fact that LECs otherwise beleaguered by declines in their legacy businesses can achieve growth from broadband, but only if they invest in competitive technologies such as fiber-to-the-node/home.

This should come as no surprise. Nothing about the FCC's 2015 *Open Internet Order* altered any of the factors driving ISP revenue growth, which continues unabated as the public's demand for open and nondiscriminatory telecommunications services grows – driven by, and growing in tandem with, the similar growth in demand for all of the services that are reachable via broadband.

The aggregate data revenues summarized in Figure 28 show strong continued revenue growth, but do not speak to whether this growth is due simply to a growing market (*i.e.*, subscriber gains) or primarily to revenue gains from existing subscribers. To get a sense of what is happening at the subscriber-level, we calculated the average monthly high-speed internet revenues per subscriber for these wireline ISPs. These results are summarized in Figure 29.³¹⁸

³¹⁸ To calculate these average data revenues per subscriber, we divided the publicly reported data revenues for a given ISP by its number of publicly reported subscribers at year's end. This approach will tend to understate the actual revenues per subscriber, because it uses (in most cases) the highest number of subscribers for a given year's revenues, and not the actual average number of subscribers during that year. Thus, this data should be considered along with the company-reported average revenues per account/subscriber/user summarized in Figure 29.

**Figure 28: Residential High-Speed Internet Access Revenues
at Publicly Traded Broadband Providers (2013–2016)**

Data Revenues (\$ thousands; Residential/Consumer unless noted)	2013	2014	2015	2016	2013-2014	2015-2016	Percent Change (2015–2016 vs. 2013–2014)	Compound Annual Growth Rate (2013–2016)
Comcast (cable)	\$10,334,000	\$11,321,000	\$12,471,000	\$13,532,000	\$21,655,000	\$26,003,000	20.1%	9.4%
Charter+TWC+BHN (pro forma)	\$9,124,294	\$10,178,000	\$11,295,000	\$12,688,000	\$19,302,294	\$23,983,000	24.2%	11.6%
Cablevision (cable)	\$1,342,627	\$1,416,328	\$1,478,719	N/A	\$2,758,955	\$3,134,884	13.6%	4.9%
Suddenlink	\$507,336	\$592,130	\$690,279	\$823,057	\$1,099,466	\$1,513,336	37.6%	17.5%
Mediacom	\$451,744	\$483,817	\$535,562	\$603,375	\$935,561	\$1,138,937	21.7%	10.1%
Wide Open West	\$329,100	\$353,400	\$351,900	\$373,100	\$682,500	\$725,000	6.2%	4.3%
Cable ONE	\$252,296	\$265,718	\$294,486	\$344,184	\$518,014	\$638,670	23.3%	10.9%
GCI (wireline)	\$99,740	\$113,306	\$130,213	\$140,196	\$213,046	\$270,409	26.9%	12.0%
TOTAL PUBLICLY TRADED CABLE MSOs	\$22,441,137	\$24,723,699	\$27,247,159	\$30,160,077	\$47,164,836	\$57,407,236	21.7%	10.4%
AT&T (entertainment segment)	\$4,219,000	\$5,522,000	\$6,601,000	\$7,472,000	\$9,741,000	\$14,073,000	44.5%	21.0%
CenturyLink	\$2,358,000	\$2,469,000	\$2,611,000	\$2,689,000	\$4,827,000	\$5,300,000	9.8%	4.5%
Frontier (excluding VZ 2016 acq.)	\$1,866,461	\$1,947,967	\$2,337,000	\$2,327,000	\$3,814,428	\$4,664,000	22.3%	7.6%
Windstream (internet bundles)	N/A	\$1,017,600	\$1,032,800	\$1,049,000	N/A	\$2,081,800	2.3%	1.5%
Fairpoint	\$161,423	\$175,490	\$178,620	\$187,268	\$336,913	\$365,888	8.6%	5.1%
Cincinnati Bell	\$89,600	\$106,900	\$122,200	\$147,200	\$196,500	\$269,400	37.1%	18.0%
Consolidated Communications	\$290,787	\$384,089	\$396,529	\$406,558	\$674,876	\$803,087	19.0%	11.8%
Hawaiian Telecom	\$27,888	\$31,024	\$32,687	\$28,993	\$58,912	\$61,680	4.7%	1.3%
Alaska Communications System	\$22,108	\$24,841	\$25,621	\$24,981	\$46,949	\$50,602	7.8%	4.2%
Otelco	\$14,540	\$14,438	\$14,868	\$15,604	\$28,978	\$30,472	5.2%	2.4%
TOTAL PUBLICLY TRADED LOCAL EXCHANGE CARRIERS	\$9,049,807	\$11,693,349	\$13,352,325	\$14,347,604	\$20,743,156	\$27,699,929	33.5%	16.6%
TOTAL FOR COMPANIES SHOWN	\$31,490,944	\$36,417,048	\$40,599,484	\$44,507,681	\$67,907,992	\$85,107,165	25.3%	12.2%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Notes: Values for Windstream's 2013–2014 total assumes 2013 data revenues were equal to 2014. Cablevision's 2015–2016 aggregate total assumes Cablevision's 2016 value (which Altice did not report) reflected industry average growth. CAGR values shown for these two companies reflect growth over the three-year periods shown. The following companies did not report residential vs. commercial or business internet/data revenues for any or all years above: Wide Open West, Frontier, FairPoint, Consolidated Communications. Companies listed in other tables but not here did not report internet access revenues.

This analysis indicates that average data revenues per subscriber grew at a CAGR of 9.4 percent during 2013–2016, slightly below the 12 percent growth rate for total data revenues. This suggests that total revenue growth is primarily due to these higher average subscriber revenues, with only a small portion due to overall broadband market growth. (These companies' subscribership grew at a CAGR of 3.1 percent during this period). At a CAGR of 9.4 percent, it

would appear that consumer expenditures for wired home internet grew at a rate approximately five times the core inflation rate during the same period.³¹⁹

Figure 29: Calculated Average Monthly High-Speed Data Revenue per Subscriber at Publicly Traded Wireline Broadband Providers (2013–2016)

Monthly data revenue per Residential High-Speed Internet subscriber*	2013	2014	2015	2016	Compound Annual Growth Rate (2013–2016)
Comcast (cable)	\$41.63	\$42.96	\$44.55	\$45.65	3.1%
Charter+TWC+BHN (pro forma)	\$41.79	\$46.09	\$47.27	\$49.47	5.8%
Cablevision (cable)	\$40.25	\$42.76	\$43.87	N/A	4.4%
Suddenlink	\$39.90	\$42.94	\$47.03	\$53.25	10.1%
Mediacom	\$39.01	\$39.80	\$41.13	\$43.50	3.7%
Wide Open West	\$37.06	\$40.46	\$41.16	\$41.60	3.9%
Cable ONE	\$47.89	\$49.22	\$53.24	\$61.15	8.5%
GCI (wireline)	\$72.09	\$79.28	\$85.24	\$91.56	8.3%
AVERAGE CABLE MSOs (shown)	\$41.58	\$44.23	\$45.72	\$47.69	4.7%
AT&T (entertainment segment)	\$24.56	\$31.86	\$38.51	\$43.91	21.4%
Frontier	\$35.09	\$35.75	\$43.14	\$45.40	9.0%
Windstream	N/A	\$74.94	\$78.59	\$83.17	5.4%
Fairpoint	\$40.99	\$45.71	\$47.84	\$50.90	7.5%
Cincinnati Bell	\$27.82	\$33.01	\$35.43	\$40.46	13.3%
Alaska Comm. System (wireline)	\$47.63	\$55.33	\$64.16	\$60.16	8.1%
Consolidated Communications	\$56.49	\$72.17	\$72.45	\$71.57	8.2%
Hawaiian Telecom	\$25.42	\$27.84	\$29.29	\$26.52	1.4%
Otelco	\$48.99	\$50.61	\$53.38	\$57.94	5.8%
AVERAGE LECs (shown)	\$27.99	\$36.08	\$42.42	\$52.35	23.2%
AVERAGE ISP (shown)	\$37.40	\$41.67	\$44.74	\$49.01	9.4%

Source: Free Press analysis of company SEC filings (10-Ks; 8-Ks; Financial Supplements). Values are calculated based on year-end reported data revenues and subscriber counts, as shown in Figure 28 (data revenues) and Figure 31 (data subscribers). Windstream's CAGR is from 2014–2016. Cablevision's CAGR is from 2013–2015.

The data summarized in Figure 29 shows somewhat uneven growth, depending on the company. To the extent that there's any overarching takeaway from this information, it's that

³¹⁹ The annual non-seasonally adjusted CPI values (less food and energy) for 2013–2016 were 1.8 percent, 1.7 percent, 1.8 percent and 2.2 percent respectively (an average of 1.875 percent). Non-seasonally adjusted CPI for all items (including food and energy) during 2013–2016 were 1.5 percent, 0.8 percent, 0.7 percent, and 2.1 percent (an average of 1.275 percent). See United States Department of Labor, Bureau of Labor Statistics, Consumer Price Index (CPI) News Release, USDL-17-0058 (Jan. 18, 2017); see also past CPI releases numbered USDL-14-0037, USDL-15-0018, and USDL-16-0109.

some LECs that invested heavily in fiber-to-the-home (e.g., Cincinnati Bell) had their investments rewarded with substantial data revenue growth.

We calculated the average monthly high-speed data revenues per subscriber shown in Figure 29 using company-reported annual data revenues and year-end data subscribers. These calculated figures are thus imprecise because they represent total annual revenues divided by year-end subscribers, not by the average number of subscribers for the relevant year. To better understand the data revenue trajectories at U.S. ISPs, in Figure 30 we present the average revenues per user for various customer types and services as reported by publicly traded companies that disclose this type of information.

Unfortunately, very few companies report per-subscriber average high-speed internet revenues. Most only disclose average revenues per customer relationship, which for most companies includes revenues from multiple residential services (internet access, cable TV service, internet and cable TV equipment rental, telephone, alarm, etc.). For the companies that do disclose average internet revenues per internet subscriber, we observe CAGRs of 8 to 12 percent during 2013–2016. The per-subscriber revenue CAGRs for the remaining wired ISPs show low single-digit growth for traditional pay-TV companies and high single-digit growth for LECs. The data reflects the fact that ISPs have ample pricing power in broadband, but face headwinds in their legacy pay-TV and telephone businesses.³²⁰

The wireless carriers shown in the bottom of Figure 30 universally experienced declining post-paid average revenues per user during 2013–2016. These declines are in part a reflection of price competition created by T-Mobile and Sprint as well as Mobile Virtual Network Operators

³²⁰ See, e.g., Tony Lenoir, “Q4’16 cable sector data depicts well-oiled cash flow machine,” *SNL Kagan* (Mar. 28, 2017) (showing average cash flow margins for Comcast and Charter to be 15 percent for pay-TV segments, 18 percent for telephone, and 61 percent for high-speed data – which is an all-time high for data).

(“MVNOs”) such as Tracfone. It also reflects the impact of an important industry shift: moving away from more expensive post-paid service plans for which handsets were subsidized; and towards less expensive, pre-paid service plans for which customers purchase their own devices separately.

One consequence of rapidly growing revenues across the board, however, is that it can lead to lower “capital intensity” – which measures capital expenditures expressed as a percentage of revenues. That metric is of particular interest to investors because it offers them a simple way to gauge how a company’s investments are changing relative to its overall business. If a company invests heavily in its business, capital intensity will likely increase; but shareholders expect those investments to lead to future revenue growth, and thus to likely lower future capital intensity as well. Investors in the ISP sector generally prefer capital investments to be as low as possible, but not so low that they lead to customer loss.³²¹

But even capital intensity can be somewhat misleading, depending upon the rate of growth of each of the metric’s components. For example, during 2013, T-Mobile invested \$4 billion in capital equipment and took in \$24.4 billion in revenues. This equated to a capital intensity of 16.5 percent, or \$16.50 of capital invested for every \$100 in revenue. In 2016 T-Mobile’s capital expenditures were \$4.7 billion, a 16 percent increase above its 2013 capex level; but its revenues in 2016 were \$37.2 billion, more than 50 percent higher than 2013. Combined, this means that during 2016, T-Mobile invested \$12.60 in capital for every \$100 in revenues – a capital intensity of 12.6 percent. This trajectory mirrors that of the ISP industry overall, with capital expenses rising at a slightly lower rate than revenues are, resulting in a slow decline in

³²¹ See, e.g., Karl Bode, “Even Wall Street Thinks Frontier Should Upgrade its Damn Network,” *DSL Reports* (Mar. 31, 2017).

capital intensity (*see* Appendix, Figure A8).³²² The lesson here is a well-worn business truism: you have to spend money to make money. In the ISP industry, with enormous economies of scale and high entry barriers, this return on investment is one of the safest bets possible.

Figure 30: Reported Average Monthly Revenues per User at Publicly Traded Broadband Providers (2013–2016)

Average Revenues per User (as reported)	2013	2014	2015	2016	Compound Annual Growth Rate (2013–2016)
Comcast (average revenue per customer relationship)	\$131.22	\$137.04	\$142.89	\$148.26	4.2%
Charter (pro forma) (average revenue per residential customer)	N/A	\$106.33	\$108.22	\$109.77	1.6%
Cablevision (average revenue per cable customer)	\$147.34	\$155.20	\$155.88	N/A	2.9% ¹
Suddenlink (average revenue per residential customer) Cequel-reported	\$109.00	\$108.82	\$111.80	\$117.00	2.4%
Mediacom (average revenue per customer relationship)	\$105.88	\$109.87	\$110.50	\$113.04	2.2%
GCI (average revenue per cable modem subscriber)	\$70.50	\$78.87	\$85.03	\$88.37	7.8%
Cable One (average revenue per residential data subscriber)	N/A	\$49.53	\$53.89	\$61.68	11.6%
Frontier (ARPU per residential customer)	\$59.23	\$61.11	\$69.93	\$77.47	9.4%
Windstream (average revenue per household)	N/A	\$67.44	\$70.36	\$74.45	5.1%
Consolidated Communications (Consumer ARPU)	N/A	\$72.58	\$83.90	\$84.15	7.7%
Alaska Comm. System (average revenue per consumer broadband subscriber)	\$48.27	\$53.17	\$60.75	\$61.26	8.3%
AT&T Wireless Service ARPU	\$47.58	\$42.04	\$38.78	\$36.58	-8.4%
AT&T Wireless Postpaid ARPU	\$66.07	\$58.43	\$55.58	\$53.59	-6.7%
AT&T IP Broadband ARPU	N/A	\$44.13	\$47.22	\$49.69	6.1%
Verizon Wireless Retail postpaid Average Revenue per Account	\$153.93	\$159.86	\$152.63	\$144.32	-2.1%
Sprint Postpaid ARPU	\$63.44	\$58.63	\$52.48	\$49.70	-7.8%
Sprint Prepaid ARPU	\$27.34	\$27.61	\$27.44	\$27.61	0.3%
T-Mobile Postpaid Phone ARPU	\$53.03	\$49.44	\$47.68	\$47.47	-3.6%
T-Mobile Prepaid ARPU	\$34.59	\$37.10	\$37.68	\$37.92	3.1%
US Cellular postpaid ARPU	\$54.23	\$56.51	\$51.46	\$45.19	-5.9%
US Cellular prepaid ARPU	\$31.45	\$35.33	\$35.54	\$33.25	1.9%
GCI (wireless ARPU)	\$48.71	\$49.97	\$45.82	\$38.41	-7.6%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). CAGR values for Charter, Cablevision, Windstream, Consolidated Communications, and AT&T IP Broadband are based on the years shown.

³²² We note that Comcast’s cable segment capital intensity between 2013–2016 was 12.9 percent, 13.9 percent, 15.0 percent, and 15.2 percent. Comcast’s Chief Diversity Officer David Cohen recently incorrectly stated that his company’s capital intensity had declined in the wake of the *Open Internet Order*. He also contradicted his own CFO’s prior statement that Title II reclassification had no impact on Comcast’s investments. *See* Sarah Barry James, “ISP execs say net neutrality order impacted broadband investment,” *SNL Kagan*, May 31, 2017 (“Cohen said it is better to look at capital intensity, or the percentage of revenues a company is spending on capital expenditures. For Comcast, based on capital intensity levels prior to adoption of the order versus current levels, the company will spend \$2.5 billion less over a three-year period as a result of the order.”).

5. Business is Booming: If You Build It, They Will Come.

Though several recent surveys suggest that wired home broadband subscriber growth has stalled, this is not reflected in the reported subscriber totals (both as reported by publicly traded ISPs to investors, and as reported in the FCC's Form 477 subscriber totals).³²³ From 2013–2016 the number of wired internet subscriptions at publicly traded ISPs increased by 7.5 million, a CAGR of 3.1 percent (*see* Figure 31).

Net growth was only seen in the cable sector, however, as LECs collectively continued to shed customers. Wired broadband subscribers on the whole are dropping slower and less expensive DSL lines in favor of faster and more expensive cable modem service. Publicly traded LECs lost nearly a quarter million high-speed internet subscribers between 2013–2016, a CAGR of -0.2 percent. LECs that invested in next-generation services like fiber-to-the-node and fiber-to-the-home generally saw better subscriber growth than their first generation ADSL-reliant peers, but not nearly the level enjoyed by most cable company ISPs.

Wireless carriers enjoyed continued healthy subscriber growth, even as the market saturated. The number of wireless subscriptions at publicly traded carriers grew at a CAGR of 5.9 percent during 2013–2016. The bulk of this recent growth, however, was concentrated at just a few carriers. During 2013–2016, T-Mobile added 24.7 million wireless lines, approximately 41

³²³ *See Digital Denied* at 20–21 (describing Pew and U.S. Census Bureau Current Population Survey data suggesting stalled wireline home broadband adoption, even as companies' reported wired subscription growth outpaced household growth). As our report noted: "For example, the Supplement results indicate that the number of households subscribing to (one or more) wired-internet service(s) decreased by 6.75 million from July 2013 to July 2015, a time when the total number of households increased by 2.67 million. This decline in wireline households is very difficult to square with other available data (*e.g.*, FCC data, SEC filings and industry-analyst reports) showing substantial growth in the residential wireline-broadband market during similar time periods, with residential cable-modem lines increasing by approximately 5 million during this two-year period. By all accounts, there is a gap of some 15 to 17 million "missing" wired connections between what the Supplement results indicate and what numerous public and private data sources indicate." *Id.* (internal citations omitted).

percent of the total industry growth during this period. AT&T captured 33 percent of the net additions, Verizon had 19 percent, and Sprint had 7 percent.

Wireless industry growth was relatively steady during the past four years, with 2015 the peak year of growth during that period. Cable ISP customer growth accelerated following the FCC's 2015 vote, in part reflecting increased customer demand for connections capable of delivering high-quality streaming video content.

But while cable companies and LECs that made next-gen system upgrades continued to enjoy strong high-speed internet revenue and subscriber growth, their pay-TV segments continued to lose customers. The 19 publicly traded pay-TV operators we track collectively have lost nearly two million subscribers since the end of 2013 (*see* Figure 32). This decline started in 2015, as consumers' online TV replacement options expanded dramatically following the FCC's Open Internet vote (*see* Part II). The widespread availability of nondiscriminatory broadband access lines, as ensured by the successful *Open Internet Order* and legal framework, has started to transform the pay-TV market for good. It is moving away from a highly concentrated industry that forced customers into bloated and expensive pay-TV channel bundles, and becoming a market in which user demands finally drive supply.³²⁴ This is a shining example of how critical it would be to our collective well-being to have near ubiquitous availability of affordable, nondiscriminatory telecommunications services. Broadband is basic infrastructure, but its utility is a function of its usability. If it is operated as a private carriage platform, its utility as infrastructure is destroyed. And while nondiscriminatory broadband access alone is not sufficient to ensure greater content diversity or broadband affordability, it is necessary for both goals.

³²⁴ For a discussion of the pay-TV market and the potential for “big open pipes” to facilitate choice and competition, *see, e.g.*, S. Derek Turner, Free Press, *Combatting the Cable Cabal: How to Fix America's Broken Video Market* (May 2013) (“*Combatting the Cable Cabal*”).

Figure 31: High-Speed Internet and Wireless Subscriptions at Publicly Traded Broadband Providers (2013–2016)

Subscribers (HSD or Wireless; Consumer or Residential unless noted)	2013	2014	2015	2016	Compound Annual Growth Rate (2013–2016)
Comcast (cable)	20,685,000	21,962,000	23,329,000	24,701,000	6.1%
Charter+TWC+BHN (pro forma)	18,196,743	18,401,000	19,911,000	21,374,000	5.5%
Cablevision (cable)	2,780,000	2,760,000	2,809,000	2,835,000	0.7%
Suddenlink	1,059,500	1,149,100	1,223,100	1,288,000	6.7%
Mediacom	965,000	1,013,000	1,085,000	1,156,000	6.2%
Wide Open West	740,000	727,800	712,500	747,400	0.3%
Cable ONE	439,032	449,839	460,977	469,053	2.2%
GCI (wireline)	115,300	119,100	127,300	127,600	3.4%
TOTAL PUBLICLY TRADED CABLE MSOs	44,980,575	46,581,839	49,657,877	52,698,053	5.4%
Verizon (wireline, pro forma)	6,930,000	7,024,000	7,085,000	7,038,000	0.5%
AT&T (entertainment segment)	14,313,000	14,444,000	14,286,000	14,179,000	-0.3%
CenturyLink	5,991,000	6,082,000	6,048,000	5,945,000	-0.3%
Frontier (pro forma)	4,432,300	4,541,000	4,514,000	4,271,000	-1.2%
Windstream	1,170,900	1,131,600	1,095,100	1,051,000	-3.5%
TDS Telecom (ex. US Cellular)	288,000	340,100	345,600	363,200	8.0%
Fairpoint	328,183	319,915	311,130	306,624	-2.2%
Cincinnati Bell	268,400	269,900	287,400	303,200	4.1%
Consolidated Comm. (pro forma)	428,955	443,489	456,100	473,403	3.3%
Shenandoah Tel. (excl. wireless)	58,408	63,780	69,021	74,809	8.6%
Hawaiian Telecom	91,437	92,875	93,002	91,089	-0.1%
Alaska Comm. System (wireline)	38,677	37,412	33,275	34,603	-3.6%
Otelco	24,732	23,771	23,211	22,441	-3.2%
TOTAL PUBLICLY TRADED LOCAL EXCHANGE CARRIERS	34,363,992	34,813,842	34,646,839	34,153,369	-0.2%
Verizon (wireless)*	102,799,000	108,211,000	112,108,000	114,243,000	3.6%
AT&T (wireless)**	114,927,484	120,554,000	128,640,000	134,859,000	5.5%
Sprint	55,354,000	55,929,000	58,359,000	59,515,000	2.4%
T-Mobile	46,684,000	55,018,000	63,282,000	71,455,000	15.2%
US Cellular	4,774,000	4,760,000	4,876,000	5,031,000	1.8%
GCI (wireless)	141,500	149,600	227,800	222,500	16.3%
Alaska Comm. System (wireless)	93,127	82,071	N/A	N/A	N/A
Shentel	410,768	433,029	455,352	958,700	32.6%
nTELOS (restated less divestitures)	273,600	282,100	302,000	N/A	N/A
TOTAL PUBLICLY TRADED WIRELESS CARRIERS	325,457,479	345,418,800	368,250,152	386,284,200	5.9%
TOTAL PUBLICLY TRADED WIRED ISP	79,344,567	81,395,681	84,304,716	86,851,422	3.1%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Notes: The following companies did not report residential vs. commercial/business subscriber counts for any or all years above: Mediacom, Wide Open West, Verizon, CenturyLink, Frontier, FairPoint, Consolidated Communications, Shenandoah, Verizon Wireless, AT&T Wireless, Sprint, T-Mobile, U.S. Cellular, ACS, Shentel/nTelos. 2016 Cablevision values are estimated, as Altice now reports subscriber counts excluding business to business connections, but has not revised 2013-2014 counts. *Verizon wireless subscriber counts represent retail wireless connections, as the company does not report wholesale connections. **AT&T wireless values represent domestic wireless subscribers; 2013 AT&T wireless values include Leap Wireless subscribers.

Figure 32: Pay-TV Subscribers at Publicly U.S. Companies (2013–2016)

Video Subscribers	2013	2014	2015	2016	Compound Annual Growth Rate (2013–2016)
AT&T (+DTV)*	25,713,000	26,272,000	25,398,000	25,265,000	-0.6%
Comcast	22,577,000	22,383,000	22,347,000	22,508,000	-0.1%
Charter+TWC+BHN (pro forma)	17,829,813	17,451,000	17,423,000	17,236,000	-1.1%
DISH	14,057,000	13,978,000	13,897,000	13,671,000	-0.9%
Verizon (pro forma less divestitures)	4,147,000	4,453,000	4,635,000	4,694,000	4.2%
Cablevision**	2,813,000	2,681,000	2,594,000	2,529,000	-3.5%
Frontier (pro forma)	1,692,000	1,782,616	1,745,700	1,419,000	-5.7%
Suddenlink	1,177,400	1,138,400	1,092,800	1,041,000	-4.0%
Mediacom	945,000	890,000	855,000	828,000	-4.3%
Wide Open West	694,400	634,700	547,500	501,400	-10.3%
CenturyLink	175,000	242,000	285,000	325,000	22.9%
Cable ONE	538,894	451,217	364,150	320,246	-15.9%
Cincinnati Bell	74,200	91,400	114,400	137,600	22.9%
GCI	136,700	135,400	133,000	125,800	-2.7%
Consolidated Communications	110,621	124,229	117,882	106,343	-1.3%
TDS (cable)	69,200	110,400	106,800	99,000	12.7%
Shenandoah (cable and wireline)	59,418	57,787	55,571	55,918	-2.0%
Otelco	4,164	3,852	3,648	3,350	-7.0%
Hawaiian Telecom	18,393	28,124	35,876	41,557	31.2%
TOTAL REPORTED PAY-TV SUBSCRIBERS	92,832,203	92,908,125	91,751,327	90,907,214	-0.7%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Notes: *AT&T's values are pro-forma, and exclude DTV's Latin America video subscribers. **Cablevision values for 2016 are estimated to maintain comparability with prior years, as Altice now reports subscribers in a different manner than Cablevision did prior to acquisition.

6. They're In the Money: ISP Profits Continue to Grow After the Open Internet Order.

All available information demonstrates that the FCC's February 2015 policy and legal interpretation changes did not negatively impact the broadband industry's profitability. Broadband industry profits – as measured by operating cash flows, operating income, and Earnings Before Interest, Taxes, Depreciation and Amortization (“EBITDA”) – were all higher during the two-year period following the FCC's Open Internet vote than in the two-years preceding (see Appendix for data summarizing industry earnings and profit metrics).

Operating cash flow³²⁵ at the publicly traded broadband providers was up 16 percent in the year following the FCC's vote, and the two-year combined value was 5 percent higher than the amount generated during the two years prior to the vote (*see* Figure A1). Individual company results varied, in some instances due to acquisitions and divestitures. Standouts, however, included T-Mobile and Sprint, which managed to grow cash flow even with aggressive promotions and investments. GCI's performance was strong, even as the company faced broader economic challenges from Alaska's oil industry decline (see discussion of GCI in Appendix).

Operating income³²⁶ at the top publicly traded broadband providers increased 56 percent in 2015, and the collective two-year post-vote increase was 18 percent (*see* Figure A2). Verizon and AT&T combined accounted for nearly 70 percent of the industry's income, and for 60 percent of the income gains during 2015–2016.

EBITDA,³²⁷ increased 27 percent at the top publicly traded broadband providers in the year following the FCC's Open Internet vote, and increased 16 percent during the two-year period following reclassification (*see* Figure A3). Mergers, acquisitions, divestitures and one-off charges created a wide range of EBITDA performance at individual companies. But the

³²⁵ Operating cash flow encompasses the cash generated from operating activities. This value is calculated by adding to the firm's net income the cash flow from depreciation and amortization of capital equipment, the value of deferred taxes, joint venture income, and other items. It is a useful measure of a firm's fiscal health, though differences in capital structure could make meaningful comparisons across firms and industries difficult.

³²⁶ Operating income is the amount of revenues generated by the business, less operating expenses. It does not include certain expenses such as interest or taxes, but does account for depreciation and amortization. It is therefore a very useful measure of a firm's fiscal health, but does not capture the impact of debt interest or special tax circumstances.

³²⁷ EBITDA represents a firm's profits before the impact of interest payments, taxes, and depreciation or amortization charges. It is therefore a useful proxy for a firm's profitability that enables comparisons across firms in different industries and even between those with unique tax or capital asset structures.

trajectory of profit growth at most publicly traded companies was in line with the trajectory for the broader market sector.

No one should be surprised that the broadband industry's profits continued to soar after Title II restoration and Net Neutrality rule codification. In reality, no informed industry observer is surprised. There was never any reason to expect disruption of this tremendously successful industry, chiefly because the FCC's actions were specifically designed to protect it. The FCC's actions provided certainty to the market, and cemented incentives that reward investment and innovation, while discouraging short-term profit-seeking from harebrained discriminatory schemes built on ISPs creating and then exploiting artificial scarcity.

The fundamentals of the broadband market remain unchanged: This is a highly concentrated industry, with such large economies of scale and scope that additional entry is not likely regardless of technology progress or changing consumer demand. The industry exhibits natural monopoly economics – particularly the fixed home access segment. Because of the market's fundamental economic structure, we should continue to expect profit growth, precisely because the high demand for this essential service will be met by largely unchallenged incumbents that enjoy the benefits of declining technology costs.³²⁸

C. The FCC's Open Internet Order and Title II Restoration Created Marketplace Certainty Followed by Massive Growth in Online Video Investment, Competition and Innovation.

The internet is a communications platform. It is an interconnected system of computers that facilitates one-to-one and one-to-many communications. Broadband internet access

³²⁸ For example, even though Verizon Wireless and AT&T Mobility have faced increased competition in recent years from a revitalized T-Mobile and from Sprint's "half-off" promotions, the biggest two wireless providers have still managed to achieve margin growth. AT&T Mobility's and Verizon Wireless's EBTIDA margin, EBITDA service margin and operating margin all achieved historic highs in 2016 (and after declining from 2013 to 2014, these margins have increased since). Verizon's wireless profits grew even as it invested substantially more capital. *See* Appendix, Figure A9.

providers are not “the internet”; they sell, as their name indicates, access to it. There is tremendous value in this service, which is why so many families rank internet access above other goods and services in terms of need and importance. But that valuation depends in large part on the essentially limitless content that a broadband subscription service can deliver. The innovations happening at the edge drive increased demand for these edge services, which in turn drives higher demand for network access. And the reverse is true: increases in broadband access capabilities induce edge innovation to capitalize on those improved capabilities. This is the “virtuous cycle” of innovation and investment that motivated the FCC’s Net Neutrality rules. It is a theory born out by evidence and embraced by the courts.³²⁹

Evidence of the virtuous cycle already was abundant prior to the FCC’s 2015 vote. Indeed, the need to preserve it motivated the Open Internet rules, and the decision to ground them in Title II. The FCC revisited its prior mistaken decision to classify broadband access as an “information service” and not “telecommunications service” under the Communications Act, rightly deciding that it could not risk this successful framework once more on compromised authority. Yet, the two years following the vote have produced a mountain of new economic evidence conclusively demonstrating the reality and scope of the virtuous cycle.

As we discuss herein, the online video market dramatically expanded during the 24 months following adoption of the *Open Internet Order*. According to SNL Kagan, 25 over-the-top (“OTT”) video services launched in the United States in 2015, and another 17 had launched in 2016 as of November 11th. The numbers of new OTT video launches in those two years were the highest in the company’s database (which counted just 3 such launches in 2013 and 15 in

³²⁹ *Verizon v. FCC*, 740 F.3d 623, 644–45 (D.C. Cir. 2014) (“The Commission’s finding that Internet openness fosters the edge-provider innovation that drives this ‘virtuous cycle’ was likewise reasonable and grounded in substantial evidence.”).

2014). Put another way, the two years following FCC restoration of Title II for broadband – and with it, the restoration of certainty regarding telecommunications nondiscrimination – saw a 133 percent increase in new OTT services compared to the two years prior to the vote. In fact, more major U.S. OTT video services launched in those two years after the vote than in the seven preceding years combined.³³⁰

The post-2015 expansion has been driven by the entry of several high-profile “Virtual Service Providers” (“VSPs”), such as Sling TV and DirecTV Now. These VSPs offer OTT pay-TV services that are direct competitors to the traditional linear channel packages offered by incumbent cable and satellite companies. Over the past two years, we’ve also witnessed a proliferation of user-generated live video content, driven by platforms like Facebook Live, Periscope, and YouTube Live. And the ubiquity of LTE services and smartphone adoption, as well as the near universal adoption of Wi-Fi in broadband-adopting homes, have increased general user engagement with data-rich online media content.

While it is wired and wireless broadband internet access networks that transmit this information, the information itself is generated and processed by computers at the edges. These edge systems range from users’ smartphones to the massive cloud-computing and hosting servers owned by huge corporations like Amazon, Google, Apple, and others. And these firms providing these facilities that generate and store internet content all depend on the legal certainty – granted by the Open Internet rules, when grounded on solid authority – that telecommunications carriers will not be able to interfere unreasonably with the transmission of this content.

³³⁰ See “Internet Media & OTT Market Industry Presentation, Q4 2016, *SNL Kagan* (Jan. 17, 2017). This article covers 2016 launches up to mid-November 2016. As we note below, several additional domestic OTT services launched in December 2016 and during the first quarter of 2017.

Title II's restoration and the Open Internet rules brought that degree of certainty to all participants in the broadband market. Carriers have clarity about their legal obligations. The businesses and people using broadband to conduct commerce, to communicate with each other, and to produce and consume media, all can be certain that carriers will transmit their data in a reasonably nondiscriminatory manner. This certainty for all (along with the disincentives the rules created against profiting from artificial broadband scarcity and discrimination) drove the massive investments and expansions at U.S. ISPs described above. But the open internet is a platform for all manner of economic and societal activity, not just a collection of access lines plowed into the ground for ISPs' own sake. The certainty that came from unquestionably preserving that platform's longstanding openness was also followed by massive investments throughout the internet ecosystem.

Capital spending in edge computing industry sectors began to grow dramatically after the election of a President who championed sound legal protection of the open internet. The fulfillment of that promise in 2015 was followed by more growth. The "data processing, hosting, and related services" sector (which includes app hosting services like Amazon Web Services ("AWS") and video streaming services like Netflix) saw tremendous growth in capital investment: a \$3.5 billion one-year increase (26 percent) following the 2015 order.

Thus, any analysis of the impact from restoring Title II and protecting the open internet with strong rules must focus on that entire internet ecosystem. Any analysis that looks only at ISP capital expenditures – such as those advanced by the ISPs themselves and their paid analysts – would tell just a fraction of the whole story, even if it were getting that ISP-centric portion of that story right. (And as the deployment and capital spending data presented above shows, the sky-is-falling crowd is decidedly not getting that broadband investment analysis right.)

Failing to account for the whole ecosystem would ignore the ISP market’s non-capital contributions to economic growth, such as consumer and producer surpluses resulting from user payments for broadband internet access services. It would ignore capital contributions to the economy from edge businesses, such as the purchase of streaming media servers. And it would ignore the internet edge’s non-capital contributions to GDP too, such as investment in programming, salaries for employees of online media firms, and similar expenditures.

Figure 33: Capital Expenditures by Telecom-Adjacent U.S. Firms³³¹
(U.S. Census Bureau Annual Capital Expenditures Survey, 2008–2015)

Industry Sector	Capital Expenditures for Structures and Equipment for Companies with Employees (\$ millions, nominal)									Change 2014 to 2015	% Change
	2008	2009	2010	2011	2012	2013	2014	2015			
Data processing, hosting, and related services	\$4,123	\$4,003	\$7,515	\$7,281	\$6,276	\$12,830	\$13,357	\$16,858	\$3,501	26.2%	
Other information services	\$3,065	\$2,917	\$6,382	\$6,199	\$7,527	\$10,197	\$16,608	\$15,979	-\$629	-3.8%	
Computer systems design and related services	\$7,442	\$8,420	\$7,450	\$7,915	\$8,574	\$10,429	\$7,569	\$7,886	\$317	4.2%	

Source: U.S. Census Bureau Annual Capital Expenditures Survey (“ACES”), Tables 4a (2015) and 4b (revised values for 2008–2014). Note: ACES data prior to 2008 represents different industry sectors and is not comparable to values from subsequent surveys.

³³¹ See OMB NAICS 2017. These industry sectors are defined as follows:

Data Processing, Hosting, and Related Services: “[E]stablishments primarily engaged in providing infrastructure for hosting or data processing services. . . . may provide specialized hosting activities, such as Web hosting, streaming services, or application hosting (except software publishing), . . . Application hosting, Optical scanning services, Web hosting, Computer data storage services, Video and audio streaming services, Computer input preparation services, Microfilm imaging services, Computer time rental.”

Other Information Services: “[E]stablishments supplying information, storing and providing access to information, searching and retrieving information, operating Web sites that use search engines . . . , or publishing and/or broadcasting content exclusively on the Internet. The main components of the subsector are news syndicates, libraries, archives, exclusive Internet publishing and/or broadcasting, and Web search portals.”

Computer Systems Design Services: “[E]stablishments primarily engaged in planning and designing computer systems that integrate computer hardware, software, and communication technologies. The hardware and software components of the system may be . . . integrated services or may be provided by third parties or vendors. These establishments often install the system and train and support users of the system. Illustrative Examples: Computer systems integration design consulting services, Local area network (LAN) computer systems integration design services, Information management computer systems integration design services, . . .”

1. Subscription Video On Demand (“SVOD”) OTT Services Expanded Dramatically Following the FCC’s Open Internet Order.

Most discussions of the state of the video industry in recent years center around the decline in traditional pay-TV service subscribers, and the role that online video services may play in that. Though figures vary based on source, it is clear that the traditional video market is in decline both in terms of the number of subscribers and the percentage of households adopting. As shown above in Figure 32, publicly traded pay-TV providers lost 2 million subscribers in the past two years. Other estimates for the full market indicate a two-year loss of nearly 3 million subscribers.³³² These declines come as the universe of occupied households grows, which translates into a decline in the percentage of pay-TV adopting households. SNL Kagan’s most recent estimates indicate that the percentage of occupied U.S. households subscribing to traditional pay-TV peaked at 81 percent during the quarter that the FCC reclassified and adopted the Open Internet rules (Q1 2015), but declined thereafter to 77 percent by the end of 2016.³³³

The size of the decline in the total number of pay-TV subscribers doesn’t necessarily match the magnitude of the growth in households relying solely on online video. This is because the subscribers dropping pay-TV service may be relying solely on broadcast television instead rather than online video, meaning that not all of those cutting the cord are subscribing to SVOD services. At the same time, these declines in pay-TV subscriptions might also understate the growth in online video too, because measuring pay-TV subscriber loss does not capture the population of households that never subscribed to pay-TV in the first place (“cord-nevers”).

To arrive at a reasonable estimate of the household population relying on online video only, we utilize estimates of the number of households that subscribe to broadband (necessary to

³³² See, e.g., Alan Breznick, “Cord-Cutting Hits New Heights,” *Light Reading* (Mar. 3, 2017).

³³³ See Chris Young, Ian Olgeirson, Tony Lenoir, “Q4’16 video subscriber declines bite into US multichannel,” *SNL Kagan* (Mar. 9, 2017).

receive online video) but that do not subscribe to traditional multichannel video. These estimates shown in Figure 34 below suggest that there are nearly 16 million broadband-only households, meaning that they take broadband internet access service at home but neither a pay-TV service that is bundled with that internet access by the same provider nor pay-TV from a separate provider. This broadband-only figure represents about 13 percent of all occupied households in the United States. The growth in broadband-only households accelerated following the FCC’s 2015 *Open Internet Order* vote, with 37 percent growth in the two-year period following the vote compared to 19 percent growth in the number of broadband-only households in the two-year period preceding the vote. Most of these broadband-only households either subscribe to a paid-OTT service or watch free online video programming, putting the total proportion of households that rely solely on online video near 11 percent of all occupied U.S. households.³³⁴

Figure 34: Broadband–Only U.S. Households (2013–2016)

Households Subscribing to Wired Broadband But not Traditional Multichannel Video	Mar. 1, 2013	Mar. 1, 2014	Mar. 1, 2015	Mar. 1, 2016	Mar. 1, 2017	Growth 2-Years Pre-FCC Vote	Growth 2-Years Post-FCC Vote
	Households (estimated)	9,520,000	10,200,000	11,370,000	13,600,000	15,600,000	
<i>Year-to-Year Change</i>		680,000	1,170,000	2,230,000	2,000,000	1,850,000	4,230,000
<i>Year-to-Year % Change</i>		7.1%	11.5%	19.6%	14.7%	19.4%	37.2%

Source: Free Press projections based on SNL Kagan and Nielsen estimates.³³⁵

³³⁴ See Ian Olgeirson, “OTT, online alternatives have measured impact on US household segmentation,” *SNL Kagan* (Oct. 18, 2016).

³³⁵ See “The Nielsen Total Audience Report Q3 2016” (Jan. 3, 2017); see also “The Nielsen Total Audience Report Q2 2016” (Sept. 26, 2016); “The Nielsen Total Audience Report Q1 2016” (June 27, 2016); “The Nielsen Total Audience Report Q4 2015” (Mar. 24, 2016). We note that Nielsen’s topline estimate for “broadband-only homes” does not include broadband-only homes using TV antennas. See also Tony Lenoir, “Q4’16 broadband-only home penetration shows segment solidifying,” *SNL Kagan* (Mar. 23, 2017) (“We estimate the U.S. counted nearly 15.4 million non-multichannel broadband homes, or ‘broadband-only homes,’ at the end of 2016, implying that 13% of U.S. occupied households and one out of six broadband-subscribing homes make the decision not to take a traditional multichannel package.”); Tony Lenoir, “As broadband-only homes flirt with 14-million mark, stars align for metric to soar,” *SNL Kagan* (May 24, 2016); Tony Lenoir, “SNL Kagan estimates 10.7 million broadband-only homes in the US,” *SNL Kagan* (Dec. 8, 2014).

The total number of pay-TV subscriptions has declined in recent years. It is important to note that prior to 2015, however, legacy cable MSOs were losing video customers but telco TV providers were gaining subscribers while satellite stayed flat. After the FCC's February 2015 vote, MSOs made a concerted effort to change their approach: they now generally focus on marketing a broadband-first offering while also differentiating their video services as complementary to online video services like Netflix. This is producing results for MSOs, particularly Comcast. Meanwhile, AT&T's planned shift away from U-Verse towards DTV³³⁶ is producing large declines for the number of telco pay-TV subs; but along with the impact of DISH's Sling TV unit, AT&T's shift to satellite reversed prior year's net losses for the U.S. satellite sector.³³⁷

To be clear, online video providers like Netflix, Amazon Prime Video, and Hulu are a key force driving pay-TV industry subscriber declines. These SVOD services certainly contribute to an ongoing secular change in how people (in particular, younger people) expect to watch video. But observers often overstate the impact of SVOD services on cord-cutting in particular. While SVOD services may be the method of choice for many young adults who were never traditional pay-TV customers,³³⁸ services like Netflix are complementary consumption

³³⁶ See Scott Moritz, "AT&T Takes U-Turn on U-Verse as It Pushes Users Toward DirecTV," *Bloomberg* (Feb. 15, 2016).

³³⁷ See, e.g., Leichtman Research Group, Press Release, "Major Pay-TV Providers Lost About 795,000 Subscribers in 2016" (Mar. 16, 2017) (noting that DirecTV's and DISH's traditional satellite businesses gained 191,000 subscribers in 2016, with Sling TV and DirecTV Now contributing an additional 845,000 net additions for those companies).

³³⁸ See, e.g., Steven Perlberg, "TV's Looming Threat: Cord-Nevers," *Wall Street Journal* (Oct. 6, 2015) (describing the results of a Forrester Research survey, which found that "cord-nevers" comprise 18 percent of the U.S. population, with half of those being under the age of 33, and that half of cord-nevers "use Netflix and YouTube").

methods for the vast majority of users.³³⁹ The majority of SVOD customers are paying for multiple SVOD services and for traditional cable or satellite TV. According to a recent survey conducted by Parks Associates, half of the households subscribing to an OTT service subscribe to more than one.³⁴⁰ This mirrors other survey results, one of which indicated that one-third of OTT households subscribe to three or more such services.³⁴¹

SVOD services may not prove quite the disruptor that online pay-TV replacements such as Sling TV may be. Yet SVOD services are an integral part of the online ecosystem. From the last mile, to the interconnection points, to the edge, and beyond to the production studios in Hollywood, SVOD services are a primary driver of internet investment and innovation. And the SVOD market was already a major success story, but it began an even better chapter following the FCC's 2015 vote. The leading SVOD companies massively increased capital and content investments around the time of that vote, with tens of billions of new dollars poured into the U.S. economy and thousands of new jobs created in this fast growing industry. Below we catalog these developments at each leading SVOD company.

SVOD services may not prove quite the disruptor as online pay-TV replacements such as Sling TV. Yet SVOD services are an integral part of the online ecosystem. From the last mile, to the interconnection points, to the edge, and beyond to the production studios in Hollywood, SVOD services are a primary driver of internet investment and innovation. And the SVOD market was already a major success story, but began an even better chapter following the FCC's

³³⁹ See, e.g., Brian Bacon, "US consumers look to multiple sources for TV content," *SNL Kagan* (Feb. 15, 2017) (reporting survey results showing that 59 percent of multichannel subscribers subscribe to one or more online video services).

³⁴⁰ See Sean Buckley, "About 50% of OTT video subs have multiple subscriptions, Parks says," *Fierce Cable* (Jan. 4, 2017).

³⁴¹ See, e.g., Keith Nissen, "Surveys indicate OTT video growth due to increased adoption by older adult households," *SNL Kagan* (Sept. 21, 2016) (showing that 54 percent of OTT households subscribed to two or more such services, and 33 percent subscribed to three or more).

2015 vote. The leading SVOD companies massively increased capital and content investments around the time of that vote, with tens of billions of new dollars poured into the U.S. economy and thousands of new jobs created in this fast growing industry. Below we catalog these developments at each leading SVOD company.

Netflix

Netflix was one of the first online SVOD providers, offering its DVD rental by mail customers limited streaming content beginning in 2007. In 2011, it launched a standalone streaming service in the U.S. Since then, its business has shifted dramatically into streaming and into original content production too. Netflix ended 2016 with 49.4 million domestic streaming subscribers, up from 21.7 million at the end of 2011. This growth came as Netflix ploughed money into its content portfolio, and into its capital assets and technology support systems too.

These investments all accelerated following the *Open Internet Order*. As Figure 35 shows, during the two years following that February 2015 vote, Netflix spent \$14.4 billion on streaming content, more than double the \$6.8 billion it spent during the 24 months prior. Its reported expenditures for “technology and development”³⁴² also nearly doubled during those time periods (\$0.85 billion during 2013–2014 vs. \$1.5 billion during 2015–2016). And though not in a traditionally capital-intensive business like broadband, Netflix’s capital expenditures also accelerated following the FCC’s vote, from \$124 million during 2013–2014 to \$199 million during 2015–2016.

³⁴² In SEC filings, Netflix defines technology and development expenses as “costs incurred in making improvements to our service offerings, including testing, maintaining and modifying our user interface, our recommendation, merchandising and streaming delivery technology and infrastructure” and “costs associated with computer hardware and software.”

**Figure 35:
Netflix Content, Capital and Technology Development Investment;
Subscribers (2011–2016)³⁴³**

Netflix Expenses	2011	2012	2013	2014	2015	2016	2013-2014	2015-2016	Percent Change (2015–2016 vs. 2013–2014)
Cash used for addition to streaming content assets (\$000)	\$2,320,732	\$2,515,506	\$3,030,701	\$3,773,019	\$5,771,652	\$8,653,286	\$6,803,720	\$14,424,938	112.0%
<i>Year-to-Year % Change</i>		8.4%	20.5%	24.5%	53.0%	49.9%			
Technology and Development (\$000)	\$259,033	\$329,008	\$378,769	\$472,321	\$650,788	\$852,098	\$851,090	\$1,502,886	76.6%
<i>Year-to-Year % Change</i>		27.0%	15.1%	24.7%	37.8%	30.9%			
Capital Expenditures (\$000)	\$49,682	\$40,278	\$54,143	\$69,726	\$91,248	\$107,653	\$123,869	\$198,901	60.6%
<i>Year-to-Year % Change</i>		-18.9%	34.4%	28.8%	30.9%	18.0%			
Domestic Streaming Subscribers (year-end)	21,671,000	27,146,000	33,420,000	39,114,000	44,738,000	49,431,000	72,534,000	94,169,000	29.8%
<i>Year-to-Year % Change</i>		25.3%	23.1%	17.0%	14.4%	10.5%			

Source: Netflix 10-K SEC filings for 2011–2016.

We’ve previously documented how Netflix’s rising popularity was directly associated with the cable ISP sector’s deployment of faster speeds.³⁴⁴ Despite the real symbiotic nature of this relationship, ISPs historically viewed it as adversarial. While MSOs recognized the substantial majority of Netflix subscribers also subscribe to traditional pay-TV services, these companies were wary of SVOD services as a catalyst for “cord cutting” and thus a threat to pay-TV earnings. Cable also had a bit of “use my pipes for free” worry, contemplating usage-based billing to extract an additional portion of the economic value created on their last mile broadband

³⁴³ Data in this table begins in 2011, the first full year after Netflix first offered standalone subscription streaming service. Netflix standalone streaming launched in Canada in the fourth quarter of 2010, then expanded into the U.S. in 2011. See Netflix, Letter to Shareholders, at 2 (Jan. 26, 2011) (“In November last year we introduced our \$7.99 per month pure streaming plan.”); see also Netflix 2011 10-K, at 1 (“Prior to July 2011, in the United States, our streaming and DVD-by-mail operations were combined and subscribers could receive both streaming content and DVDs under a single ‘hybrid’ plan.”).

³⁴⁴ See Petition to Deny of Free Press, *In the Matter of Applications of Comcast Corp. and Time Warner Cable Inc. For Consent to Assign or Transfer Control of Licenses and Authorizations*, MB Docket No. 14-57, at 40–58 (filed Aug. 25, 2014).

networks (beyond what they already extract from charging higher monthly fees for higher speeds).³⁴⁵

The tense SVOD-ISP relationship boiled over during 2014, with the so-called “peering” disputes (which, as we’ve also documented, were not peering issues but terminating access monopoly abuse issues).³⁴⁶ In short, before the FCC’s adoption of Open Internet rules and restoration of Title II authority, U.S. streaming video consumers were plagued with poor performance because ISPs refused to make upgrades at interconnection points despite the miniscule cost of doing so. But following the vote, we now see major ISPs like Comcast integrating OTT services like Netflix into their set-top boxes, and even offering free Netflix access promotions.³⁴⁷

Finally, we note that the number of Netflix employees also increased dramatically following the FCC’s 2015 vote. After ending 2011 with 2,927 employees, the company shed workers in 2012 (down to 2,429) and again in 2013 (down to 2,327), before slightly increasing by the end of 2014 (at 2,450). But at the end of 2015, the company tallied 3,700 workers and finished 2016 with 4,700. This means Netflix nearly doubled its workforce in two years, completely reversing its decline during the company’s first four years offering standalone streaming.

Amazon Prime

Amazon’s Prime Video launched in 2011 as a free add-on service for its Prime (free shipping service) customers. Based on its success, and the response to its foray into original

³⁴⁵ See, e.g., Karl Bode, “Sling TV Boss Says Comcast Usage Caps Hurt Competition,” *DSL Reports* (Dec. 7, 2015).

³⁴⁶ See Free Press 2014 Comments at 144–148.

³⁴⁷ See Bernie Arnason, “Comcast Free Netflix Promotion Underlies Remarkable Co-opetition Evolution,” *Telecompetitor* (Mar. 20, 2017).

programming, in April of 2016 the company began marketing the SVOD service on a standalone basis for \$8.99 per month.³⁴⁸

Amazon's investment in acquired and original content escalated substantially following the FCC's February 2015 vote (*see* Figure 36). During the two years prior to the vote, Amazon spent an estimated \$1.5 billion on content (and \$86 million of this was on original programming). For the two years following the vote, Amazon's programming spend more than doubled, to \$3.2 billion (with spending on original content quintupling to \$442 million). Those investments came in response to a large uptick in viewership. Though Amazon does not disclose subscription figures (in part because Prime Video is included in the overall Prime membership), on its 4th quarter 2016 investor call it indicated that it "had a doubling of Prime hours for video, music and reading."³⁴⁹

Though Amazon's OTT video service is a "free" add-on for customers ostensibly purchasing a free two-day shipping service, it appears to enjoy high-utilization rates. A 2016 SNL Kagan survey indicated that 72 percent of Amazon Prime subscribers used the Prime Video feature.³⁵⁰ An estimate produced at roughly the same time of the number of Amazon Prime U.S. subscribers (54 million)³⁵¹ then would imply that there are 39 million U.S. Prime subscribers

³⁴⁸ *See* Brett Molina, "Amazon targets Netflix with standalone video sub," *USA Today* (Apr. 18, 2016).

³⁴⁹ *See* Comments of Brian Olsavsky, Amazon.com Inc. 4th Quarter 2016 Earnings Call (Feb. 2, 2017).

³⁵⁰ *See* Brian Bacon, "Amazon Prime Video user profile, U.S.," *SNL Kagan* (Sept. 16, 2016).

³⁵¹ *See* Consumer Intelligence Research Partners, LLC, "Amazon Prime Grew 35% in 2015" (Jan. 25, 2016).

(essentially households) using the Prime Video service. This corresponds to other estimates of subscriber overlap between Netflix and Prime Video.³⁵²

Amazon's 39 million would be nearly 14 million more subscribers than the nation's largest traditional pay-TV provider: AT&T combined with DirecTV. However, while there are some households that substitute SVOD services like Prime Video for pay-TV, the vast majority of Prime Video subscribers use the service in a complementary manner. This means Prime Video, like Netflix, is more comparable to a premium network such as HBO, which ended 2016 with 50 million subscribers.

While Amazon Prime Video's growth (and the success of its original programming) is impressive, Prime Video is not Amazon's primary online content business. AWS is the company's cloud hosting and computing service, and it underpins many online websites and streaming services including some of the web's most-used applications.³⁵³ Amazon's AWS business, like its streaming video business, saw tremendous growth in the two years following the adoption of the *Open Internet Order*. AWS revenues are up nearly 160 percent for the two-year post-vote period compared to the two-year pre-vote period. Amazon's investment in AWS grew markedly too. Capital investments went up 36 percent during the two-year post-vote period. Amazon classifies AWS segment spending as expenses for "Technology and Content,"

³⁵² See, e.g., Nathan McAlone, "Why Netflix Doesn't Have to Sweat a Challenge From Amazon's Prime Video," *Slate* (Apr. 18, 2016) (showing survey results indicating that 62 percent of Amazon Prime Video users also use Netflix).

³⁵³ Companies large and small rely on AWS for hosting, storage, content delivery and numerous other functions. Notable users include Comcast (to support its Xfinity X1 video services), Verizon's AOL unit (for cloud servers and other purposes), MLB Advanced Media (to power its OTT streaming service, Bam-Tec, which is also the platform ESPN will utilize for its upcoming OTT service), Netflix (for OTT content delivery), PBS (for OTT content delivery), and Sling Media (Dish's place-shifting hardware). See Amazon AWS "All Customer Success Stories," <https://aws.amazon.com/solutions/case-studies/all/> (Mar. 25, 2017).

which were \$9.3 billion in 2014, growing to \$16.1 billion in 2017. The total two-year post-vote vs. pre-vote growth for the entire company was 81 percent.

**Figure 36:
Amazon Programming, Capital and Technology Investment;
AWS Revenues (2013–2016)³⁵⁴**

Amazon	2013	2014	2015	2016	2013-2014	2015-2016	Percent Change (2015–2016 vs. 2013–2014)
Estimated Streaming Programming Costs (\$000)*	\$548,000	\$975,000	\$1,288,000	\$1,940,000	\$1,523,000	\$3,228,000	112.0%
<i>Year-to-Year % Change</i>		77.9%	32.1%	50.6%			
Technology and Content (\$000)	\$6,565,000	\$9,275,000	\$12,540,000	\$16,085,000	\$15,840,000	\$28,625,000	80.7%
<i>Year-to-Year % Change</i>		41.3%	35.2%	28.3%			
Capital Expenditures (\$000)	\$3,444,000	\$4,893,000	\$4,589,000	\$6,737,000	\$8,337,000	\$11,326,000	35.9%
<i>Year-to-Year % Change</i>		42.1%	-6.2%	46.8%			
AWS Net Sales Revenues (\$000)	\$3,108,000	\$4,644,000	\$7,880,000	\$12,219,000	\$7,752,000	\$20,099,000	159.3%
<i>Year-to-Year % Change</i>		49.4%	69.7%	55.1%			

Source: Amazon 10-K SEC filings for 2013–2016; SNL Kagan.³⁵⁵

³⁵⁴ Data presented in this table begins in 2013, the first year Amazon publicly reported AWS segment results. In its 10-K, Amazon describes technology and content expenditures as “costs consist[ing] principally of research and development activities including payroll and related expenses for employees involved in application, production, maintenance, operation, and platform development for new and existing products and services, as well as AWS and other technology infrastructure expenses. Content costs consist principally of payroll and related expenses for employees involved in category expansion, editorial content, buying, and merchandising selection. Digital media content costs related to revenue recorded gross, including Prime Video, are included in cost of sales.” Thus these amounts include the capital expenditure amounts shown in the above table, in addition to the other non-capital expenditures described. As Amazon reported capital investments in its 2016 10-K: “Cash capital expenditures were \$4.9 billion, \$4.6 billion, and \$6.7 billion in 2014, 2015, and 2016, which primarily reflect additional capacity to support our fulfillment operations and additional investments in support of continued business growth due to investments in technology infrastructure (the majority of which is to support AWS), during all three periods.” See Amazon.com Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 (Form 10-K), for the fiscal year ending December 31, 2016.

³⁵⁵ See Deana Myers, “Amazon Prime video spend to hit \$2.67B in 2019,” *SNL Kagan* (Oct. 22, 2015). SNL Kagan later revised this predicted 2019 Amazon spend, increasing its projection to \$4 billion some 14 months after publishing the initial article. See Deana Myers, “Amazon Prime video expansion necessitates big content spend,” *SNL Kagan* (Dec. 28, 2016).

Amazon's entire business is predicated on an open internet. But its high-data volume Prime Video and AWS services require the certainty of consumer access to high-capacity, nondiscriminatory, net neutral fixed and mobile broadband. Any legitimate accounting of the impact from the FCC's Title II restoration and Open Internet rules is incomplete without factoring in the policy's impact on businesses like Amazon's. The data clearly shows accelerated growth in Amazon's online content business following the FCC's vote – growth that demonstrates the validity of the FCC's benefit-cost theory of the “virtuous cycle” of investment.

Hulu

Launched in 2007, Hulu was one of the internet's original sources for on-demand video content authorized by big studio content producers, with an emphasis on broadcast TV programming libraries. Hulu's current ownership group consists of Comcast/NBCU, Fox, and Disney (each with a 30 percent) and Time Warner/Turner Broadcasting (10 percent).

For its first few years, Hulu solely relied on advertising revenues. The company launched a paid subscription service dubbed “Hulu Plus” at the end of 2010, offering paying customers a larger content library and earlier access to just-aired programming. It experienced moderate paid-subscriber growth during Hulu Plus's first few years, but that growth accelerated appreciably in 2015. Hulu's largest year of subscriber growth came in that year of the FCC's Open Internet vote, when it added 3.8 million accounts, finishing with 10.7 million paying subscribers. The company ended 2016 with 11.7 million subscribers.³⁵⁶

In 2016, Hulu brought in \$2.1 billion in revenues, with \$1.1 billion of this from its subscription service. This single year revenue total was almost identical to the total that Hulu

³⁵⁶ See, e.g., Ali Choukeir, “Profile: Hulu,” *SNL Kagan* (Feb. 22, 2017). Other reports cite less specific figures at different time periods. See Jacob Kastrenakes, “Hulu now has 12 million subscribers, but growth is slowing,” *The Verge* (May 4, 2016); Brian Stelter, “Hulu Says Number of Paid Subscribers Has Doubled,” *New York Times* (Apr. 30, 2013).

brought in for the 24 months combined prior to the FCC's February 2015 vote (\$2.2 billion for 2013–2014). Similarly, Hulu's paid subscription revenue in 2016 alone (\$1.1 billion) was higher than the paid revenues it earned during the 24 months preceding the FCC's vote (\$1 billion for 2013–2014).

As it did for Netflix and Amazon, Hulu's investment in acquired and original content also rose substantially following the FCC's February 2015 vote. In 2014, Hulu spent an estimated \$896 million on programming (only \$19 million on original content, \$877 on acquired content). In 2015, this rose 43 percent to \$1.28 billion (with \$44 million original). It rose again in 2016 by another 35 percent, to a total of \$1.73 billion (\$1.65 billion on acquired, and nearly double 2015's spending on original content with \$86 million).³⁵⁷

We cannot know whether Hulu's annual content expenditures, in the absence of the FCC's 2015 vote, would have nearly doubled (as the did by the second year after that vote, when compared to Hulu's outlay in the year before the vote). But what's clear is that the FCC's action provided substantial market certainty, which gave OTT operators like Hulu the confidence that they could expand their businesses without fear of ISP discrimination.

Indeed, Hulu is not just expanding its content spending: in May 2017, the company launched a direct competitor to the ISPs' pay-TV services (see discussion of VSPs below).³⁵⁸

³⁵⁷ See Deana Myers, "Hulu content spend ramping up" *SNL Kagan* (Oct. 13, 2016). This article presents SNL Kagan's estimation of Hulu's programming costs for 2015 and 2016, with a growth figure for 2015 that enables calculation of its 2014 expenditures. We do not have directly comparable information regarding Hulu's 2013 programming costs.

³⁵⁸ See Todd Spangler, "Hulu Live TV Service Launches With 50 Channels for \$40 Monthly," *Variety* (May 3, 2017).

Originally announced just over 14 months after the FCC’s vote,³⁵⁹ “Hulu With Live TV” is a live, linear channel bundle similar to Sling TV and DirecTV Now.

**Figure 37:
Hulu Programming Costs, Revenues, and Paid-Subscribers (2013–2016)**

Hulu	2013	2014	2015	2016
Estimated Streaming Programming Costs (\$000)	N/A	\$896,000	\$1,280,000	\$1,730,000
<i>Year-to-Year % Change</i>			42.9%	35.2%
Revenues (\$000)	\$955,000	\$1,229,000	\$1,696,000	\$2,068,000
<i>Year-to-Year % Change</i>		28.7%	38.0%	21.9%
Paid Subscribers (year-end)	5,100,000	6,900,000	10,700,000	11,700,000
<i>Year-to-Year % Change</i>		35.3%	55.1%	9.3%

Source: SNL Kagan

Acorn TV

Acorn TV is an SVOD service that carries content geared towards fans of British television series. Its \$5 monthly offering had 430,000 subscribers by the end of 2016, up from 190,000 the year prior.³⁶⁰ Acorn’s parent company, RLJ Entertainment, was founded by Robert L. Johnson, who founded the cable channel BET in 1980.

Urban Movie Channel

Just days after the FCC adopted the *Open Internet Order*, Johnson’s RLJ Entertainment’s Urban Movie Channel (“UMC”) started serving subscribers.³⁶¹ This service was, according to Johnson, “designed so that the African-American and urban creative community could directly reach consumers in a way that removes many of the restrictions associated with the legacy

³⁵⁹ See Jacob Kastrenakes, “Hulu confirms plan to stream live TV next year,” *The Verge* (May 4, 2016).

³⁶⁰ See Todd Spangler, “British TV Streaming Service Acorn TV Tops 430,000 Subscribers,” *Variety* (Jan. 17, 2017).

³⁶¹ See RLJ Entertainment Inc., 2016 Form 10-K, at 5.

content development and distribution models.”³⁶² Priced at \$5 per month, the service had nearly 25,000 subscribers at the end of 2016.³⁶³

Qello Concerts

Gary Winnick, the founder of Global Crossing and one of the personalities at the center of the internet’s original “gold rush,” recently acquired a majority stake in the live concert streaming service Qello.³⁶⁴ Winnick’s strategy for Qello involves developing the company’s underlying technology for use by other content providers to enable their own streaming video apps.

2. After the *Open Internet Order*, Online Pay-TV Replacement Services Are Thriving.

Internet apps are often hyped as “disruptors” of existing, stale industries. When it comes to online video, this disruption of traditional and stale pay-TV has been real, but piecemeal. Netflix’s ease of use made binge-watching easy and popular, but cable companies had offered on-demand services years before Netflix launched a streaming service. The incumbent pay-TV providers’ response to the rise of Netflix was to beef up their on-demand catalogs, improve their badly outdated set-top box user interfaces, and facilitate subscriber access to linear channels online through the “TV Everywhere” consortium. These responses, while welcomed by most consumers, were more evolution than revolution. Pay-TV prices continue to rise faster than the rate of inflation. And until 2015, pay-TV choice in terms of traditional packaged channel offerings was no different than it was two decades prior.

³⁶² See Todd Spangler, “Bob Johnson’s RLJ Entertainment Launches ‘Urban Movie Channel’ Over-the-Top Video Service,” *Variety* (Nov. 5, 2014).

³⁶³ See RLJ Entertainment Inc., 2016 Form 10-K, at 5; see also Todd Spangler, “Apple TV Adds Urban Movie Channel Subscription Service,” *Variety* (Nov. 5, 2014).

³⁶⁴ See Jessica Toonkel, “Exclusive: Ex-Global Crossing CEO bets on over the top streaming video,” *Reuters* (Mar. 9, 2017).

But after the FCC restored the certainty of nondiscriminatory telecom access with the *Open Internet Order* and its solid legal framework, truly productive disruption began. The biggest development in the online video market is the availability of VSPs, which offer subscription access to linear cable channels. In contrast to OTT on-demand services like Netflix and Hulu – which are marketed and purchased as complementary to pay-TV services, VSP services are marketed as a replacement for traditional cable or satellite TV.

The U.S. VSP market did not even exist prior to the FCC's February 2015 vote, but it exploded in the months that followed that vote. Sling TV, the early pioneer, launched the same month as the FCC's vote. PlayStation Vue followed in March 2015, and YipTV in May 2015. And perhaps the biggest potential disruptor of them all, DirecTV Now, began offering services in November 2016. LeEco followed that same month, and FuboTV's 70+ channel service entered beta in December 2016. Premium VSP Layer3 TV is now selling service in three markets, with more to follow. And more VSPs are coming. Hulu's pending VSP offering – which, like Sling TV, Sony Vue, and DirecTV Now, includes live local broadcast channels in numerous markets – is set to launch this year at a \$40 per month price point. Google's YouTube TV joined the fray in April 2017. And media reports suggest legacy pay-TV providers and incumbents like Comcast and Verizon are considering doing what was once unthinkable: selling channel packages online, and outside of their existing physical network footprints.

Beyond possibly jumping into the VSP game themselves in this way soon, traditional cable pay-TV companies have responded to the proliferation of lower-cost VSPs in dual fashion. They are chasing the high-revenue end of the market with investments in services and devices that combine linear pay-TV and online capabilities. Offerings such as Comcast's X1 set-top box, Charter's Spectrum TV service, and Verizon's Quantum DVR all use the set-top box as a media

hub. They enable these cable company subscribers to access third-party streaming content more easily, and they also serve these incumbent cable companies' linear TV and cloud DVR content to their customers' tablets and smartphones. At the same time, cable MSOs are also chasing value-conscious and younger demographics by offering their own, managed streaming video services and "skinny" channel packages. For example, in late 2015, Charter launched "Spectrum TV Stream." It offers an exceptionally whittled-down basic cable lineup for \$13 per month, with additional channels available to add on for extra prices. The service requires no set-top-box. Comcast is trialing a similar offering with a similar name ("Stream"). Both Comcast's and Charter's skinny-bundle services are only available to their own broadband subscribers, meaning that they are managed cable TV services, not pure online and over-the-top VSP offerings.³⁶⁵

These actions and reactions are exactly the kind of competition and innovation the market needs. They are also exactly what Congress envisioned happening when it wrote and passed the 1996 Act. That law sought a future of "big, open pipes": high capacity, competitive, and nondiscriminatory broadband telecommunications services. This encourages facilities-based investment, deployment, and competition; but it also makes over-the-top competition possible too, because that also delivers tremendous opportunities for business and value for users. Ideology-driven politicians and FCC leadership temporarily derailed this bipartisan blueprint during the Bush Administration. It took until the FCC's 2015 Open Internet vote to restore it. That decision is bearing fruit.

Below we discuss each of these VSPs listed above, and we analyze their impact on the internet's virtuous cycle of investment and innovation.

³⁶⁵ See, e.g., Tony Lenoir, "Top cable MSOs take cue from Sling TV, hedge video prospects via streaming services," *SNL Kagan* (Nov. 6, 2015).

Sling TV

After years of struggling to maintain its traditional pay-TV customer base, DISH launched its VSP service “Sling TV” in the first quarter of 2015.³⁶⁶ This is a lower-cost service that lets customers choose their own skinny bundle of linear channels, which are then delivered over-the-top on the internet. It came about in part because DISH recognized the need to respond to the secular challenges facing the pay-TV market and its traditional big channel bundles. DISH also recognized its own specific struggles, as a satellite pay-TV distributor, competing against cable companies that can offer customers bundled broadband/TV/phone packages – and that have the ability to cross-subsidize their declining pay-TV margins with inflated, monopoly broadband earnings.³⁶⁷

Though Sling TV’s user base is relatively small, it appears to be growing rapidly. DISH does not disclose subscriber counts, but various analyst estimates suggest that the number of Sling TV subscriptions rose from 100,000 in the first few months after launch to a million just

³⁶⁶ See DISH Network, Press Release, “Sling TV to launch live, over-the-top service for \$20 per month,” (Jan. 5, 2015).

³⁶⁷ See, e.g., Joseph Williams, “DISH exec Roger Lynch: How Sling was slung,” *SNL Kagan* (Jan. 7, 2015) (“I think it helps us reach a demographic that’s not being reached with the traditional pay TV model. Price is certainly one [reason], but that’s not the only reason. It’s the handcuffs that come with the traditional pay TV model: the contract, the credit check, the two-year commitment, all this special equipment, all these other fees that are never in the marketing material. And all those things combined with the fact that you have alternatives today, legal and illegal, and that’s what’s causing the decline in penetration among millennials.”); see also Tim Stenovec, “One CEO trying to blow up TV isn’t afraid of Apple, he’s worried about internet companies,” *Business Insider* (June 18, 2015) (“Roger Lynch, who has headed up Sling TV since it launched earlier this year, told Business Insider last week that he’s ‘quite concerned’ that cable companies, like Comcast, Time Warner Cable, and Charter, could respond to the growing trend of cord cutting by jacking up the prices of their broadband-only subscriptions. ‘They have their dominant – in many cases monopolies – in their market for broadband, especially high-speed broadband,’ Lynch told us in an interview, adding that it’s actually cheaper sometimes for people to subscribe to TV and broadband from a cable company than just subscribe to broadband. The cable companies, Lynch said, ‘concern us because they’re using their dominant position to try to thwart over the top services.’”).

two years later. The company credits Sling TV with helping to produce its first increase in pay-TV subscribers in a fourth quarter since the end of 2013.³⁶⁸

Sling TV is marketed as a low-cost, less bloated replacement for traditional pay-TV channel packages and equipment packages. But as is the case with traditional pay-TV subscribers, Sling TV adopters are also heavy users of non-linear SVOD services. According to a recent survey, the substantial majority of Sling TV subscribers are also customers of major SVOD providers like Netflix.³⁶⁹

Though DISH also does not disclose expenditures specific to its Sling TV business separately from its traditional satellite TV business expenditures, OTT services like Sling TV are always far less capital intensive than their traditional pay-TV counterparts. Instead of needing to launch a satellite into space, VSPs can simply install media servers at data hosting centers around the country (or even rent space on existing media servers). Instead of needing to purchase and then deliver multiple set-top boxes to each of its customers, VSPs have no need to purchase any customer premises equipment. CPE comprises a large portion of any MSO's capital outlay. For example, in 2016, CPE accounted for 48 percent of Comcast's \$7.6 billion in cable segment capex.

These lower producer costs act to boost both producer and consumer surpluses (the former via higher operating profits; the latter via lower monthly service fees). This is a good illustration of why simply focusing on ISP capital expenditures alone is a poor way of measuring

³⁶⁸ See Peter Kafka, "Sling TV's Web-TV Service Attracts at Least 100,000 Sign-Ups in Its First Month," *Re/code* (Mar. 5, 2015); Wayne Friedman "OTT Vs. Traditional Pay TV: Digital No Longer A Supplement," *MediaPost* (Feb. 23, 2017).

³⁶⁹ See Brian Bacon, "Sling TV and PlayStation Vue user profiles," *SNL Kagan* (June 7, 2016) (showing that more than half of Sling TV subscribers also subscribe to Netflix, Amazon Prime, Hulu, and/or HBO Now).

the health of the U.S. internet market, and why such a myopic approach is fundamentally useless for gauging the efficacy of FCC policies.

YouTube TV

YouTube is one of the Internet’s earliest and most well-known platforms for online video. Over the past decade, the Google-owned site has matured from one on which most users strictly share personal videos to one that also enables content owners to generate ad revenue. But perhaps sensing the opportunity created by the *Open Internet Order*’s certainty, Google is poised to leverage YouTube’s popularity and enter the increasingly crowded VSP market. On the last day of February 2017, Google announced that it would offer an online pay-TV service with 40-plus linear for \$35 per month. Dubbed “YouTube TV,” the service packages local channels, regional sports networks, a personal cloud DVR. A single subscription can be shared across six accounts.³⁷⁰ It launched in early April 2017.³⁷¹

Google’s parent company, Alphabet Inc., does not report detailed information on its capital and non-capital investments across its myriad businesses. However, it does separately report capital expenditures for its core “Google” and “Other Bets” segments, the latter of which largely consists of its Google Fiber unit. Capex at the core Google segment is by the company’s own admission highly variable. For example, for the four years from 2013–2016, Alphabet’s Google segment capex went from \$7 billion, up to \$11.2 billion, down to \$8.9 billion, and up again to \$9.4 billion. But capital outlays in the Other Bets segment (mainly Google Fiber) increased steadily (\$187 million, \$496 million, \$850 million, and \$1.39 billion) for those four years.

³⁷⁰ See YouTube, Official Blog, “Finally, live TV made for you” (Feb. 28, 2017).

³⁷¹ See, e.g., Steve Kovach, “YouTube’s \$35-a-month TV streaming service just launched – here’s what it’s like,” *Business Insider* (Apr. 5, 2017).

To the extent there are any lessons to be gleaned from Alphabet’s capital investments, they are that (1) its core segment’s investments are generally cyclical, as are most other company’s, which is to be expected given the very long shelf life of durable goods; and (2) the company accelerated its investments in its ISP business following the Commission’s February 2015 *Open Internet Order* vote. (Alphabet’s “Other Bets” segment capex was 227 percent higher during 2015–2016 than it was during 2013–2014). Both the accelerated investment in its ISP business and its launch of YouTube TV make clear that the FCC’s vote preserved the successful status quo of the virtuous cycle on the open internet. The FCC’s decision restored market certainty on the legal status of broadband, which did not hinder Alphabet’s investments in either the ISP side or OTT side of that ecosystem. And although late 2016 saw Alphabet shift its ISP strategy towards wireless, it did so not due to Title II, but as a rational response to changing technology and to the massive entry barriers that even a corporate giant cannot overcome, even when it is willing up to a point to cross-subsidize its initial losses.³⁷²

³⁷² See, e.g., Dave Smith, “Google has made a big shift in its plan to give everybody faster internet: from wired to wireless,” *Business Insider* (Aug. 15, 2016); see also Comments of Ruth Porat, CFO, Alphabet Inc., Q3 2016 Alphabet Inc. Earnings Call (Oct. 27, 2016) (“In terms of Fiber, the impetus for it was really about the opportunities that we see to focus on innovation, and what [] does that mean if the objective with Other Bets is really these 10X opportunities. And when you go back to the initial impetus for creating the business, it was the Founders’ view that there’s a sizable opportunity, given the need for abundant connectivity on networks that are always fast and always open, and we do continue to be committed to that vision. The team had some important breakthroughs in new technologies. You noted the most important in our view, all that we are doing with wireless, but also technologies that are key to implementation. And we believe that both of those, a number of things that [we] are doing to enhance both our effectiveness and efficiency. And so we wanted to focus on the potential with these efforts before we reaccelerate deployment, and it was about being – ensuring that we can take advantage of those, before again pushing forth. We are very active in a lot of cities. In the third quarter alone, we rolled out four new cities, so that brings us to 12 cities across the US, where we are deployed, in construction, or in development. And we’re making great progress in those cities. We remain very committed to growth across those cities, and then we also have a presence in six cities with our wireless acquisition, Webpass. So we’re pausing for now our work in eight cities, where we’ve been an exploratory discussions, but very much to your question, it’s to better integrate

Sony PlayStation Vue

Sony's "PlayStation Vue" is one of the better-reviewed online pay-TV replacements, even though it is priced substantially higher than other packages such as Sling TV.³⁷³ Originally launched in three markets in March 2015, the service went nationwide one year later.³⁷⁴ Sony, like other VSPs, has yet to disclose its subscriber totals; but media reports suggest that the service attracted 120,000 paying customers just three months after its nationwide rollout.³⁷⁵ And like Sling TV, even though Vue is marketed as a replacement for traditional linear pay-TV, a majority of its subscribers are also customers of major SVOD providers.³⁷⁶

There is no indication from media reports whether or how the FCC's *Open Internet Order* impacted Sony's 2015 launch and 2016 expansion of Vue. Nor is there any way to discern how much the Japanese conglomerate is spending on the project inside the U.S. (though we note that the company's 2016 capital expenditures were the highest in its history). What is clear, however, is that the ISP industry's open hostility to OTT competition dramatically subsided following that FCC 2015 vote; and ISPs changed their approach, as they realized that they too benefit greatly from the added demand for high-capacity broadband created by services like PlayStation Vue.

some of the technology work we've been developing, and there's more detail in cities on the Fiber side to the extent you want to go into those.").

³⁷³ Vue's base package is \$30 per month, while Sling TV's is \$20. See "Playstation Vue: The Current Top Cord Cutting Option," *DSL Reports* (Sept. 27, 2016).

³⁷⁴ See "PlayStation Vue Internet-Based Live TV Service Expands Nationwide," Sony Computer Entertainment Press Release, Mar. 14, 2016

³⁷⁵ See Lucas Shaw, "Sony's Vue Web TV Service Said to Surpass 100,000 Subscribers," *Bloomberg* (June 28, 2016).

³⁷⁶ See Bacon, "Sling TV and PlayStation Vue user profiles," *supra* note 369.

DirecTV Now

“DirecTV Now,” launched on November 30, 2016, is a full OTT pay-TV service, initially offered at a competitive price point (\$35 per month) on a nationwide basis with local channels in some markets. In just one month, the service gained over 200,000 subscribers.³⁷⁷ Even before its launch, AT&T’s Chief Financial Officer characterized DirecTV Now as “a game changer.”³⁷⁸

And in terms of AT&T’s business, as well as the overall evolution of the video market, that was an accurate statement. Though AT&T’s business strategy with DirecTV Now is partially predicated on using it to attract and retain wireless broadband customers, it is marketed universally to all internet users, not just existing subscribers to AT&T’s broadband internet access offerings. This makes AT&T the first of the traditional, vertically integrated ISPs to offer multichannel pay-TV service delivered to customers of competing ISPs.

This, more than any other development following the 2015 Open Internet vote, illustrates just how much the attitudes of the market’s leading ISPs have changed since the FCC settled the legal issues surrounding Network Neutrality. AT&T kicked off what has now become a decade-plus policy battle back in 2005 when Ed Whitacre, the CEO of AT&T’s predecessor company SBC, said “[w]e and the cable companies have made an investment and for a Google or Yahoo! or Vonage or anybody to expect to use these pipes [for] free is nuts!”³⁷⁹

³⁷⁷ See Comments of John Stephens, AT&T Inc. Senior Executive Vice President and Chief Financial Officer, Fourth Quarter 2016 Earnings Call (Jan. 25, 2017).

³⁷⁸ See Comments of John Stephens, AT&T Inc. Senior Executive Vice President and Chief Financial Officer, Second Quarter 2016 Earnings Call (July 21, 2016).

³⁷⁹ See “At SBC, It’s All About ‘Scale and Scope,’” *Business Week* (Nov. 7, 2005). Whitacre thus succinctly explained his company’s rationale for wanting to violate Net Neutrality, which is particularly ironic in light of AT&T’s actions with DirecTV Now today. AT&T was not alone in its resistance a decade ago, however. In 2006, Verizon VP John Thorne said that “[t]he network builders are spending a fortune constructing and maintaining the networks that Google intends to ride on with nothing but cheap servers.” See Arshad Mohammed, “Verizon Executive Calls for

Well, it is now AT&T taking advantage of the true nature of the broadband market: subscribers purchase access to the internet in order to communicate with the other people and access all of the content choices that are available on it. Broadband subscribers pay handsomely to make those connections, just as edge companies pay their own ISPs (or self-provision facilities) to put content on the internet on their side. No one uses “pipes” for free. ISPs profit from subscriber relationships with their end-users, and the only reason they have so many millions of them is the wealth of information and entertainment their subscribers can get online. Today, AT&T is not entering the content business by simply making a generic website available to subscribers of its ISP competitors: it’s marketing a pay-TV service that directly competes with the pay-TV services of those other ISPs.

AT&T’s entry into the VSP sector with DirecTV Now is a rational business response. The marketplace now offers – thanks to the *Open Internet Order* – widely available, open, and

End to Google’s Free Lunch,” *Wash. Post* (Feb. 7, 2006). This belief that content and application companies get a “free ride” on the internet is completely wrong, and reflects a serious misunderstanding of what actually gives internet access services their value. Content companies pay billions of dollars to transmit their content via the Internet; and consumers spend even more for the ability to access that content. In the internet market, unlike the long-distance telephone market, end-users have no direct financial relationship with the party in the middle transporting the “call” – as there are potentially dozens of network owners in the middle routing the data to its final destination. Content companies pay large sums of money to telecommunications companies to serve their content “up to the Internet.” Those telecom companies in turn have financial relationships with other carriers to transport data across the country. So when Verizon receives traffic originating from an edge company, handed off by a long-haul network provider, it also gives the long-haul provider data from Verizon customers to carry back out across the Internet. Sometimes this traffic is unbalanced and fees are paid, while at other times the traffic going back and forth across this interconnection point is roughly equivalent and there is no money exchanged. (In still other instances, large edge companies may rent space inside an ISP’s network in order to get as close to end-users as possible). In other words, ISPs already receive remuneration for traffic traversing their networks; what these decade-old statements reflected was the desire of ISPs to use their position as terminating access monopolies to price discriminate.

nondiscriminatory high-capacity telecommunications services.³⁸⁰ AT&T is prevented from extracting a portion of the edge value or otherwise acting out Whitacre’s troll-under-the-bridge toll-taking fantasy. So the company instead captures part of that edge value by offering its own premium content video subscription service, as well as by investing in higher capacity broadband networks for which many of its customers are quite willing to pay. This is the virtuous cycle at work, and its beneficiaries are internet users, as well as both the businesses that sell internet access and online content to them. Anyone who surveys the current landscape truthfully, and concludes that the 2015 vote and policy changes were harmful or a failure, is simply ignoring these successes in favor of their own anti-regulatory ideology.

Hulu

In May 2017, Hulu launched “Hulu With Live TV,” a live, linear channel bundle similar to Sling TV and DirecTV Now. The \$40 per month service includes 50 live channels from networks such as ESPN, CNN, Fox News, TNT, TBS, and all major broadcast networks in some markets. Facing competition not only from legacy pay-TV but other VSPs too, Hulu

³⁸⁰ These broadband internet access services are, of course, not available to or affordable for every individual subscriber. In fact, as we have shown, broadband remains out of reach for far too many, with low-income people in general and people of color most often kept out of the market by lack of choice, high prices, and other structural barriers. *See Digital Denied* at 3–14. Contrary to Chairman Pai’s completely unsupported assertions of late, this persistent divide is in no way caused or exacerbated by Title II, nor solvable by reversing the classification and repeating the mistakes of Chairman Wheeler’s predecessors. As we showed in Part I above, broadband deployment and investment continue apace, and nothing about restoring the proper legal classification to broadband internet access dictates ISPs’ choices about where to invest. Instead, in the absence of truly effective universal service requirements, buildout obligations at the state or municipal level, or effective anti-redlining provisions, monopolistic wireline ISPs in particular are able to chase high-dollar customers while ignoring whole portions of the demand curve. *See, e.g.,* Petition to Deny of Free Press, *In the Matter of Applications of Charter Communications Inc., Time Warner Cable Inc., and Advance/Newhouse Partnership For Consent to Assign or Transfer Control of Licenses and Authorizations*, MB Docket No. 15-149, at 37 (filed Oct. 13, 2015).

differentiates its offerings with its owners' large broadcast libraries, a cloud DVR, and round-the-clock U.S.-based customer service.³⁸¹

fuboTV

In December 2016, fuboTV (which originally had launched as a soccer streaming network in January 2015) expanded its offerings to include a full suite of linear channels. Its introductory \$35 monthly package mirrors the Vue and DirecTV Now entry-level packages, offering more than 70 broadcast and cable channels.³⁸²

Layer3 TV

Layer3 TV, which bills itself as a premium OTT provider, began rolling out service across several large markets over the past year, including Washington, DC, Chicago and Los Angeles. Layer3's CEO recently said that its service is available to 13 million homes.³⁸³ Though it is unclear, it appears that the Layer3 TV service is not delivered over the open internet, but as a managed service delivered over MSOs' last mile networks.³⁸⁴

Comcast

Recent news reports suggest Comcast is preparing to re-launch its "Stream TV" streaming pay-TV service, which is available solely to Comcast broadband customers.³⁸⁵ The service is not an OTT service, nor a VSP, because it is delivered over Comcast's last mile

³⁸¹ See "Hulu Prepares to Launch Its Live TV Service," *Reuters* (Mar. 2, 2017).

³⁸² See Todd Spangler, "FuboTV to Launch Sports-Focused Skinny Internet TV Bundle, Inks Pacts with Fox Networks, NBCU, A&E, Others," *Variety* (Dec. 14, 2016).

³⁸³ See Jeff Baumgartner, "Layer3 TV Launches in La La Land," *Multichannel News* (Mar. 14, 2017).

³⁸⁴ See Ian Olgerison, "Layer3 pushes new model for video delivery," *SNL Kagan* (Nov. 23, 2016) ("CEO Jeff Binder, speaking at the SNL Kagan Multichannel Summit Nov. 17, said that in addition to building a master headend and 25,000 mile backbone, Layer3 is delivering its service over managed connections with agreements from operators including Comcast Corp., Cox Communications Inc. and Altice NV's Suddenlink Communications.").

³⁸⁵ See "Comcast to expand streaming service amid cord-cutting trend," *Reuters* (Mar. 28, 2017).

broadband network (with just a subset of its content available to Comcast's broadband subscribers via the open internet when those broadband subs are outside of their homes). It appears that Comcast continues to believe, for now, that it has no business need to offer a VSP service.³⁸⁶ Yet it does feel that it needs a skinny pay-TV bundle that appeals to its broadband customers, who may be more likely to drop Comcast's pay-TV services or never subscribe to them in the first place.

However, even though Comcast is not yet entering the VSP fray, it has left the door open³⁸⁷ and may be preparing to do so in the near future.³⁸⁸ A recent Bloomberg report suggests that as Comcast renews its contracts with programmers, the company is securing rights to distribute this content via a nationwide VSP service.³⁸⁹ Comcast, with its superior broadband

³⁸⁶ See Comments of Brian Roberts, Comcast Corporation Chairman and CEO, from Q2 2016 Comcast Corp. Earnings Call (July 27, 2016) (“Look, we just fundamentally believe for now that our in-market, in-footprint strategy is where we add the most value to consumers. Right now we’re 40% X1 penetrated. We’re hoping to increase that in a short period next year or two as it continues to scale. Our broadband is great results, business services, it all works well with having a network. OTT economics are unproven to us. And out of footprint, it’s not clear that that’s the right strategy for us.”).

³⁸⁷ See Comments of Matt Strauss, Comcast Corporation, Executive Vice President and GM, Video Services, Comcast Cable, at the Wells Fargo Technology, Media & Telecom Conference (Nov. 10, 2016) (“OTT is not for the faint of heart, especially a video-only OTT service. When you really try to evaluate the business model, we have not seen one that really gives us confidence that this is a real priority for us. . . . So when you look at the opportunity, continuing to go deeper in our footprint where I can bundle-in multiple products is just a much higher return and a bigger opportunity. And it very much speaks fundamentally to our overarching strategy, which is in many ways you want to own the home. And to own the home, I think we are in a much better position and there is significantly more upside and profitability in going deeper and deeper into our base first versus following a video-only offering OTT. If it turns out that that is an opportunity for us, OTT, there’s nothing that would ever preclude us from doing that. It really just comes down to priority and focus and where we really believe it’s going to give our investors the most return and the best products and services for our customers.”).

³⁸⁸ For instance, it is noteworthy that Comcast just hired a vice president for IP Video whose prior position was Global Head of Video at Amazon. See “Comcast Hires VP of IP Video,” *Light Reading* (Mar. 29, 2017).

³⁸⁹ See Gerry Smith, “Comcast Said to Gain Rights to Offer Online TV Nationwide,” *Bloomberg* (Mar. 23, 2017) (“Comcast Corp. acquired rights from cable network owners to offer their

network and vertical content holdings, is positioned better than any other traditional pay-TV provider to ward off VSP competition. But as pay-TV profit margins continue to decline, and consumer expectations change, Comcast (like AT&T before it) will likely decide to enter the VSP market too. Indeed, Comcast has already licensed its X1 pay-TV interface technology to other MSOs like Cox³⁹⁰ and will soon convert its video distribution platform to all-IP.³⁹¹ This could pave the way for it to offer a premium, X1-powered VSP service differentiated from other offerings in an increasingly competitive video marketplace. Furthermore, as the owner of major content provider NBCU, Comcast has additional incentives to make sure its programming is on as many paying platforms as possible. This motivation likely drove the company's recent moves to secure OTT rights from its affiliates so that VSPs like Sling and Vue can carry local broadcast channels.³⁹² It is also a likely motivator for Comcast's rumored NBCU-powered SVOD service.³⁹³

Without the certainty against unreasonable discrimination offered by Title II and the Open Internet rules, it would be impossible to imagine a world in which an MSO offers its pay-

channels nationwide, according to people familiar with the negotiations, giving the biggest U.S. cable operator a backup plan if rival online-TV services catch on with consumers. The rights allow Comcast to sell video service for the first time outside its regional territories.”). However, other reports suggest that Comcast is weighing its options and simply “passively collecting digital rights.” See Joseph Williams, “Comcast not eyeing national OTT offering,” *SNL Kagan* (Mar. 28, 2017).

³⁹⁰ See Jeff Baumgartner, “Cox Inks National X1 Deal with Comcast,” *Multichannel News* (Nov. 11, 2015).

³⁹¹ See Comments of Neil Smit, Comcast Corporation, Executive Vice President, President and CEO of Comcast Cable, Q3 2016 Comcast Corp. Earnings Call (Oct. 26, 2016) (“[W]e will be going to an IP-based video solution over the next let’s just call it couple of years. We have the product in the lab, it is working well. We will continue to roll out new devices.”); see also Mari Silbey, “Comcast May Go All IP by End of Year – Rumor,” *Light Reading* (Mar. 29, 2017).

³⁹² See Todd Spangler, “NBC Reaches Deal With TV Affiliates for Opting in to Internet Video Distribution Agreements,” *Variety* (Apr. 13, 2017).

³⁹³ See Lucas Shaw and Alex Sherman, “Comcast Is Planning a Netflix Rival Using NBC Shows,” *Bloomberg* (Apr. 10, 2017).

TV services to customers of other MSOs' via those competing MSOs' distribution facilities. But now we have two of the nation's four largest pay-TV providers (AT&T/DTV and DISH) doing just that, and Comcast seemingly preparing to. These positive, pro-competitive marketplace developments are precisely what we'd expect (and what we predicted)³⁹⁴ when internet users and content producers have access to nondiscriminatory, high-capacity telecom services.

Verizon

Similar to Comcast's reported moves, Verizon too is reportedly securing additional streaming rights from linear channel owners. Unnamed sources say these could be used for a new online service launching later this year.³⁹⁵ Verizon has not commented on these reports, and it is possible that Verizon is simply securing the rights for an offering exclusive to its wireless service. However, even if Verizon doesn't launch a VSP service, it is clear that the company is responding to the competitive pressures produced by the open internet.

³⁹⁴ See, e.g., *Combatting the Cable Cabal* at 43.

The answer to the video market's problems is to throw money at it. If venture capitalists in pursuit of a better video-bundling business model throw money at the programmers, the programmers will play ball. Over time, this investment could produce new video business models where supply more closely matches demand. But this investment and innovation will not happen if there is any uncertainty about the openness of the delivery platform. While American Internet Service Providers [] all claim to embrace openness, their actions tell a different story. When ISPs embrace data caps and overage charges that serve no legitimate engineering or economic purpose, they send a signal to the market that scarcity, not abundance, is the business model. Artificial scarcity is a market failure, one that depresses investment and deprives Americans of the benefits of technological progress. So the answer to this complex problem is the one we came up with so long ago. We don't need public policy to dictate how the industry should behave; that's the consumers' job. We need public policy to allow innovation to happen. If we keep the pipes open, the content will flow and consumers will win.

(Emphasis added).

³⁹⁵ See Lucas Shaw, Scott Moritz, and Gerry Smith, "Verizon Said to Plan Online TV Package for Summer Launch," *Bloomberg* (Mar. 30, 2017).

Viacom/Discovery/AMC

The rise of the SVOD and VSP markets is driven in part by consumers' desire for alternatives to the perpetually increasing price of traditional pay-TV services. Millions of families want the pay-TV experience, but can't justify the escalating monthly fees for mandatory equipment and bloated channel bundles. Some of the biggest contributors to escalating pay-TV bills in recent years are sports networks, which command licensing fees well in excess of other even more popular channels. Perhaps sensing an opportunity, pay-TV channel owners Viacom, Discovery and AMC Networks are reportedly in talks with MSOs about creating a service that includes these and other popular linear channels, but does not include sports networks.³⁹⁶ This rumored service could cost \$20 per month, a price point lower than other VSP services that include ESPN.

This is exactly the type of efficient market segmentation and servicing that the old, bloated basic cable model does not offer. The open internet has started to let viewers express their precise demands, and suppliers are responding. This efficiency is predicated on the continued existence of a common carrier broadband telecom service market. Killing that market, as Chairman Pai proposes now to do, would return us to the era in which ISPs' every move was designed to "cable-ize" the internet – all in order to ward off this type of over-the-top competition that so clearly benefits the public, including content creators and consumers too.

Other ISPs and Tech Companies

The coming months could bring news of even more online video choices. While ISPs like AT&T and Verizon (and possibly Comcast) enter the OTT space, others may be close behind.

³⁹⁶ See Gerry Smith and Lucas Shaw, "No-Sports TV? Viacom, AMC, Discovery Said Eyeing Web Bundle," *Bloomberg* (Apr. 13, 2017).

For example, CenturyLink has pulled back on its own traditional pay-TV offering, and has publicly stated that it is exploring OTT alternatives. One analyst thinks it is possible CenturyLink could chose to go it alone and launch its own VSP service. T-Mobile and Sprint are said to be exploring this possibility too. And tech giants Apple and Amazon are also the subject of analyst chatter as possible future VSP entrants.³⁹⁷

The VSP sector may look radically different in coming years than it does today, as new companies enter and compete for customers, with the likely outcome a few dominant players pushing out others whose offerings failed to catch on with consumers. But none of this will happen if the FCC returns unfettered gatekeeper powers back to the vertically integrated ISPs, who will return to their preferred path: picking the pockets of online content companies, and shutting out those that refuse to pay.

3. Traditional Linear Channels Are Now Directly Serving Subscribers Over the Open Internet.

Prior to the streaming media era, households had very limited options for video. They could put up an antenna and gain free access to broadcast networks, or they could subscribe to a cable or satellite pay-TV package. These pay-TV packages largely failed to offer purchasers an ability to express their precise preferences. Subscribers were – and still are – given a choice of extremely “limited basic” service (essentially just broadcast channels); a more typical basic service (50–100 linear channels); or an expanded basic package (with hundreds of channels), plus options most often to purchase additional premium packages but not simply to purchase additional channels a la carte for set-top delivery. The retail price for these bloated bundles increases annually, going up at a rate much greater than the rate of inflation, leaving subscribers frustrated and looking for options.

³⁹⁷ See, e.g., Mike Dano, “Who’s next? Apple, Amazon, CenturyLink may join streaming pay-TV fray,” *FierceCable* (Apr. 4, 2017).

Now that we're in the streaming media era, however, video customers frustrated with those bloated bundles finally have options. And in addition to skinny VSP channel bundles that are more flexible than traditional pay-TV bundles, viewers are increasingly able to subscribe directly to the "channels" of their choice. While not quite the set-top based a la carte service for which many viewers have clamored, the entry of traditional linear channels into the subscription (and/or ad-supported) online video-on-demand market enables consumers to express their demands much more directly and precisely than forced channel bundles allow. Popular linear channels like CBS and HBO now sell online SVOD services directly to viewers, cutting out the MSO middleman. But there are now also numerous less popular and niche channels selling direct access to their viewers, enabled by an open and nondiscriminatory broadband telecom market.³⁹⁸ In addition to these SVOD services, a number of traditional linear channels also offer free, ad-supported OTT services.³⁹⁹

After years of refusing to offer the content aired on its ESPN suite of channels outside of a traditional cable bundle, recent comments by Disney indicate that the cable dial's most expensive channel will soon be available as a standalone SVOD/live OTT hybrid service. (ESPN and its sister networks are currently available on VSP platforms too.) Though this is notable, Disney seemingly wants to have its cake and eat it too. The forthcoming ESPN OTT service

³⁹⁸ Linear channel owners that now market SVOD services to customers over the open internet include: A&E Television Networks ("History Vault," "Lifetime Movie Club"); AMC ("Shudder," "Sundance Now"); Bounce TV ("Brown Sugar"); CBS Corporation ("CBS All Access," "Showtime," "Smithsonian Earth"); Gala; Hallmark ("FeelN"); Time Warner Entertainment ("HBO Now"); Comcast-NBCU ("Seeso"); Starz; Tennis Channel ("Tennis Channel Plus"); TheBlaze ("TheBlaze TV"); Charter/Time Warner Cable ("FilmStruck"); Univision ("Univision NOW"); and Viacom ("NOGGIN").

³⁹⁹ Linear channel that now market ad-supported video on demand services to customers via the open internet include: Comcast-NBCU ("Watchable," "FandangoNow"); FilmON TV Networks ("CinemaNow"); Sony ("Crackle"); and Viacom ("Paramount Movies").

apparently will not be an online version of any linear channel, but one that combines some live sports and sports entertainment programming with on-demand content.⁴⁰⁰

ESPN annually pays the major sports leagues and college conferences billions of dollars for exclusive rights to air live games. But the leagues themselves market their own streaming services, which have become very popular with diehard fans. The early innovator in this space was Major League Baseball. Its “MLB.tv” service was a pioneer in live streaming technology. In fact, the company behind MLB.tv (called MLB Advanced Media) provides the underlying technology that powers other live streaming services such as WWE Network and PGA Tour Live.⁴⁰¹ The National Hockey League (“NHL.TV All Access”) and the National Basketball Association (“NBA League Pass”) are also heavily promoting their live streaming services, and seeing good success.⁴⁰²

4. Internet Platforms are Using Online Video to Increase Customer Engagement and Sell Ads.

go90

In October 2015, Verizon launched a free, ad-supported online video portal called “go90.” Verizon initially envisioned the service as a way to leverage its AOL assets, capture revenues from advertising to the coveted millennial demographic, and attract and retain customers in Verizon’s maturing wireless business. To date, the service appears to be – as one Verizon content partner put it – “a dud,” largely because it is lost in a sea of online content.⁴⁰³

Verizon presses on though, and it’s likely that the company’s acquisition of Yahoo! (which has

⁴⁰⁰ See Matt Pressberg, “Disney Finally Announces Over-the-Top Streaming ESPN Service,” *The Wrap* (Aug. 9, 2016).

⁴⁰¹ See John Lombardo & Eric Fisher, “PGA Tour-MLBAM initiative began around Augusta picnic table,” *Sports Business Daily* (May 4, 2015).

⁴⁰² See, e.g., NBA, Press Release, “NBA Digital sees record-setting growth during season” (Apr. 14, 2016).

⁴⁰³ See Karl Bode, “Verizon go90 Streaming Service a Huge ‘Dud’ Say Partners,” *DSL Reports* (Sept. 9, 2016).

its own disappointing history when attempting to attract online video viewers) will result in additional investment in the platform.⁴⁰⁴

However Verizon's over-the-top ambitions play out, it is clear the company believes it needs to have an OTT video component to augment its core telecom business and its more traditional pay-TV service delivered to its Fios TV subscribers. This is the outcome the Open Internet decision's framework helped to create: incentivizing ISPs to innovate and invest in all parts of the internet ecosystem, instead of chasing rents that could in theory be earned from using their gatekeeper power to discriminate against the successful innovations of edge companies and users.

Facebook Live

Perhaps one of the biggest developments in the online video space in recent years is the rise of live streaming content produced by users who are (as a rule) not content production professionals. Pioneered by start-ups such as Justin.tv, this medium went more mainstream with the 2015 launches of Meerkat and Periscope (the latter of which was acquired by Twitter even before its launch). Both launches happened practically contemporaneously with the *Open Internet Order* vote.

Facebook, with its existing size and scope, quickly moved in and dominated this market segment upon its launch of Facebook Live later that same year. The live streaming functionality has had a profound impact on civic life in the U.S. It lets users document all manner of newsworthy events (political rallies, candidate townhalls, protest marches, and police misconduct, to name just a few important examples) as well as their own daily lives and milestones.

⁴⁰⁴ See Lucas Shaw and Scott Moritz, "Verizon's Foray Into Hollywood Is Already Getting a Reboot," *Bloomberg* (Jan. 24, 2017).

Facebook does not disclose any details on how it allocates its capital and non-capital investments across its various endeavors. However, the company’s total capital expenditures have risen sharply in recent years, accelerating after the FCC’s 2015 Open Internet vote. It reported \$1.4 billion, \$1.8 billion, \$2.5 billion and \$4.5 billion, respectively, for the four years from 2013 to 2016, and provided 2017 guidance of \$7 to \$7.5 billion.⁴⁰⁵ Facebook’s increased capital outlay is largely due to its investment in “data centers, servers, office buildings, and network infrastructure.” These are all ISP-adjacent activities directly enabled by the continued existence – which the *Open Internet* Order and Title II framework preserves – of nondiscriminatory wired and wireless broadband telecommunications services.

CONCLUSION

For the foregoing reasons, explained at some great length in these comments, the Commission should abandon its plans announced in the *Notice*. There is nothing needed to “restore” internet freedom, beyond leaving the 2015 *Open Internet Order* alone. It’s working. That is plain for all to see. This Commission would upset that framework for no good reason.

Gaurav Laroia, Policy Counsel
Derek Turner, Research Director
Jessica González, Deputy Director & Senior Counsel
Leo Fitzpatrick, Summer Legal Fellow
Matthew F. Wood, Policy Director

Free Press
1025 Connecticut Avenue, N.W.
Suite 1110
Washington, D.C. 20036
202-265-1490

July 17, 2017

⁴⁰⁵ See Facebook Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2016.

APPENDIX

Individual ISP Results Demonstrate the FCC's Open Internet Policy is Working

In the main section of these comments, we summarized publicly available data demonstrating that ISP industry capital investments increased in the aggregate following the FCC's 2015 *Open Internet Order*. This fact should come as no surprise. It largely reflects the continuation of prior trends not in any way altered by the FCC's actions, which were undertaken to preserve the virtuous cycle by returning to solid legal authority for Net Neutrality rules. In Part II, we discussed the exponential growth in the online video market following the FCC's 2015 vote. This growth also should come as no surprise. Far from causing uncertainty as its critics blithely claim, the FCC's vote and return to Title II reduced market uncertainty. It affirmed that end-users and edge-producers would continue to be able to connect with one another via nondiscriminatory, high-speed broadband telecommunications services.

Despite the existence of these positive and easily verifiable facts, the Trump administration's FCC and hardline ideologues in Congress are pushing to repeal this hugely successful policy – and doing so despite its adherence to the largely deregulatory path laid out for the advanced telecommunications market in the bipartisan 1996 Act. The main, and often only, proffered justification for overturning the will of the people and ignoring the law is the usual trope that the removal of regulation will spur investment. But it is clear from the totality of the evidence that this is merely unsupported ideological nonsense, in no way based on the law or on sound policy analysis. If the new FCC were concerned with law and analysis, then it would recognize that broadband internet access service meets the statutory definition of a Title II telecommunications service; and it would acknowledge that the 2015 order coupled with extensive forbearance did nothing to alter the ISP industry's successful trajectory. The *Open Internet Order* and reclassification merely returned the FCC to its rightful, congressionally mandated authority in its role as the last line of defense against unreasonably discriminatory behavior by telecom providers. That vote rightly and thankfully signaled to the industry that monopoly abuses from artificial scarcity are not an acceptable business model, and are in fact bad for business and the general public too.

Unfortunately, the plethora of facts and reasoned analysis supporting *Open Internet Order* have done nothing to deter the Pai FCC's push. The number of data points illustrating this framework's success have only grown in number since the February 2015 decision. Yet Chairman Pai is moving as fast as he can to give ISPs the legal right to discriminate unreasonably against the traffic they are hired to carry. To justify this radical shift, the Pai regime has repeatedly peddled falsehoods about ISP investment declines since February 2015, and blamed this supposed decline on the mere possibility of future Title II-based interventions. As we detailed in Part I (and in our March 2016 report), Pai's claim of a post-vote ISP investment decline is factually incorrect.

But let's be absolutely clear: even if aggregate ISP capital investment had declined, this would in no way prove that the decline was caused (or even meaningfully impacted) by FCC policy decisions. Aggregate industry capital investments, and any change in them from year-to-year, are at most a starting point for understanding industry trends. These trends depend on

numerous factors, many well outside the influence of public policy. Furthermore, there are different types of capital investments, some which are more beneficial to the public than others. The aggregate dollar value of capital investments alone does not determine the change in availability of last mile broadband access services, nor the prices for, capacity of, and consumer and producer surpluses derived from the availability of these services. And as we noted in Part II, any consideration of the efficacy of a policy designed to benefit the entire internet ecosystem must examine the policy's impact on all parts of that ecosystem.

In these comments we led with aggregate results, primarily because of the need to rebut the blatant falsehoods peddled by the pro-ISP ideologues. In a more rational world, the head of the nation's communications regulatory agency would not actively peddle falsehoods and illogical analysis. In that more rational world, the FCC Chair would understand that capital investments are cyclical, and that each individual company's investments might go up or down over the short term simply because of its completion of upgrade projects. In that more rational world, the ISP industry's aggregate capital outlay would play second fiddle in the analysis to a comprehensive review of individual broadband service providers' actual investments, deployments, and offerings, as laid out in painstaking detail in those companies' public disclosures and public comments on their motivations and plans.

Unfortunately, it appears we now live in a world in which ideology has replaced rational thought and reasoned analysis in communications policymaking. We're now in a world in which the fate of people's communications rights, and their essential protections against unreasonable discrimination, hinge on how the Chairman of the FCC reads (or intentionally misreads) the state of the broadband market based on one inappropriate measure.

Chairman Pai and others possessed of irrational anti-Title II fervor are supported by ISPs' money, with the resulting corruption used to stoke irrational fears. And these ideologues-for-hire operate in a system in which it is easier to promote simplistic falsehoods than it is to counter them with facts, logic, and reason. Nevertheless, the truth is available for those who care to look. Below, we offer excerpts from each publicly traded ISP's public statements, made prior to the FCC's vote and during the two years after it. There's no mystery as to how or why any individual ISP's capital spending changed: 2015's final results held close to the guidance these companies gave prior to the vote, and 2016's results continued those trends, based on each ISP's deployment schedule.

Judging by the words of the ISPs themselves, as spoken to investors and to the SEC, the broadband market remains very healthy two years after the FCC's Title II and Net Neutrality vote. Indeed, as we document herein, the topic of Title II and the Open Internet rules largely disappeared from every company's communications with investors and investment analysts during the two years following that vote. These companies and the analysts that closely follow their progress clearly viewed the policy change as a non-impactful event, certainly less worthy of attention than other oft-raised issues like broader economic trends and tax policy.

As the statements summarized below show, company-specific changes in capital investments detailed above in Figure 24 are easily explained: increases reflect certain ISPs' higher spending on core network investment and on CPE upgrades; decreases reflect other ISPs'

completion of prior network deployments and upgraded CPE rollouts for those companies. Guidance for 2017 indicates that capital expenditures will continue to be elevated for many ISPs as they continue their upgrades, but lower for others as they complete their projects.

We urge policymakers and reporters who cover this sector to resist simplistic narratives pushed by pro-discrimination ideologues. Don't take the words of lobbyists (or lobbyists in regulators' clothing) at face value. Go and read the transcripts of what the companies themselves told their investors; go and study each company's results; and use this evidence when confronting claims about the impact from Title II and forbearance.

The reality is clear for anyone interested in taking the time to see it: the FCC's 2015 vote did nothing to alter the ISP industry's long-term trends. Cable company ISPs continue to leverage their superior last mile platform into near-monopoly dominance; incumbent telephone companies continue to lose share on residential and business services to cable companies, even as these legacy telcos deploy targeted fiber upgrades to stem some of these losses. And the wireless market's dominant "Twin Bells" (AT&T and Verizon) are feeling the impact of effective competition from Sprint and T-Mobile, as rejuvenated by Obama-era FCC policies, all to wireless consumers' benefit. Most cable companies are deploying the latest generation of cable modem technologies throughout their entire footprint as soon as they are commercially available, and they are pushing fiber deeper into their networks. Most ILECs are taking advantage of technology advances (such as IP-DSLAM or G.fast), but continue to be selective in their upgrades due to the cable industry's insurmountable natural monopoly advantages. And even as aggregate wireless industry capital investments cycle down with the completion of 4G LTE deployments, individual companies are poised for future capacity expansion (*e.g.*, Sprint's pending network densification; AT&T's SDN expansion and investments in high-frequency 5G spectrum; T-Mobile's preparations to use its newly acquired 600 MHz spectrum; Comcast's entry utilizing Verizon's network).

In sum, while the word "investment" is used as something of a panacea in politics, it's not as simple as totaling up one sector's aggregate totals. Politicians of all stripes speak of "promoting investment," while the companies that curry their favor make promises and threats about investment based on whether government acts as they desire. But in reality it's a complicated subject, and if investment is going to be a primary driver of policy decisions then lawmakers (and the reporters who supposedly hold them accountable) must focus on the details.

Cable Company Internet Service Provider Investment Summaries and Disclosures.

Comcast

Comcast spent \$7.6 billion on its cable segment⁴⁰⁶ capital expenditures during 2016, the most the company has ever invested in a single year. Its 2016 outlay broke its previous record high of \$7 billion, set just a year prior. Comcast's cable segment capital investments totaled \$14.6 billion during the two years following the FCC's *Open Internet Order* vote, nearly a 27 percent increase from the \$11.6 billion it invested during 2013–2014. Comcast's capital investments have trended up and down over the past dozen years. They increased through the end of 2007, declined sequentially annually through 2011, then steadily increased thereafter.⁴⁰⁷

Comcast's post-vote increase in capital investment primarily stems from deployment of new lines ("line extensions"), the firm's accelerated rollout of its "X1" IP-video platform, and its network fiber densification along with the associated "scalable infrastructure" capital needed to enable Comcast's DOCSIS 3.x cable modem services.⁴⁰⁸

⁴⁰⁶ Comcast Corporation's segments include cable communications, cable networks, broadcast television, filmed entertainment, theme parks, and internal corporate. Throughout this report we present results for Comcast Corp. that exclude all financials from segments other than cable communications.

⁴⁰⁷ For 2005–2016, Comcast's cable segment capital expenditures each year were: \$3.41B; \$4.2B; \$6.0B; \$5.5B; \$5.0B; \$4.9B; \$4.8B; \$4.9B; \$5.4B; \$6.2B; \$7.0B; \$7.6B. *See* Comcast Corp., Financial and Operational Supplements, 2005–2016.

⁴⁰⁸ CPE, such as set-top boxes and Wi-Fi/modem gateways, continues to account for nearly half of Comcast's cable segment capital expenditures, but declined from 55 percent of cable segment capex during 2014 to 48 percent during 2016. 2015 was the peak year for its CPE investments, totaling \$3.7 billion. Comcast's investments in scalable infrastructure and upgrades/rebuilds increased from \$1.375 billion in 2014 to \$1.539 billion in 2015, and rose again to \$1.827 billion during 2016. Comcast's investments in line extensions increased from \$673 million in 2014 to \$886 million in 2015, increasing again to \$1.208 billion during 2016. *See* Comcast Corp., Financial and Operational Supplements, 2005–2016; *see also* Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corp., Q4 2015 Comcast Corp. Earnings Conference Call (Feb. 3, 2016) ("At Cable Communications, capital expenditures increased 10.2 percent to \$2.1 billion for the fourth quarter and 14.3 percent to \$7 billion for the year. This growth reflects higher spending on our customer premises equipment, including X1 and wireless gateways, increased investment in network infrastructure to increase network capacity, as well as the continued investment to expand Business Services. In 2016, we will continue to invest in each of these areas as they are driving positive results in our business.") (emphasis added); Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corp., Q3 2016 Comcast Corp. Earnings Call (Oct. 26, 2016) ("While the largest component of our capital spending continues to be customer premise equipment including X1 and wireless gateways, the largest source of year-over-year growth in spending is our investment in scalable infrastructure to increase network capacity. We believe this investment in scalable infrastructure enhances our competitive position in broadband by staying ahead of rapid growth and bandwidth consumption by our customers. In addition, we

It is important to emphasize that while Comcast's recent capital investment increases contributed to the company's expanded broadband capacity, Comcast was previously able to increase service speeds while decreasing capital investments during its nationwide DOCSIS 3.0 rollout.⁴⁰⁹ This may seem counterintuitive, but it simply reflects the reality that for cable companies, the cost of increasing their capacity is primarily a function of the cost of electronics on each end of an already deployed coaxial cable line. That cost continues to decline as technology improves. Thus, if the public policy goal is nearly universal availability of latest-generation telecommunications technology as quickly as possible, capital expenditure is a poor metric for assessing progress.

In sum, Comcast's elevated capital expenditures in the two years following the FCC's *Open Internet Order* vote were largely due to the company's massive increase in network infrastructure investments. During the two years prior to the FCC's vote, Comcast invested \$3.37 billion in its core network infrastructure (line extensions, upgrade/rebuilds, and scalable infrastructure; see Figure 26 above). In the two years following the FCC's February 2015 vote, Comcast's network investments jumped a whopping 62 percent, with a two-year total of \$5.46 billion. These investments translate into higher-capacity services. For example, the majority of Comcast's footprint will be DOCSIS 3.1 capable by the end of 2017, with multi-gigabit symmetrical services rolled out the following year.⁴¹⁰ In the year following the FCC's 2015 vote, Comcast deployed 2 gigabit symmetrical service to 18 million customer locations.⁴¹¹ Also during

have extended our network to more customer addresses primarily business addresses through line extensions. We continue to expect that for the full year of 2016 our cable capital intensity will remain flat to 2015 at approximately 15 percent.”) (emphasis added); Comments of Neil Smit, Senior EVP & President, CEO, Comcast Cable, Q3 2016 Comcast Corp. Earnings Conference Call (Oct. 26, 2016) (“Concerning the network, we have continued to invest over the years in our network capacity and we will continue to do that. Business services has brought fiber deeper into the network. We are going fiber direct to new developments and to some MDUs. So we will continue to invest in the network but it is nothing new to our business. We have increased capacity, doubled capacity every 18 to 24 months and that has been happening for the last 8 to 10 years. So we feel pretty good about our position.”) (emphasis added).

⁴⁰⁹ See Comcast Corp. Financial Supplements for periods ending 12/31/2008, 12/31/2009, 12/31/2010, and 12/31/2011.

⁴¹⁰ See, e.g., Comments of Neil Smit, Senior EVP & President, CEO, Comcast Cable, at Deutsche Bank Media, Internet and Telecom Conference (Mar. 6, 2017) (“[W]e are going to continue to grow out DOCSIS 3.1, it will be at the majority of our households; it will be available by the end of the year. We have already rolled it out in Atlanta, Chicago, Detroit, Nashville. So we are seeing the roll out going very effectively [O]ver the next 24 months we are going to do DOCSIS symmetrical – DOCSIS Duplex, rather, that will get symmetrical speeds – multi-gigabit speeds out into the network, leveraging our core network, our HFC plant. And we continue to roll fiber deeper into the network both with business services as well as with residential. And so, we feel very confident that our network is extendable and flexible and we can continue to deliver higher speeds.”).

⁴¹¹ See Comments of Neil Smit, Senior EVP & President, CEO, Comcast Cable, Q1 2015 Comcast Corp. Earnings Conference Call (May 4, 2015) (“We have invested significantly in our capacity and will continue to do so and that includes both the – we launched a 2 gigabit speed, 2

2015, the proportion of Comcast’s ISP customers subscribing to service with 50 megabits per second (“Mbps”) or greater downstream speeds increased from 58 percent to 77 percent.⁴¹²

These measurable facts clearly indicate that the *Open Internet Order* had no negative impact on Comcast’s network investments, which increased to historic levels following the FCC’s vote. Nor did that order impact the quality of services available in Comcast’s footprint, as it deploys the latest-generation technology as fast as humanly possible. As the nation’s largest home internet service provider, Comcast’s candid statements about the impact of regulation are of particular importance. These pronouncements are not as informative as its actions, but the signals sent to shareholders have weight too. Thus it is particularly telling that mentions of Title II and the Open Internet rules were absent from Comcast’s public statements during quarterly investor calls⁴¹³ and nearly all investor conferences following the February 2015 vote, until after the November 2016 election.⁴¹⁴

gigabit symmetrical speed recently. We are rolling that out across 18 million homes by the end of the year and we’ve got the fastest in-home Wi-Fi router.”).

⁴¹² See Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corp., Q4 2014 Comcast Corp. Earnings Conference Call (Feb. 24, 2015) (“High-speed Internet revenue increased 9.5 percent for the year reflecting continued growth in our customer base, rate adjustments and an increasing number of customers taking higher-speed services. At year-end 58 percent of our residential high-speed Internet customers receive speeds of at least 50 megabits, a meaningful increase compared to 2013.”); Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corp., Q4 2015 Comcast Corp. Earnings Conference Call (Feb. 3, 2016) (“The strong momentum in our high-speed data business continued. Revenue increased 9.8 percent during the quarter, making it again the leading contributor to overall cable revenue growth, driven by an impressive increase in our customer base, as well as rate adjustments and an increasing number of customers taking higher-speed services. We added 460,000 data customers during the quarter and 1.4 million during the full year with 77 percent of our customers receiving speeds of 50 megabits per second or greater.”).

⁴¹³ No questions were asked about, nor did Comcast make any comments concerning Title II or the FCC’s Open Internet rules, on its Q2 2015, Q3 2015, Q4 2015, Q1 2016, Q2 2016, and Q3 2016 investor calls. Title II did come up on Comcast’s Q1 2015 investor call (the first one following the FCC’s vote). Comcast was asked by an analyst, “now that Title II is the new state of the world, if you can lay out for us how you see that framework affecting broadband pricing going forward or what you can or cannot do with this new framework now?” Comcast Cable CEO Neil Smit responded, “on Title II, it really hasn’t affected the way we have been doing our business or will do our business. We believe in Open Internet and while we don’t necessarily agree with the Title II implementation, we conduct our business the same we always have, transparency and nonpaid peering and things like that.” See Comments of Neil Smit, Senior EVP & President, CEO, Comcast Cable, Q1 2015 Comcast Corp. Earnings Conference Call (May 4, 2015) (emphases added).

⁴¹⁴ The topic of Title II and the FCC’s *Open Internet Order* was largely absent from the discussions with Comcast executives at the numerous analyst conferences during the 21-month period following the FCC’s February 2015 vote until after the November 2016 election. The exception was the May 2016 MoffetNathanson Media & Communications Summit, when the topic was in the news due to the pending decision of the appeal by the D.C. Circuit. When asked

Comcast's first statements on this issue following that 2016 election were quite telling, but not surprising to anyone who has closely followed this company and this sector in recent years. Given the election of a president who had ignorantly assailed the FCC's Net Neutrality policies, investors were clamoring for concrete answers on how the potential reversal of the 2015 decision would impact Comcast's business. At the December 2016 UBS Global Media and Communications Conference, Comcast executive Mike Cavanagh was asked "if you saw Title II go away or the reclassification undone, would that be a meaningful change or meaningful benefit for Comcast?" He answered:

I think in terms of what actually happens – I've been asked this – it's the fear of what Title II could have meant, more than what it actually did mean. And, as you know, we very much believe in the principles behind what policy was trying to get at, but the overhang of where it could go in the future was something that I think had a chilling effect. Hopefully that chilling effect is gone; both from how investors look at the space and businesses look at the space.⁴¹⁵

During this same talk, along with his admission that Title II had no impact on Comcast's business, Cavanagh also noted Comcast had made considerable progress on its deployment "roadmap" towards DOCSIS 3.1-enabled symmetrical multi-gigabit broadband.⁴¹⁶ He called broadband a "fantastic business,"⁴¹⁷ acknowledged that Comcast has "long-term pricing power in

if he felt that "cable is being unfairly targeted by the FCC right now," Comcast executive Neil Smit said "I think we've operated under the consent decree for six years now in conditions like net neutrality and it hasn't affected the way we run the business." Smit made no other mention of FCC regulations (past or future), Title II, or the specific Open Internet rule prohibitions. Smit did pivot, however, and note the company's myriad network investments: "We are launching DOCSIS 3.1 in Atlanta right now and have announced four other cities, so we can get the gigabits speeds. We have an Internet Pro product where we can offer up to 2 gigs and we are investing a lot in Wi-Fi and we will have multi-gigabit routers coming out in the relatively near future. So if you get a gig coming up to the house, you can actually get a gig going through the house across the Wi-Fi network with all the devices people are hanging over it. So I think it's – and the DOCSIS – our HFC network is very flexible. We can do things beyond DOCSIS. So I think it's continued investment in capacity. We double our capacity every 18 months or so, but we want to have the best product out there both inside and outside the house." *See* Comments of Neil Smit, Senior EVP and President & CEO, Comcast Cable Communications, at the MoffettNathanson Media & Communications Summit (May 19, 2016).

⁴¹⁵ *See* Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corp., at the UBS Global Media and Communications Conference (Dec. 7, 2016).

⁴¹⁶ *See id.* ("In a couple of years' time, we'll have the next-generation DOCSIS, which will allow for a multi-gig symmetrical. So that's our roadmap; nothing changes about that roadmap. And, of course, we preserve the ability to take fiber directly all the way anywhere where it makes sense.").

⁴¹⁷ *See id.* ("The broadband business just is a fantastic business, so it's – we've been investing, again, heavily in making that the best product, the best broadband, best Wi-Fi in home, and making sure that that extends as a value proposition to our customers. You think about – I think last year was the 10th year in a row with more than 1 million high-speed data net adds. Last year, in particular, it was 1.3 million and change. This year we're tracking to be right in that same ZIP

the broadband product,” and noted that “regardless of regulatory, [broadband is] a product that has a trajectory where pricing it properly and getting paid well for the investment we’re making seems very reasonable to me to be able to be done well over the long term.”⁴¹⁸

So according to Comcast’s Chief Financial Officer, Title II had no negative impact on its investments or business in any way. Comcast made and will continue to make substantial profits from its broadband investments. And Comcast’s investment decisions depend on market realities, not regulatory authority.

Comcast’s most recent comments to investor analysts on the matter of potential Title II repeal continue to reflect this reality, that the legal framework change has not had and will not have an impact on its broadband investments. However, now that Title II repeal is a possibility, Comcast is of course eager to see it go. The company clearly feels that since there’s a compliant regulator, it might as well do away with Title II authority just in case Comcast decides in the future to engage in the discriminatory behaviors it swears it will never entertain.⁴¹⁹ But the fact that the topic of Title II and the Open Internet rules disappeared from Comcast’s investor calls for nearly two years following the FCC’s vote, and that Comcast followed a roadmap for multi-gigabit symmetrical broadband deployment in that time, strongly suggest that the policy is working as intended. Maintaining baseline nondiscrimination obligations on solid legal authority is steering Comcast – a company that once blocked the BitTorrent protocol – away from unreasonably discriminatory practices, and towards investments that benefit its businesses, its customers, and the businesses that reach Comcast’s ISP customers via the open internet.

Code, so we got a lot of runway ahead of us, both in terms of more volume and ability to monetize that business.”) (emphasis added).

⁴¹⁸ *See id.* When asked “what’s your view on the pricing power you have in the high-speed data business and does that change? Is it potentially improved if we do get the regulatory changes it seems like we’re set to see?” Cavanagh also said, “You know, we feel that we’ve got long-term pricing power in the broadband product. It’s a product that is – the use cases for – the data usage of our networks grow at a ridiculous pace, which reflects people using the product, getting value, whether it’s us providing the service that’s utilizing the data. Obviously, video is the killer app for why you need such high-speed data, but it’s not the only one. And with the plethora of things going on in the digital and internet ecosystem around us, we think that the consumers’ experienced value of the product is going to keep growing. And that’s a good backdrop for making sure we can monetize it.”

⁴¹⁹ *See* Comments of Brian Roberts, Chairman & CEO, Comcast Corp., Q4 2016 Comcast Corp. Earnings Call (Jan. 26, 2017) (“I think regulatory certainty for investors is the same as it is for management: it helps you have the confidence to make long-term plans. And the kind of discussion we’ve been having this morning, whether it’s fiber or other investments in in-home equipment and what your business opportunities are, the more uncertainty, the less encouraging it is to want to invest. So we are encouraged by the prospect of rules that we believe will encourage that investment, stimulate investment, whether that’s tax decreases or revisiting the authority of the government to go to places that they said they weren’t going to but legally they could go to in the Open Internet order with Title II.”).

Indeed, it was Comcast's ham-fisted blocking of Bit Torrent that led the FCC eventually to return to Title II for the Open Internet rules. The trajectory of Comcast's network management and investment practices in the years since it started that chain of events illustrates the importance of policy incentives that discourage unreasonable discrimination and artificial scarcity. Following the Bush FCC's admonishment of Comcast for its unreasonably discriminatory "network management" of peer-to-peer traffic, Comcast retooled its practices and began utilizing a congestion management technique that targeted specific heavy users' consumption during periods of actual congestion. It also dramatically increased its total network capacity and improved end-user speeds, making investments that largely eliminated any congestion the company claimed as the excuse for its decision to block the BitTorrent protocol originally.⁴²⁰ These investments not only enabled Comcast customers to use online video services that compete with Comcast's pay-TV business: they also enabled Comcast to offer an improved pay-TV experience to its customers, so they won't cut the TV cord as often; while at the same time giving Comcast an immensely profitable broadband revenues hedge against secular changes impacting pay-TV.⁴²¹

The mutually beneficial nature of the incentives put in place by the *Open Internet Order's* legal framework were made clear by Comcast's CEO one year after the FCC vote. When asked by a Morgan Stanley analyst to "help us think about where you are investing and how we might think about the trajectory of capital intensity over time," Brian Roberts said, "not all capital is created equal. Some you have to do and some you want to do. And right now we are in

⁴²⁰ See, e.g., Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corp., Q4 2016 Comcast Corp. Earnings Call, (Jan. 26, 2017) ("Through consistent investment in innovation, we offer the best broadband product on the market. We double the capacity of our network every 18 to 24 months, have increased internet speeds 17 times in the past 16 years, and now over 50 percent of our residential customers have speeds of 100 megabits per second or higher."); Comments of Neil Smit, Senior EVP & President, CEO, Comcast Cable, Q4 2016 Comcast Corp. Earnings Call (Jan. 26, 2017) ("Concerning the usage, our HSD usage went from an average of – a median of 88 gigabits per month in Q4 and that's up 55 percent from 57 gigabits during the same period of 2015.").

⁴²¹ See, e.g., Comments of Matt Strauss, Comcast Corp. EVP & GM, Video Services, Comcast Cable, at the Wells Fargo Technology, Media & Telecom Conference (Nov. 11, 2016) ("In many ways, video is foundational but at the same time we are continuing to invest in DOCSIS 3.1, which is allowing us to introduce gigabit speeds. We are continuing to invest in our XB6, which is our next-generation router which is going to have 5 times the Wi-Fi coverage, in addition to investing in Wi-Fi hotspots. We've got over 15 million Wi-Fi hotspots."); Comments of Neil Smit, Senior EVP & President, CEO, Comcast Cable, Q2 2016 Comcast Corp. Earnings Call (July 27, 2016). Smit was asked "how do you guys think about positioning a single play broadband product and [] how much flexibility do you have in pricing that?" He answered, "concerning single play and broadband we do market that. We think there is going to continue to be streaming services and OTT services that come through and broadband will continue to grow as we continue to invest in the network and the Wi-Fi capabilities." *Id.*

an era of the capital we are spending we want to. Giving you a better Wi-Fi in your house is job one. Giving you faster Internet speeds is job one [and] that is what's powering our success."⁴²²

Comcast's guidance for 2017 indicates that it could be another record year for its capital investments.⁴²³ And depending on how it markets its upcoming wireless service and utilizes its recently purchased 600 MHz spectrum, these investments could remain high. Of course, they might also decline – not because of regulatory fears, but because of the large amounts of capacity already enabled by Comcast's current DOCSIS 3.1 deployments, and because of CPE spending declines as it shifts pay-TV services towards a cloud-based model.⁴²⁴

In sum, Comcast (like most other ISPs) railed against the potential adoption of basic nondiscrimination rules under Title II authority prior to the FCC's 2015 *Open Internet Order* vote to do just that. Comcast predicted an unspecified amount of investment harm due to regulatory uncertainty, even as it claimed to agree with the actual legal duties set out in the actual Net Neutrality rules.⁴²⁵

⁴²² Comments of Brian Roberts, Chairman, President & CEO, Comcast Corp., at the Morgan Stanley Technology, Media & Telecom Conference (Mar. 1, 2016) (emphasis added). During this same interview, Roberts was asked "what do you tell your shareholders about the regulatory oversight around the business and whether that could impact your earnings power long-term?" He said, "I don't envision any great activity that would require a whole other conversation about us and try to execute this year the momentum that we've got. . . ." *Id.*

⁴²³ See, e.g., Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corp., Q4 2016 Comcast Corp. Earnings Call (Jan. 26, 2017) ("The full year was led by customer premise equipment, including X1 and wireless gateways, which remain the largest component of our capital expenditures, though spending declined modestly year over year. We also invested in our network through increased spending in line extensions as we extended our network to more business and residential customers and in scalable infrastructure as we invested to increase our network capacity. These investments enhance our competitive position, allowing us to continue to take advantage of opportunities to grow penetration and market share by delivering the best broadband product to more homes and businesses. For 2017, spending on CPE is expected to continue to decline while we increase our investment in network capacity as well as our investment in line extensions to reach more customers. As a result, our outlook is for 2017 capital intensity to remain flat to 2016 at approximately 15 percent.") (emphasis added).

⁴²⁴ See *id.* ("Longer term, as spending on CPE continues to decline as X1 scales and shifts to less expensive IP devices, we expect to see a decline in overall capital intensity.") (emphasis added); see also Comments of Neil Smit, Senior EVP & President, CEO, Comcast Cable, Q4 2016 Comcast Corp. Earnings Call (Jan. 26, 2017) ("If you look at cellular data usage, it's about 3 gigabits per month average, so there's a lot of capacity in the wired network.") (emphasis added).

⁴²⁵ See, e.g., Comments of Brian Roberts, Chairman, President & CEO, Comcast Corp., Q4 2014 Comcast Corp. Earnings Call (Feb. 24, 2015) ("We are absolutely for a free and open Internet. We even agree on what President Obama and Chairman Wheeler say should be in the rules – transparency, nondiscrimination, no blocking, no throttling and no paid prioritization – and we've been consistent in communicating our agreement with those principles. The disagreement boils down to what legal authority the FCC should use to put in place these rules. We think the Title II regulation is antiquated and has real downsides. So our attention, just like everyone else,

But following the 2015 vote, Comcast's investments increased dramatically as it accelerated its deployment of gigabit-capable infrastructure and next-generation pay-TV services (the latter in response to increased competition from online video services enabled by the open internet). And the entire issue of Title II essentially disappeared from the conversation. Whatever Comcast's actual concerns (if any) about FCC action were prior to that vote, those concerns apparently melted away once the final text of the order made clear that Title II with heavy forbearance would change nothing actually impacting the fundamentals of the ISP business.

None of this should come as a surprise to an honest and rational observer. The FCC adopted a highly deregulatory, forbearance-heavy policy framework that simply preserved the internet ecosystem's and broadband market's status quo. This deregulatory Title II framework has had a quarter-century of success in the wireless voice market, and a decade-plus record of success spurring investment in the enterprise broadband market. The new FCC would be wise to let these facts guide its future actions, not the anti-regulatory faith-based alternative reality that those opposed to Title II construct in their attempt to tear down this highly successful framework.

Charter/Time Warner Cable/Bright House Networks

Charter Communications is yet another example of an ISP that dramatically increased its network investments during the two years following the FCC's *Open Internet Order* vote. While Charter's *pro forma* capital expenditures were flat during 2015, investment rose substantially during 2016 following its acquisitions of Time Warner Cable ("TWC") and Bright House Networks ("BHN"). During 2013–2014, these three legacy companies' capital expenditures totaled \$12.6 billion. From 2015–2016 Charter's *pro forma* capital investments topped \$14.5 billion, a 15 percent increase which came despite hundreds of millions of dollars (or more) in synergies that Charter claimed following the May 2016 closing of the deal. Charter's *pro forma* core network investments (*i.e.*, line extensions, upgrades/rebuilds, scalable infrastructure) increased in 2015 and again in 2016. The combined company's network investments were \$5.57 billion during the two years prior to the FCC's February 2015 vote, increasing by 24 percent to a total of \$6.9 billion in the two years after (see Figure 26 above).

is on the actual text of the order, the upcoming vote, the strength of forbearance and ultimately the Commission's focus on preservation of incentives for the private sector to continue to invest aggressively in broadband. . . . Obviously, my comments I just made about our view that we don't believe Title II was the right answer, but if that is indeed what happens, we will have to appropriately adjust and reflect on what the words are, what the specific details are. We are heartened that there is at least the desire to forbear from things that would be a disincentive to invest, but until we see the fine print, I think we have to reserve judgment."); *see also* Comments of Mike Cavanagh, Senior EVP & CFO, Comcast Corp., Q4 2014 Comcast Corp. Earnings Call (Feb. 24, 2015) ("[O]bviously the uncertainty that Title II may provide I think does provide us with the opportunity for a higher degree of scrutiny on capital and broadband. We really, as Brian said, need to look at the details, but there will be some internal scrutiny here in terms of what our investment plans look like with broadband."). Based on Comcast's increased and accelerated investments following this statement, it is clear that Comcast felt completely comfortable with the order's scope of regulatory forbearance.

Charter's *pro forma* capital expenditures have thus far exceeded guidance it gave investors in an August 2015 proxy statement.⁴²⁶ It estimated *pro forma* capital expenditures would be \$12.979 billion for 2015–2016. The actual amount proved to be \$14.514 billion, 12 percent higher than anticipated 16 months prior. Spending jumped even as the combined firm brought in almost exactly the proxy statement projection on revenues.⁴²⁷

The particulars of the Charter/TWC/BHN capital investment story, both before and after the *Open Internet Order* vote, are somewhat complex. We must account for each company's pre-existing trajectory and also the typical slowdown in spending during a merger review. Standalone Charter had completed its all-digital system upgrades nearly 18 months prior to the acquisition closing,⁴²⁸ but had not yet finished deployment of its cloud-based X1-style "Spectrum" IP-video platform.⁴²⁹ As of mid-2016, approximately 40 percent of the Time Warner Cable footprint and 60 percent of the BHN footprint had not yet converted to all-digital,⁴³⁰ but TWC had heavily promoted its higher-capacity "Maxx" services in the markets where its upgrades were complete.⁴³¹ According to

⁴²⁶ See Charter Communications Inc., Schedule 14A, Proxy Statement Pursuant to Section 14(a) of the Securities Exchange Act of 1934, at 221 (Aug. 18, 2015) ("August 2015 Proxy Statement").

⁴²⁷ See *id.* In the August 2015 Proxy Statement, Charter estimated *pro forma* revenues of \$77.01 billion for 2015–2016. The actual amount totaled \$77.417 billion, just 0.5 percent higher than originally estimated.

⁴²⁸ See Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2014 Charter Communications Inc. Earnings Call (Feb. 5, 2015) ("With all digital behind us, the capital intensity of our operations and our retained footprint will decline significantly in 2015, driving meaningful free cash flow growth.") (emphasis added).

⁴²⁹ See Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2015 Charter Communications Inc. Earnings Call (Feb. 4, 2016) ("Through the course of 2016, we're rolling out our new cloud-based Spectrum Guide. Our initial Spectrum Guide launches are working and scaling well, with positive customer response. Spectrum Guide's more intuitive and feature-rich user interface improves both video search and discovery, fully enables our on-demand offering, and allows us to include internet video in the Guide, which enhances the value of our service. And because the Guide is cloud-based, and will work across nearly all of our 10 million set top boxes, we can launch and refresh the Guide without purchasing or installing new set top boxes. By avoiding deployment of new boxes, Spectrum Guide minimizes customer disruption, and accelerates the time to put a modern UI on every outlet.").

⁴³⁰ See Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2016 Charter Communications Inc. Earnings Call (Feb. 16, 2017) ("In the second quarter, we'll restart our all-digital deployment, featuring fully two-way advanced set top boxes to video customers in the approximately 40 percent of TWC and 60 percent of Bright House that are not yet all-digital, which allows us to offer more HD, interactivity on every video outlet, faster data speeds, and reduced operating costs. We should be 100 percent all-digital in less than two years.").

⁴³¹ See, e.g., Comments of Rob Marcus, Chairman & CEO, Time Warner Cable Inc., Q1 2016 TWC Earnings Call (Apr. 28, 2016) ("TWC Maxx is proceeding apace. At quarter end that all digital conversion and broadband speed increases were complete in around half our footprint,

Charter, the substantial increase in its *pro forma* capital investments during 2016 were largely due to increases in core network equipment (*e.g.*, CMTS units).⁴³² These increases more than offset savings from other IT-related synergies⁴³³ and from the company's later "pause" of all-digital upgrades in the legacy TWC markets.⁴³⁴ Charter has since restarted those all-digital upgrades, and the company expects capital expenses will remain elevated for the next couple of years⁴³⁵ before efficiency gains translate into a return to "normal" levels.⁴³⁶

with another quarter of our footprint in process. . . . Customer satisfaction and churn improvements in Maxx markets continued to outpace those in non-Maxx markets.”).

⁴³² A cable modem termination system (“CMTS”) is a piece of equipment at the cable headend used to provide high speed data services. *See* Comments of Chris Winfrey, EVP & CFO, Charter Communications Inc., Q2 2016 Charter Communications Inc. Earnings Call (Aug. 9, 2016) (“There was also some what I believe is pull-forward of good capital, but a significant pull-forward of capital around CMTS and routers and some of that type of activity. That should slow down a little bit as well. But the danger in providing capex guidance or even expectations is, frankly, if we see the opportunity to go make an investment that’s going to put the Company in a position to grow faster, then we’re going to do that inside of a particular quarter or inside of a particular last 12 months or fiscal year. And our view on the trends of capex is that capital intensity will go down significantly once we get through the all-digital program.”).

⁴³³ *See id.* (“In Q2, excluding transition capital, TWC spend [on] capital [was] approximately 21 percent, Charter 18 percent, and Bright House 15 percent of revenue, respectively. Going forward, obvious we’ll reduce the spend on IT, product development, and other areas which were by definition duplicative, and we should see a short-term benefit from the regrouping on the remaining all-digital projects Even though capex was being spent at a more elevated level, and it included the duplicative portion of capex which is three different companies spending on IT and different types of product development . . . at least [] 2 if not 3 times over. So that’s another area that it should automatically get more efficient.”).

⁴³⁴ *See* Comments of Chris Winfrey, EVP & CFO, Charter Communications Inc., Q2 2016 Charter Communications Inc. Earnings Call (Aug. 9, 2016) (“We’re not going to be providing capex guidance. But I think the thing that is clear is that one of the big drivers for spend in the first half of the year on a pro forma basis – again, it wasn’t us managing the combined capex But there was obviously the significant amount of all-digital activity that was continuing at TWC, and that will be largely put on hold as we put it in the Charter all-digital strategy beginning at the beginning of next year.”).

⁴³⁵ *See* Comments of Chris Winfrey, EVP & CFO, Charter Communications Inc., Q4 2016 Charter Communications Inc. Earnings Call (Feb. 16, 2017) (“The all-digital will restart in Q2, and it will go probably for around two years. But the bulk of the activity [] is going to be taking place next year, so we’ll be doing all-digital from Q2 to the end of this year, but the bulk of it’s going to be in 2018. There will be some CapEx associated with that rollout. The bigger portion of CapEx this year is going to be driven by a higher amount of CPE and placement costs for Spectrum pricing and packaging connects, because A, we expect sales in connects to be higher, as we’ve already seen in the markets where we’ve gone. But, when we do an install under Spectrum pricing and packaging, there’s a higher number of devices that we’re placing in the home because of our two-way set top box strategy, as well as our strategy not to charge for modem rental, and to have reasonable router fees, which means that you’re going to put more

So, we know that Charter's *pro forma* capital expenditures and core network investments increased following the restoration of Title II, even as the company paused TWC's all-digital upgrades and even with merger synergy-related savings. But how does this increased spending translate into what's available and what will shortly be available to internet users living in Charter's expanded footprint? Charter's legacy footprint was already all-digital and DOCSIS 3.0-enabled prior to the FCC's Open Internet vote. During the year following it, the percentage of Charter customers on a 60 Mbps downstream tier increased from 80 percent to 90 percent.⁴³⁷ Prior to the November 2016 election, Charter made clear its plans to complete the all-digital upgrades of TWC and BHN systems by the end of 2018.⁴³⁸ Charter is preparing to roll out DOCSIS 3.1,⁴³⁹ and expects to have all of its 50 million-plus customer locations multi-gigabit enabled by the end of 2021.⁴⁴⁰ Charter also told investors that it will begin offering symmetrical

capital into the home on an average transaction, and we expect to have higher transactions. So that's going to be a bigger driver in 2017, offset by some transaction synergies. . . .").

⁴³⁶ *See id.* ("On capex, we're not providing capex guidance, just because we approved a budget internally which is what we want to operationally deploy this year. It could be less than that, just because of what practically can be done, or it can be in a position to accelerate. But from our perspective, it doesn't make sense to really set an artificial target, try to wag the dog for what's ultimately right. But if you think back to what I said, in 2017, we will be spending more on Spectrum pricing and packaging through that higher CP placement for connect. We will restart all-digital. We will be insourcing. But offsetting some of that increase will be the benefit of synergies. So without giving specific guidance, 2017 is probably a bit higher in terms of absolute dollars than what we were pro forma in 2016, but it shouldn't be a dramatic change in terms of capital intensity or capex as a percentage of revenue.").

⁴³⁷ *See* Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2014 Charter Communications Inc. Earnings Call (Feb. 5, 2015) ("And at year end, over 80 percent of our internet customer base subscribed to tiers that provided 60 megabits or more."); Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2015 Charter Communications Inc. Earnings Call (Feb. 4, 2016) ("As of the end of the fourth quarter, nearly 90 percent of our residential internet customers subscribed to internet service that provided speeds of 60 megabits or more.").

⁴³⁸ *See* Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q2 2016 Charter Communications Inc. Earnings Call (Aug. 9, 2016) ("In 2017, the all-digital project at Time Warner Cable and Bright House markets will use the Charter all-digital strategy, which uses fully functioning two-way set-top boxes with video-on-demand and advanced guide functionality on every TV outlet. We expect the project to be completed by 2018.").

⁴³⁹ *See* Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2015 Charter Communications Inc. Earnings Call (Feb. 4, 2016) ("[W]ith regard to 3.1, we didn't specifically plan for it in Legacy Charter in this fiscal year. But the modems will become available commercially later this year, and we think that it's possible that we'll start to deploy those modems, in lieu of 3.0 modems. But we don't have a specific plan to do that yet. But over the next 18 months, this platform is going to become available to the industry, at commercially deployable pricing. And we expect that we will begin the transition in the new Company over that timeframe.").

⁴⁴⁰ *See* Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q3 2016 Charter Communications Inc. Earnings Call (Nov. 3, 2016) ("Over the next five years or so, with

10 gigabit services over coaxial infrastructure before the end of 2020.⁴⁴¹ And because most of the network is already in place, and because of coaxial cable’s large room for increased capacity too, Charter is going to deploy these future-proofed capacities even as its capital investments decline.⁴⁴²

Thus, it is clear that Charter planned for (and began upgrading) its systems to be multi-gigabit capable during the months following the FCC’s vote to restore Title II and adopt the Open Internet rules. Charter repeatedly told investors to expect higher capital investments in the period following the FCC’s February 2015 vote, and emphasized that network investment was its top priority, even ahead of returning capital to shareholders.⁴⁴³ Charter followed through, and it continues to follow through on its investment and upgrade promises made when the company believed that Title II would likely remain in place for the foreseeable future. In many markets, Charter’s entry-level service is 100 megabits per second – a capacity four-times the level the FCC considers to be “advanced,” and that Chairman Pai has previously said most ISP customers do not want even if it is available.⁴⁴⁴ After Title II’s restoration but before the 2016 election,

relatively small infrastructure investments, our network will be able to deliver symmetrical multi-gigabit speeds with high compute and low latency capabilities to all 50 million homes and businesses in our footprint.”).

⁴⁴¹ See Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., at the Deutsche Bank Media, Internet and Telecom Conference (Mar. 6, 2017). When asked “what do you think the timing is on [10-gig symmetrical] commercial availability,” Rutledge answered, “probably three years from now.” See *id.*

⁴⁴² See, e.g., August 2015 Proxy Statement at 221 (showing Charter’s projection that *pro forma* capital expenditures would peak in 2017, decline by 6 percent during 2018, and decline by another 10 percent during 2019); see also Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2016 Charter Communications Inc. Earnings Call (Feb. 16, 2017) (“So we’re very comfortable with the extensibility of our network, and the ability to put high capacity anywhere in our network. We have a cable labs project, which is an industry association organization, that has developed 10-gig symmetrical products in the lab that are capable of running on our nodal architecture. To get to those speeds, we may need to go deeper with our fiber, but we can go to 5G symmetrical with less deep fiber penetration. So we think we have a very flexible architecture that allows us to grow significant capacity, without a lot of capital investment.”) (emphasis added); Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q1 2016 Charter Communications Inc. Earnings Call (Apr. 28, 2016) (noting the coming savings from cloud-based IP-TV services, and explaining that “[e]lectronic disconnects and self installs will provide significant benefits to Charter systems in the coming years. It will also reduce operating costs and capital expenditures.”).

⁴⁴³ See Comments of Chris Winfrey, EVP & CFO, Charter Communications Inc, Q2 2016 Charter Communications Inc. Earnings Call (Aug. 9, 2016) (“But in order of priority, we’ll invest in our business, including areas that provide faster and more sustainable growth; pursue accretive M&A when available and ready; return capital to shareholders in the form of share repurchases; and if we had no better use of cash or determined it prudent to reduce our target leverage, we’ll pay down debt.”).

⁴⁴⁴ See *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such*

Charter outlined plans to spend heavily to complete all-digital upgrades of the legacy TWC and BHN systems, and made clear that it would offer multi-gigabit services as quickly as DOCSIS 3.1 modems were available on a mass-market basis.⁴⁴⁵ And it undertook these activities in part as a response to the growing online video competition that takes place over its broadband network⁴⁴⁶ – competition that the FCC’s Open Internet rules promote and protect.

Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, 30 FC Rcd 1375, 1485 (2015) (Dissenting Statement of Commissioner Ajit Pai) (“For today’s report declares that 10 Mbps Internet access service is no longer broadband. Only 25 Mbps or more counts. This decision should surprise American consumers. 71 percent of consumers who can purchase fixed 25 Mbps service – over 70 million households – choose not to.”).

⁴⁴⁵ See Alan Breznick, “Charter Issues RFP for D3.1 Modems,” *Light Reading* (Mar. 7, 2017) (“Charter Communications has put out an RFP on DOCSIS 3.1 cable modems to equipment suppliers as it gets ready to try out the new cable broadband spec.”).

⁴⁴⁶ See, e.g., Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2015 Charter Communications Inc. Earnings Call (Feb. 4, 2016) (“And because the [Spectrum Guide] is cloud-based, and will work across nearly all of our 10 million set top boxes, we can launch and refresh the Guide without purchasing or installing new set top boxes. By avoiding deployment of new boxes, Spectrum Guide minimizes customer disruption, and accelerates the time to put a modern UI on every outlet. It turns every TV into a connected smart TV, and allows us to integrate third party video services, including over the top providers like YouTube, Netflix, Hulu, and Amazon Prime, giving customers the ability to search and view all the content they’re interested in, without changing consumer owned hardware or devices. . . . And so we think that we have a tremendous upside to grow our own business, with the quality of video services that we can build and provide, and with the service infrastructure we’ve built around that. I do think – we’ve talked about the macro issues previously, and the pressures on video, most of which I think are economic. The costs have been high. It does look like costs have moderated a little bit on the margin. And that’s partially because over the top is affecting the value of content, in a good way, from our perspective.”); see also Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q1 2016 Charter Communications Inc. Earnings Call (Apr. 28, 2016) (“Our go-to-market strategy and our programming relationships are designed to encourage the sale of our existing products and the development of over-the-top products. Our broadband package and the capabilities of our broadband service are realized when customers use it. They use it when they subscribe to over-the-top services. Video is the most bandwidth-intensive product there is. We have superior network, which we have invested to make superior. We cleared it to create more spectrum available for broadband. We’ve taken broadband speeds up and capabilities. The way that our drive into the marketplace is accelerated is by people’s perceiving the value of our broadband and the way they perceive that value is through over-the-top I don’t know how high broadband penetration can go. I think it continues to rise. I think there are other – there are substitution possibilities on the margins that are already occurring, but I think that we have a better infrastructure and we’ve invested in a better infrastructure and I think we have an opportunity to take significant share.”) (emphasis added); Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q2 2016 Charter Communications Inc. Earnings Call (Aug. 9, 2016) (“And by going all-digital and using your two-way interactive

These are not the actions of a company that is retreating in fear of regulation. They are the actions of a company that is deploying new services as fast as possible. These are the actions of a company that is smartly leveraging its natural monopoly position with relatively modest investments in order to grow its business and network capacity,⁴⁴⁷ just as it did before the FCC's vote too.

And while its actions speak louder than its words, Charter also has made clear its thoughts on Title II's ultimate impact. Even though the topic largely disappeared from its investor calls during 2015–2016, when the subject did arise Charter executives repeatedly stated that Title II had no and would have no negative impact on its investments or overall business. For example, Charter was asked about Title II on its May 1, 2015 investor call (for Q1 2015 results), which followed the FCC's vote. Charter CEO Tom Rutledge told analysts that “Title II was a – it's actually a longstanding issue. . . . Although I wish it were structured differently and I thought that the outcome was less than ideal, I don't think that is particularly related to being friendly or not friendly to cable in general.”⁴⁴⁸ One month later Rutledge recounted a

platform, you can build a better video product than your competitors, in my opinion; which is why I think Charter is growing its video business year-over-year. It's a slow process. The inertia is real in the marketplace. But I think Charter has turned the video business positively, and I think the same is possible in Time Warner and Bright House. But it requires the proper investment in a video product, which means you need a two-way product with an excellent user interface and all the functionality and features that you get from an Internet-type-like service with live, fully featured content. So I think there's still lots of upside selling traditional MVPD products, that cable service, to customers who have broadband only.”)

⁴⁴⁷ See, e.g., Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2016 Charter Communications Inc. Earnings Call (Feb. 16, 2017) (“There are a bunch of ways you can manage capacity on our network. We can do what are called virtual node splits. So what that means is if you clear spectrum electronic – take off analog spectrum and go all-digital, and you have excess capacity in your network, and you have demand that would say, I need to put more capacity in a node, there's two ways of doing it. One way is to physically split the node into a smaller node, which requires the placing of an electronic device in the field, and maybe the expansion of some fiber, depends on how the architecture of that is structured, but it's a relatively – it's inexpensive on a grand scale capital perspective, but a lot more expensive than a digital or virtual node split. You can do those if you have channel capacity, by just recreating additional DOCSIS paths, you can create a virtual node, essentially. We manage our network for the future based on the actual load on the network, as opposed to some theoretical issue, and there are other ways of getting capacity out of all-digital networks. Like for instance, most of our set top boxes now are capable of IP delivery. They're also capable of MPEG4 delivery, which means that we can squeeze the capacity out of our video business, and get more DOCSIS capability in our network, which means we can do more virtual or electronic node splitting than we might have done a couple of years ago. And that's a function of our CPE strategy. So we're managing all of those things together to get capacity. But in any model we get to, some future state, where there's a whole new product set that requires massive capacity that currently isn't required, we would take our fiber deeper and go to a passive network, and go to the symmetrical 5 or 10 gig that I talked about earlier.”) (emphases added).

⁴⁴⁸ See Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q1 2015 Charter Communications Inc. Earnings Call (May 1, 2015) (“Title II was a – it's actually a

conversation he had with then-FCC Chairman Tom Wheeler, who asked him directly “are you not going to invest?” with Rutledge responding, “obviously I’m investing.”⁴⁴⁹

Other than these two mentions, and one further comment in May 2015 when Charter volunteered that it has “no plans to block, throttle or engage in paid prioritization of internet traffic,”⁴⁵⁰ the issue of Title II was not raised at any of Charter’s investor calls or conference appearances until after the November 2016 election. At the December 2016 UBS Global Media and Communications Conference, Rutledge was asked about what the new administration “means for Charter and the cable industry.” He responded, “I mean, Title II, it didn't really hurt us; it hasn't hurt us.”⁴⁵¹ A similar question was asked on Charter’s February 2017 investor call, and Rutledge again noted, “look, we had a lot of headwinds in the previous administration, from a regulatory point of view, we got Title II. It didn't really affect us but had the potential of affecting us.”⁴⁵²

In sum, Charter’s network investments increased following the FCC’s Title II reclassification. Charter’s post-vote investments exceeded its own predictions. Charter is deploying the latest generation of cable modem technology in rapid fashion, and is following

longstanding issue. The issue of net neutrality has been around for a long time and companies have been agitating. It’s been part of the President's agenda all along, and he campaigned on it initially. So it’s not surprising that the forces that prevailed there did. Although I wish it were structured differently and I thought that the outcome was less than ideal, I don’t think that is particularly related to being friendly or not friendly to cable in general.”).

⁴⁴⁹ On June 17, 2015, at the Guggenheim TMT Conference, Rutledge was asked about Title II authority versus the failed effort of the Genachowski FCC to adopt rules under a 706 theory. The questioner recounting his recent conversation with the former Chairman stated, “[Genachowski] said that he doesn’t see any signs that capital spending – you look at the auctions or spectrum, and you look at the spending – that the uncertainty of regulatory is not inhibiting the deployment. And [Charter is] talking about deploying capital.” Rutledge responded, “Well I had to file an ex parte statement after I saw the FCC. And they asked me that question, so why are you here? Are you not going to invest? I said, no; I’m sort of – obviously I'm investing.” (Emphasis added).

⁴⁵⁰ See Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Charter Communications Inc. Conference Call Announcing Transactions with Time Warner Cable and Bright House Networks, M&A Call (May 26, 2015) (“Charter invests significantly in interconnection. And in capacity before ports get congested, so customers will have a quality experience when watching on-line video or gaming. And regardless of Title II litigation, we have no plans to block, throttle or engage in paid prioritization of internet traffic.”).

⁴⁵¹ See Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., at the UBS Global Media and Communications Conference (Dec. 6, 2016) (“I mean, Title II, it didn't really hurt us; it hasn't hurt us. But it has the potential of hurting us. And even the privacy regulations, which have the potential of hurting us relatively – speaking to the edge companies, the Googles of the world and so forth – in terms of what kind of advertising products we have and what they’re allowed to do and what we’re not allowed to do. Those authorities come out of Title II.”) (emphasis added).

⁴⁵² See Comments of Tom Rutledge, Chairman & CEO, Charter Communications Inc., Q4 2016 Charter Communications Inc. Earnings Call (Feb. 16, 2017).

through on its post-vote commitment to upgrade all of its lines with multi-gigabit symmetrical capabilities well ahead of any market demand for this level of service. Charter repeatedly told its investors that Title II did not and would not impact its investments or business, and it voluntarily committed to the FCC's Open Internet rules even before they were codified. There's simply no logical reason to believe that the continued application of the FCC's deregulatory Title II framework has caused, or would cause, a negative impact on Charter's highly successful enterprise.

Altice/Cablevision/Suddenlink Communications

Netherlands-based Altice N.V. acquired mid-sized MSO Suddenlink Communications in December 2015, and closed on its acquisition of Cablevision Systems Corporation in June of 2016. Shortly thereafter, just about a year after the Open Internet vote, Altice announced a five-year plan to upgrade its entire footprint of 8.4 million locations with fiber-to-the-home technology capable of delivering 10 gigabits per second symmetrical.⁴⁵³ Analysts estimate Altice will spend up to \$9.6 billion to do so, meaning an average cost of \$1,100 per passing.⁴⁵⁴

Yet despite this ambitious plan, Altice estimates that its total U.S. capital expenditures will decline from the company's 2013 *pro forma* peak. This is another example of why absolute change in all ISPs' total capital investments – or even in a signal ISP's total outlay – is an exceedingly poor metric for measuring infrastructure availability. Altice claims to have a proprietary method for fiber deployment that leads to substantial cost savings. It is aided by the fact that much of its service area has aerial rather than buried lines.⁴⁵⁵ It also benefits from legacy Cablevision's and legacy Suddenlink's prior investments pushing fiber deeper into their networks.

⁴⁵³ See, e.g., Anita Balakrishnan, "Speedy new rival for Verizon Fios and Google Fiber headed to 20 states," *CNBC* (Nov. 30, 2017).

⁴⁵⁴ See Alan Breznick, "Altice USA Sticks to High-Fiber Diet," *Light Reading* (Mar. 9, 2017) ("Despite cutting back on its overall capital expenditures, Altice is still going full speed ahead with its plans to go all-fiber throughout its US territories. With the integration of its two new US cable properties (Cablevision Systems and Suddenlink Communications) continuing to proceed as planned, Altice is now building FTTH networks in the regions of both acquired cablecos. Plans call for blanketing nearly the entire Cablevision and Suddenlink footprints, encompassing a total of 8 million homes passed, with fiber by the end of 2022, at an estimated cost of up to \$9.6 billion.").

⁴⁵⁵ See Comments of Dexter Goei, President, Altice N.V., Q4 2016 Altice N.V. Earnings Call (Mar. 9, 2017) ("We clearly are focused on driving to our fiber-to-the-home rollout over the next five years. We're going to maintain the same capex budget envelope that we're spending today. We don't think we need to increase that. You have to remember that we are doing last-mile upgrade as opposed to end-to-end fiber-to-the-home build-out. And secondly that our network, even in the Optimum footprint, overall across our Altice USA footprint is 80 percent aerial, right. So we clearly believe that our capex needs are covered by our existing budget and spend that we're seeing in 2016 and we don't expect that to materially increase at all going forward.") (emphasis added).

Though total capex at Cablevision and Suddenlink combined declined from a 2013 peak, Altice's *pro forma* U.S. core network investments actually increased after the FCC's vote, peaking in 2015 (see Figure 26). This was due in part to large decreases in spending on CPE (such as set-top boxes) and support capital during 2015–2016, offset by increases in line extensions, upgrades/rebuilds and scalable infrastructure during 2015.

But even with its 2016 net capex declines, Altice managed to greatly increase the speeds offered to its newly-acquired Cablevision and Suddenlink customers. At the end of March 2016, Cablevision's peak consumer downstream speed offering was 101 megabits per second. With minor additional investments, Altice took this to 300 Mbps by the end of 2016.⁴⁵⁶ When it acquired Suddenlink, 50 percent of that predecessor's footprint was capable of delivering maximum downstream speeds of 150 Mbps. By the end of 2016, Altice's investments helped bring 58 percent of Suddenlink's lines up to gigabit speed capability.⁴⁵⁷ What's more, Altice's speed upgrades (and those made by Suddenlink⁴⁵⁸ and Cablevision prior to acquisition) are helping it to stay ahead of customer demand and helping it to grow bottom line profits.⁴⁵⁹

⁴⁵⁶ See Altice N.V., 2016 Results Investor Presentation at 9 (Mar. 9, 2017) (“Altice 2016 Results”); see also Comments of Dexter Goei, President, Altice N.V., Q3 2016 Altice N.V. Earnings Call (Nov. 10, 2016) (“Altice Q3 2016 Call”) (“Optimum has already made a lot of investments in its network, . . . It’s 100 percent digital, almost wholly encrypted with an average of 300 homes per node. The maximum download speed previously being offered to customers, though, were only 101 megabits, so we have directed a lot of investment over this in the last few months in taking this to 300 megabits across the whole footprint for residential customers and 350 megabits for commercial B2B customers, which meets our public interest commitments more than one year ahead of schedule and allows us to upsell more customers now for higher speeds. This included head-end equipment upgrades which are scalable for DOCSIS 3.1.”) (emphases added).

⁴⁵⁷ See Altice 2016 Results at 9; see also Altice Q3 2016 Call (“For Suddenlink, on the right-hand side, the cable network that we bought was less invested than Optimum’s, but we have continued with Project GigaSpeed to deliver next-generation one gig broadband services, reaching 46 percent of Suddenlink’s footprint by the end of September 2016. This is being achieved with the utilization of the network as more capacity is being freed up for broadband services, as well as encrypting the network for security and similar head-end equipment upgrades that we’ve done at Optimum.”) (emphasis added).

⁴⁵⁸ In 2014, Suddenlink started its upgrade project dubbed “Operation GigaSpeed,” which pushed fiber deeper into its networks and replaced headend and customer equipment in order to facilitate higher capacity ISP services. During 2014, Suddenlink upgraded half of its customers to this new capability. The bulk of the capital cost of this upgrade project came during 2015, with Altice reducing the pace of this DOCSIS-based project during 2016 as it changed to an all-fiber strategy. See Cequel Communications Holdings I, LLC, Annual Report for the Year Ended December 31, 2014 (“In 2014, we completed the initial phases of Operation GigaSpeed in 26 markets, which serve approximately 49 percent of our residential high-speed Internet customers. Those investments allowed us to increase the flagship Internet speed from 15 Mbps to 50 Mbps and to increase our top Internet speed to up to 150 Mbps to 300 Mbps in those markets. We spent approximately \$35.2 million of the total capital expenditures related to Operation GigaSpeed in the second half of 2014, and expect to spend \$85 million in 2015, with the remainder expected to

Altice describes its strategy as “upgrade networks, simplify and harmonize bundle offers, and then drive the penetration of higher broadband speeds and higher cash flows, which we can then reinvest to support further growth.”⁴⁶⁰ Altice’s adoption and revenue metrics indicate it is working as planned. For example, at the end of 2014, only 47 percent of Suddenlink ISP customers subscribed to service of 50 Mbps or faster downstream.⁴⁶¹ This increased to 87 percent at the end of 2015, and 90 percent at the end of 2016.⁴⁶² At the end of 2014, just 2

be invested during 2016 and 2017.”); Cequel Communications Holdings I, LLC, Annual Report for the Year Ended December 31, 2015 (“We completed the initial phases of Operation GigaSpeed in 112 markets, which serve over 90 percent of our residential high-speed Internet customers. Those investments allowed us to increase the flagship Internet speed from 15 Mbps to 50 Mbps and to increase our top Internet speed to up to 150 Mbps in those markets, with top speeds in 28 markets increasing to 1 Gbps, which serve approximately 50 percent of our residential high-speed Internet customers. For the year ended December 31, 2015, we spent approximately \$81.3 million of capital expenditures related to Operation GigaSpeed. Since the inception of Operation GigaSpeed, we have incurred \$116.5 million in capital expenditures related to this initiative.”); Cequel Communications Holdings I, LLC, Annual Report for the Year Ended December 31, 2016 (“For the year ended December 31, 2016, we incurred approximately \$31.5 million of capital expenditures related to Operation GigaSpeed. Since the inception of Operation GigaSpeed, we have incurred \$148 million of capital expenditures related to this initiative. In November 2016, we announced we would build a fiber-to-the-home network capable of delivering speeds of up to 10 Gbps across most of our footprint by the end of 2021.”).

⁴⁵⁹ See Altice Q3 2016 Call (“And to give you a sense of the impact on ARPUs as a customer, if you take 200 megabits for an extra EUR20 you get 3 to 3.5 times the speeds you were getting previously at the 60 megabits level. This is not a high incremental cost to the customer for a lot more value but it does have a meaningful impact on our cash flow growth. You can see particularly for Suddenlink this migration of customers to higher broadband speeds has increased the average broadband speeds delivered to customers from 19 megabits when Project GigaSpeed started to 82 megabits at the end of Q3. This is almost double the average speeds delivered at Optimum at 44 megabits. But we should now have a catch up that is really going to drive much better service for our customers now.” (emphasis added).

⁴⁶⁰ See Altice Q3 2016 Call (“As has been with every asset Altice has acquired, we are focused on upgrading our broadband networks to drive increases in broadband speeds and better customer experience. And if you’re driving higher broadband speeds and higher ARPUs you’re driving very high incremental cash flow growth. This is a common approach across the entire Altice Group[.] Altice USA is now the prime example of this approach [I]mmediately after the closing of Optimum we focused on upgrading the Optimum network and selling higher than 100 megabits speeds. Following this upgrade you can see the spike in the number of new customers taking higher speeds since we made these early network upgrades from just 12 percent previously to about 40 percent by the end of Q3. And at just 8 percent of the total base taking higher speeds over 100 megabits, we think there’s a lot of further growth to come from this.”).

⁴⁶¹ See Cequel Communications Holdings I, LLC, Annual Report for the Year Ended December 31, 2014. According to Cequel, 87 percent of Suddenlink’s ISP customers subscribed to 15 Mbps or faster downstream services.

⁴⁶² See Cequel Communications Holdings I, LLC, Annual Report for the Year Ended December 31, 2015; *see also* Cequel Communications Holdings I, LLC, Annual Report for the Year Ended

percent of Suddenlink's gross customer adds subscribed to 100 Mbps or faster service. That was 34 percent by the end of 2015, and 59 percent by the end of 2016. Only 1 percent of Cablevision's new ISP customers subscribed to its top-tier 101 Mbps service at the end of 2014. That went up to 12 percent by mid-2016. Less than a year later, 62 percent of Cablevision's gross customer adds subscribe above the 100 Mbps threshold.⁴⁶³The Form 477 deployment data presented in Figure 7 above confirms these high-end speed upgrades, with the percentage of Altice's Census blocks with 300 Mbps and faster service doubling between the end of 2014 and mid-2016.

These real-world metrics demonstrate that Cablevision and Suddenlink customers were offered substantially higher capacity broadband services following the FCC's February 2015 vote. Both Cablevision and Suddenlink increased network investments during 2015, even as their attention turned to their pending sale to Altice. Altice also planned for and announced a full fiber upgrade during the fourth quarter of 2016, the only U.S. cable operator to make such a commitment (as most will utilize DOCSIS 3.1 to offer symmetrical multi-gigabit services). That means Altice is poised to invest more per-passing than any other U.S. ISP in coming years.

These are not the actions of a company afraid of Title II. Indeed, there were no questions about and no mentions of Title II, Network Neutrality, the *Open Internet Order* or any FCC broadband regulation on Altice's investor calls preceding or following its acquisitions. This leads to the question: what "problem" is Chairman Pai proposing to solve with his efforts to kill Net Neutrality rules and Title II authority? What benefits will this bring to Cablevision and Suddenlink customers, who currently have access to transmission capacities well in excess of demand, and who will shortly have access to services with speeds exceeding what any other global ISP offers? Chairman Pai bears the burden of providing an answer for why ISPs like

December 31, 2016. According to Cequel, 92 percent of Suddenlink's ISP customers subscribed to 15 Mbps or faster downstream services at the end of 2015, increasing to 95 percent at the end of 2016.

⁴⁶³ See Altice 2016 Results at 26; see also Comments of Dexter Goei, President, Altice N.V., Q4 2016 Altice N.V. Earnings Call (Mar. 9, 2017) ("Altice USA continues to be a prime example of our approach across the Group to upgrade our networks, simplify and harmonize bundle offers and then drive the penetration of higher broadband speeds, resulting in higher cash flows, which we can then reinvest to support further growth. . . . [O]ur initial upgrade to Optimum's network has led to a significantly higher number of customers taking higher speeds, from just 12 percent before Altice's control to about 60 percent today, matching Suddenlink by the end of Q4 2016. The proportion of the total base taking higher speeds has now increased to 13 percent, but we know we have a lot further to go with this. . . . [A]bout 60 percent of Suddenlink's new customers tak[e] higher broadband speeds, almost 40 percent of the customer base are now taking speeds of 100 megabits or higher, from a similar starting point at Optimum just over a year ago. As a result, Optimum average broadband speeds delivered to our customers has now started to accelerate at 51 megabits in Q4 2016, from 40 megabits last year. And eventually we expect to catch up, narrow the gap with Suddenlink's average broadband speeds of 90 megabits and growing. And we have now taken our network upgrade to the next level with our new project Generation GigaSpeed to deliver []10 gig broadband speed services to our customers and drive structural cost efficiencies in our network.").

Altice should be free from baseline nondiscrimination laws. And phony claims of “investment harms” simply won’t do.

Mediacom

Mediacom does not hold investor calls, but its SEC filings and press releases reflect a medium-sized MSO committed to network upgrades in order to capture share and grow earnings. After a 3 percent decline in capex in 2014 (attributed to “reduced outlays on the company's all-digital video platform, HSD bandwidth expansion, and cell tower backhaul, among other factors”),⁴⁶⁴ Mediacom dramatically increased its capital outlay directly after the FCC’s vote in 2015, continuing throughout 2016.

In March 2016, a year after the FCC vote, Mediacom announced it would invest an additional billion dollars over a three year period to bring gigabit broadband to its entire 3 million home footprint.⁴⁶⁵ Though this was slated as a 3-year project, a mere 9 months later Mediacom announced that its “entire broadband network will be gigabit-capable by the end of 2016” and that it would become “the first major U.S. cable company to fully transition to the DOCSIS 3.1” technology.⁴⁶⁶ According to its CEO Rocco Commisso, the company was able to accelerate its plan due to earlier than expected commercial availability of compatible modems. In a comical attempt to express his continued displeasure with the FCC’s *Open Internet Order*, he made it clear that Title II had no negative impact on Mediacom’s investments while stating that the company’s “substantial investments in our rural markets were made despite the heavy-handed and unfair regulatory burdens recently imposed on our company by the FCC and without depending on government subsidies.”⁴⁶⁷ Some burden that was.

Mediacom’s story is instructive on how the market fundamentals of technology, competitive advantage, cost structure, and consumer demand drive cyclical upgrades, and how little an impact regulation has. Mediacom’s leadership team, like many ISP executives, clearly loathes the FCC for reestablishing baseline consumer protections for two-way telecommunications services. But this loathing is not enough to overcome their desire to make money. Mediacom recognized after the FCC’s vote that it could cement its monopoly, grow earnings, and future-proof its network at a relatively small cost. Anti-Title II zealots will of course ignore Mediacom’s real story. They’ll suggest that, if not for the restoration of backstop legal authority, Mediacom might have perhaps taken even less time than the record-breaking 9 months it took to deploy gigabit service across its entire footprint. Such absurdity reveals the factual bankruptcy of the anti-Title II ideology.

⁴⁶⁴ See Kamran Asaf and Tony Lenoir, “Comcast, TWC drive spending as Q2 cable CapEx spike 27.7 percent YoY,” *SNL Kagan* (Aug. 19, 2014).

⁴⁶⁵ See Mediacom Communications, Press Release, “Mediacom Communications Marks 20th Anniversary by Announcing \$1 Billion Capital Investment (Mar. 14, 2016).

⁴⁶⁶ See Mediacom Communications, Press Release, “Entire Mediacom Communications Broadband Network to be Gigabit-Ready by Year End” (Dec. 7, 2016).

⁴⁶⁷ See *id.*

Wide Open West

Wide Open West (branded as “WOW!”) is a cable overbuilder, meaning it competes with not only a telephone company ISP in all of its markets but also an incumbent cable company ISP. Wide Open West’s business model traditionally involved growth not through acquisitions, but by building out its existing systems. Thus, if any company should be worried about any impact of regulation on investment, it is WOW! As an overbuilder, it always has one additional company vying for market share against it. Wide Open West’s overall capital investments in 2015 were \$231.9 million, down from \$251.9 million in 2014 (though still exceeding the company’s prior guidance).⁴⁶⁸ As in every other case analyzed above though, this was not due to Title II.

The 2014 results do not account for the company’s divestiture late that year of its South Dakota systems. On a *pro forma* basis, Wide Open West’s 2014 capex was \$238.8 million.⁴⁶⁹ Furthermore, it announced this one-year decrease in 2015 ahead of the FCC’s vote. The company’s 2014 expenditures were temporarily elevated due to upgrades to Knology systems it acquired in 2012, and those upgrades were completed during 2014.⁴⁷⁰ But now that all of its systems are all-digital, WOW! is once again returning to its strategy of growth through building. Its 2016 capital investments were \$287.5 million, the highest total in the company’s history.⁴⁷¹ That means its total capital investments were nearly 10 percent higher during the two years following the FCC’s vote than in the two years prior, and an estimated 16 percent higher on a *pro forma* basis (excluding the capital spent on systems divested in 2014). The company has

⁴⁶⁸ See Comments of Rick Fish, Chief Financial Officer, WOW! Internet, Cable & Phone 2014 Earnings Release Conference Call (Mar. 31, 2015) (“And finally, we put out guidance for 2015 last month. So to reiterate, we’re anticipating total revenue for 2015 to be between \$1.255 billion and \$1.275 billion, which is the midpoint growth percentage of about 4.6 percent and adjusted EBITDA to be between \$440 and \$450 million with a midpoint growth percentage of 7.9 percent. Capex is estimated to be between \$205 and \$215 million.”).

⁴⁶⁹ See *id.* (“So our statement of cash flows for the year shows total cash outflow related to capex for the year totaling \$251.9 million. On a pro forma basis, however, stripping out South Dakota, capex for the year totaled \$238.8 million.”).

⁴⁷⁰ See, e.g., WOW! Investor Presentation at the J.P. Morgan 2016 Global High Yield & Leverage Finance Conference (Feb. 29, 2016) (“Between 2008–2012, the Company invested over \$100 million in edge-out projects [. . .] Elevated levels of capital expenditures, however, following the Knology acquisition in 2012 to integrate the Knology network & back-office infrastructure have prevented investment in edge-out growth opportunities since 2012. New primary equity investment from Crestview, however, will enable WOW! to pursue these opportunities going-forward. In excess of \$200 million of such edge-out opportunities have been identified with similarly favorable return characteristics providing a relatively low-risk growth opportunity.”) (emphasis added).

⁴⁷¹ See WideOpenWest Finance, LLC, Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2016 (“Capital expenditures were \$287.5 million and \$231.9 million for the years ended December 31, 2016 and 2015, respectively. The increase in capital expenditures is primarily due to our build out of our fiber network in our Midwest region.”) (emphasis added).

indicated that 2017 capital expenditures will remain at an elevated level while it finishes the current upgrade cycle,⁴⁷² and will likely decline during 2018.⁴⁷³

These temporary swings in total company capital expenditures don't reflect the improvements in the quality of services available to customers living in Wide Open West's service area. The company reported in its 10-K filings that its most popular tier was 15 Mbps at the end of 2014, increasing to 30 Mbps at the end of 2015. During 2015, WOW! rolled out 300 Mbps services across its entire footprint.⁴⁷⁴ During 2016 WOW! continued this process: it made its entire footprint DOCSIS 3.1 capable, brought 600 Mbps speeds to 93 percent of its lines and started offering gigabit residential services in 2016, with additional markets coming online during 2017.⁴⁷⁵

Finally, the topic of Title II and the FCC's Open Internet rules did not come up on any of WOW!'s investor calls following the FCC's February 2015 vote. This fact, and the company's real-world investments, certainly indicate that the people running Wide Open West and its new investors at Crestview have ample confidence about the future of the broadband market. If it

⁴⁷² See Comments of Rick Fish, Chief Financial Officer, WOW! Internet, Cable & Phone 3Q 2016 Earnings Release Conference Call (Nov. 14, 2016) ("2017 in total, will probably be, directionally in the same amount of the similar size as, you know, 2016. When you add in, you know, the two buckets, baseline capex plus the incremental growth initiatives, so baseline will, probably slide up a bit just, given activity volume, you know, a bigger base to take care of, etc. We will have most likely an uptick in our edge out opportunity for next year from where we are this year. I would anticipate that we would try and move that number up to, kind of in \$50 million range.").

⁴⁷³ See Comments of Steve Cochran, CEO, WOW! Internet, Cable & Phone 2Q 2016 Earnings Release Conference Call (Aug. 16, 2016) ("I think this year will be \$50 to \$60 million related to this and next year we'll have another \$20 plus. So we'll see a nice step-down related to this project year-over-year and then as we move into 2018 it goes away.").

⁴⁷⁴ See Comments of Steve Cochran, Chief Executive Officer, WOW! Internet, Cable & Phone 2015 Earnings Release Conference Call (Mar. 18, 2016) ("Significant investments have been made over the last year as it relates to our HSD offerings, whereby, we now have 30, 60 and 110 meg offers in every market; 300 meg offers in 75 percent of our footprint. That 300 will be rolled out to 100 percent of the footprint by the end of the year, and we're also rolling out 600 meg in numerous markets as well as introducing one gig in three markets throughout the year.") (emphasis added).

⁴⁷⁵ See Comments of Steve Cochran, Chief Executive Officer, WOW!, Internet, Cable & Phone 3Q 2016 Earnings Release Conference Call (Nov. 14, 2016) ("We now have 600 meg offers in over 90 percent of our footprint and we've launched one gig in five of our markets and connected our first customers to 1 gig in the month of October."); WOW! Investor Presentation, at the J.P. Morgan Global High Yield & Leverage Finance Conference (Nov. 9, 2016) ("Fully upgraded systems with DOCSIS 3.0 and 3.1 capabilities in all markets providing 750+ MHz capacity in 100 percent of the combined markets. 95 percent of network footprint is on an all-digital platform. 300Mbps and 600Mbps data offering available in 93 percent of footprint. . . . 1Gbps data offering in Q416/Q117 in ~13 percent of footprint with additional markets planned for 2017.").

were actually worried about the potential impact of Title II on future earnings, the company would not have started the process to spend hundreds of millions of dollars more to keep overbuilding existing cable and phone company ISP networks. The logical explanation for the data is that WOW! and its investors are not concerned about Title II whatsoever.

Cable One

Arizona-based MSO Cable One Inc. is unique among its traditional cable company peers. The company has pursued a strategy that promotes its broadband product ahead of double- and triple-play offerings.⁴⁷⁶ While other MSOs are content to pass along ever-escalating broadcast and cable channel licensing fees, Cable One has shown it's not afraid to tell rights-holders "no thanks" and drop their channels.⁴⁷⁷ Thus far, it appears that Cable One's decision to turn away from a video-centric or bundle-centric business model is working.⁴⁷⁸

To implement this broadband-first strategy, Cable One increased its capital investments during 2014–2015. Specifically, Cable One increased capital spending to convert its systems to

⁴⁷⁶ See Comments of Tom Might, CEO, Cable One Inc., Q2 2015 Cable One Inc. Earnings Call (Aug. 6, 2015) ("Q2 2015 Cable One Earnings Call") ("Three years ago this summer we turned our attention away from video and the triple-play as centerpieces of our long-term strategy based on several trends that we started seeing back then, and even though video was over half our revenues and units back then. We saw then that cable TV started losing video subs in 2007 The total pay-TV industry started losing household penetration in 2010 Cable ONE video gross margins [] dropped 13 percent [from] just two prior years and Netflix, Hulu, and YouTube had started the OTT evolution a few years earlier that may now be a revolution. On the phone side of triple-play, total landline[s] were dropping at about 10 percent per year across the US, despite cable phone's temporary success, and phone ARPUs were falling even faster than that. So we decided that what would eventually be left of the triple-play was HSD only and our cost analysis with virtually all of the triple-play profit had already shifted to HSD thanks to forces like programmers, cell phones, Vonage-like companies, the FCC, and many other forces. Cable ONE's strategic decision . . . was to confront these brutal facts, not pretend we had the wherewithal to repeal them. Since then, we have been optimizing the inevitable transition to an HSD home-dominated residential business.").

⁴⁷⁷ David Liberman, "Cable One Says It's Doing Just Fine After Dropping Viacom Channels," *Deadline* (Oct. 31, 2014).

⁴⁷⁸ See, e.g., Comments of Tom Might, Q2 2015 Cable One Earnings Call ("But contrary to popular myth: one, we have not abandoned video. In fact, we have been growing video operating cash flow since 2012. We call it harvesting. Two, dropping Viacom was not our strategy. It was a small tactic that fit our strategy very well. It cost us about 2 percent of our video subs, not 20 percent. And, three, HSD can survive without the triple-play just fine. Since 2011, before this strategy change, video subs are down about 35 percent. Phone subs are down about 13 percent, but HSD subs and cash flow are up about 10 percent. HSD is the primary source of today's approximately \$300 million of operating cash flow. However, business services or commercial sales is the primary growth engine for new cash flow. Both of these products have much higher margins than residential video or phone and their volumes are growing, not shrinking.") (emphasis added).

all-digital, increase the spectral capacity of its physical plant, upgrade headend equipment to 24-channel bonding DOCSIS 3.x-capability, and push fiber deeper into its network.⁴⁷⁹ With these upgrades completed during 2015, Cable One's 2016 capex declined to pre-IPO levels, making for an overall decline at Cable One in the two-year period after the FCC's February 2015 vote compared to the two years before it. Was this decline due to Title II? Certainly not, if you believe the company's logical explanations for spending less after completing that 2015 push. As Cable One made clear repeatedly during 2015⁴⁸⁰ and 2016,⁴⁸¹ its capex would decline in 2016 and beyond due to completion of these upgrades that put it "ahead of the curve."⁴⁸² And in

⁴⁷⁹ See, e.g., Cable One Inc., Quarterly Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Quarterly Period Ended June 30, 2015 ("Because of the levels of competition we face, we believe it is important to make investments in our infrastructure. We are investing at an aggressive pace by increasing cable plant capacities and reliability, launching all-digital video services and increasing data capacity by moving from four-channel bonding to 24-channel bonding, a 600 percent increase. We believe these investments are necessary to remain competitive. However, we anticipate that a significant amount of these capital projects will be completed in the near-term, freeing up sources of cash that would otherwise have been used on such investments.") (emphases added).

⁴⁸⁰ See, e.g., Comments of Kevin Coyle, SVP & CFO, Cable One Inc., Q2 2015 Cable One Earnings Call ("Turning to capital expenditures, property, plant, and equipment totaled \$32.8 million in the second quarter, compared to \$44.2 million during the second quarter of 2014. The decrease was primarily due to the decline in spending for customer premise equipment and it was offset by spending on four major initiatives: our all-digital conversion; remaining plant upgrades to 750 megahertz; 4- to 24-channel bonding; and increases in fiber deployment. We expect significant expenditures for the remainder of 2015 due to the completion of these capital projects, and we are still forecasting that capital expenditures for 2015 will be approximately 20 percent of revenues."); Comments of Kevin Coyle, SVP & CFO, Cable One Inc., Q3 2015 Cable One Inc. Earnings Call (Nov. 5, 2015) ("[O]ur capital expenditures totaled \$31.4 million in the third quarter compared to \$52.3 million during the third quarter of 2014. This decrease was primarily due to the decline in spending for customer premise equipment and offset by four major initiatives . . . – our all-digital conversion, remaining plant upgrades to 750 MHz, increased channel bonding and increased node splitting and fiber deployment. We expect significant expenditures for the remainder of 2015 due to the completion of most of these projects and we are still forecasting that capital expenditures for 2015 will be approximately 20 percent of revenues in the \$155 million to \$165 million range. As we mentioned in our second-quarter investor call, with the completion of most of these capital initiatives by the end of this year, we expect capital expenditures to return to historical levels in the mid to high teens after 2015.") (emphasis added).

⁴⁸¹ See, e.g., Comments of Tom Might, CEO, Cable One Inc., Q4 2015 Cable One Inc. Earnings Call (Mar. 3, 2016) ("Our CapEx as a percentage of total revenues has been running high over the last few years due to various plant investments. As we have previously said, we expect that CapEx spending should return to a more historical range of mid to high teens in 2016, which should have a large positive impact on free cash flow.") (emphasis added); Comments of Tom Might, CEO, Cable One Inc., Q1 2016 Cable One Inc. Earnings Call (May 5, 2016) ("Well, we've outlined in our Form 10 a year ago and several times since the four major unusual capital investments we were making in things like all digital, CMPS replacements, bandwidth

November 2015 – a mere nine months after the FCC reclassified broadband internet access as a Title II service – Cable One announced its “GigaONE” initiative to deploy gigabit-capable service across its entire footprint.⁴⁸³ Just another 13 months after announcing that initiative, Cable One reported that 70 percent of its passings were gigabit-enabled.⁴⁸⁴

Let’s pause to review the facts once again, this time using Cable One as the example. Its capex and network investments increased following the FCC’s vote. It announced and nearly completed a system-wide gigabit upgrade shortly after that vote too. And Cable One did not

expansion, etcw. And we’ve put years on all of those as well in the Form 10 so you could see they were largely expiring last year or a few all digital for example ends at the end of this year. We have three systems left to do. So it’s really the expiration of all those one-time unusual plant enhancements”) (emphasis added); Comments of Kevin Coyle, SVP & CFO, Cable One Inc., Q3 2016 Cable One Inc. Earnings Call (Aug. 4, 2016) (“ [L]ast year we had a lot of higher expenses and CapEx to a lot of projects like own digital going on . . . and now the launching of one GIG. But there was temporarily an extra expense in capex which we talked about in press quarters. A lot of that is behind us for right now so . . . can look at the long-term trends and draw your own conclusions.”) (emphasis added).

⁴⁸² See, e.g., Comments of Kevin Coyle, Q2 2015 Cable One Earnings Call (“We mentioned that this year will be the finish of the large capital expenditures, that capital will be in the \$155 million to \$165 million range, which is 20 percent of revenues. We are forecasting that going forward, with the completion of most of these major capital initiatives, we should return to historical levels which are in the mid to high teens . . . somewhere in that range so we are forecasting that they will go down. Again, we are fully cognizant of the fact that we want to stay ahead of the curve from a technology standpoint on HSD. So they’re not going to go away but they are going to go down.”) (emphasis added).

⁴⁸³ See Cable One Inc., Press Release, “GigaONE Gives Cable ONE Markets Next Gen Speeds” (Nov. 5, 2015) (“More than 200 cities and towns across the United States will be able to lay claim to the title “Gig city” with the 2016 launch of GigaONE, the company’s new Gigabit service [GigaONE] will be available to the majority of Cable ONE customers by the end of 2016 Cable ONE has invested more than a half billion dollars over the past five years on network upgrades and enhancements in order to bring the latest technology and fastest speeds to its customers. . . . Unlike many of our competitors, Gigabit service will be available to all of our customers – not just a select few in certain areas. We’ve been committed for decades to serving smaller cities and towns, and we are delighted to provide them with the latest technology to make them Gig cities in 2016 ‘Our extensive fiber network deployment and continued investment in improving and expanding our network enables us to offer the fastest, most reliable Internet connections at the best value, while contributing to the economic development of the communities we serve,’ Joe Felbab, Vice President of Marketing for Cable ONE said. ‘The company recently doubled speeds on virtually all of its plans for new and existing residential and business customers. . . . [W]e’re committed to offering our customers a variety of powerful Internet speeds to choose from in order to meet their family’s tech needs,’ Felbab said.”) (emphasis added).

⁴⁸⁴ Comments of Julie Laulis, President & CEO, Cable One Inc., Q4 2016 Cable One Inc. Earnings Call (Feb. 28, 2017) (“At the end of 2016, approximately 70 percent of our homes passed had access to GigaONE, our 1 gigabit service.”).

mention – and was not asked about – the impact of Title II and Net Neutrality on its investment on any investor calls or at any conferences following the FCC’s vote, until after the November 2016 election.

Despite these facts, in the wake of the election, Cable One’s executives are only now saying Title II will harm investment. When asked at the December 2016 UBS conference if “a change [] or a rollback” would meaningfully impact its business, Tom Might, Cable One’s now-former Chairman and CEO answered, “[i]n the long run, yes. Because in the long run there’s a serious overhang and risk of Title II rate regulation. So that would, at least for now, eliminate that long-term risk. Short term, the issues are nuisance – minor regulatory compliance issues more than economic issues. But, long term, there’s a very serious rate regulation overhang.”⁴⁸⁵

This statement confirms only that the election reinvigorated irrational anti-Title II fervor, emboldening ISPs to once again resort to scare tactics with no basis in reality. As we’ve previously noted, in its February 2015 order the FCC explicitly ruled that it was not going to regulate rates, and it forbore from the statutory and rule sections that would require it to regulate them. There’s no plausible reason to think the FCC would set rates somewhere down the line either, if for no other reason than the agency’s 25-plus years of experience applying Title II to ILEC services. The FCC also has applied a “light” Title II approach to cellular voice services since 1993, without ever regulating rates. It never regulated the rates for DSL services prior to 2005, when those were classified as Title II services. It never even dictated the rates for rural ILECs’ monopoly DSL services, which many rural ISPs voluntarily kept under Title II from 2005 to 2015. And the FCC does not regulate rates for the Baby Bell’s Title II enterprise broadband services, to which it gave the same “Title II light” status a decade ago.

These irrefutable facts strongly indicate that the “overhang” Cable One now pretends to fear is not real. Its post-hoc comments, made after the company completed a major upgrade following the FCC’s 2015 return to Title II, are the kind of tired scare tactics that ISPs use to push for deregulation enhancing their market power.

But for the moment let’s set this FCC history of deregulation and rate non-regulation aside, and name what Cable One is worried about: its customers having potential legal protections against monopolistic pricing. Cable One certainly understands that the FCC simply doesn’t regulate rates outside of a complete monopoly market, and even in those has done little there to respond to monopoly pricing (*e.g.*, Prison Phones and Special Access). So to the extent Cable One has anything to fear, it is regulatory intervention against monopoly, and even then, possibly only for the most egregious monopolistic practices. This raises the question: what sort of practices does Cable One have in mind that it thinks would be prohibited under Title II?⁴⁸⁶

⁴⁸⁵ See Comments of Tom Might, CEO, at the UBS Global Media and Communications Conference (Dec. 7, 2016).

⁴⁸⁶ Based on the totality of the FCC’s history of enforcing Title II, it is clear that ISPs like Cable One have an extremely wide berth when it comes to exercising pricing power. If a modicum of competition exists in a market, the FCC will not intervene in pricing. Perhaps Cable One’s former CEO was concerned given his company’s questionable actions and his own questionable statements. In May 2016, Might indicated Cable One uses FICO scores as a screening tool not

And it also raises another question: shouldn't people have a potential defense against egregiously discriminatory monopolistic abuses when purchasing an essential telecommunications service? Congress certainly thought so, which is why nondiscrimination protections remain at the core of Title II. They exist to provide relief if needed. No telecom carrier, in order to justify investing, needs the "certainty" that it can reek monopolistic havoc. The history of investment following adoption of the 1993 and 1996 Amendments to the Communications Act demonstrates this, as does the market's recent evolution discussed herein. So do Cable One's actions after the FCC's 2015 Open Internet vote. Talk of a long-term fear of "overhang" is just another tenet of an anti-regulatory ideology that is unmoored from evidence and reality.

General Communications Inc.

Alaska-based cable and wireless company GCI increased its capital investments during 2015–2016. Its two-year post-vote combined capex was 4 percent higher than the company's combined 2013–2014 investment total. These results were largely in line with GCI's investor guidance,⁴⁸⁷ and reflected increases in certain company segments with decreases in others.⁴⁸⁸

just to determine which prospective customers should pay a deposit, but to determine what level of customer service a customer receives. *See* Daniel Frankel, "Cable One using FICO scores to qualify video customers, Might says," *FierceCable* (May 23, 2016) ("According to company CEO Thomas Might, . . . 'We don't turn people away,' . . . but the cable company's technicians aren't going to 'spend 15 minutes setting up an iPhone app' for a customer who has a low FICO score."). Might also made statements indicating his desire to avoid serving low-income customers, not simply to decrease churn but so that the company could keep prices high. In August 2015, when asked about the large low-income population in Cable One's territory and how that impacts penetration, Might said, "we are not chasing volume there either. Even though we are HSD-centric in our residential thinking, we're still going for the more profitable part of the market rather than just trying to build up our volume of HSD. So if we can grow just 2 percent or 3 percent in units, but do it persistently for a long period time, we are thrilled. Rather than having 5 percent to 7 percent growth in one year, but a lot of that coming in at ARPUs down in the \$30s* or something of that sort." *See* Comments of Tom Might, Q2 2015 Cable One Earnings Call (emphasis added).

⁴⁸⁷ *See, e.g.,* General Communications Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2012 ("[W]e expect our 2013 expenditures from unrestricted cash for property and equipment, including construction in progress, for our core and non-core operations, to total approximately \$150.0 million and \$15.0 million, respectively."); Comments of Peter Pounds, CFO, General Communications Inc., Q4 2013 General Communications Inc. Earnings Call (Mar. 6, 2014) ("For the year as a whole, we invested \$181 million in capital expenditures. Of this, \$16 million was funded by grants for a net of \$165 million of cash capex. . . . For capital expenditures, our base investment program will be lower than 2013. It should be \$140 million to \$150 million, down from the \$165 million net of grants in 2013."). Comments of Peter Pounds, CFO, General Communications Inc., Q4 2014 General Communications Inc. Earnings Call (Mar. 5, 2015) ("For the year, our core cash capital expenditures totaled \$164 million, slightly under our guidance of approximately \$170 million. . .

GCI's \$194.5 million total in capital investments during 2016 was the highest in the company's history, as it reinvested proceeds of tower sales into its fiber network.⁴⁸⁹

Historically, GCI's capital expenditure as a percentage of revenue is higher than most other MSOs,⁴⁹⁰ primarily due to the unique challenges of operating systems in Alaska – though its data ARPUs are also higher than most other ISPs (*see* Figure 29). GCI's total capital expenditures historically have cycled up and down,⁴⁹¹ unsurprisingly, and according to the company's most recent forecasts they will cycle down again during 2017.⁴⁹²

This pending downturn has nothing to do with the FCC's regulatory framework. GCI is reducing investments due to completion of prior deployments,⁴⁹³ and due to its concern over

. We have the following guidance for 2015[:] Forecast capital expenditures will be approximately \$170 million.”); Comments of Peter Pounds, CFO, General Communications Inc., Q4 2015 General Communications Inc. Earnings Call (Mar. 3, 2016) (“[C]apital expenditures for the year totaled \$176 million, or approximately guidance of \$170 million. . . . [They] are expected to be approximately \$210 million in 2016.”).

⁴⁸⁸ For example, GCI's wireless segment capital expenditures for 2014–2016 were \$30.2M, \$47.9M, and \$34.6M respectively. Its wireline segment capital expenditures for 2014–2016 were \$145.9M, \$128.3M, and \$159.9M respectively. *See* General Communications Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2016, at 113–114.

⁴⁸⁹ *See* Comments of Peter Pounds, CFO, General Communications Inc., Q4 2015 General Communications Inc. Earnings Call (Mar. 3, 2016) (“We will be reinvesting the proceeds of our tower sale transaction back into the business. The two main projects that these proceeds will fund are a diverse fiber to the North Slope of Alaska, and a completion of the ring for our TERRA network. These projects represent approximately \$60 million of our spending in 2016.”).

⁴⁹⁰ *See* Comments of Peter Pounds, CFO, General Communications Inc., Q4 2016 General Communications Inc. Earnings Call (Mar. 2, 2017) (“And just note that we got where we are today because we have been aggressively growing the business. We have spent 20 percent to 22 percent of our revenues historically on CapEx and the focus was on building a great network just as quickly as we could.”) (emphasis added).

⁴⁹¹ For 2005–2016, GCI's annual capital expenditures were (in millions): \$79.8, \$96, \$153, \$221.5, \$121, \$96.2, \$177.1, \$146, \$180.6, \$176.1, \$176.2, \$194.5.

⁴⁹² *See* GCI, 2016 Earnings Release (Mar. 1, 2017) (“Capital expenditures are expected to be approximately \$165 million in 2017, a reduction of 21 percent from our 2016 expenditures. This reduction represents our commitment to growing free cash flows in the face of continuing signs of economic challenges for Alaska.”) (emphasis added).

⁴⁹³ *See* Comments of Peter Pounds, CFO, General Communications Inc., Q3 2016 General Communications Inc. Earnings Call (Nov. 3, 2016) (“Yes, the two primary areas where we'll be reducing capital expenditures next year is number one, on the fiber going to the North Slope where we are forward funding. It's a two year project, but more than half of that is being spent this year, so year-over-year, we should experience a decline. And number two, the spending on the TERRA project will decline next year, with some of the significant spending that we've had this year. . . . And then, otherwise it's just smaller percentages of multiple areas of capital spend in the Company, kind of some belt-tightening there.”).

Alaska's growing fiscal crisis⁴⁹⁴ and declining population.⁴⁹⁵ Indeed, just as for all other ISPs, there were no mentions of Title II or the FCC's Net Neutrality rules on any of GCI's investor calls following the agency's February 2015 vote. GCI's pending capex declines likely won't impact the overall quality of wired or wireless services GCI offers. This is because the company's elevated capex during 2015–2016 helped bring 4G LTE to most of GCI's footprint,⁴⁹⁶ and its aggressive fiber deployments have the company on track to meet its gigabit deployment goals.⁴⁹⁷

⁴⁹⁴ See GCI, 2016 Earnings Release (Aug. 2, 2016) ("The state government has not been able to adopt a workable long term fiscal plan in 2016. As a result, we have announced that we will be reducing 2017 capital expenditures by 20 to 25 percent from our 2016 forecast of \$210 million. This implies 2017 capital expenditures of \$158 to \$168 million."); Comments of Peter Pounds, CFO, General Communications Inc., Q2 2016 General Communications Inc. Earnings Call (Aug. 3, 2016) ("I think the message is that without long-term stability on the state fiscal front, we are going to be reducing our capex and that's really what we felt comfortable releasing, is that next year's capex is going to be 20 percent to 25 percent below the current year. And I did note that if we continue to have problems with the state's fiscal situation, if there is not action to handle that, . . . there is the likelihood of additional cuts in capex in out years.") (emphasis added).

⁴⁹⁵ See, e.g., Comments of Ron Duncan, President, CEO & Co-Founder, General Communications Inc., Q2 2016 General Communications Inc. Earnings Call (Aug. 3, 2016) ("We're expecting the size of the market to compress rather than continue growing. Depending on how bad the state economy gets in reaction to the fiscal situation, we're going to see some loss of population over the next several years up here. We're already seeing it with the compression in the oil industry. We're going to compound it with the compression of investment spending by not just us, by others in the economy. So we won't have a need for as much growth in the network. We won't be doing as much densification. We won't be building as much new bandwidth capacity, because when the size of the market shrinks, you don't need that and we'll be slowing down the deployment of the new products. So there would be slower advances beyond the gigabit speeds. There'll be fewer locations to get upgraded to gigabit, there will be less network to expand. And we're slowing down our infrastructure investments in [the] rest of the state. And as Pete said, they will slow down more if the state can't figure a path to some sort of long-term stability. We will also be prioritizing our investments, so that they're directed away from things that rely on the consumer economy and more into core assets where we know there is a return from either government entities that are in place or our roaming partners or that sort of thing. . . . If some economic surprise happens and the state goes from a situation where the economy is gradually declining to where it's robustly growing again and we feel confident in making investments would have a good return, in subsequent years we would look at stepping back our capital.") (emphases added).

⁴⁹⁶ See, e.g., Comments of Peter Pounds, CFO, General Communications Inc., Q4 2015 General Communications Inc. Earnings Call (Mar. 3, 2016) ("On the network side, we continued our wireless build-out and now cover over 80 percent of the state's population with LTE. Additionally, we continue to make progress on expanding our 1 gigabit consumer cable modem product, and our TERRA network.")

⁴⁹⁷ See, e.g., Comments of Peter Pounds, CFO, General Communications Inc., Q1 2016 General Communications Inc. Earnings Call (May 5, 2016) ("Progress on our 1-gigabit red consumer data rollout has continued, with Juneau coming online in early April and Fairbanks later.");

In sum, the evidence demonstrates that even for a small ISP like GCI, and one that faces particular geographic and topographic challenges in covering a rugged and sparsely populated service territory, the FCC's Net Neutrality rules and reclassification vote did not negatively impact broadband deployment. The company's investments are not determined by FCC authority, but by economic reality.

Local Exchange Carrier Internet Service Provider Investment Summaries and Disclosures.

AT&T

AT&T (along with Sprint) serves as the main source for Hal Singer's and USTA's false claim of a post-reclassification capital decline. We explained above how both Singer and USTA incorrectly manipulated AT&T's capital spending to produce their desired result. We also explained how illogical it is for them to suggest a systemic negative impact from Title II reclassification, based solely on a (manipulated) aggregate capex decline, when the bulk of the market's participants increased capex and all ISPs are increasing broadband capacities.⁴⁹⁸

But focusing on AT&T's individual outlays once again, we can see that its historical investments belie the anti-Title II ideologues' faulty premise: it's simply not true that capital spending must always go up, both at the aggregate industry level and also at the company level, or else the mere existence of regulatory authority is to blame. In fact, that ridiculous notion that lies at the heart of Singer's and USTA's – and thus, Chairman Pai's – Title II critique is absurd on its face. Yet here we are still debating it despite the reams of real-world data and actual explanations for AT&T's changes in capital spending over time.

Unfortunately, AT&T changed its segment reporting in 2013. Prior to that date, we see that AT&T's wireline segment capital investments decreased every year after peaking in 2008, with decreases that occurred even as the company made massive investments deploying fiber-fed VDSL and IPTV services to millions of its customers. There's no mystery then as to why AT&T's capital investments were temporarily down more recently, in the first year after the FCC's 2015 reclassification vote. AT&T told investors that its capex would increase then subsequently decline, and it told them so more than two years prior to that vote – and long before

Comments of Ron Duncan, President, CEO & Co-Founder, General Communications Inc., General Communications Inc., QVC Group, Liberty Interactive Corporation, Liberty Ventures, M&A Call (Apr. 4, 2017) (“[W]e’ve been focused on aggressively growing our company through a series of technology transitions from analog to digital, from dial-up to gigabit cable modems, from briefcase cell phones to pocket computers, and along the way, we’ve turned the company that started out with a lot of debt and no revenues into almost \$1 billion in revenue. And today, the largest telecommunication provider in Alaska. We’re not done.”).

⁴⁹⁸ AT&T's size means that the company's completion of an upgrade cycle could be enough to produce an aggregate market capex decline even if all other firms were in the midst of a cycle of elevated investment. Note in Figure 24 that from 2014 to 2015, AT&T accounted by itself for 28 percent of all publicly traded ISPs' total capital expenditures. It accounted for a whopping 80 percent of the aggregate capex decline for the seven ISPs that saw a drop during that one-year period.

Title II was even on the table. AT&T's 2013–2014 capex increases were due to its “Project VIP,”⁴⁹⁹ and its declines thereafter were due to completion of this LTE expansion/wireline IP-DSLAM deployment effort.⁵⁰⁰

Even before the FCC's February 2015 vote, AT&T's Project VIP spending surge was winding down. VIP's peak quarter for capex was Q2 2014, and it declined after that until increasing for the final push under the VIP project in the first quarter after that vote (which, coincidentally, was also the last quarter prior to the DirecTV merger closing). During the first two years of VIP (Q1 2013 to Q4 2014), AT&T's average quarterly wireless segment capital expenditures were about 10 percent higher than its average for 2011–2012 (\$2.82B vs. \$2.57B). These dropped sharply starting in the 3rd quarter of 2014 (\$2.6B, from highs such as \$3.5B in Q2 2014 and \$3.1B in Q3 2013). Capital intensity during this period fell from 18.4 percent in Q2 2014 to 12.2 percent in Q1 2015. And even in that second quarter of 2015, after the FCC's vote but before the DTV deal closed in late July 2015, AT&T's overall capital intensity rose again to 14.2 percent with total a outlay for that quarter of \$4.7B.

In other words, as we have explained on numerous occasions before, AT&T told investors in late 2012 that the higher than normal capital investments associated with the Project VIP upgrade would come to an end by year-end 2015. AT&T then finished that project ahead of schedule, contributing to its decreased capex during 2015.⁵⁰¹ This had nothing to do with Title II.

⁴⁹⁹ See Comments of John Stankey, Group President and Chief Strategy Officer, AT&T Inc., 2012 Analyst Conference (Nov. 7, 2012) (“AT&T Project VIP Announcement”) (AT&T's Project VIP upgrade plans were “to deliver IP broadband to 57 million customer locations. We'll reach 33 million total U-verse customer locations by year-end 2015, 24 million U-verse IPDSLAM customer locations by the end of next year, though we're nearly complete today. We'll expand 4G LTE to reach 300 million POPs by year-end 2014. . . . Our plan is to increase our U-verse footprint by a third to 43 percent, meaning 75 percent of our customer locations will have access to either U-verse or IPDSLAM. We'll be essentially complete with this IP broadband build by the end of 2015.”) (emphasis added).

⁵⁰⁰ See *id.* (Comments of John Stephens, Senior EVP & CFO, AT&T Inc.) (“In terms of overall capital, we expect wireless spending to continue to outpace wireline, with wireline remaining stable during the investment period, with the increased investment offsetting lower baseline spending. This will move capex to the upper end of our current capital intensity range, which is mid-teens as a percent of our revenues. So, we're looking at annual capex in the \$22 billion range over the next three years, then returning to normal levels.”) AT&T's actual capex for 2010–2016 was \$20.3B in 2010, \$20.3B in 2011, and \$19.7B in 2012; then \$21.2B in 2013 and \$21.4B in 2014, but \$20.0B in 2015; finishing at \$22.4B in 2016.

⁵⁰¹ See Comments of John Stephens, Senior EVP & CFO, AT&T Inc., Q2 2015 AT&T Inc. Earnings Call (July 23, 2015). An analyst noted that the spending projection at the midpoint of year “implies a nice downtick in the U.S. spending. What's driving that? Are you finding that you just don't need to spend it or are you sort of pushing that out to next year?” Stephens explained that the spending ramp-down in mid 2015 came from simply finishing the job ahead of schedule. “Once again the network has done a great job in getting the Project VIP initiatives completed and when they're done the additional spend isn't necessary because the project's been

And as we explained above, it is not analytically possible to somehow exclude the impact of the DirecTV acquisition on AT&T's capex either, because the reduction in capex from the combination stemmed in part from synergies and savings that AT&T realized⁵⁰² (and in fact, used to justify) this horizontal merger. Yet even if that were analytically possible, we would still see that AT&T's capital investments did appear to return to "normal" levels for the company⁵⁰³ because of its (earlier than planned) completion of Project VIP and other savings. AT&T's CEO made this all quite clear when he told investors that 2014 had been "the monster of all years" because the company had "finished off our VIP project All of that stuff tailed off in 2014 and so our CapEx has come down rather dramatically."⁵⁰⁴

Ultimately, this all shows the absurdity of this exercise, trying to determine what AT&T's "real" capex spend was for a particular year or span of years. The absolute dollar amount spent on capital equipment from quarter to quarter or from year to year is impacted by a number of factors, and thus not a reliable metric for judging the impact of regulations or supposed regulatory uncertainty. But just as importantly, the notion that AT&T's investments would have somehow been higher is belied by the company's business fundamentals too. There's simply no plausible scenario in which AT&T could have earned enough marginal profit from Net

completed. And not for lack of anything but success. That's what's driving our changes." *Id.* (emphasis added).

⁵⁰² See Comments of John Stephens, Senior EVP & CFO, AT&T Inc., AT&T Inc. Analyst Conference (Aug. 12, 2015) ("Other synergies include capital spending savings. Just one example. Today we have about 70 million set-top boxes in the market between our two platforms. That creates a need for two sets of engineering standards, two roadmaps for planning and two refurbishment groups to support customer needs. As we move to a single set-top box environment we can be much more efficient in these areas. Our new scale will also provide us the capital efficiency opportunity. On average we purchase about 25 percent of that embedded base for replacements in new sale [additions.]").

⁵⁰³ AT&T's 2012 wireline plus wireless segment capex was \$19.7B. A portion of this for was U-Verse video delivery capital now spent on DirecTV video delivery. Therefore AT&T's capital spending may even be higher than what it would have considered "normal" in the fall of 2012. In its Project VIP announcement press conference, AT&T said that over a three-year period the project's wireless investments would amount to an additional \$8 billion, and that wireline investments would be an additional \$6 billion. AT&T executed the project at a lower cost. It projected annual capex of \$22 billion total each year during the three-year period, but actual outlays were closer to \$21 billion. This implies that without Project VIP, AT&T's baseline capex was less than \$16 billion per year, well below the current level even assuming no DTV acquisition. AT&T's capital expenditures were 15.5 percent of revenues at the start of Project VIP, and stood at 14.6 percent during its most recent reporting quarter (Q1 2017), in line with the company's general expectation. See for note 40.

⁵⁰⁴ See Comments of Randall Stephenson, *supra* note 307. Stephenson also proudly proclaimed to the same audience that day that "[w]e are going to deploy more fiber next year than we did this year, but the capital requirements are going down" because "[o]ur capital requirements are getting more and more efficient all the time." *Id.* (emphases added).

Neutrality violations to then justify increased network spending based on the discriminatory tolls it could levy.⁵⁰⁵

What matters more than baseless speculation about what an ISP might've spent is what it actually spent and got for it. It's not just the sheer dollar amounts, but the capacity increases achieved – potentially at a lower cost, as AT&T executives' statements and Comcast's deployment history demonstrate – because of efficiency gains from new technology. We must understand not just what a particular company deployed, but also why it did or didn't, as spurred on by competitors' upgrades (or deterred by their fundamental advantages).

In AT&T's case, the company is progressing just as it projected in November 2012. AT&T fully deployed 4G LTE, banking on wireless as its future. On the wireline side, as for all other ILECs, AT&T's capex is in secular decline⁵⁰⁶ due to the natural advantages that cable MSOs have with their superior physical plant and cheaper upgrade path. Yet AT&T made IP-DSLAM upgrades as planned, and went beyond its 2012 fiber plans. It is exploring both 5G mobile and fixed projects, with project "AirGig" an example of potential innovation.⁵⁰⁷ The company is increasing its wireless capacity even ahead of full 5G deployment, with SDN and network densification projects far less capital intensive than Project VIP's wireless efforts were.

⁵⁰⁵ According to information publicly disclosed by AT&T, its U-Verse homes-passed cost was approximately \$240 during the early years of deployment, and approximately \$350 during later years and during the Project VIP expansions. *See, e.g.*, AT&T Inc. 2006 10-K, at 2; *see also* AT&T Project VIP Announcement. This indicates that while Verizon was willing to risk between \$1500-\$2000 of capital per passing initially (and \$800-\$1000 in later stages), AT&T's willingness was always much lower. (And notably, it was lower even in 2006, just a year after the FCC removed DSL from Title II and at a time when AT&T was obtaining favorable changes to video franchising regulations in the states). Yet nothing about the 2015 reclassification and rule adoption changed AT&T's calculus in terms of inhibiting, even marginally, its willingness to spend on wireline upgrades. In other words, long before the FCC's 2015 vote, AT&T maxed out its willingness to deploy FTTN in its footprint, at a final average cost of \$350 per passing. The gap between FTTN and FTTH is another \$500 per passing. Assuming AT&T would want to recover its capital within 3 years (and assuming a generous average of 35 percent penetration over that period), this implies AT&T would need to earn an additional marginal net income per FTTH customer of \$40 per month in a world without Net Neutrality rules. Even if the company were more patient than the investor class (targeting a 7 year recovery, with 40 percent average penetration), the marginal net income from whatever priority or blocking scheme it might cook up would need to be more than \$15 per customer per month. These estimates illustrate the folly of the notion that "uncertainty" from Title II might have dampened deployment, especially when all evidence demonstrates healthy continued investment and no evidence suggest that the rules themselves cost ISPs enough in "lost" profits to justify spending more.

⁵⁰⁶ AT&T Wireline segment capital expenditures from 2007–2012 were \$14B, \$14.3B, \$11.2B, \$11B, \$10.4B, and \$8.9B, before ramping up under Project VIP to \$10B in 2013 and 2014, the last year in which AT&T reported wireline capex.

⁵⁰⁷ *See, e.g.*, AT&T, Press Release, "AT&T in Advanced Discussions with Power Companies and Others to Trial Project AirGig" (Jan. 31, 2017).

And it's investing in video delivery innovation after the DTV acquisition, to retain high value customers and stay ahead of the market's transition away from bloated pay-TV bundles.

Adhering to its long-stated guidance, AT&T will maintain its historically high level of capital investments during 2017,⁵⁰⁸ even as innovations like SDN and its large spectrum portfolio reduce its overall capital requirements.⁵⁰⁹ This elevated capex will be driven in part by the positive response to its fiber deployments.⁵¹⁰

⁵⁰⁸ See Comments of John Stephens, Senior EVP & CFO, AT&T Inc., Q4 2016 AT&T Inc. Earnings Call (Jan. 25, 2017) (“Our teams executed well in 2016. We grew revenues, and on an adjusted basis, we expanded our operating margins and increased earnings, as we had projected. And free cash flow came in at the high end of expectations even with strong capital investment Moving to cash flows, we had more than \$39 billion in cash from operations for the full year. That’s a record for us. This allowed us to return substantial value to the shareholders through dividends while also investing more in capital than we ever have before. Capital investment was at \$22.9 billion for the year; that includes taking advantage of pricing and financing terms from our vendors that made good business sense for us, particularly with bonus depreciation still intact. Our investments are growth focused. For example, we’re ahead of plan with our fiber-to-the-home build. Today, we market to nearly 4 million consumer customer locations Let’s now take a look at our operations where you see a consistent story of investment and the subscriber growth it generated “Fourth-quarter margins were down year-over-year because we didn’t hesitate to invest in growth opportunities “Customer growth was strong. We added 1.3 million new wireless subscribers in the fourth quarter and over 3 million customers for the full year. This strong investment obviously pressures margins, but, as you can see in several parts of our business, we are clearly willing to invest in growth. . . . “Capital investment was at the high end of what we expected. CapEx is expected in the \$22 billion range, similar to last year.”) (emphases added).

⁵⁰⁹ See Comments of John Stephens, Senior EVP & CFO, AT&T Inc., Q2 2016 AT&T Inc. Earnings Call (July 21, 2016) (“On the capex budget, we’ve done well of in all aspects of it. . . . [B]ecause of our software-defined network we’re starting to see a little bit of those savings. If you think about our buying capacity and the overall economic conditions, we’ve been able to get some volume pricing and some purchasing power benefits. Certainly, we’re getting more efficient with what we do. I will tell you, though, that one of the things I think people miss out on is that, because of the spectrum that we’ve invested in over the last, say, five years or so, we’ve got a lot of effective capital deployment that doesn’t involve a lot of dollars. It involves deploying spectrum, and that’s a really efficient way to deploy capacity. So on a per unit of capacity, our dollars can be really efficient because of the spectrum portfolio that we have that we’re putting in use.”) (emphasis added).

⁵¹⁰ See Comments of John Stephens, Senior EVP & CFO, AT&T Inc., Q4 2015 AT&T Inc. Earnings Call (Jan. 26, 2016) (“In broadband, overall subscribers were relatively stable in the quarter while our fiber build out continues to be a great story. Our penetration of broadband is a full 9 percentage points higher in those markets compared with our non-fiber footprint. After we launched our 100 percent fiber network in the new market, we are seeing about half of the new broadband customers buying speeds of 100 megabits per second or higher with 30 percent of the customers taking a gig. And the real kicker is that the vast majority of recent sales in those

The evidence is clear: AT&T is a diversified company for which investments come in cycles⁵¹¹ against a backdrop of secular changes in telecom. AT&T had elevated spending during the two years preceding the FCC's vote, and will now increase investments again in certain segments as it pushes FTTH services and prepares for 5G.

And in AT&T's case, the subject of the *Open Internet Order* and Title II was not mentioned on any of the company's quarterly investor calls from April 2015 until July 2016, when it was asked about the impact of the DC Circuit upholding the FCC's ruling. (On that same call, AT&T affirmed that its wireless segment capital spending was trending lower due to the company's completion of its nationwide 4G LTE deployment). Even as it sidestepped the question,⁵¹² AT&T expressed confidence in its FTTH deployment plans and the potential to expand them without once mentioning supposed uncertainty from Title II.⁵¹³ When the subject

markets are taking multiple services from us. So as our fiber deployment accelerates, we're excited about this growth opportunity.”).

⁵¹¹ See Comments of John Stephens, Senior EVP & CFO, AT&T Inc., Q2 2016 AT&T Inc. Earnings Call (July 21, 2016) (“Since the introduction of the first smartphone, we’ve seen unprecedented growth in mobile data traffic. Even more incredibly, we expect that to continue to grow at a very strong pace. To meet this demand, we undertook several strategic initiatives to improve the capacity of our network for today and the years to come. Here is what we’ve accomplished. First, we ratchet up our investment cycle with Project VIP. This was crucial to getting the high-quality, high-capacity network we have today. Our 4G LTE network deployment was accelerated. Fiber backhaul was deployed and cell sites built. We now have almost 70,000 cell sites, thousands more than our largest competitor, and our move into the Mexico wireless market further expands our LTE reach. We also drove fiber deeper in our wireline network. We added more than 1 million business locations to our fiber network, and we expanded our IP broadband footprint to more than 60 million customer locations. The next phase of driving fiber into our network is our GigaPower deployment. Over the next few years we expect to reach at least 12.5 million customer locations with our gigabit broadband service. We now have more than 2.2 million fiber-to-the-home customer locations, and we expect to reach 2.6 million or more by the end of the year. Our already dense wireless network and expanding fiber footprint puts us in an excellent position as we move to more small-cells and 5G. We have already filed patents, trials are already underway, and testing is ongoing. When 5G is ready to roll, we will be ready as well. At the same time we launched VIP we moved to expand our spectrum portfolio. We have about 150 megahertz of spectrum in our portfolio today, including 40 megahertz of relatively untapped AWS and WCS spectrum. We have the best, most balanced spectrum portfolio in the industry.”). We note too that AT&T also has agreed to acquire FiberTower and its extensive physical assets, which will reduce capex and opex for all of these expansions.

⁵¹² See *id.* (“On Title II, we always expected the final resolution to be in the hands of the Supreme Court, and we’ll work through the process and follow the Supreme Court process closely, and then make our decisions going from then on.”).

⁵¹³ See *id.* (“When you’re done with that, you may still have some profitable builds that are at or above the 12.5 million commitment, and you may go ahead and build those. . . . But the ability or the schedule to build is an economics activity, a business case activity with, of course, the opportunity to overbuild in some areas being probably more timely and less expensive.”) (emphasis added).

was brought up on AT&T's third quarter 2016 investor call in the context of the government's review of the Time Warner merger, AT&T again indicated that so long as there were no price regulation there would be no impact on this massive acquisition.⁵¹⁴ In fact, both AT&T's and Time Warner's CEOs made statements indicating they understand quite well the importance of video to AT&T's business with Net Neutrality upheld and the openness of the internet preserved.⁵¹⁵ In other words, the virtuous cycle is still working, just as the FCC intended. Title II and the *Open Internet Order* were not raised again until the January 2017 investor call, after the election. AT&T's CEO only then dusted off his old rhetoric about Title II suppressing investment.⁵¹⁶ But nowhere did he suggest that it had impacted AT&T's own investment in any specific way. In fact, the company's CFO noted on that call that during 2016 AT&T had accelerated its previously planned FTTH builds.⁵¹⁷

⁵¹⁴ See Comments of Randall Stephenson, Chairman, President & CEO, AT&T Inc., AT&T Inc. Acquisition of Time Warner Inc and 3Q 2016 Results Conference Call (Oct. 24, 2016). When asked "if the FCC does decide to look at things like rate regulation for broadband, how does that impact your view on the deal and the optionality that it gives you?" Stephenson answered, "I don't think it has any bearing as you think about this deal," because "we're hopeful the Chairman of the FCC as well as the President, when Title II was discussed, both said that they had no intention to regulate prices of broadband. So hopefully that will be the case as we move forward with this transaction." *Id.* (emphasis added).

⁵¹⁵ See *id.* Time Warner CEO Jeff Bewkes was asked, in light of the Time Warner Cable spinoff in 2009, whether "content and distribution together [are] synergistic" – and if so, what had changed in the seven years after that spinoff. Bewkes said, "[T]he world's much different now. You now have net neutrality in place, you've got broadband distribution, you have mobile as an ever-bigger part of the distribution package. And you have a lot of incoming new distributor or competition coming from Facebook, Netflix, Google, Amazon." AT&T's CEO agreed: "[A]s we begin to stimulate even more and more demand of video over-the-top on our mobile networks, the desire and the incentive to go faster on 5G deployment is heightened. . . . Our expectation is, as we began to innovate with content, delivering content over these mobile networks, it's going to give us a lot more enthusiasm to go faster with 5G and not slower." *Id.* (emphases added).

⁵¹⁶ See Comments of Randall Stephenson, Chairman, President & CEO, AT&T Inc., Q4 2016 AT&T Inc. Earnings Call (Jan. 25, 2017) ("We happen to be advocates of net neutrality, just the concept of net neutrality, but placing utility style regulation on our mobility and Internet businesses. There's no way anybody could argue that that is not suppressive to investment. And so, we're hopeful that Chairman Pai will come in and begin to address some of these issues that are suppressing capital investment.").

⁵¹⁷ See *id.* (Comments of Comments of John Stephens, Senior EVP & CFO) ("We've spent the last few years in a very heavy investment cycle; it's no secret. We've been getting ready for a world where mobile technology and premium video content would intersect. And, we've been convinced for a long time that this intersection was inevitable. And when it happened, we wanted to have the foundation laid to make the intersection a very different experience for our customers. And that foundation, in our mind, begins with a network that's engineered and designed for the special requirements of video. It has to have deep capacity; it has to have broad distribution. . . . [T]his is exactly the foundation we've built. Our high-speed network is engineered and it's built for video. It's an LTE network that covers nearly 400 million people in the US and Mexico. There's nobody else that's even close. We're building out fiber to 12.5

It comes as no surprise that AT&T has not once told investors that Title II impacted its own investments, or issued even a loose dollar estimate (much less a firm one) on the magnitude of this supposed regulatory harm. The fact is that Title II had no negative impact, as AT&T's numerous prior statements and its own investments reveal. And again illustrating how the total dollar amount a company spends on capital is a poor indicator of progress, AT&T's own statements reveal it is deploying next-generation capacities at a far lower per-unit cost.⁵¹⁸ AT&T's fiber-to-the-home service deployments are up sharply following the *Open Internet Order*, with even more deployment in 2016 than prior years.⁵¹⁹

In sum, AT&T's capital and deployment plans for 2015 and afterwards were driven by its business plans, which have not been impacted one iota by Title II. In fact, the certainty from the FCC's Open Internet framework, derived from the Congressional blueprint for telecommunications services, helped AT&T's business by making online video a stable growth area during a time when the home and wireless broadband markets reached saturation. AT&T's recently renewed but unsupported protests about Title II harms do not square with the reality of AT&T's own investments or those of its peers.

Verizon Communications Inc.

Verizon's capital investment total increased during the year following the FCC's adoption of the *Open Internet Order*⁵²⁰ (just as the company said it would, a month before the February 2015 vote).⁵²¹ And Verizon's total two-year post-vote capital expenditures were 3.1

million locations. This network is software defined and that gives us unique scalability at the lowest cost per megabyte around. It's a network with an elegant path to gigabit speeds and 5G. And in terms of capacity, we are really in a unique position here. We've invested \$27 billion in spectrum over the past five years and, as a result, we have the premier spectrum position in the industry; 40 megahertz of fallow spectrum. And, as John referenced, if we're successful with our FirstNet bid, we get access to another 20 megahertz of prime nationwide spectrum for public safety and secondary use.") (emphases added).

⁵¹⁸ See Comments of Randall Stephenson, *supra* note 307.

⁵¹⁹ See *id.* AT&T's FTTH network reached approximately 1.5 million locations at the time of the DirecTV merger closing (late July 2015). This increased to 3.8 million locations by the end of 2016, and reached 4.6 million locations by May 2017. AT&T says it will reach 5.8 million locations by the end of 2017, and that it is accelerating the pace of deployment thereafter to reach 12.5 million locations by mid-2019. See AT&T Inc., Press Release, "AT&T Invests Nearly \$6.8 Billion Over 3-Year Period to Enhance Local Networks in Texas" (May 9, 2017); see also AT&T Investor Day Presentation (Aug. 12, 2014).

⁵²⁰ See Comments of Fran Shammo, EVP & CFO, Verizon Communications Inc., Q4 2015 Verizon Communications Inc. Earnings Call (Jan. 21, 2016) ("Verizon Q4 2015 Earnings Call") ("Our capital spending was consistent with our guidance of around \$17.5 billion to \$18 billion for the year. In total, capital expenditures were \$5.2 billion in the fourth quarter and \$17.8 billion for the full year, up 3.4 percent from 2014.").

⁵²¹ See Comments of Fran Shammo, EVP & CFO, Verizon Communications Inc., Q4 2014 Verizon Communications Inc. Earnings Call (Jan. 22, 2015) ("On capex, Mike, it goes directly to

percent higher than they were in the two years preceding the vote, even as the company divested its Florida, Texas and California systems to Frontier Communications.

There's no mystery about Verizon's capital spending. The company's wireline network spending peaked at \$11 billion during 2007, and it has declined sequentially every year since – even as Verizon continued to deploy its Fios FTTH internet and pay-TV services, including a recent “refresh” of its CPE as a part of Verizon's “Quantum” project. Meanwhile, the company's wireless segment capital investments increased annually from 2008–2015, as it took the lead rolling out 4G LTE and LTE-Advanced services. More recently, Verizon rolled out gigabit services at half the price it previously charged for much slower speeds.⁵²² And it is on a fiber and millimeter spectrum buying spree as it prepares for the 5G wireless era.⁵²³

Investors understand this history well. Verizon's made a point of emphasizing exactly why it believes it can grow earnings through reduced wireline capex⁵²⁴ and sustained wireless capex.⁵²⁵ Though 2016's total company spend was down slightly, Verizon expects 2017 capital

what you said. I have been pretty consistent with this in the fact that we will spend more capex in the Wireless side and we will continue to curtail capex on the Wireline side. Some of that is because we are getting to the end of our committed build around FiOS, penetration is getting higher. We are reconnecting homes that we've already connected, so it's not additional capital that we have to outlay and we are very focused on those, what we call connected homes, that are not our customers to go back after them. That is a very good return for us because we already spent the capital to connect that home. So it's a lot of combination around that, but yes, this is around densification. This is around our projection of growth for the wireless industry and staying ahead of that. Again, it's all that encompassing so we're looking at a slight increase from where we ended 2014.” (emphases added).

⁵²² See Verizon Communications Inc., Press Release, “Verizon launches Fios Gigabit Connection service delivering millions of customers the speeds they deserve” (Apr. 24, 2017).

⁵²³ See, e.g., Lauren Thomas, “Verizon agrees to \$1.05 billion fiber-optic cable deal to grow its wireless platform,” *CNBC* (Apr. 18, 2017); see also Prysmian Group, Press Release, “Prysmian awarded a \$300 million optical cable supply agreement from Verizon Communications” (May 8, 2017); “Straight Path stock surges after Verizon raises its takeover offer,” *Reuters* (May 8, 2017).

⁵²⁴ See Verizon Q4 2015 Earnings Call (“Capital spending in Wireline was \$1.6 billion in the fourth quarter and totaled \$5 billion for the year, down 12.2 percent, which is consistent with our strategy to reduce our capital spending in the Wireline segment.”).

⁵²⁵ See *id.* (“We remain committed to consistently investing in our networks for the future. Our 2015 investments have positioned us for growth and allow us to maintain our network leadership position, as consistently acknowledged by third parties. Wireless densification enables us to add capacity to manage the growing trends of video consumption and the demand required for the Internet of Things, as well as prepositioning us for the future 5G technology. We invested in AWS-3 spectrum during the year, acquiring spectrum covering 480 markets for a total value of \$10.4 billion. We continued to execute a disciplined capital allocation model with the priority to invest for the future.”) (emphases added).

expenditures to rise again,⁵²⁶ as it continues to invest in wireless densification and fiber deployment⁵²⁷ ahead of a commercial launch of 5G technology.⁵²⁸

After the FCC's February 2015 vote and before the November 2016 election, there was only one question on the company's quarterly calls about the impact of Title II on Verizon's investment. On its April 2016 investor call, when asked about the pending court case, CFO Fran Shammo said: "The thing that we disagreed with and opposed was applying Title II [to] broadband services and particularly wireless broadband. . . . This will, obviously, have some negative consequences on innovation as a whole. But, look, we are a company that has operated under regulation for 100 years and has been very successful, so we will wait and see what the FCC concludes and then we will operate accordingly. But it's too early to say what exactly is going to happen here."⁵²⁹

This tone was much more measured than the one Shammo took on the company's investor call two months ahead of the vote, when he claimed that reclassification "will absolutely affect us and the industry on long-term investment in our networks. That can be seen factually as to what happened in the rest of the world, where you have high regulation, the networks are not

⁵²⁶ See, e.g., Comments of Matt Ellis, EVP & CFO, Verizon Communications Inc., Q4 2016 Verizon Communication Inc. Earnings Call (Jan. 24, 2017) ("[W]e are targeting the following for 2017: consolidated capital spending between \$16.8 billion and \$17.5 billion").

⁵²⁷ See *id.* ("As you think about the capex, as you say, the number is reasonably consistent year after year and that's something you've seen from us for a number of years. But, as you say, within that it changes over time. So within LTE our spending continues to transition from coverage to densifying the network. And that continues to evolve as we leverage new technologies around radio and hardware and software and then refarming our spectrum within 4G and densifying with small cell. So you will continue to see that densification of the 4G network. And that includes how we put fiber out there, which obviously is needed for the 4G network, but also is something that we think about for prepositioning for 5G. So you will continue to see that. You will continue to see us launch additional parts of LTE Advanced as we go through that. We had the initial launch of that last year. We expect additional features to come during the course of this year and we will continue to expand our C-RAN architecture. So within Wireless you should expect to see the spending continue to move to make the network more efficient on a cost-per-gig basis going forward. Then, as we've mentioned, fiber is a consistent part of our business so that is something you should expect to see us continue in. We've talked about what we're doing in Boston; you should continue to see us do that. Some of the other businesses aren't – as we've said previously, they are not as capital intensive as our network business, so you should expect to see that capex will continue to be focused on the network side of the business as we go into 2017.") (emphases added).

⁵²⁸ See *id.* ("5G wireless technology is a focus for us. We are now launching about 10 pre-commercial pilots across the country with multiple use cases, including dense urban and suburban neighborhoods. Our goal is to test the 5G fixed wireless technology in different environments in order to successfully operationalize 5G products for a commercial launch.").

⁵²⁹ See Comments of Fran Shammo, EVP & CFO, Verizon Communications Inc., Q1 2016 Verizon Communications Inc. Earnings Call (Apr. 21, 2016).

invested in, they are not good quality of service networks. And that's where this will put us.”⁵³⁰ Yet it is abundantly clear from Verizon's continued wireless segment investment and its fiber deployments – along with those made by its wired and wireless competitors – that Verizon's pre-vote rhetoric was nothing more than bluster. Its more sober post-vote comments reflect the reality that the FCC's policy had zero negative impact on its own investment and the industry's pro-growth status quo.

CenturyLink

Unlike AT&T and Verizon, CenturyLink's business is strictly wireline. Thus it acutely feels the impacts of the cable industry's continued dominance of the fixed broadband market, driven by the much lower-cost upgrade path for cable modem service compared to DSL. And like many other wireline-only telephone companies, CenturyLink's capital spending has been flat in recent years. Despite these existential challenges, CenturyLink has committed to upgrading a portion of its first-generation DSL networks to next-gen VDSL and full fiber. For example, during 2016 CenturyLink “increased addressable units receiving 100 megabits and 1 gigabit-plus speeds by 31 percent and 53 percent respectively.”⁵³¹

However despite its next-gen DSL deployment efforts, CenturyLink's 2015 capital spending was down slightly from 2014. Even with an increase in 2016, its total two-year post-vote capex declined by 4 percent. Nevertheless, this downturn had nothing to do with the FCC's vote, nor the company's spending on its core ISP business. In fact, its consumer broadband network investments are up following the FCC's vote.⁵³² CenturyLink's total capex is slightly

⁵³⁰ See Comments of Fran Shammo, EVP & CFO, Verizon Communications Inc., Q4 2014 Verizon Communications Inc. Earnings Call (Jan. 22, 2015).

⁵³¹ See, e.g., Comments of Glen Post, CEO, CenturyLink Inc., Q4 2016 CenturyLink Inc. Earnings Call (Feb. 8, 2017) (“Moving to the second initiative, we believe the greatest potential for us to drive returns on our capital investment lies in enabling and delivering broadband services. . . . During the year we increased addressable units received 100 megabits and 1 gigabit-plus speeds by 31 percent and 53 percent respectively.”) (emphasis added).

⁵³² See, e.g., Comments of Glen Post, CEO, CenturyLink Inc., Q4 2015 CenturyLink Inc. Earnings Call (Feb. 10, 2016) (“Finally, we deploy a disciplined approach to our operating capital investments to deliver profitable growth, first by investing more capital to enable high bandwidth network connectivity, and pursuing capital light investment approaches for our complementary adjacent services. Allocating capital based on the best returns on investment and opportunities and key strategic objectives will be key.”) (emphasis added); Comments of Glen Post, CEO, CenturyLink Inc., Q4 2016 CenturyLink Inc. Earnings Call (Feb. 8, 2017) (“Also in the capital side, you will notice that we reduced our expected 2017 capital spend to \$2.6 billion. I want to say a word about that. First, I want to point out that we don't believe this reduction will materially affect our revenue trajectory in 2017 or 2018. We have a significant amount of embedded capacity in our existing network. Our broadband investments for 2017 are expected to actually be a little higher than 2016 levels.”) (emphasis added).

down because the growth in consumer broadband capital spending was offset by declines in data center investment⁵³³ and pay-TV segment capex.⁵³⁴

After reviewing its capital plan in early 2016,⁵³⁵ CenturyLink made it clear to investors that it would pursue a strategy of growth through network upgrades that enable downstream speeds of 40 to 200 Mbps.⁵³⁶ The company expects capital intensities to remain elevated for the

⁵³³ See Comments of Glen Post, CEO, CenturyLink Inc., Q2 2015 CenturyLink Inc. Earnings Call (Aug. 5, 2015) (“We believe we have a number of opportunities to manage our business in a way that supports the dividends, as we work to capitalize on our growth prospects. First, we have made significant investments in our network and data center infrastructure over the last several years and believe we have the flexibility to lower our planned capital budget by about \$200 million to approximately \$2.8 billion in full year 2015, without significantly affecting our path to growth.”); See also *id.* (Comments of Stewart Ewing, CFO) (“[S]ome of the projects that we’re looking at that we’ve actually cut really relate to what we – that falls in the revenue enablement bucket. . . . And then another one-third of the \$200 million really comes from furniture equipment, vehicles, and things like that that we just think we can not have to do.”).

⁵³⁴ See, e.g., Comments of Glen Post, CEO, CenturyLink Inc., Q4 2016 CenturyLink Inc. Earnings Call (Feb. 8, 2017) (“On the video side, we are trialing an over-the-top product, but more generally we’re monitoring the rapidly evolving video market closely. . . . If we can get a better deal or we can get some of our content cost down and get the same type of service with the DirecTV Now, we will certainly take a look at that. We are talking to all the service providers looking at every possibility there . . . if you look at our Prism product, as you know, we’ve talked about content costs have really gone out of sight the last couple of years. If you look at the margins, sometimes actually negative margins. But we certainly – we have to make a truck roll and the cost of provisioning really makes it difficult from a returns standpoint for really driving the kind of returns we expect. With the over-the-top product, we don’t have to make a truck roll. We have much wider availability due to the lower bandwidth requirements for over-the-top. We have network-based storage for DVR, we’ll have local channels to help distinguish that product. And our trial is getting really strong reviews right now. But we have really deemphasized the Prism product because of the margin issue. Now, the value there is the pull-through. We get a strong pull-through, 90 percent pull-through of additional services, and 50 percent of those customers are new customers to CenturyLink. So that’s the real value here of the Prism product. But we have deemphasized that in moving more toward the over-the-top product and also focusing more on the broadband offerings we have versus the video.”) (emphasis added).

⁵³⁵ See Comments of Glen Post, CEO, CenturyLink Inc., Q1 2016 CenturyLink Inc. Earnings Call (May 4, 2016) (“[W]e believe our priority for capital investment is in the network to protect and grow our consumer and business network market positions. Therefore, we’ve launched the strategic review process for our data center and colocation business last year.”).

⁵³⁶ See Comments of Glen Post, CEO, CenturyLink Inc., Q2 2016 CenturyLink Inc. Earnings Call (Aug. 3, 2016) (“As you can see, even this relatively high usage case, which is well beyond the vast majority of users’ activity, can be met with speeds of less than 100 megabits, and that aligns with our own experience, where we see speeds of 40 megabits to 100 megabits as competitive today in virtually all of our markets. We expect that usage curve to continue to increase over time, moving to the 100 megabits or 200 megabits range over the next several years. Certainly, there will be users who will seek the gigabit connection, but for the vast

next few years as it makes these broadband upgrades, even as overall capex remains flat.⁵³⁷ Another recent change for CenturyLink is its decision to deemphasize its pay-TV service in favor of a lower-cost OTT/VSP approach. This is an example of how LEC ISPs are improving their own competitiveness vis-a-vis cable companies by utilizing Open Internet-enabled video competition. Relying on OTT as a video solution benefits consumers while also decreasing capex on the ILEC's balance sheet. This is the sort of benefit versus cost analysis that simply counting capex alone misses.

Finally, we note that there were no mentions of Title II or the Open Internet rules' impact on investment on any of CenturyLink's quarterly investor calls following the FCC's February 2015 vote.

majority of consumers, we see 100 megabits to 200 megabits as being more than sufficient to meet market demand for a number of years. . . . We're confident we can accomplish these broadband speeds within the confines of our existing capital budget levels, and this is based on currently available compression and access technologies, and average cost of deployment, which we hope will improve over time. By year-end 2018, we expect to enable speeds of greater than 40 megabits to 85 percent of our top 25 markets, and to reach more than 55 percent of those markets with more than 100 megabits, with a lot of that improvement coming over the next 12 to 18 months. And . . . across all of our markets, this will represent about 50 percent of addressable units receiving 40 megabits and higher speeds, and more than 30 percent of addressable units receiving 100 megabits and higher speeds by year-end 2018. By the time we get to year-end 2019, we'll have [] almost 11 million addressable units, representing 42 percent of total addressable units, across all of our markets, capable of receiving 100 megabits and higher. And in our top 25 markets, over 70 percent of addressable units are expected to have 100 megabits and higher speeds. By this time, we also expect to have approximately 3 million addressable units enabled for 1 gigabit, and higher speeds across all of our markets. Obviously, the changes in technology, cost of deployment, and market factors could cause us to reassess our actual deployments either a little lower or a little higher. While the details may vary, the point is, we believe we can deploy very competitive speeds within our existing capital plans. And while our investment plans assume capital intensity at current levels for the next several years, we do anticipate our capital intensity to return to historical averages over time." (emphases added).

⁵³⁷ *See id.* ("I was not saying the capital intensity would be up. It just won't come down for a couple of years, two or three years. We've had – our capital intensity has a little been higher than the industry for a couple of years, and we expect that level to continue. We believe we can hit these objectives in terms of broadband speed, improve the network, and enhancing the network with SDN and the other services that we are putting into the network, other technologies, within the current capital budget which is about \$3 billion today. . . . As for the more normal level of capex we can get to, we think there's \$300 million or \$400 million that come out easily out of \$3 billion so we think the \$2.5 billion level is certainly achievable, maybe less. It depends on what the opportunities are in terms of driving or investing in technology to drive revenue and margins. But right now, we think a more normal level being closer to the \$2.5 billion mark.") (emphases added).

Telephone and Data Systems Inc. (TDS Telecom/U.S. Cellular)

Telephone and Data Systems Inc. (“TDS”) is the parent company of regional mobile carrier United States Cellular Corporation (“U.S. Cellular”) and of ILEC/MSO

TDS Telecommunications Corporation (“TDS Telecom”). TDS’s wireline and cable capital investments were up more than 6 percent for the two-year period after the FCC’s Open Internet vote, while its cellular capex declined by 24 percent. TDS told investors before the FCC’s vote to expect these diverging directions in its capex spending across those two ISP business segments, and it explained precisely why: completion of its 4G LTE deployment on the wireless side, but increases in deployment of FTTH, DOCSIS 3.0, and bonded DSL high-speed internet access services.

Long before the FCC’s vote in 2015 to restore Title II, TDS’s U.S. Cellular unit had completed the bulk of its 4G LTE upgrades to nearly its entire network.⁵³⁸ U.S. Cellular’s capital investments peaked in 2012, and have declined annually ever since. The company made it clear, well ahead of the FCC’s vote, that its 4G project completion would be followed by a decline in capital investment,⁵³⁹ and that’s exactly what happened. This is no surprise. U.S. Cellular’s 4G LTE network reached 94 percent of its customers on the eve of the FCC’s February 2015 vote,⁵⁴⁰ and expanded to reach more than 99 percent of postpaid customers by the end of 2016.⁵⁴¹

But while TDS’s wireless segment was reaching the end of an upgrade cycle, its cable and ILEC segment continued to rollout higher-capacity broadband services. Contrary to the myths surrounding Title II, TDS executives repeatedly expressed strong confidence in their

⁵³⁸ See Comments of Ken Meyers, President & CFO, U.S. Cellular, Q4 2013 TDS and U.S. Cellular Earnings Call (Feb. 26, 2014) (“[C]apex was down in 2013 over 2012 by about 13 percent, and it’s down again this year. Part of that has been the work we’ve been doing with LTE. This year, while we start the year with about 87 percent of our customers covered, that’s only about two-thirds of our cell sites. So, our plan right now is to push that out this year, probably covering about another 1,100 cell sites. Which will get us somewhere – 93 percent or so of our customers, maybe 88 percent of our cell sites. . . . That will give us a little bit of a job next year to finish the LTE rollouts. We expect to get to all of our cell sites when we are done. . . . Next year’s LTE piece isn’t as big, so there is a potential there.”) (emphasis added).

⁵³⁹ See *id.*

⁵⁴⁰ See Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom, Q4 2014 TDS and U.S. Cellular Earnings Call (Feb. 25, 2015) (“[R]esidential broadband customers are increasingly choosing higher speeds in our ILEC market with 41 percent choosing speeds of 10 megabits or greater and 11 percent choosing speeds of 25 megabits or greater, driving increases in our average revenue per connection . . . and we continued to deploy 4G LTE, which now reaches 94 percent of our postpaid customers, providing an excellent network experience in our suburban and rural markets.”).

⁵⁴¹ See Comments of Ken Meyers, President & CFO, U.S. Cellular, Q4 2016 TDS and U.S. Cellular Earnings Call (Feb. 24, 2017) (“Our 4G LTE network reaches 99 percent of our postpaid customers”)

business prospects and their desire to invest – well after the FCC’s vote – in higher capacity services in order to drive growth.⁵⁴² Just prior to that vote, TDS said it had set aside a third of its capital spend to bring fiber-fed services to 35,000 new locations.⁵⁴³ This represented an acceleration of its plans for 2015, announced the day before the FCC’s vote – which as everyone knew by then, was to adopt strong net Neutrality rules and return to Title II.⁵⁴⁴

In May 2016, TDS announced it would increase DSL speeds at *an additional* one-third of its ILEC passings by deploying line-bonding technology.⁵⁴⁵ Six months later it reported completing nearly half of these upgrades.⁵⁴⁶ And during 2016, TDS announced deployment of 300 Mbps cable modem services.⁵⁴⁷ One year later, this higher-speed DOCSIS 3.0-enabled service is available to more than half of TDS’s cable customers.⁵⁴⁸

⁵⁴² See, e.g., Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom, Q1 2015 TDS and U.S. Cellular Earnings Call (May 1, 2015) (“We are very pleased with the success of our IPTV deployments and will continue to make fiber investments this year to achieve our goal of approximately 25 percent.”) (emphasis added).

⁵⁴³ See Comments of Dave Wittwer, CEO, TDS Telecom, Q4 2014 TDS and U.S. Cellular Earnings Call (Feb. 25, 2015) (“We are very pleased with the success of our IPTV deployments and will continue to make fiber investments this year In the wireline we will continue to deploy fiber where it strategically and economically makes sense or our costs and demographic metrics support the business case. In 2015, we have earmarked about a third of our capital spend to enable high speed broadband and video to approximately 35,000 additional service addresses.”).

⁵⁴⁴ See *id.* (Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom) (“Wireline CapEx, which is about two-thirds of total spend, is expected to increase slightly as we pull forward deployments of additional fiber build[:] the cable capital budget includes funds to increase capacity related to household growth, success based capital and continued network upgrades.”) (emphasis added).

⁵⁴⁵ See, e.g., Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom, Q1 2016 TDS and U.S. Cellular Earnings Call (May 6, 2016) (“We are completing our planned fiber builds to reach approximately 21 percent of our ILEC service addresses, and when combined with copper service, our IPTV-enabled markets cover approximately 25 percent of our service addresses. For the remainder of the year we will focus on driving IPTV and high-speed broadband bundles in these markets. To further strengthen our broadband offerings we are deploying bonding technology to an additional one third of our ILEC service addresses to drive higher speeds in our middle-tier ILEC copper markets.”) (emphasis added).

⁵⁴⁶ See, e.g., Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom, Q3 2016 TDS and U.S. Cellular Earnings Call (Nov. 4, 2016) (“Our planned fiber builds are almost complete, and will reach approximately 22 percent of our ILEC service addresses. When combined with copper service our IPTV enabled markets will cover approximately 25 percent of our ILEC service addresses. We have been focusing on further driving IPTV and high speed broadband bundles in these markets. To further strengthen our broadband offerings we are deploying bonding technology up to approximately 20 percent of our ILEC service addresses to drive higher speeds in our middle tier ILEC copper markets.”) (emphases added).

⁵⁴⁷ See Comments of Dave Wittwer, CEO, TDS Telecom, Q4 2015 TDS and U.S. Cellular Earnings Call (Feb. 19, 2016) (“Where economically feasible, fiber technology is being deployed

TDS Telecom's peak year for capex was 2015, when it completed much of its planned-fiber build.⁵⁴⁹ Wireline and MSO capex decreased in 2016 because of project completion,⁵⁵⁰ but is expected to rise again in 2017 as the company spends more on success-based capacity enhancement.⁵⁵¹ U.S. Cellular also told investors its capex would increase during 2017, as it spends more to provide "additional capacity to accommodate increased network usage."⁵⁵² The firm's customers are certainly taking advantage of access to these greater capacities (and the third-party edge-services to which they provide an open path) by subscribing to higher speed tiers.⁵⁵³

to provide Internet speeds up to 1 gigabit per second. By the end of 2015 we have deployed fiber-to-the-home to 21 percent of ILEC service addresses. . . . To support our strategy of growing broadband penetration, we will roll out speeds up to 300 megabits per second in our most competitive cable markets throughout the year." (emphasis added).

⁵⁴⁸ See Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom, Q4 2016 TDS and U.S. Cellular Earnings Call (Feb. 27, 2017) ("We are now offering 300 megabit service [to] more than half of our cable service addresses.").

⁵⁴⁹ See Comments of Dave Wittwer, CEO, TDS Telecom, Q4 2015 TDS and U.S. Cellular Earnings Call (Feb. 19, 2016) ("In 2016 we are completing our plan to fiber build to reach approximately 25 percent of our ILEC service addresses, and will focus on driving further penetration of triple play bundles in our existing markets. The completion of the planned fiber deployments is driving the lower capital spending for the wireline segment in 2016.") (emphasis added).

⁵⁵⁰ See Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom, Q4 2015 TDS and U.S. Cellular Earnings Call (Feb. 19, 2016) ("[W]ithin the segments, wireline capex, which is about two-thirds of total spend, is expected to decrease as we complete our planned fiber spending in targeted wireline markets. The cable capital budget includes funds for success-based growth, including the one-time analog reclamation project and increased broadband speeds.").

⁵⁵¹ See *id.* (noting TDS Telecom would have cable segment capex increases for broadband speed increases, but wireline decreases due to prior fiber deployment completion); see, e.g., Telephone and Data Systems Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2016 ("TDS 2016 10-K") ("TDS Telecom's capital expenditures for 2017 are expected to be approximately \$225 million [to m]aintain and enhance existing infrastructure at Wireline, Cable and HMS; Improve broadband capacity and speeds associated with A-CAM and state level stimulus grants; and Success-based spending to sustain IPTV, Cable and HMS growth.").

⁵⁵² See TDS 2016 10-K ("U.S. Cellular's capital expenditures for 2017 are expected to be approximately \$500 million [to e]xpand and enhance network coverage, including providing additional capacity to accommodate increased network usage, principally data usage, by current customers; [and] Continue deployment of VoLTE technology in certain markets . . .").

⁵⁵³ See, e.g., Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom, Q3 2016 TDS and U.S. Cellular Earnings Call (Nov. 4, 2016) ("Reflecting both our fiber and bonded copper deployments, residential broadband customers in these ILEC markets are continuing to choose higher speeds, with 52 percent choosing speeds of 10 megabits or greater, and 21 percent choosing speeds of 25 megabits or greater, which also contribute to the higher ARPUs we have experienced.").

As TDS continued to invest, and to express confidence in its strategy of growth thanks to higher quality and higher capacity services, the subject of Title II and the FCC's Open Internet rules never came up during any of its post-vote investor calls. The only time TDS ever even hinted that any FCC policy might impact some of its deployment plans was when it mentioned the FCC's USF policies for rural monopoly LECs.⁵⁵⁴ This is a common theme in ISP investor calls: the impact of FCC policy on network construction is solely a function of how much ratepayer money the FCC is willing to give monopolists through the USF program.

Frontier Communications

Frontier, the nation's fourth-largest ILEC ISP, sharply increased its capital investments after the FCC's vote. Its 2015 capex was 25 percent higher than it was in 2014, the year prior to broadband reclassification, and that number jumped again in 2016 (for a two-year post-vote increase of 71 percent over the two-year pre-vote total). Though much of that large increase is due to the acquisition of former Verizon assets, Frontier's capex was on a broadband deployment-driven uptick in the months prior to the FCC's vote, and that uptick continued afterwards. Like many ILECs, Frontier is seeing capex needs decline sharply in its legacy exchange business, replaced by investment opportunities in higher capacity residential and commercial services.⁵⁵⁵

Frontier is selective about where it invests in capacity upgrades, based on the economic realities facing LECs that serve a mix of (1) monopoly service territory high-cost rural markets, and (2) non-monopoly suburban and urban markets in which they typically face cable MSO competition. Frontier is pushing speed increases for its existing copper network by utilizing fiber-to-the-node network architecture in many cases (rather than full FTTH) in order to maintain some parity with cable's low-cost DOCSIS upgrades. This typifies LECs' strategy in light of harsh natural monopoly economics: they must invest some in order to remain viable against

⁵⁵⁴ See, e.g., Comments of Vicki Villacrez, VP, Finance & CFO, TDS Telecom, Q3 2016 TDS and U.S. Cellular Earnings Call (Nov. 4, 2016) ("In our remaining markets, generally those with no cable competition, we are evaluating how the FCC's modified service funding mechanism will further support broadband buildout.").

⁵⁵⁵ See, e.g., Frontier Communications Corp., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2014 ("We continued to invest in network speed and capacity to support our goal of attracting additional customers and increasing broadband penetration. In 2014, our broadband availability increased by over 1.4 million new households, which includes 1.3 million new households attributable to the Connecticut Acquisition, and we are now able to offer broadband to over 7.8 million households as of December 31, 2014."); Frontier Communications Corp., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2015 ("We continued to invest in network speed and capacity to support our goal of attracting additional customers and increasing broadband penetration. As of December 31, 2015, we are able to offer broadband to over 7.9 million households.") (emphases added).

cable⁵⁵⁶ and to lower their operating costs,⁵⁵⁷ but the time required to recover the \$1,000-plus incremental cost of full fiber upgrades is often too long a period to ask investors to wait. While it remains to be seen how viable this fiber-to-the-node strategy is over the long term, copper-based upgrades do enable Frontier to offer 50–100 Mbps services to a large portion of its customers. This strategy is helping increase Frontier’s per-customer revenues, even as it continues to experience net ISP customer loss because users in un-upgraded areas migrate to cable modem.

Frontier’s ILEC-born challenges notwithstanding, the company has repeatedly made clear that it is committed to continued broadband investments even after the FCC’s Title II reclassification. A large portion of the residential lines Frontier acquired from Verizon were first-generation DSL technology. Frontier told investors that it would bring next-generation DSLAM equipment to the central offices feeding many of these lines, enabling 50 Mbps or higher services. In an August 2016 investor presentation, Frontier spelled out a plan to bring 50+ Mbps service to 2 million more households by August 2017, and to extend its IPTV-capable network to an additional 3 million households by 2020–2021.⁵⁵⁸

Frontier is making quick progress towards those speed upgrade goals. In its February 2017 investor call, it reported upgrading “1 million households to 50 megabits or higher speeds” during 2016.⁵⁵⁹ In 2016, Frontier devoted half of its capex budget to broadband speed upgrades

⁵⁵⁶ See, e.g., Frontier Communications Corp., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2016 (“A main component of our strategy is to enable and strengthen the broadband capabilities of our network. . . . In order to remain competitive, we must continue to evolve our product offerings to remain current with the changing needs of the market, to provide strong customer service and support, [and] to invest in our network so we maintain adequate capacity and can deliver new capabilities as needed, . . .”) (emphasis added).

⁵⁵⁷ See, e.g., Comments of Dan McCarthy, President & CEO, Frontier Communications Corp., Q4 2015 Earnings Call (Feb. 23, 2016) (“We also continue to improve broadband capabilities [outside of our CAF-supported footprint]. For example, in Connecticut and other markets we are in the process of introducing speeds in excess of 100 megabits over copper, led by our fiber-to-the-node infrastructure. We have been investing to transform our operating support systems, our customer self-service capabilities, and our provisioning platforms. We believe these investments will position us well to lower operating expenses from our existing business as we deploy these enhancements and customers begin to adopt the new functionality.”) (emphasis added).

⁵⁵⁸ See Frontier Communications Corp., Investor Update, Second Quarter 2016 (Aug. 1, 2016). Frontier laid out its plan to expand “the revenue opportunity by leveraging technology advantage,” with steps such as increasing broadband penetration and customer migration to higher speeds by increasing “speeds across the network,” and “leveraging existing investments and upgrading to next-generation IP-based copper broadband technology.”)

⁵⁵⁹ See Comments of Dan McCarthy, President & CEO, Frontier Communications Corp., Q4 2016 Earnings Call (Feb. 27, 2017) (“Turning to speed improvements, during 2016, we upgraded 1 million households to 50 megabits or higher speeds. In the CTF markets, we upgraded approximately 200,000 copper-fed homes.”).

and FTTH expansion.⁵⁶⁰ But it expects a decline in capex during 2017 with many of these projects nearing completion⁵⁶¹ and with the company's shifting video service strategy.⁵⁶²

This video shift again shows how the FCC's Open Internet policy can increase broadband competition by lowering a carrier's capital and operational costs. Prior to the dawn of VSP competition, an ILEC had to invest in its own pay-TV service in order to compete with the triple-play offerings of traditional cable MSOs. This meant high operational costs (truck rolls, programming fees, administrative overhead) and greater capital costs (video server equipment, video CPE) – all to offer a service that, across the industry, is suffering overall margin and customer declines.⁵⁶³ But today, a midsized ILEC like Frontier can either partner with a VSP like DirecTV Now or Sling TV; or it can simply encourage customers to “BYO-TV,” saving substantial operational and non-network capital costs while remaining competitive against cable's triple-play bundles. This strategy, however, requires the carrier maintain a robust broadband network. This is something Frontier recognizes, as it told investors that it could achieve its priority of revenue generation by making sure its networks can deliver its customers a quality online video experience, all of which means its “not really cutting capex at this point.”⁵⁶⁴

Finally, for yet another company, we note there were no mentions of Title II or the Open Internet rules' impact on investment on any Frontier quarterly investor call following the FCC vote. On the eve of that vote, then-CEO Maggie Wilderotter said, “we live by the net neutrality

⁵⁶⁰ *See id.* (Comments of Perley McBride, EVP & CFO) (“Approximately half of 2016 capital expenditures were in support of growth initiatives including broadband expansion speed upgrades and fiber to the home expansions.”).

⁵⁶¹ *See id.* (“Our capital spending plan for 2017 is in the range of \$1 billion to \$1.25 billion. This is a decline for 2016 as our larger size has enabled greater efficiency including better pricing and procuring services. We also have more than adequate inventory on consumer devices and as mentioned we're scaling back our video build as we evaluate the opportunities created by the evolution of technology.”).

⁵⁶² *See id.* (“We also slowed new video deployment as we evaluate the opportunities now available as technology in this area continues to evolve. The remainder of our capital spending is combination of IT investments related to productivity enhancements and maintenance related projects.”).

⁵⁶³ *See supra* note 534 (discussing CenturyLink's decision to deemphasize PrismTV product in favor of OTT video to reduce costs and increase profits while remaining a reasonable substitute for triple-play cable service in its customers eyes).

⁵⁶⁴ *See, e.g.,* Comments of Dan McCarthy, President & CEO, Frontier Communications Corp., Q4 2016 Earnings Call (Feb. 27, 2017) (“[T]here ha[ve] been some advances and some changes in the landscape on the OTT side. So I think we could spend time developing our own; we may partner with others, but I think that will be an important part of the strategy going forward. But that's not going to stop us from investing in the network. One of the key priorities is revenue generation, whether that's really on the commercial side or it's really making sure that our speeds and our network are congestion-free going forward, because more and more video traffic is flowing[. W]hether it's our OTT product or it's someone else's, we want to make sure that's a good experience for customers. So we're not really cutting capex at this point.” (emphases added)).

rules and regs today, even though we are not required to do so. And we have also been under a Title II regulatory framework for years. So we understand how to operate in that environment.⁵⁶⁵ This mirrors the sentiment of other ISPs, particularly mid-sized and small ILECs, that understand quite well the difference between the full application of Title II in a monopoly exchange access market and the Title II light touch applied by the FCC in other telecom service sectors and markets.

Windstream

Windstream is the nation's fifth largest LEC ISP, with over one million residential high-speed access subscribers. After several years of decline, Windstream's capital expenditures rose dramatically following the FCC's February 2015 vote. Windstream's capital investments were nearly 26 percent higher in the two years following that vote than they were in the two-year period preceding it.

Windstream's increased broadband investments made after Title II's restoration are paying dividends for the company and its customers. In fact, the company saw such an immediate benefit from these increased post-vote investments that it decided to rollout higher speed services even more quickly than it had planned prior to the FCC's vote.⁵⁶⁶ In November 2015 Windstream announced "Project Excel," a plan to accelerate the company's ILEC network capacity upgrade plan from targeted completion in 2018 to a 2016 completion date.⁵⁶⁷ That

⁵⁶⁵ See, e.g., Comments of Maggie Wilderotter, Chairman & CEO, Frontier Communications Corp., Q4 2016 Earnings Call (Feb. 27, 2017) ("We do expect the new rules to focus on obligations for Frontier, that we already embrace; things like transparency, disclosure requirements, nondiscrimination obligations, and no blocking mandates. We do think there will be some reporting requirements put on us that we don't have today, which would include either performance characteristics of the broadband network or congestion management. Again, the devil is going to be in the details. We do not expect to file any lawsuits at this point in time. We want to wait and see what the final order looks like. We live by the net neutrality rules and regs today, even though we are not required to do so. And we have also been under a Title II regulatory framework for years. So we understand how to operate in that environment.").

⁵⁶⁶ See, e.g., Comments of Tony Thomas, CEO, Windstream Holdings Inc., Q3 2015 Earnings Call (Nov. 5, 2015) ("Project Excel [] accelerates our plans to upgrade and modernize the Consumer and ILEC SMB broadband capabilities by year-end 2016, or two years ahead of our previous timeline. This program upgrades our entire fiber-fed DSLAM infrastructure with VDSL2 electronics to enable faster broadband speeds and enhances backhaul to address future capacity demands and improve reliability. As illustrated in the Internet speed availability chart, we made significant improvements to our speed profiles in 2015 and Project Excel will meaningfully advance offerings in 2016. Upon completion, 25 meg speeds will be available to 54 percent of our broadband footprint and 50 meg speeds to 30 percent, which are very competitive offerings in our rural markets. These network upgrades provide a great customer experience, drive higher ARPU and allow us to increase market share.") (emphasis added).

⁵⁶⁷ See, e.g., Windstream Holdings Inc., Q3 2015 Earnings Presentation, at 9 (Nov. 5, 2015).

project took the percentage of Windstream's locations capable of 25 Mbps and higher from less than 20 percent (at the end of 2014) to 54 percent by the end of first quarter 2017.⁵⁶⁸

Prior to the FCC's vote, none of Windstream's consumer lines were capable of 50 Mbps; yet by the end of 2016, 26 percent could transmit data above this threshold, with 13 percent capable of downstream speeds above 75 Mbps.⁵⁶⁹ Windstream's vectored DSL and fiber upgrades came quickly, with the company reporting that it had rolled out 50-plus megabit services to one million locations during the last 3 months of 2015 alone.⁵⁷⁰ The company also began rolling out gigabit fiber services during the first half of 2016,⁵⁷¹ yet another sign that the FCC's Open Internet vote had no negative impact on even Windstream, an ISP that faces severe geographic service territory challenges and competitive challenges too for its legacy telco broadband deployment efforts.

⁵⁶⁸ *See id.*; *see also* Comments of Tony Thomas, CEO, Windstream Holdings Inc., Q4 2017 Earnings Call (Mar. 1, 2017) (“[O]ur operational strategy for ILEC consumer and SMB is to continue to enhance the broadband network and deliver more speed to more people by expanding premium speed availability, deploying additional gig markets and leveraging next-generation broadband technology such as vectoring and G.fast. As you know, Project Excel has been a big driver of increasing Internet speed availability, and once completed in the first quarter we will be able to offer premium Internet speeds of 25 meg or higher to over half of our footprint. Our focus will then transition to activating more customers and increasing our penetration where we have implemented premium broadband speeds. Currently 89 percent of our existing customer base subscribes to Internet speeds of less than 25 meg. With the increased availability of premium broadband speeds we have a significant opportunity to migrate customers to faster speeds which will reduce churn and improve the customer experience. This will position Windstream to take market share and grow revenue and contribution margin.”).

⁵⁶⁹ *See, e.g.*, Windstream Holdings Inc., Q4 2016 Earnings Presentation, at 7 (Mar. 1, 2017).

⁵⁷⁰ *See* Comments of Tony Thomas, CEO, Windstream Holdings Inc., Q4 2015 Earnings Call (Feb. 25, 2016) (“In 2016, we will benefit from the deployment of 50, 75 and 100 megabyte premium speeds, which were rolled out during the fourth quarter of 2015, to approximately one million locations.”).

⁵⁷¹ *See id.* (“We will also continue to expand the availability of premium speeds throughout 2016 via Project Excel, which enhances backhaul capabilities in the middle mile to support current and future capacity demands and greatly improve broadband speed across all of our speed tiers. At the end of 2016, we estimate that 25 megabyte Internet service will be available to 54 percent of our broadband footprint and 50 megabytes to 30 percent. These are very competitive speeds in our rural markets. In addition, we are launching one gig service in four markets in the first half of 2016 and continue to expand the availability of our IPTV service. The network will further benefit from CAF investments which will support and expand broadband to an additional 470,000 locations. Collectively, these programs significantly enhance our broadband capabilities, improve our competitiveness and position us to grow consumer and SMB ILEC revenue and contribution margin.”) (emphasis added).

With the capital-intensive portion of these upgrades largely complete (*i.e.*, the fiber deployment portion),⁵⁷² Windstream's capital expenditures are expected to decline during 2017.⁵⁷³ But now that such a large portion of the company's network is (in Windstream's words) "future proof," this doesn't mean capacity upgrades won't continue.⁵⁷⁴ This is something that anti-Title II propagandists often fail to acknowledge: broadband network capacity is a function not only of the quality of the line running between a node and the customer's location, but also of the electronics powering that line on both ends.

Cable companies have gone from offering single-digit megabits per second services to offering multi-gigabits per second services, simply by deploying new headend equipment and

⁵⁷² See Comments of Bob Gunderman, CFO, Windstream Holdings Inc., Q4 2015 Earnings Call (Feb. 25, 2016) ("If you look further out, one of the things that we're doing obviously, with Project Excel is to accelerate the investment into the consumer and ILEC SMB broadband network. We'll address all of our fiber fed DSLAMs by the end of this year. Once that is done, it is done. We really have pulled in those investments from a multi-year period into 2016. . . . And after that, we really don't see that being a continuing need in the business. We'll have a more moderated capacity and expansion capex need on the consumer and ILEC SMB networks. We are really accelerating a lot of things to both put ourselves in a better competitive position and certainly drive some better financial results.") (emphases added).

⁵⁷³ See Comments of Bob Gunderman, CFO, Windstream Holdings Inc., Q4 2016 Earnings Call (Mar. 1, 2017) ("At the midpoint of our capex guidance we are targeting total adjusted capex of \$815 million as we pursue strategic initiatives to advance our high-speed Internet capabilities, strategically expand the wholesale network, enhance overall network performance and reduce network operating expenses. . . . We came out of 2016 with really a lot of the physical plant builds in the field complete. And so now in first quarter we are really going through and finishing off some of what we call the test and turn-up activities and really making a big push with our vendor partners to get that completed in first quarter. So still tracking well there. Obviously, once those activities get done you would expect to have additional speed to sell to our consumer customers and ILEC SMB in some cases. So where that capex actually lands in terms of completion we could see some of it bleed over into 2Q as the vendor invoices come in. But we are excited about getting that wrapped up real soon, and that team is pushing really hard to really finish that off and get an even greater set of speed capabilities into the hands of our customers.") (emphasis added); see also Comments of Bob Gunderman, CFO, Windstream Holdings Inc., Q3 2016 Windstream Holdings Inc. Earnings Call (Nov. 7, 2016) ("As a reminder, if you look ahead, past 2017, we've consistently said that we would expect our organic capex to start to come down, really, based upon the wrap-up of some of our legacy IT integration projects, and as well as some of the wholesale projects starting to subside in terms of capex intensity.").

⁵⁷⁴ See Comments of Tony Thomas, CEO, Windstream Holdings Inc., Q4 2016 Earnings Call (Mar. 1, 2017) ("And I think as you look forward in terms of capital intensity I think we feel comfortable where we've been. Obviously, one of the benefits of doing Project Excel was creating a scalable Internet infrastructure. So every fiber-fed node on the backend of Project Excel in our network will be a fully scalable Ethernet architecture, and that's a big advancement. Not only do we get the increased speed capability, we future proof the network.") (emphasis added).

customer modems with no line upgrades necessary for much of this speed upgrade. LECs don't quite have this luxury, but once they shorten local loop lengths by pushing fiber into neighborhoods, they are able to use newer technologies like vectoring to take downstream speeds from single-digit megabits per second to more than 100 Mbps. The incremental costs of electronics upgrades are far lower than the incremental costs of fiber deployment.⁵⁷⁵ In other words, speeds can go up – way up – even when capex goes down. ISPs can and do take advantage of what they've already invested in prior years. This is why fixating solely on changes in aggregate capex is a terrible way of measuring progress.

Finally, yet again and for yet another company, the topics of Title II and the FCC's *Open Internet Order* never came up on any of Windstream's post-vote quarterly investor calls. As with other smaller ILECs, mentions of FCC policy on these calls almost exclusively focused on the Connect America Fund. This yet another strong indicator of the total lack of material impact on – let alone harm to – ISP investment from Title II's restoration.

Cincinnati Bell

Cincinnati Bell has been busy over the past few years deploying its “Fioptics” fiber-to-the-home service, and is close to its original goal of 70 percent coverage.⁵⁷⁶ And though the company thought that its capital investment for 2015 would be its peak, the 2016 total was even higher,⁵⁷⁷ despite 2015 itself having exceeded the company's pre-FCC vote guidance.⁵⁷⁸

⁵⁷⁵ See, e.g., Comments of Tony Thomas, CEO, Windstream Holdings Inc., Q3 2015 Earnings Call (Nov. 5, 2015) (“[T]o just reinforce, these are network elements that we have today that already have fiber to them. So all we're doing is updating the electronics. That is what makes this such a compelling rate of return and opportunity we have, is we have already done the hard work of digging the ditch and laying the fiber. Now we're simply placing electronics there.”) (emphasis added).

⁵⁷⁶ At the end of 2014, Fioptics was available to 335,000 addresses, or 41 percent of Cincinnati Bell's market. As of the end of 2016, the service is available to 533,400 addresses, or 67 percent of “greater Cincinnati.” See, e.g., Presentation made by Cincinnati Bell Inc. at the Morgan Stanley Technology, Media & Telecom Conference (Mar. 2, 2017); Comments of Ted Torbeck, President & CEO, Cincinnati Bell Inc., Q4 2014 Earnings Call (Feb. 19, 2015) (“Our Fioptics suite of products is currently available to more than 40 percent of greater Cincinnati and we plan to expand that coverage to between 70 percent and 80 percent over the next few years.”).

⁵⁷⁷ See Comments of Leigh Fox, CFO, Cincinnati Bell Inc., Q4 2015 Earnings Call (Feb. 18, 2016) (“In total, we expect [] capital expenditures to be down compared [to] 2015 and range between \$265 million and \$275 million. . . . [In 2016] we expect capex to begin declining. We stated in the past that on a normalized basis, capex is going to be . . . in the historic . . . 12 percent ranges of revenue, historic telco ranges. I don't see any different story right now as we sit here and look forward into 2017. We do believe we will be cash flow positive in 2017. We will make progress in 2016 compared to 2015 so you will see improvement in cash flow from 2015 to 2016. We won't be positive but we will be positive in 2017. I would expect ranges to be the normal telco ranges of capital spend. . . . It's not going to be – 2017 won't look like a normalized year. We will still be building out. We've said that the build will stretch into 2017. We will see a reduction. At this point, I don't want to go beyond that. We are intently focused on

Cincinnati Bell's combined capital expenditures were more than 50 percent higher for the two years following the FCC's *Open Internet Order* vote than for the two years preceding it.

In 2014, the year before the FCC's February 2015 vote, Cincinnati Bell spent \$50 million to pass 59,000 additional locations with fiber.⁵⁷⁹ In 2015, the company allocated 74 percent more than that (\$87 million) to deploy fiber to an additional 97,000 locations – far exceeding its target of 66,500 new passings for that year.⁵⁸⁰

And even though it had expected total capex to decline in 2016, that year the company spent an even higher amount (\$90 million) than it did in 2015 to pass even more (101,000) locations with fiber than it did in 2015, signing up a record number of new Fioptics customers.⁵⁸¹ The company's executives have publicly stated that declining deployment costs⁵⁸² and strong demand give it “confidence to accelerate [] fiber investments.”⁵⁸³

cash flow, being cash flow positive in 2017 so I can sit here and say we do see that in front of us but I don't want to get too detailed on the commitment on capital levels yet.”)

⁵⁷⁸ See Comments of Leigh Fox, CFO, Cincinnati Bell Inc., Q4 2014 Earnings Call (Feb. 19, 2015) (“In total, 2015 capital expenditures are expected to be in the range between \$270 million and \$280 million.”).

⁵⁷⁹ See *id.* (“In 2014, we invested \$50 million on the construction of Fioptics passing 59,000 addresses.”).

⁵⁸⁰ See Comments of Leigh Fox, CFO, Cincinnati Bell Inc., Q4 2015 Earnings Call, Feb. 18, 2016 (“[C]apital expenditures for 2015 total \$180 million for Fioptics Specific to our Fioptics investment, the Company invested \$87 million to pass 97,000 new addresses during the year. [O]ur goal is to construct a fiber-to-the-home product for 95 percent of the 70,000 new addresses targeted to pass in 2016.”).

⁵⁸¹ See Comments of Ted Torbeck, President & CEO, Cincinnati Bell Inc., Q4 2016 Earnings Call (Feb. 15, 2017) (“[C]apital expenditures were \$286 million for the year as we ramped up investments significantly in the fourth quarter to capitalize on the continued strong demand for Fioptics. In total, we invested \$180 million in Fioptics during 2016. Construction costs to pass 101,000 new addresses accounted for \$90 million of the investment . . . as we experienced a record-high 44,000 Fioptics Internet activations – net activations. We also invested \$62 million for success-based fiber builds for business and managed service projects.”).

⁵⁸² See *id.* (Comments of Andy Kaiser, Chief Financial Officer) (“So for 2016, that number was around \$850 from a cost-to-pass perspective. And I believe Ted mentioned that was probably 10 percent, 15 percent better than what we had anticipated. So we continue to see opportunities to build out at a significantly reduced cost relative to what we had anticipated. From a CapEx per install, we are around the \$900 range. We continue to see – and we were having a discussion earlier this morning where pieces of that install are coming down in price. But what we saw in 2016 was around \$800-\$900 per install.”).

⁵⁸³ See, e.g., Comments of Ted Torbeck, President & CEO, Cincinnati Bell Inc., Q4 2014 Earnings Call (Feb. 19, 2015) (“Our goal is to get our fiber products in the hands of as many consumers as soon as possible. The ongoing success of Fioptics combined with our unique market opportunity gives us the confidence to accelerate our fiber investments.”); see also Comments of Ted Torbeck, President & CEO, Cincinnati Bell Inc., Q4 2015 Earnings Call (Feb. 18, 2016) (“On the penetration, year one, when we add fiber to the home, we get about 36

Given Cincinnati Bell's massive increases in investment and fiber deployment following the FCC's Open Internet vote, it is not surprising that the topic of Title II never came up on any of the company's quarterly investor calls after that February 2015 vote. The closest it came was the company's Q2 2016 earnings call, when it was asked about the impact of the Open Internet rules on Cincinnati Bell's ability to implement "two tier pricing." CFO Leigh Fox responded, "there is really no impact on how we think about pricing in net neutrality right now[;] the way that [] our network[']s architected[, it] is a non-issue, non-event."⁵⁸⁴

Consolidated Communications

Consolidated Communications is a LEC with operations in portions of 11 states. The company has just under 500,000 high-speed Internet access subscribers and 100,000 pay-TV customers. It has grown significantly over the past decade, with its most recent acquisitions including a 2014 purchase of Eventis and a mid-2016 purchase of Champaign Telephone Company. In December 2016, Consolidated announced it would acquire FairPoint Communications in an all-stock transaction. This deal would double Consolidated's revenues and make it the nation's 6th largest publicly traded ILEC ISP, behind Windstream.

Consolidated Communication's capital investments increased during the two years following the FCC's Open Internet vote (increasing in 2015, then declining in 2016). This as-reported increase came during a period in which the company made acquisitions (the Eventis and Champaign deals mentioned above) and divestitures too (Iowa ILEC assets, along with Consolidated's equipment and services business).⁵⁸⁵

Though Consolidated did not report *pro forma* results, we estimate that the company's capex (including capital expenditures by pre-merger Eventis and accounting for these subsequent divestments) was essentially flat for the 2015–2016 period when compared to the 2013–2014 period. Given the secular declines in investment seen at most ILECs, this result is par for the course. Consolidated's post-FCC vote capital expenditures also exceeded the company's pre-vote guidance.⁵⁸⁶

percent on high-speed internet and on video we get about 25 percent. Second year, we get 33 percent and 24 percent. So that's kind of what we are seeing. In fiber then, the node's a little less than that. That's why we're accelerating the fiber to the home. It's significantly higher. Year three, we are up in 40 percent in high speed and close to 30 percent in video.").

⁵⁸⁴ See Comments of Leigh Fox, CFO, Cincinnati Bell Inc., Q2 2016 Earnings Call (Aug. 4, 2016).

⁵⁸⁵ See Comments of Bob Udell, President & CEO, Consolidated Communications Holdings Inc., Q4 2016 Earnings Call (Feb. 23, 2017) ("We also took steps in 2016 to refine and focus on our core strategy by completing two divestitures. First we sold our rural Iowa ILEC property last August. These communities will be better served by adjacent incumbents who acquired the assets, allowing us to allocate our capital dollars to best support our broadband strategy in [] markets with higher returns. Second, we completed the divestiture of our equipment and services business in December, which allows us to concentrate on our network-based business and broadband services.").

⁵⁸⁶ See Comments of Steve Childers, SVP & CFO, Consolidated Communications Holdings Inc., Q4 2014 Earnings Call (Feb. 26, 2015) ("Now, let me discuss our 2015 guidance as compared

Though Consolidated's *pro forma* capital investments are essentially flat over several years, the company is still aggressively investing in fiber optic infrastructure deployment. This fiber expansion began before the FCC's vote⁵⁸⁷ and continued thereafter.⁵⁸⁸ Following that vote, Consolidated continued to offer its residential customers higher-capacity service, and an increasing proportion of them subscribe to 100 Mbps and 1 gigabit plans.⁵⁸⁹

The topic of the impact of Title II and the FCC's Open Internet rules did not come up in any of Consolidated's investor calls following the February 2015 FCC vote. The company was asked about it on its Q4 2014 investor call, held the same day as the FCC's vote. Consolidated's CEO Bob Udell made it quite clear that the regulatory framework was of no concern, telling analysts "regarding the Title II, this discussion is actually interesting internally, and the way we look at this is really along the lines of having lived with Title II for our existence. We're familiar

with the pro forma results for 2014. Capital expenditures are expected to be in a range [of] \$122 million to \$129 million." Actual 2015 capex was \$133.9 million.

⁵⁸⁷ See Comments of Bob Udell, President & CEO, Consolidated Communications Holdings Inc., Q4 2014 Earnings Call (Feb. 26, 2015) ("The success and demand we see for these services will drive continued investment in our fiber network and expansion into additional markets during 2015. Some of the expansion will come from commercial business plans and others will be initially driven by winning new fiber-to-the cell sites. The positive results from our expansion efforts during 2014 paved the way for us to do more in the future, all of which will be accomplished within our capex guidance.").

⁵⁸⁸ See Comments of Steve Childers, SVP & CFO, Consolidated Communications Holdings Inc., Q4 2016 Earnings Call (Feb. 23, 2017) ("We have flexibility in our capital plans with two-thirds tied to success-based opportunities with a continued focus on fiber deployment, and our capital investments have to meet our internal paybacks and returns And we expect capital expenditures [for 2017] to be in the range of \$115 million to \$120 million.") (emphasis added).

⁵⁸⁹ See, e.g., Comments of Bob Udell, President & CEO, Consolidated Communications Holdings Inc., Q2 2015 Earnings Call (Aug. 6, 2015) ("On the consumer side, we continue to increase broadband speed offerings, where 50 percent of our marketable homes can now receive 100 megabytes or more and we can deliver 1 gig to portions of all of our major markets. Consumers taking 20 megabytes or more have increased from 9 percent last year in the second quarter to 22 percent this year."); see also Comments of Bob Udell, President & CEO, Consolidated Communications Holdings Inc., Q4 2015 Earnings Call (Feb. 25, 2016) ("Well, we're not giving prospective guidance on that, but let me do it this way and talk about what we've accomplished 2014 to 2015, and I think it might be representative. We've got roughly 89 percent of our market that can get the 20-meg product, and in terms of the 100-meg product in actual homes passed, we have roughly 42 percent of our addressable market that can take that product and receive it. That's up from 31 percent in 2014, so you can see we've continued to expand our capability and backbone network ability to support those capacity adds."); Comments of Bob Udell, President & CEO, Consolidated Communications Holdings Inc., Q4 2016 Earnings Call (Feb. 23, 2017) ("We now offer over 90 percent of our marketable homes a broadband connection of 20 meg per second or higher and 42 percent can receive our 100 meg product. The number of customers subscribing to our 1-gig speed offering has more than doubled in the last year. And the demands for higher speeds will continue and our network, our service, and our support are key differentiators.").

with it, we understand it, would prefer to have less regulation, but in some ways this levels the playing field. And so, Title II regulation really is more of an issue for cable competitors to get used to and we're anxious like everyone else to see how significantly the move is by the FCC to impose reporting requirements and things that largely we're familiar with already."⁵⁹⁰ Judging by the disappearance of this issue from subsequent calls, it's clear that this anxiousness disappeared as it became clear that the FCC's policy was a highly deregulatory framework preserving the status quo.

FairPoint Communications

FairPoint's 2015 capital spending was down slightly from 2014, something the company told investors to expect in its fourth quarter 2014 earning's release.⁵⁹¹ FairPoint explained that this slight decline was due to "the flow of our business as we have completed major build out."⁵⁹² FairPoint's 2016 capex rose slightly above that 2015 level, the first increase at the company since 2010, and in line with the guidance given a year prior.⁵⁹³

FairPoint's decline in capital investment from 2014 to 2015 is not in any way an impact from Title II's restoration or the Net Neutrality rules. The company – like all ILECs – finds its legacy core business in a long-term, secular decline. In fact, the 2.8 percent drop in capex from 2014 to 2015 was the smallest percentage point decrease in nearly a decade straight of annual capex declines at FairPoint.⁵⁹⁴

FairPoint's capital expenditures peaked in 2008, following its purchase of certain Verizon landline assets, and they have been in a relative steady decline ever since, even as the company has continued to make targeted investments in growth capital in addition to maintenance capital. There's no mystery as to what's been happening at FairPoint: it is a mid-sized ILEC that's been clinging to a 20th century monopoly mindset; and, in fairness, unable to do much in the face of its cable competitors' natural monopoly and cost advantages. Like many other ISPs, Frontier's approach to capital investments is largely driven by a need to balance opportunities for growth against its desire to keep capital intensity in the low- to mid-teens in order to maintain EBITDA in line with analyst expectations. By the company's own admission, its investment ups-and-

⁵⁹⁰ See Comments of Bob Udell, President & CEO, Consolidated Communications Holdings Inc., Q4 2014 Earnings Call (Feb. 26, 2015) (emphasis added).

⁵⁹¹ See FairPoint Communications Inc., 2014 Earnings Release (Mar. 4, 2015) ("In addition [for 2015] . . . annual capital expenditures are expected to be less than \$120 million.").

⁵⁹² See Comments of Ajay Sabherwal, Chief Financial Officer, FairPoint Communications Inc., Q4 2014 Earnings Call (Mar. 4, 2015) ("So the CapEx one is the easier one, Mike. No, that is the flow of our business as we have completed major build out. Our greatest asset is our network, so that is already in place. There is a natural progression of that capital spending and we are getting much better at managing that spending as well, so I wouldn't attribute it directly to this particular labor negotiation.") (emphasis added).

⁵⁹³ See FairPoint Communications Inc., 2015 Earnings Release (Mar. 2, 2016) ("For full year 2016 . . . annual capital expenditures are expected to be \$115 million to \$120 million.").

⁵⁹⁴ FairPoint's annual capital expenditures for 2005–2016 were as follows (in millions): \$28, \$32.3, \$149.5, \$297, \$178.8, \$197.8, \$176.1, \$145.1, \$128.3, \$119.5, \$116.2, \$117.

downs are driven more by expectations of future FCC Universal Service Fund receipts than by concerns about regulation.⁵⁹⁵

In December 2016, Consolidated Communications announced plans to acquire FairPoint in a pure stock transaction. That could impact short-term capital spending at both companies and (if consummated) would create a synergy-related capex decline at the combined firm.⁵⁹⁶

As usual in our exhaustive review, there were no mentions (prompted or unprompted) of Title II or the Open Internet rules on FairPoint's investor calls following the FCC's February 2015 vote. There was, however, ample discussion of FCC subsidies and the impact of the Commission's Connect America Fund policy on the company's investments. Clearly, Title II authority was not of concern for FairPoint or the financial analysts whose job it is to worry about every possible factor impacting FairPoint's cash flows.

Shenandoah Telecommunications Company

Shenandoah Telecommunications Company ("Shentel") is a small but rapidly growing telecom company with LEC, MSO, and mobile wireless segments. The company serves mostly exurban and rural service territories in Virginia, West Virginia, Pennsylvania, Maryland, Kentucky, and Ohio. Shentel's as-reported capital expenditures during 2015 were slightly higher than its 2014 investments. Its expenditures were massively higher again in 2016, but due in part to the May 2016 closing of its acquisition of wireless carrier nTelos.⁵⁹⁷ On a *pro forma* basis, Shentel's two-year post-FCC vote capex was slightly higher than it was for the two years preceding the vote, with 2016's investments a peak year for the company on a *pro forma* basis. This uptick in investment comes just a few years after another, earlier period of elevated capex

⁵⁹⁵ See, e.g., Comments of Paul Sunu, CEO, FairPoint Communications Inc., Q4 2015 Earnings Call (Mar. 2, 2016) ("In addition, our August acceptance of CAF II provides financial support to extend the network to certain un-served and underserved locations in our service areas. Using our outstanding complex project management platform, we are confident we have the wherewithal to complete this six-year project on time and on budget. And, in the near term, we expect to meet or exceed the FCC's 2017 year-end mandate of 40 percent completion. Overall, we expect to be able to maintain our capex level in the low teens as a percentage of total revenue while we deliver this needed bandwidth to these high-cost and hard-to-reach locations.").

⁵⁹⁶ See FairPoint Communications Inc., 2016 Earnings Release (Mar. 6, 2017) ("For full year 2017 . . . annual capital expenditures are expected to be \$110 million to \$115 million.").

⁵⁹⁷ See Comments of Earle MacKenzie, EVP & COO, Shenandoah Telecommunications Company, Q4 2015 Earnings Call (Feb. 26, 2016) ("The 2016 capital plan includes \$123.3 million that we now plan to spend in the nTelos service area, as we finish the LTE upgrade, and 50 new coverage sites. Omitting the \$123 million for nTelos, the remaining CapEx plan is \$95.1 million, an increase over our previous two years, due to approximately \$36 million of non-nTelos expenditures for network expansion. The major projects of the upgrade [are] the Colane Cable, a fiber build along Interstate 81 in Virginia from Harrisonburg to Roanoke, and plans to continue to build fiber to the tower.").

during 2011–2013,⁵⁹⁸ illustrating the cyclical nature of spending – particularly at an ISP with diversified wireline, cable, and wireless operations.

Based on its recent public statements, it appears that Shentel’s capital expenditures will decline during 2017, because the company completed a large portion of its upgrade plans in 2016. But even with that pending predicted decline, Shentel has made clear that going forward the “biggest item in both the cable and wireline budgets is for the expansion of our fiber network.”⁵⁹⁹ These continued capacity upgrades are benefiting the company’s bottom line and benefitting Shentel’s customers too, the overwhelming majority of whom can receive 100 Mbps and faster services even in these less densely populated areas. These higher-speed wired offerings were launched after the FCC’s vote – yet another indicator that Title II had no negative impact on broadband market progress.⁶⁰⁰ Based on these results it is not surprising that the topics of Title II and the *Open Internet Order* were not raised or mentioned on any of Shentel’s investor calls following the FCC’s 2015 vote.

Hawaiian Telcom

Hawaiian Telcom is an ILEC formed in 2005 when Verizon spun off its assets in Hawaii. As a company serving a geographically isolated location, Hawaiian Telcom faces even more challenges than those typically confronting ILECs in an era of cable company ascent. To remain competitive and grow its business, Hawaiian Telcom has made infrastructure deployment and investment a top priority.

After peaking in 2009, Hawaiian Telcom’s capital investments declined for three straight years. In late 2011, however, the company began a six-year fiber deployment project to help it

⁵⁹⁸ See Comments of Christopher Finch, President & CEO, Shenandoah Telecommunications Company, Q4 2014 Earnings Call (Feb. 27, 2015) (“The major investments we made to upgrade our wireless network to 4G capabilities and to improve our cable network are paying off as we can now deliver the combination of high-speed, reliability and overall quality typically found in larger metropolitan areas. On the Wireless side of our business, our 4G upgrade has enabled us to meet the growing consumer demand for consistent coverage in any location. On the Cable side, our improved network meets customer demand for high-speed broadband and access to premium television packages. We have aggressively marketed our enhanced service offerings with the result of attracting new customers and signing up existing customers for expanded services. With the system upgrades completed, our capital expenditures have decreased, resulting in higher free cash flow.” (emphasis added).

⁵⁹⁹ See Comments of Earle MacKenzie, EVP & COO, Shenandoah Telecommunications Company, Q4 2016 Earnings Call (Mar. 20, 2017) (“We are projecting 2017 [actual capex] at \$152.3 million, with 57 percent going towards completion of the upgrade of the nTelos network and the expansion of the coverage. The biggest item in both the cable and wireline budgets is for the expansion of our fiber network.”) (emphasis added).

⁶⁰⁰ See Comments of Earle MacKenzie, EVP & COO, Shenandoah Telecommunications Company, Q4 2015 Earnings Call (Feb. 26, 2016) (“We also launched broadband speeds of 15 megabytes to 101 megabytes on our cable network, which overlaps approximately two-thirds of the homes passed in our regulated home service area.”).

compete directly with the triple-play offerings of its primary competitor (Time Warner Cable) and help it meet the increased backhaul bandwidth demands of cellular companies.⁶⁰¹ This fiber project resulted in sustained capital investment that started in 2013 and continues to this day, even as the company completed its 6-year targeted consumer fiber build plan.⁶⁰²

The company's elevated capital spending continued after the FCC's 2015 vote. Capex was up nearly 8 percent in the two years since the FCC adopted Title II-based Net Neutrality rules, compared to the two years preceding that decision. The company's capital investments during the year following the FCC's vote were the highest in its history, exceeding its investor guidance given two weeks after the vote.⁶⁰³ Hawaiian Telcom began offering gigabit fiber-to-the-home service in the months just after the FCC restored Title II classification.⁶⁰⁴

Hawaiian Telcom's 2016 capex was slightly down from that 2015 highpoint,⁶⁰⁵ and it has told investors to expect a further drop during 2017. This is not due to any concerns about the

⁶⁰¹ See Comments of Bob Reich, SVP & CFO, Hawaiian Telcom Holdco Inc., Q4 2014 Earnings Call (Mar. 12, 2015) ("Reported capex was \$96.7 million for the full-year 2014, up from \$86.3 million in 2013. The year-over-year increase was largely attributable to success-based spending related to the fiber-to-the-tower initiatives, costs associated with consolidating and virtualizing internal data centers, and increased success-based spending related to the growth and video subscribers, with more of our new subscribers being fiber-to-the-premise. As we've discussed on prior calls, the pace of the fiber-to-the-tower builds accelerated throughout 2014 at the request of our carrier customers. We ended the year completing 122 sites, more than double the 59 sites we completed in 2013. In addition, we've done the outside plant work on an additional 39 sites so we've already spent most of the required capital. We haven't included these sites in our year-end completed count, because additional customer work was required to make these sites Ethernet ready.").

⁶⁰² See Comments of Scott Barber, CEO, Hawaiian Telcom Holdco Inc., Q4 2016 Earnings Call (Mar. 14, 2017) ("Hawaiian Telcom TV and our fiber internet is now available to 202,000 homes on Oahu. And as I shared with you on our last call, this officially brings our targeted consumer fiber build program to its conclusion. Any incremental build going forward will be success-based when we have signed bulk MDU contracts or for Greenfield homes.") (emphasis added).

⁶⁰³ See *id.* ("Our capital program in 2015 is expected to be consistent with 2014 levels, as we continue to expand the reach of our next-generation fiber network and deploy success-based capital to support the subscriber growth of Hawaiian Telcom TV.").

⁶⁰⁴ See Comments of Scott Barber, CEO, Hawaiian Telcom Holdco Inc., Q4 2015 Earnings Call (Mar. 8, 2016) ("I'm also proud of a number of achievements we were able to deliver in all of our customer channels in 2015. Hawaiian Telcom became the home of Hawaii's fastest Internet service when we launched our 1 gigabit Internet product in mid year.").

⁶⁰⁵ See Comments of Dan Bessey CFO, Hawaiian Telcom Holdco Inc., Q4 2015 Earnings Call (Mar. 8, 2016) ("Reported capex was \$99 million for the full year 2015, up from \$96.7 million in 2014. The year-over-year increase in growth capex was largely attributable to success-based spending to support the growth of our next-generation services, including the spending to provision high-capacity circuits for the large government agency contract mentioned earlier. This increase in growth capex is offset by a decrease in maintenance capex. . . . Our capital program in 2016 is expected to be consistent with 2015 levels as we continue to focus on efficiently

regulatory or economic climate, but simply because Hawaiian Telcom has largely finished deploying fiber throughout its footprint, and thus “growth” capex will decline while “maintenance” capex will remain flat.⁶⁰⁶

Like many other ISPs reaching the end of a fiber-upgrade cycle, Hawaiian Telcom is entering a “harvest” mode where it reaps higher earnings from the increased business enabled by prior upgrades, even as operating and capital requirements decline.⁶⁰⁷

It’s instructive to examine how the quality of Hawaiian Telcom’s available infrastructure has changed in recent years, since total capex alone is a poor metric for measuring such developments. Prior to the FCC’s Open Internet vote, Hawaiian Telcom passed 160,000 locations with its IPTV service, and 92,000 of these were FTTH-enabled.⁶⁰⁸ One year after the

expanding our next-generation fiber network. We plan to enable 10,000 to 15,000 single family homes and MDU you units on Oahu this year, thus reflecting a shift towards more success-based marketable homes.”) (emphasis added).

⁶⁰⁶ See Comments of Dan Bessey CFO, Hawaiian Telcom Holdco Inc., Q4 2016 Earnings Call (Mar. 14, 2017) (“[C]apex was \$97.8 million for the full year 2016, a decrease of \$1.2 million compared to 2015. The year-over-year decrease was from lower growth capex, partially offset by higher maintenance capex due to investments in fleet and plant modernization to improve the reliability of our copper network. For 2017, our total level of capital expenditures is expected to be in the high \$80 million range. Maintenance capex for 2017 is expected to remain consistent with 2016 levels as we continue to optimize and modernize our copper plant to reduce future maintenance costs and improve customer service. Program capex consists of investments in our core network and IT infrastructure that provide the platform for future growth. Our consumer fiber build, CAF, [and] fiber-to-the-business initiative . . . are all included in this category. In 2016 we spent \$9 million on our targeted consumer home fiber build, which is now concluded, so we expect a similar [] drop . . . in our total program capex for 2017. . . . For 2017 we expect our total growth capex category to be consistent with 2016 levels as demand for our next generation IP-based services continue[s] to grow across all three customer channels. If we exclude trans-Pac related payments, our total capex expenditures have consistently declined year-over-year for the last few years from a high \$90 million level in 2014 to a mid \$80 million level in 2016. And we will continue to reduce further this year as we have completed our targeted consumer fiber build.”) (emphases added).

⁶⁰⁷ See *id.* (Comments of Scott Barber, CEO) (“Overall, I’m pleased with our 2016 results and the progress we’ve made in executing our four core strategies: to invest in our network and systems, grow the business, deliver superior service and improve financial performance. Over the last six years we have made robust investments to expand our fiber network and upgrade our systems. . . . This consistent increase in strategic revenue is directly attributable to our fiber investment which has enabled new products and services and offset declines in legacy services revenues.”) (emphasis added).

⁶⁰⁸ See Comments of Eric Yeaman, Hawaiian Telcom Holdco Inc., Q4 2014 Earnings Call (Mar. 12, 2015) (“In terms of footprint, we enabled 8,000 households in the quarter, expanding our service footprint to 160,000 households enabled. It’s notable that 57.5 percent of those households are capable of directly connecting to our next-generation fiber network, which is up from 44 percent at the end of 2013.”).

FCC's Title II restoration, the company's progress continued unabated, with 190,000 IPTV passings and 114,000 gigabit FTTH-enabled locations – with promises for additional upgrades to enable higher speeds on DSL too.⁶⁰⁹ By the end of 2016, with completion of its 6-year fiber deployment plan, the company's IPTV passings totaled 202,000 and FTTH-enabled locations exceeded 127,000.⁶¹⁰

Finally, we note that the topics of Title II and the FCC's *Open Internet Order* were not mentioned on any of Hawaiian Telcom's investor calls following the FCC's February 2015 vote.

Alaska Communications Systems

Alaska Communications Systems (“ACS”) is a wireline carrier primarily serving business and wholesale customers in Alaska. ACS divested its wireless assets to GCI during a series of transactions beginning in 2013. These divestitures are part of the reason ACS's capital investments declined in recent years. (Its capex peaked in 2008). ACS's recent capex decline is also due to the company's completion of major fiber system deployments that have future-proofed the company's operations and reduced its annual need for new investments.⁶¹¹

As its CEO told investors a week after the FCC's 2015 vote: “Six years ago, we made a substantial \$200 million investment in our [submarine] cables and in-state long-haul fiber

⁶⁰⁹ See Comments of Scott Barber, CEO, Hawaiian Telcom Holdco Inc., Q4 2015 Earnings Call (Mar. 8, 2016) (“In terms of footprint, at the end of the year 60 percent of our 190,000 next-generation households enabled on Oahu are capable of utilizing fiber-to-the-home technology, enabling the market-leading 1 gigabit Internet speed. We continue to see excellent Internet take rates in our fiber footprint and are looking to deploy technologies in the near future to increase Internet speed over existing copper network.”) (emphasis added).

⁶¹⁰ See Hawaiian Telcom Holdco Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2016 (“During the fourth quarter, 1,000 additional households were fiber-enabled, increasing the total number . . . to 202,000 with 63 percent of those households capable of utilizing fiber-to-the-premise technology. This brings the Company's targeted consumer fiber build program to its conclusion.”).

⁶¹¹ See, e.g., Comments of Anand Vadapalli, President & CEO, Alaska Communications Systems Group, Inc., Q3 2016 Earnings Call (Nov. 2, 2016). In response to a question about its capex decline, which posited that “you're obviously selling into locations where you've already brought fiber to the location, so you don't need to install the fiber again.” the CEO said “[Y]ou are right, this year the nature of sales opportunities that we got required us to spend less capital than we had originally thought. So this is a little nice surprise for us, a favorable term, and we'll take it.” *Id.* (emphases added); see also Comments of Laurie Butcher, SVP of Finance, Alaska Communications Systems Group, Inc., Q3 2015 Earnings Call (Nov. 5, 2015) (“We were able to reduce net capital spending coming in at \$30.9 million for the year, primarily due to the nature of customer opportunities in our sales funnel, as well as operational efficiencies around capital governance.”).

network. Since then, we've continued to strengthen our last mile access network. A lot of our growth today derives from these investments.”⁶¹²

Though ACS's exit from the wireless business and its completion of prior projects led to a decline in capex in recent years, the company's post-vote capex exceeded guidance given at the time of the vote.⁶¹³ ACS continues to expand its fiber systems,⁶¹⁴ which benefits the company's more than 30,000 high-speed internet access service customers. After reclassification, ACS increased its entry-level offering to 10 Mbps downstream, and increased the percentage of its customers on 10 Mbps and higher tiers from 25 percent in May 2015 to 50 percent in May 2016.⁶¹⁵ The upgrades are improving ACS's earnings per customer and reducing churn.⁶¹⁶

Finally, as for most other ISPs, the topics of Title II and the FCC's *Open Internet Order* were not raised on any of ACS's investor calls following the FCC's February 2015 vote.

⁶¹² See Comments of Anand Vadapalli, President & CEO, Alaska Communications Systems Group, Inc., Q4 2014 Earnings Call (Mar. 5, 2015) (emphasis added).

⁶¹³ See *id.* (“[2015] Capital spending is expected to be between \$34 million and \$36 million and we are allocating \$16 million of that to success based capital spending.”). ACS's 2016 capex also exceeded prior guidance. See Comments of Laurie Butcher, SVP of Finance, Alaska Communications Systems Group, Inc., Q4 2015 Earnings Call (Mar. 3, 2016) (“Starting with 2016 guidance . . . Capital spending is expected to be approximately \$35 million.”). ACS's 2017 capex guidance indicates a continuation of this slight sequential decline. See Comments of Laurie Butcher, SVP of Finance, Alaska Communications Systems Group, Inc., Q4 2016 Earnings Call (Mar. 14, 2017) (“[C]apital spending [will be] between \$35 million and \$38 million.”).

⁶¹⁴ See, e.g., Comments of Anand Vadapalli, President & CEO, Alaska Communications Systems Group, Inc., Q3 2015 Earnings Call (Nov. 5, 2015) (“Certainly we continue to deploy more fiber behind each one of these opportunities. In fact that is one of the consumers of our success based capital is investing behind these kind of opportunities. So we continue to drive fiber investments and build on those relationships.”) (emphasis added).

⁶¹⁵ See Comments of Anand Vadapalli, President & CEO, Alaska Communications Systems Group, Inc., Q1 2016 Earnings Call (May 9, 2016) (“[I]n terms of the consumer business, we have been focused for the last almost 18 months in increasingly moving to 10 meg or higher services. I think we've said in the past that we stopped selling anything less than 10 meg though we have grandfathered existing customers who have lower speeds. Today when I look at the broadband subscriber base on consumer, almost half of our subscribers are 10 meg or higher compared with about a quarter of the customers who were 10 meg or higher a year ago.”) (emphasis added).

⁶¹⁶ See *id.* (“So, we have significantly increased the percentage of the higher-speed customers in our base. That is by design, it helps with ARPU, it helps with churn, it helps to the value proposition that we have in the marketplace.”).

Otelco

Otelco is a very small, publicly traded rural LEC serving just over 22,000 ISP customers and 3,350 video subscribers in portions of six states. With just under \$70 million in annual revenues (\$15.6 million from internet access), it is by far the smallest publicly traded ISP covered in this report.⁶¹⁷ Like most ILECs, Otelco's core business continues to decline as businesses migrate to less expensive enterprise services and households substitute wireless voice service for traditional landlines. Otelco's annual revenues in 2012 were \$98.4 million, declining to \$68.9 million by 2016. The entirety of these revenue declines comes from the company's traditional voice services business.⁶¹⁸

Despite these challenges, Otelco's capital investments increased during 2015 and again in 2016, after declining sequentially in previous years since 2011. Otelco's post-vote two-year capital investment total was 10 percent higher than the total for the two years prior to the vote.⁶¹⁹ Otelco's 2017 guidance suggests that this trend of increased investments in the Title II era will continue as the company expands its fiber offerings.⁶²⁰

As a small RLEC, Otelco is very used to Title II oversight. Not surprisingly, the topics of Title II and the FCC's *Open Internet Order* were not raised on any of Otelco's investor calls following the FCC's vote. The company did get dozens of questions about the FCC's USF policy

⁶¹⁷ See Otelco Inc., Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2016.

⁶¹⁸ Otelco's local service and network access annual revenues (*i.e.*, local voice services and revenues earned from interconnecting with long-distance carriers) declined \$30.179 million from 2012, with its total annual revenues declining by \$29.46 million.

⁶¹⁹ These two years of capex growth came after the company was asked by a shareholder in 2015 if it was "leaving [] opportunities on the table by underinvesting in capex in any way," to which Otelco's CEO replied "no, not at this time." See Comments of Sam Yake, Private Investor, and Rob Souza, President and CEO, Otelco Inc., Q4 2014 Earnings Call (Mar. 3, 2015). Yake said, "I own stock in other companies in the industry and I watch them closely. It seems to me with all due respect that you have the lowest CapEx in the industry and it seems to me like it's a little bit pushing the envelope. And I think you might be leaving some growth opportunities on the table or whatever." Souza said that "I think we've made reasonable capital expenditures not only this past year but in the past. I think we continue to invest in our IP technology including Hosted PBX. We've got the cloud hosting platform where we continue to invest money. As a matter of fact this year we invested \$300,000 in our cloud hosting capability to give us some additional diversity and capacity. So I believe that we're making the correct capital expenditures and I don't believe we're leaving anything on the table.").

⁶²⁰ See Comments of Rob Souza, President and CEO, Otelco Inc., Q4 2016 Earnings Call (Mar. 7, 2017) ("I would imagine the 2017 trend would be similar to 2016. . . . Our primary strategy consists of leveraging our strong incumbent RLEC position, including expanding our fiber network and providing better service and support levels and a broad suite of services, including managed services and hybrid cloud-based hosting.").

changes for rate-of-return carriers and other issues around A-CAM funding during this time, because these factors actually impact Otelco's investments and business prospects.

Cellular-Only Internet Service Provider Investment Summaries and Disclosures.

T-Mobile US Inc.

T-Mobile US Inc. ("T-Mobile") lagged AT&T and Verizon for its initial 4G network upgrades. But once it found itself flush with cash (from the AT&T/T-Mobile merger break-up fee) and spectrum (from Verizon's SpectrumCo divestiture), T-Mobile quickly ramped up capital investments in order to deploy nationwide 4G LTE service. T-Mobile's two-year post-vote capital investments (for 2015 and 2016) were 13 percent higher than they were during the two years preceding that vote (2013 and 2014). In fact, the company's post-vote capital spending exceeded the guidance given to investors ahead of the FCC's Title II reclassification.⁶²¹ During the two years since the FCC's vote, T-Mobile has increased its 4G LTE coverage from 265 million persons at the end of 2014 to 314 million at the end of 2016.⁶²² It also increased the number of markets with wideband LTE four-fold during those two years, ending 2016 with 252 million persons now able to access this higher-capacity 4G LTE service.⁶²³ T-Mobile told investors its capital spending will remain elevated, even as it completes its initial upgrade plans.⁶²⁴

⁶²¹ See Comments of Braxton Carter, CFO, T-Mobile US Inc., Q4 2014 Earnings Call (Feb. 19, 2015) ("We have a strong outlook for 2015 that balances growth and profitability. . . . Cash capex is expected to be in the range of \$4.4 billion to \$4.7 billion, slightly up from 2014.").

⁶²² See Comments of John Legere, President & CEO, T-Mobile US Inc., Q4 2014 Earnings Call (Feb. 19, 2015) ("We ended 2014 with 265 million 4G LTE POPs, that was significantly ahead of our committed 250 million target. And by expanding our network to 300 million 4G LTE POPs by the end of 2015, we intend to further level the playing field with our major competitors. We are quickly deploying wide band LTE already live in 121 market areas."); see also Comments of John Legere, President & CEO, T-Mobile US Inc., Q4 2015 Earnings Call (Feb. 17, 2016) ("Now we have 305 million 4G LTE POPs covered, and we continue to close in on Verizon. . . . Our deployment of extended range LTE on 700 megahertz A Block spectrum is way ahead of schedule. More than 300 markets [are] live, covering approximately 190 million people."); Comments of John Legere, President & CEO, T-Mobile US Inc., Q4 2016 Earnings Call (Feb. 14, 2017) ("Our 4G LTE coverage is at 314 million pops today, and we're targeting 320 million by year-end 2017. We are reaping huge benefits from this. . . . Our deployment of extended range LTE on the 700 megahertz A Block spectrum band is way ahead of schedule – 500 markets live covering more than 252 million people.").

⁶²³ See *id.*

⁶²⁴ See, e.g., Comments of Braxton Carter, CFO, T-Mobile US Inc., Q4 2015 Earnings Call (Feb. 17, 2016) ("Free cash flow in the quarter was impacted by higher cash CapEx, which amounted to \$1.4 billion in the fourth quarter and \$4.7 billion for the year, reflecting the continued investment in the expansion of our 4G LTE network."); see also Comments of Braxton Carter, CFO, T-Mobile US Inc., Q4 2016 Earnings Call (Feb. 14, 2017) ("Cash capex was flat year-over-year at \$4.7 billion. . . . We target cash capex of \$4.8 billion to \$5.1 billion in 2017 excluding capitalized interest compared to \$4.6 billion in 2016 on a like for like basis.").

There were no mentions of Title II or the FCC's Net Neutrality rules on any of T-Mobile's quarterly investor calls following the February 2015 vote. On eve of that vote, T-Mobile's CEO John Legere said, "I'm comfortable that if passed as we understand it, it will have no impact on music freedom. And relative to our competitors, I think we would continue to drive forward with our business as it is."⁶²⁵ Judging by T-Mobile's continued investments and its launch of a data cap-exempted video streaming service in the interim, Legere was right: the FCC's rules had "no impact" on any aspect of T-Mobile's business, much less a negative impact.

Sprint

Sprint's 2015 capital spending was up sharply from 2014, due in large part to its new strategy of purchasing smartphones and then leasing them to its customers. USTA and Hal Singer ignore the capital Sprint spent to buy these leased devices, in their strenuous efforts to manufacture a decline in aggregate ISP industry investment. But this is a real capital expense and a real risk of capital. Sprint, not its customers, owns these devices. It is on the hook for selling them on the secondary market if it wishes to recover the remaining capital value of these assets after a lease ends. Sprint's capital spending for leased devices is no different than a cable company's spending on set-top boxes or a DSL company's spending on modems. Furthermore, ensuring that its customers are using the tri-band devices necessary to receive the full capacities of its network is a key component of Sprint's business strategy. Excluding Sprint's equipment purchases from the analysis while including all other companies' CPE capital spending is a biased approach.

Sprint continues to invest capital to improve its network, even as it finds itself under enormous pressure to cut costs. Sprint's 2016 capital investments were down sharply, but this decline was largely due to its completion of its 4G LTE rollout, and near completion of its "LTE Plus" tri-banded service, which enables speeds above 200 Mbps.⁶²⁶ Sprint is now in a phase of capacity expansion through network densification, which requires less capital than its initial nationwide 4G LTE rollout and multi-band deployment.⁶²⁷ Sprint has indicated that the primary factor limiting its capex is municipal government approval for its network densification work.⁶²⁸

⁶²⁵ See Comments of John Legere, President & CEO, T-Mobile US Inc., Q4 2014 Earnings Call (Feb. 19, 2015).

⁶²⁶ See Comments of Marcelo Claure, President & CEO, Sprint Corp., Q3 2016 Earnings Call (Jan. 31, 2017) ("LTE Plus is now available in over 250 markets in the US, and I am proud of our network team for having the foresight two plus years ago to deploy 8T8R radios as part of the 2.5 rollout . . . providing a stronger signal delivery for better performance. In addition, Sprint has already deployed three-channel carrier aggregation in over 100 markets, which is expected to provide big download speeds of more than 200 megabits per second on capable devices.").

⁶²⁷ See Comments of Tarek Robbiati, CFO, Sprint Corp., Q3 2016 Earnings Call (Jan. 31, 2017) ("While Sprint is uniquely positioned to operate [at] lower capital intensity as a result of our tri-band LTE network foundation and our deep spectrum position, we do expect CapEx to accelerate in the fourth quarter and into FY17 as part of our densification program.").

⁶²⁸ See Comments of Marcelo Claure, President & CEO, Sprint Corp., Q4 2015 Earnings Call (May 3, 2016) ("One of the things we have to realize is that our network is performing quite well today. So therefore, we're going to continue to make the necessary investments in our network.

Sprint's historical capital spending pattern is another important illustration of the fact that improvements in capacity do not always require annual increases in total capital investment. Sprint's annual capital expenditures reached a low during 2009, then increased sequentially through 2013 as Sprint rolled out its 4G LTE network. Sprint launched LTE in mid-2012,⁶²⁹ and extended it to more than 200 million persons by the end of 2013.⁶³⁰ Then its capex declined during 2014, even as it extended 4G LTE to an additional 70 million persons reaching 270 million total.⁶³¹ Sprint's 2015 capex was the highest in the firm's history, largely due to its new handset program, but also due to further LTE expansion and new banded-LTE deployment.⁶³² With its LTE network reaching more than 300 million persons by 2016,⁶³³ its capex for that year declined to a more "normal" level.⁶³⁴ The elevated levels for 2012–2016's LTE deployment were temporary, and driven by that deployment cycle.⁶³⁵

We're still fully committed to our densification and optimization strategy, including tens of thousands of small cells and more macros. While at the same time, we're continuously looking at ways to deliver the benefit at a lower cost, based on various radio access equipment and structures that we have available. We have not changed our strategy at all, and we're going to continue to invest. The reason why we might push some of the capex to the following year is . . . approvals that we get from municipalities and others for the new structures that we have applied for leasing and permitting at this point in time. Therefore, nothing has changed.") (emphasis added).

⁶²⁹ See Sprint Corp., Full Year 2011 Earnings Release (Feb. 8, 2012) ("[A]s part of Network Vision Sprint has announced it expects to begin launching 4G LTE by mid-year 2012. In addition to Houston, Dallas, San Antonio and Atlanta, Sprint today announced Kansas City and Baltimore will be among the initial six major cities to launch.") (emphasis added).

⁶³⁰ See Sprint Corp., Full Year 2013 Earnings Release (Feb. 11, 2014) ("LTE coverage is now available to more than 200 million people. The company continues to expect that by the middle of this year LTE coverage will reach 250 million people.") (emphasis added).

⁶³¹ See Sprint Corp., Third Fiscal Quarter of 2014 Earnings Release (Feb. 5, 2015) ("During the quarter, Sprint's 800 MHz voice deployment reached nationwide availability, 4G LTE coverage expanded to cover 270 million people, and the 2.5 GHz 4G LTE deployment now covers 125 million people.") (emphasis added).

⁶³² See, e.g., Comments of Marcelo Claure, President & CEO, Sprint Corp., Q3 2015 Earnings Call (Jan. 26, 2016) ("Our new LTE Plus network is now in more than 150 markets across the country and takes advantage of our rich spectrum position, coupled with technology enhancement like carrier aggregation and antenna beamforming to create wider channels, producing more capacity and faster speeds and better sales performance.").

⁶³³ See Sprint Corp., FY 2015 Earnings Release (May 3, 2016) ("The Sprint LTE Plus Network, which takes advantage of the company's rich tri-band spectrum portfolio and uses some of the world's most advanced technologies in wireless such as carrier aggregation and antenna beamforming, is now available in 204 markets across the country, including recent launches in New York City, Boston, and Philadelphia. . . . Total LTE coverage now reaches nearly 300 million people, including approximately 70 percent being covered by the 2.5 GHz spectrum deployment.") (emphasis added).

⁶³⁴ See Comments of Joe Euteneuer, CFO, Sprint Corp., Q1 2015 Earnings Call (Aug. 4, 2015) ("[W]e are very focused on capital efficiency, and concentrating our resources on evolving our

When a carrier constructs a new network, it incurs substantial capital costs primarily due to the deployment of fiber to towers (and the construction of these towers, if space is not leased on existing towers). Once the initial network is in place, capacity expansions can take several forms, not all of which come with the same capital requirements. The move from 4G LTE to banded-LTE involves the installation of electronics that virtually bond different spectrum frequencies. If a carrier has ample unused spectrum (as Sprint does, with its 2.5 GHz portfolio, which it is also using for backhaul in order to lower costs),⁶³⁶ then it can increase capacity at a

network to be highly competitive. As a result, we expect to deliver a great network, while our CapEx over the next three years including 2015 is expected to be less than \$15 billion.”). This August 2015 capex guidance appears to have been close to accurate, as 2015–2016 capex totaled \$12 billion, and Sprint’s guidance for 2017 is less than \$3 billion. *See* Comments of Tarek Robbiati, CFO, Sprint Corp., Q3 2016 Earnings Call (Jan. 31, 2017) (“Regarding our guidance for cash capital expenditures, excluding leased devices, we now expect to spend between \$2 billion and \$2.3 billion, given better visibility to the timing of cash payments related to the densification. We continue to expect to further ramp up our densification and utilize the expanded toolbox of various cost-efficient coverage and capacity options in the fourth quarter of FY16, and into FY17.”).

⁶³⁵ *See* Comments of Marcelo Claure, President & CEO, Sprint Corp., Q4 2015 Earnings Call (May 3, 2016) (“The right way to look at this is – I think we’re coming from an advantaged position that few come to realize. Most of the heavy investment was done doing network vision, in which we were setting the foundation to have a pretty solid network. You’re seeing the results today, out of which – if you look at RootMetrics ratings, we’re already number two in voice, surpassing AT&T. If you look at Nielsen, we can claim that we have the fastest speeds in the country.”) (emphasis added); *see also* Comments of Tarek Robbiati, CFO, Sprint Corp., at the Deutsche Bank Media, Internet and Telecom Conference (Mar. 7, 2017) (“Relative to the history, our capex spend in fiscal year 2016 was lower. And there was an element of also deferral of some of the spend as we are awaiting permits to densify and optimize our network. There will be possibly some capex increase in fiscal year 2017, we foreshadowed that. But we do not expect our capital spend to reach back the levels of the years where Sprint had three platforms. I’m referring to the years of network division back all the way up to 2013. We now have an incredibly strong position with our spectrum assets and we can exploit this position with very creative solutions that will drive capital intensity down.”) (emphasis added).

⁶³⁶ *See* Comments of Marcelo Claure, President & CEO, Sprint Corp., Q1 2015 Earnings Call (Aug. 4, 2015) (“Also we expect to utilize various options for deployment of backhaul for small cell, in order for us to balance the performance, cost and the speed to market. The team is extremely excited about not only the performance enhancement these plans expect to deliver, but also the significant expected financial efficiency from both a capital and operating perspective . . . , requiring significantly less CapEx to achieve the desired performance and capacity, as well as lower anticipated operating costs to support.”) (emphases added). Comments of Tarek Robbiati, CFO, Sprint Corp., at the Deutsche Bank Media, Internet and Telecom Conference (Mar. 7, 2017) (“I would point you to the fact that we can use a lot of our spectrum to do wireless backhaul for example. We know so with big data where we have to deploy capacity, where we have to enhance our coverage. And that is helping us a lot in being very, very efficient from a CapEx standpoint.”) (emphases added).

very small incremental cost.⁶³⁷ All of the national wireless carriers have fully deployed the most-expensive parts of their networks, and are moving into a densification phase, in which capital costs can vary depending upon the specific company's existing architecture, densification technique,⁶³⁸ and unused spectrum portfolio.⁶³⁹

Finally, as with other carriers, the topics of Title II and the Open Internet rules did not come up on any of Sprint's quarterly investor calls following the 2015 vote. To the extent Sprint is concerned about any aspect of FCC policy, it is the agency's efforts to streamline carriers' ability to deploy small cells.⁶⁴⁰

⁶³⁷ See Comments of Tarek Robbiati, CFO, Sprint Corp., Q1 2016 Earnings Call (July 25, 2016) (“We expect site acquisitions and the associated capex to accelerate as we progress through the year. . . . Sprint is uniquely positioned to operate at a lower capital intensity as a result of our tri-band LTE network foundation today and our deep spectrum position.”) (emphasis added).

⁶³⁸ See *id.* (“I would call [Network Vision's deployment] phase 1. Phase 2 is a massive densification of our network, in which we're doing it a bit different. The traditional way network vision was done and many of the network buildups have done is you basically outsource the deployment, and you go to the traditional tower companies and you spend several billions of dollars. . . . We have a very clear densification strategy. And what we're seeing – leveraging big data is we're actually figure out where is the exact point in which we have to put additional structures in order for us to better serve our customers? Then we're going and seeing what is the least cost way to actually put the structure. It's a combination of going to tower companies in many cases. It's a combination of putting our own monopoles, of using small cells, of using femtocells. A lot of this [] depending on getting approvals from the different municipalities or different cities. [W]e have an estimate that we intend to spend around \$3 billion of capex this year. In the case that those approvals come faster, out of which, so far we're satisfied the rate they're coming, we will be spending potentially more than \$3 billion. If these approvals get delayed, then we will move it forward. . . . [T]here is not an intent to basically defer capex into FY17. We're going to spend as much as is necessary in order for us to provide a good experience to our customers, and continue with the densification of our network. As you know, when you're building things different in a way that hasn't been done, . . . it's a little harder to predict the actual capex.”) (emphases added).

⁶³⁹ See Comments of Masayoshi Son, Chairman, Sprint Corp., Q1 2015 Earnings Call (Aug. 4, 2015) (“[W]ithin Japan, SoftBank spent almost half in capex, compared to our competitor, but the result of our network coverage, the speed is number one. So what we are good at is spending less in capex, and create a number one network. Of course, it's easy to spend money and get the result. But if you have less money, . . . you have to use [your] brain, instead of money and muscle. . . . [W]e discussed with Sprint [] and SoftBank engineers, and initially the reaction was, [the] US environment is different. However, after all these studies, most of the key fundamentals are exactly identical. . . . So I am now very, very confident that Sprint will be able to create [an] equal or better . . . network very soon with much lower capex.”) (emphases added).

⁶⁴⁰ See Comments of Tarek Robbiati, CFO, Sprint Corporation, at the Deutsche Bank Media, Internet and Telecom Conference (Mar. 7, 2017) (“[T]here needs to be legislation that facilitates a rollout of dense sites and networks from a federal side, but each state has to define within that how they're going to implement it. So there needs to be a bit of a harmonization of the legislation to make that happen nationwide. But we see more and more positive momentum and

This is again illustrative of how Chairman Pai is wholly wrong to focus on Title II, especially when carriers are making it clear that there are actual deployment barriers that warrant attention (*e.g.*, high-cost rural areas, utility pole access, small cell deployment hurdles, high-frequency 5G spectrum), but Title II is no concern.

There's No Disputing the Facts: Restoring the Regulatory Framework to What Congress Dictated in the 1996 Amendments to the Communications Act is Working as Intended

The Commission's main (and possibly only) supposed justification for dismantling the FCC's Title II-based Open Internet framework is the utterly false claim that the current legal framework dampens ISP investment. This is not just the wrong metric to use, it is also demonstrably false and illogical.

In the two years since the FCC's February 2015 vote, Open Internet rules have re-set carriers' incentives towards growth and away from artificial scarcity. The country has seen an explosion in over-the-top video competition, but also realized as well a dramatic increase in next-generation broadband network deployment. The FCC's 2015 decision is working as intended. Carriers have clarity about their legal obligations, and so do the hundreds of millions of people and businesses that rely on broadband services for their everyday lives and most important activities. Whatever they say or do online, these users have the assurance of their communications rights granted to them by Congress. They know that carriers are subject to limited but essential obligations, requiring these internet access providers to transmit their customers' data in a reasonably nondiscriminatory manner.

ISPs now understand the path to profit is capacity growth, not unreasonable discrimination and artificial scarcity. This virtuous cycle of innovation and investment is only possible with the continued existence of nondiscriminatory telecommunications services; and its continued existence depends on retaining strong and enforceable Net Neutrality rules, based on a strong legal foundation. If Chairman Pai eradicates the telecom services market by fiat, it will stop the virtuous cycle.

The anti-Title II ideology has apparently led the new Commission's leadership to ignore not only the successes of the broadband market in the two years since the FCC's vote, but also the historic investment and competition happening on the Open Internet too. More new U.S. OTT services launched in the two years following that vote than in the seven years prior. The certainty of the order spurred the entry of numerous viable full pay-TV replacement services, with even vertically integrated carriers such as AT&T now distributing their pay-TV services via other ISPs' last mile networks.

Other incumbent ISPs with legacy pay-TV businesses may soon join that competition. The existence of this market (and of robust OTT video in general) is improving the choices

we are encouraged by the changes. Marcello, our CEO, is currently chairing CTIA and all the carriers are very much focused on streamlining this process because everybody wants to densify their networks.”).

available to video consumers, driving down the prices they pay, and increasing the diversity of offerings available to them. Without the certainty that Title II and the Open Internet rules provide against unreasonable discrimination, it would be impossible to imagine a world in which cable companies entered each other's markets, offered their pay-TV services to customers via their competitors' distribution facilities, or even scaled back and eliminated their own bloated channel bundles in favor of third-party video streaming over the top of their high-capacity broadband networks.

The FCC's return to the sound law of Title II is working. It's exactly what Congress envisioned for these markets when it overhauled the Communications Act at the dawn of the broadband-era: a highly deregulatory framework that nevertheless preserves the most basic and essential communications rights. The FCC's rules prohibit the worst discriminatory abuses, and they set norms that all ISPs claim to support. But as the courts have made clear, Title II authority is required for these rules, and it's also required to allow the FCC step in and stop any future unreasonably discriminatory practices that we may not foresee today. There's simply no good reason for the FCC to return the internet economy to an era of uncertainty under Title I or some other unworkable regime.

The anti-Title II crusade is carried out in service of a warped ideology, not in the service of internet users, and certainly is not in the pursuit of truth. And policymakers should care about the truth. Policy changes should be guided by facts and logic, not unbending ideology.

ADDITIONAL FIGURES ON ISP PROFITABILITY AND OTHER METRICS

**Figure A1:
Operating Cash Flow at Publicly Traded Broadband Providers (2013–2016)**

Operating Cash Flow (\$ thousands)	2013	2014	2015	2016	2013-2014	2015-2016	Percent Change (2015–2016 vs. 2013–2014)
Comcast (cable)	\$17,205,000	\$18,097,000	\$19,037,000	\$20,109,000	\$35,302,000	\$39,146,000	10.9%
Charter	\$2,158,000	\$2,359,000	\$2,359,000	\$8,041,000	\$4,517,000	\$10,400,000	130.2%
TWC	\$5,753,000	\$6,350,000	\$6,539,000	N/A			
Cablevision	\$1,333,983	\$1,377,072	\$1,257,603	N/A			
Suddenlink	\$510,605	\$690,663	\$695,714	\$771,824	\$1,201,268	\$1,467,538	22.2%
Wide Open West	\$168,300	\$201,500	\$213,000	\$201,500	\$369,800	\$414,500	12.1%
Cable ONE	\$236,647	\$205,833	\$246,413	\$251,831	\$442,480	\$498,244	12.6%
GCI	\$159,634	\$258,203	\$253,955	\$200,276	\$417,837	\$454,231	8.7%
Verizon	\$38,818,000	\$30,631,000	\$38,930,000	\$22,715,000	\$69,449,000	\$61,645,000	-11.2%
AT&T	\$34,796,000	\$31,338,000	\$35,880,000	\$39,344,000	\$66,134,000	\$75,224,000	13.7%
CenturyLink	\$5,559,000	\$5,188,000	\$5,152,000	\$4,608,000	\$10,747,000	\$9,760,000	-9.2%
Frontier	\$1,495,627	\$1,270,072	\$1,301,000	\$1,666,000	\$2,765,699	\$2,967,000	7.3%
Windstream	\$1,519,400	\$1,467,300	\$1,026,600	\$924,400	\$2,986,700	\$1,951,000	-34.7%
TDS Telecom +US Cellular	\$494,610	\$394,812	\$789,694	\$782,000	\$889,422	\$1,571,694	76.7%
Fairpoint	\$171,085	\$121,063	\$112,001	\$134,252	\$292,148	\$246,253	-15.7%
Cincinnati Bell	\$78,800	\$175,200	\$110,900	\$173,200	\$254,000	\$284,100	11.9%
Consolidated Communications	\$164,356	\$187,785	\$219,179	\$218,233	\$352,141	\$437,412	24.2%
Shenandoah Telecom. Co.	\$94,264	\$114,993	\$119,321	\$161,526	\$209,257	\$280,847	34.2%
Alaska Communications System	\$67,707	\$51,169	\$12,581	\$37,253	\$118,876	\$49,834	-58.1%
Hawaiian Telecom	\$76,961	\$90,490	\$90,596	\$90,088	\$167,451	\$180,684	7.9%
T-Mobile	\$3,454,000	\$4,146,000	\$5,414,000	\$6,135,000	\$7,600,000	\$11,549,000	52.0%
Otelco	\$18,650	\$18,122	\$21,013	\$18,637	\$36,772	\$39,650	7.8%
Sprint	\$2,610,000	\$1,996,000	\$3,579,000	\$4,194,000	\$4,606,000	\$7,773,000	68.8%
TOTAL PUBLICLY TRADED ISP (less Cablevision)	\$115,609,646	\$105,352,205	\$122,101,967	\$110,777,020	\$220,961,851	\$232,878,987	5.4%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements).

Figure A2: Operating Income at Publicly Traded Broadband Providers (2013–2016)

Operating Income (\$ thousands)							Percent Change (2015–2016 vs. 2013–2014)
	2013	2014	2015	2016	2013-2014	2015-2016	
Comcast (cable)	\$10,811,000	\$11,661,000	\$11,986,000	\$12,439,000	\$22,472,000	\$24,425,000	8.7%
Charter	\$909,000	\$971,000	\$1,114,000	\$3,355,000	\$1,880,000	\$4,469,000	137.7%
TWC	\$4,580,000	\$4,632,000	\$4,239,000	N/A			
Cablevision	\$699,224	\$921,258	\$848,471	N/A			
Suddenlink	\$184,668	\$258,499	\$49,236	\$385,287	\$443,167	\$434,523	-2.0%
Wide Open West	\$141,900	\$138,500	\$204,900	\$243,600	\$280,400	\$448,500	60.0%
Cable ONE	\$164,446	\$163,813	\$161,742	\$188,207	\$328,259	\$349,949	6.6%
GCI	\$112,862	\$143,562	\$106,211	\$79,103	\$256,424	\$185,314	-27.7%
Verizon	\$31,968,000	\$19,599,000	\$33,060,000	\$27,059,000	\$51,567,000	\$60,119,000	16.6%
AT&T	\$30,479,000	\$12,212,000	\$24,785,000	\$24,347,000	\$42,691,000	\$49,132,000	15.1%
CenturyLink	\$1,453,000	\$2,410,000	\$2,605,000	\$2,331,000	\$3,863,000	\$4,936,000	27.8%
Frontier	\$980,721	\$819,941	\$745,000	\$888,000	\$1,800,662	\$1,633,000	-9.3%
Windstream	\$1,009,000	\$507,100	\$509,400	\$515,400	\$1,516,100	\$1,024,800	-32.4%
TDS Telecom +US Cellular	\$235,359	-\$189,864	\$397,071	\$30,318	\$45,495	\$427,389	839.4%
Fairpoint	-\$113,186	-\$93,274	\$169,592	\$229,345	-\$206,460	\$398,937	-293.2%
Cincinnati Bell	\$163,800	\$176,900	\$128,000	\$93,000	\$340,700	\$221,000	-35.1%
Consolidated Communications	\$103,661	\$91,189	\$87,775	\$87,440	\$194,850	\$175,215	-10.1%
Shenandoah Telecom. Co.	\$55,407	\$61,943	\$74,086	\$22,526	\$117,350	\$96,612	-17.7%
Alaska Communications System	\$256,961	\$29,760	\$47,746	\$19,509	\$286,721	\$67,255	-76.5%
Hawaiian Telecom	\$41,771	\$30,471	\$19,262	\$18,792	\$72,242	\$38,054	-47.3%
T-Mobile	\$996,000	\$1,416,000	\$2,065,000	\$3,802,000	\$2,412,000	\$5,867,000	143.2%
Otelco	\$18,651	\$16,858	\$19,255	\$18,813	\$35,509	\$38,068	7.2%
Sprint	-\$1,855,000	-\$1,793,000	\$620,000	\$1,302,000	-\$3,648,000	\$1,922,000	-152.7%
TOTAL PUBLICLY TRADED ISP (less Cablevision)	\$82,697,021	\$53,263,398	\$83,193,276	\$77,454,340	\$135,960,419	\$160,647,616	18.2%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements).

Figure A3: EBITDA at Publicly Traded Broadband Providers (2013–2016)

EBITDA (\$ thousands)							Percent Change (2015–2016 vs. 2013–2014)
	2013	2014	2015	2016	2013-2014	2015-2016	
Comcast	\$21,449,000	\$22,985,000	\$24,639,000	\$26,730,000	\$44,434,000	\$51,369,000	15.6%
Charter+TWC+BHN (pro forma)	N/A	\$12,918,000	\$13,004,000	\$14,464,000			
Charter	\$2,651,000	\$3,066,000	\$3,100,000	\$10,226,000	\$5,717,000	\$13,326,000	133.1%
TWC	\$7,872,000	\$8,038,000	\$8,085,000	N/A			
Cablevision	\$1,700,000	\$1,904,700	\$1,815,600	\$2,219,600	\$3,604,700	\$4,035,200	11.9%
Suddenlink	\$836,600	\$870,300	\$985,900	\$1,170,600	\$1,706,900	\$2,156,500	26.3%
Wide Open West	\$438,100	\$412,300	\$443,900	\$463,600	\$850,400	\$907,500	6.7%
Cable ONE	\$209,020	\$372,176	\$302,145	\$335,511	\$581,196	\$637,656	9.7%
GCI	\$259,668	\$312,054	\$239,442	\$280,927	\$571,722	\$520,369	-9.0%
Verizon	\$48,486,000	\$36,610,000	\$49,062,000	\$41,231,000	\$85,096,000	\$90,293,000	6.1%
AT&T	\$50,018,000	\$32,144,000	\$46,733,000	\$50,451,000	\$82,162,000	\$97,184,000	18.3%
CenturyLink	\$6,063,000	\$6,849,000	\$6,817,000	\$6,254,000	\$12,912,000	\$13,071,000	1.2%
Frontier	\$1,997,217	\$1,996,386	\$2,065,000	\$2,926,000	\$3,993,603	\$4,991,000	25.0%
Windstream	\$2,308,500	\$1,892,600	\$2,173,400	\$1,583,000	\$4,201,100	\$3,756,400	-10.6%
TDS Telecom +US Cellular	\$1,400,060	\$778,748	\$1,381,899	\$1,049,944	\$2,178,808	\$2,431,843	11.6%
Fairpoint	\$167,328	\$134,952	\$393,896	\$451,944	\$302,280	\$845,840	179.8%
Cincinnati Bell	\$294,400	\$576,000	\$723,900	\$420,800	\$870,400	\$1,144,700	31.5%
Consolidated Communications	\$272,517	\$260,387	\$261,644	\$288,994	\$532,904	\$550,638	3.3%
Shenandoah Telecom. Co.	\$118,580	\$129,888	\$146,513	\$170,622	\$248,468	\$317,135	27.6%
Alaska Communications System	\$297,476	\$62,343	\$76,735	\$53,915	\$359,819	\$130,650	-63.7%
Hawaiian Telecom	\$115,412	\$108,465	\$107,141	\$108,708	\$223,877	\$215,849	-3.6%
T-Mobile	\$4,712,000	\$5,817,000	\$6,742,000	\$10,039,000	\$10,529,000	\$16,781,000	59.4%
Otelco	\$140,451	\$27,441	\$28,133	\$26,680	\$167,892	\$54,813	-67.4%
Sprint	\$6,791,000	\$3,405,000	\$7,282,000	\$9,131,000	\$10,196,000	\$16,413,000	61.0%
TOTAL PUBLICLY TRADED ISP (less Cablevision)	\$158,597,329	\$130,566,740	\$165,424,248	\$170,557,845	\$289,164,069	\$335,982,093	16.2%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Notes: Charter pro forma values represent “Adjusted” EBITDA, which Charter defines as “consolidated net income (loss) plus net interest expense, income taxes, depreciation and amortization, stock compensation expense, loss on extinguishment of debt, (gain) loss on financial instruments, other (income) expense, net and other operating (income) expenses, such as merger and restructuring costs, other pension benefits, special charge.” Cablevision and Suddenlink values for 2015 and 2016 represent Altice-calculated “Adjusted” EBITDA; 2013 and 2014 values are author-calculated values to conform with this reporting. Altice defines Adjusted EBITDA as “operating profit before depreciation and amortization, restructuring, deal fees, litigation and other non-cash items.” Wide Open West’s values represent “Adjusted” EBITDA.

Figure A4: Return on Invested Capital at Publicly Traded Broadband Providers (2013–2016)

Return on Invested Capital	2013	2014	2015	2016	2013-2014 (average)	2015-2016 (average)	Percentage Point Change (2015–2016 vs. 2013–2014)
Comcast	9.79%	11.56%	11.99%	11.74%	10.68%	11.87%	1.2%
Charter (as reported)	7.04%	6.49%	5.27%	4.19%	6.77%	4.73%	-2.0%
Cablevision	16.01%	19.74%	18.05%	N/A			
Suddenlink	2.89%	4.18%	2.06%	5.00%	3.54%	3.53%	0.0%
Cable ONE	N/A	18.74%	14.16%	12.33%	18.74%	13.25%	-5.5%
GCI	8.61%	9.00%	8.87%	5.15%	8.81%	7.01%	-1.8%
Verizon	19.94%	10.99%	21.81%	14.57%	15.47%	18.19%	2.7%
AT&T	17.93%	8.03%	12.09%	9.02%	12.98%	10.56%	-2.4%
CenturyLink	7.34%	6.95%	7.78%	6.46%	7.15%	7.12%	0.0%
Frontier	7.61%	7.13%	5.60%	6.91%	7.37%	6.26%	-1.1%
Windstream	10.53%	6.36%	8.85%	10.16%	8.45%	9.51%	1.1%
TDS w/ US Cellular	-5.21%	-1.91%	3.25%	3.42%	-3.56%	3.34%	6.9%
Fairpoint	-4.81%	-3.44%	0.27%	2.17%	-4.13%	1.22%	5.3%
Cincinnati Bell	12.53%	11.27%	12.05%	10.66%	11.90%	11.36%	-0.5%
Consolidated Communications	10.46%	9.12%	7.36%	7.57%	9.79%	7.47%	-2.3%
Shenandoah Telecom. Co.	8.31%	9.32%	11.53%	2.24%	8.82%	6.89%	-1.9%
Hawaiian Telecom	6.20%	5.04%	3.23%	3.17%	5.62%	3.20%	-2.4%
Alaska Communications System	9.19%	6.18%	-0.93%	5.84%	7.69%	2.46%	-5.2%
Otelco	24.30%	16.69%	19.67%	20.72%	20.50%	20.20%	-0.3%
Sprint	-6.93%	1.42%	2.11%	3.52%	-2.76%	2.82%	5.6%
T-Mobile	3.77%	2.20%	5.36%	6.42%	2.99%	5.89%	2.9%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Notes: Return on invested capital is the firm's net operating profit after tax (plus any partnership income), expressed as a percentage of the firm's average annual value of equity plus debt.

Figure A5: Value of Stock Repurchases at Publicly Traded Broadband Providers (2013–2016)

Value of Stock Repurchases (\$000)	2013	2014	2015	2016
Comcast	\$2,000,000	\$4,251,000	\$6,750,000	\$5,000,000
Charter (as reported)	\$15,000	\$19,000	\$38,000	\$1,562,000
TWC	\$2,509,000	\$259,000	\$0	N/A
Cablevision	\$12,262	\$6,608	\$19,141	N/A
Cable ONE	\$0	\$0	\$16,367	\$56,370
GCI	\$17,208	\$6,850	\$55,774	\$58,679
Verizon	\$153,000	\$0	\$5,134,000	\$0
AT&T	\$13,028,000	\$1,617,000	\$269,000	\$512,000
CenturyLink	\$1,586,000	\$650,000	\$819,000	\$16,000
Windstream	\$0	\$0	\$46,200	\$28,900
TDS w/ US Cellular	\$28,236	\$58,039	\$6,188	\$8,000
Cincinnati Bell	\$0	\$0	\$0	\$4,800
Consolidated Communications	\$887	\$1,856	\$1,125	\$1,231
Shenandoah Telecom. Co.	\$1,600	\$1,785	\$1,885	\$5,097
TOTAL	\$19,351,193	\$6,871,138	\$13,156,680	\$7,247,980

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Notes: Only companies that repurchased shares during the 4-year period are shown.

Figure A6: Dividends Paid at Publicly Traded Broadband Providers (2013–2016)

Dividends Paid (\$000)	2013	2014	2015	2016
Comcast	\$1,964,000	\$2,254,000	\$2,437,000	\$2,601,000
TWC	\$758,000	\$857,000	\$865,000	N/A
Cablevision	\$159,709	\$160,545	\$127,170	N/A
Cable ONE	\$0	\$0	\$458,782	\$34,445
Verizon	\$5,936,000	\$7,803,000	\$8,538,000	\$9,262,000
AT&T	\$9,696,000	\$9,552,000	\$10,200,000	\$11,797,000
CenturyLink	\$1,301,000	\$1,228,000	\$1,198,000	\$1,167,000
Frontier	\$399,768	\$200,892	\$576,000	\$707,000
Windstream	\$593,600	\$602,200	\$369,200	\$58,600
TDS w/ US Cellular	\$130,528	\$58,040	\$61,219	\$65,000
Cincinnati Bell	\$10,400	\$10,400	\$10,400	\$10,400
Consolidated Communications	\$62,064	\$62,341	\$78,209	\$78,419
Shenandoah Telecom. Co.	\$8,191	\$10,761	\$11,085	\$11,705
T-Mobile	\$0	\$0	\$55,000	\$55,000
TOTAL	\$21,019,260	\$22,799,179	\$24,985,065	\$25,847,569

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements). Notes: Only companies that paid dividends during the 4-year period are shown.

Figure A7: Earnings per Share at Publicly Traded Broadband Providers (2013–2016)

Basic Earnings per Share (before extraordinary)	2013	2014	2015	2016
Comcast	\$1.30	\$1.62	\$1.64	\$1.81
Charter (as reported)	-\$1.65	-\$1.88	-\$2.68	\$17.05
TWC	\$6.76	\$7.21	\$6.46	N/A
Cablevision	\$0.49	\$1.17	\$0.70	N/A
Cable ONE	N/A	N/A	\$15.21	\$17.23
GCI	\$0.23	\$0.18	-\$0.69	-\$0.10
Verizon	\$4.01	\$2.42	\$4.38	\$3.22
AT&T	\$3.39	\$1.24	\$2.37	\$2.10
CenturyLink	-\$0.40	\$1.36	\$1.58	\$1.16
Frontier	\$0.11	\$0.13	-\$0.29	-\$0.51
Windstream	\$2.35	-\$0.45	\$0.24	-\$4.11
TDS w/ US Cellular	\$1.31	-\$1.26	\$2.02	\$0.39
Fairpoint	-\$3.95	-\$5.15	\$3.39	\$3.88
Cincinnati Bell	-\$1.60	\$2.57	\$6.69	\$2.17
Consolidated Communications	\$0.73	\$0.35	-\$0.02	\$0.29
Shenandoah Telecom. Co.	\$0.62	\$0.70	\$0.84	-\$0.02
Hawaiian Telecom	\$1.01	\$0.76	\$0.10	\$0.10
Alaska Communications System	\$3.37	-\$0.06	\$0.26	\$0.05
Otelco	\$37.36	\$1.62	\$2.31	\$1.57
Sprint	N/A	-\$0.82	-\$0.43	-\$0.38
T-Mobile	\$0.05	\$0.31	\$0.83	\$1.71

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements).

Figure A8: Capital Intensity at Publicly Traded Broadband Providers (2013–2016)

Capital Intensity (capital expenditures as a percent of revenue)	2013	2014	2015	2016	2013-2014	2015-2016	Percentage Point Change (2015–2016 vs. 2013–2014)
Comcast (cable)	12.9%	13.9%	15.0%	15.2%	13.4%	15.1%	1.7%
Charter+TWC+BHN (pro forma)	16.5%	19.8%	18.6%	18.9%	18.2%	18.7%	0.6%
Cablevision (excluding Newsday)	15.5%	13.9%	12.4%	10.7%	14.7%	11.6%	-3.1%
Suddenlink	16.5%	18.0%	19.8%	12.7%	17.3%	16.1%	-1.1%
Mediacom	16.3%	15.5%	16.7%	18.5%	15.9%	17.7%	1.7%
Wide Open West	18.5%	19.9%	19.1%	23.6%	19.2%	21.3%	2.1%
Cable One	19.4%	20.3%	20.6%	15.3%	19.9%	17.9%	-1.9%
GCI	22.2%	19.3%	18.0%	20.8%	20.7%	19.4%	-1.3%
AT&T	16.5%	16.2%	13.6%	13.7%	16.3%	13.7%	-2.7%
Verizon	13.8%	13.5%	13.5%	13.5%	13.6%	13.5%	-0.1%
CenturyLink	16.8%	16.9%	16.0%	17.1%	16.9%	16.5%	-0.3%
Frontier	13.3%	14.4%	15.5%	15.7%	13.9%	15.6%	1.8%
Windstream	14.0%	13.5%	18.3%	18.4%	13.8%	18.3%	4.6%
Cincinnati Bell	15.7%	15.7%	24.3%	24.2%	15.7%	24.2%	8.5%
TDS (excluding US Cellular)	17.5%	19.1%	19.2%	15.8%	18.3%	17.5%	-0.9%
Fairpoint	13.7%	13.3%	13.5%	14.2%	13.5%	13.8%	0.4%
Consolidated Communications	17.8%	17.1%	17.3%	16.8%	17.5%	17.1%	-0.4%
Hawaiian Telecom	22.1%	24.7%	25.2%	24.9%	23.4%	25.0%	1.6%
Shenandoah Telecom. Co. (pro forma)	29.6%	25.5%	25.0%	31.6%	27.5%	28.2%	0.7%
Alaska Communications System	13.8%	16.3%	20.8%	17.8%	15.0%	19.3%	4.3%
Otelco	7.9%	8.1%	9.3%	10.0%	8.0%	9.6%	1.6%
Sprint	19.7%	15.5%	23.9%	12.9%	17.6%	18.3%	0.7%
T-Mobile	16.5%	14.6%	14.7%	12.6%	15.5%	13.6%	-1.9%
US Cellular	18.8%	14.3%	13.3%	11.3%	16.6%	12.3%	-4.2%
TOTAL (for companies shown)	15.6%	15.3%	15.2%	14.3%	15.5%	14.8%	-0.7%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements).

Figure A9: AT&T and Verizon Wireless Profits and Revenues (2011–2016)

AT&T & Verizon - Key Wireless Segment Financials	2011	2012	2013	2014	2015	2016	Compound Annual Growth Rate (2011–2016)	Compound Annual Growth Rate (2013–2014)	Compound Annual Growth Rate (2015–2016)
AT&T Mobility EBITDA	\$21,631	\$23,467	\$25,391	\$25,068	\$27,915	\$28,935	6.0%	-0.3%	0.7%
AT&T Mobility Operating Income	\$15,307	\$16,594	\$17,923	\$17,127	\$19,802	\$20,643	6.2%	-0.9%	0.8%
AT&T Mobility Revenues	\$63,212	\$66,763	\$69,899	\$73,992	\$73,705	\$72,821	2.9%	1.1%	-0.2%
AT&T Mobility Service Revenues	\$56,726	\$59,186	\$61,552	\$61,032	\$59,837	\$59,386	0.9%	-0.2%	-0.2%
AT&T Mobility EBITDA Margin	34.2%	35.1%	36.3%	33.9%	37.9%	39.7%	3.0%	-1.4%	1.0%
AT&T Mobility EBITDA Ser. Margin	38.1%	39.6%	41.3%	41.1%	46.7%	48.7%	5.0%	-0.1%	0.9%
AT&T Mobility Op. Inc. Margin	24.2%	24.9%	25.6%	23.1%	26.9%	28.3%	3.2%	-2.0%	1.1%
VZ Mobility EBITDA	\$26,489	\$29,728	\$34,199	\$35,219	\$38,953	\$39,036	8.1%	0.6%	0.0%
VZ Mobility Operating Income	\$18,527	\$21,768	\$25,997	\$26,760	\$29,973	\$29,853	10.0%	0.6%	-0.1%
VZ Mobility Revenues	\$70,154	\$75,868	\$81,023	\$87,646	\$91,680	\$89,186	4.9%	1.6%	-0.6%
VZ Mobility Service Revenues	\$59,157	\$63,733	\$69,033	\$72,630	\$70,396	\$66,580	2.4%	1.0%	-1.1%
VZ Mobility EBITDA Margin	37.8%	39.2%	42.2%	40.2%	42.5%	43.8%	3.0%	-1.0%	0.6%
VZ Mobility EBITDA Ser. Margin	44.8%	46.6%	49.5%	48.5%	55.3%	58.6%	5.5%	-0.4%	1.2%
VZ Mobility Op. Inc. Margin	26.4%	28.7%	32.1%	30.5%	32.7%	33.5%	4.9%	-1.0%	0.5%

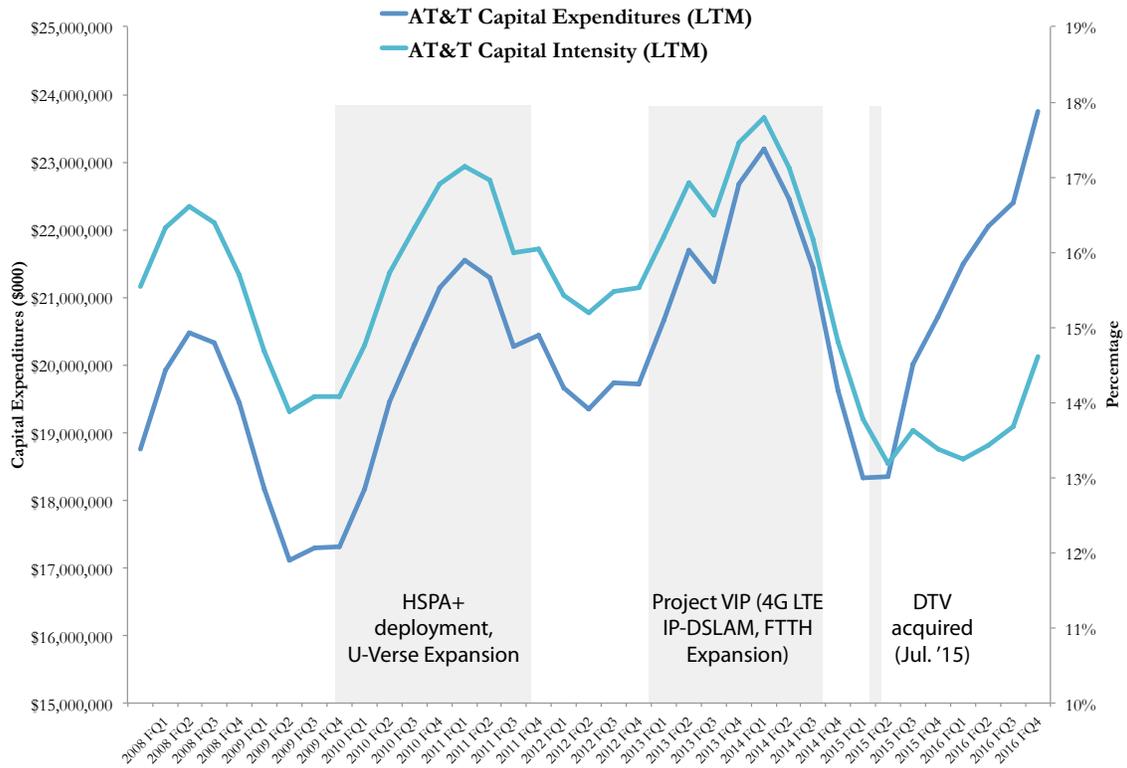
Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements).

Figure A10: AT&T Capital Expenditures Post-DTV Acquisition

AT&T Capital Expenditures Following DTV Acquisition	3Q 2015	4Q 2015	1Q 2016	2Q 2016	3Q 2016	4Q 2016	Q1 2017
Reported Capital Expenditures	\$5,255,000	\$6,093,000	\$4,669,000	\$5,470,000	\$5,813,000	\$6,456,000	\$6,015,000
Year-over-Year Change					\$558,000	\$363,000	\$1,346,000
Year-over-Year Change (%)					10.6%	6.0%	28.8%

Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements).

Figure A11: AT&T Capital Expenditures and Capital Intensity (12-Month Trailing, 2008–Q1 2017)



Source: Company SEC filings (10-Ks; 8-Ks; Financial Supplements).

Figure A12: U.S. Census Bureau – Telecommunications Industry Capital Expenditures, Revenues and Capital Intensities (2008–2015)

Aggregated Industry Data (For Listed NAICS Codes, from US Census Annual Capital Expenditures and Services Annual Surveys)			Capital Expenditures, Revenues, & Capital Intensity (Employer Firms)							
	2012 NAICS Code	2012 NAICS Desc.	2008	2009	2010	2011	2012	2013	2014	2015
Capital Expenditures (\$ mil., nominal)	5171	Wired telecommunications carriers, cable and other program distribution, broadband internet services providers	\$51,892	\$43,851	\$42,971	\$44,508	\$43,661	\$49,848	\$48,496	\$51,178
	5172	Wireless telecommunications carriers (except satellite)	\$25,272	\$20,651	\$23,052	\$25,283	\$32,949	\$34,040	\$35,046	\$32,794
	5174, 5179	Telecommunications resellers, satellite, and other telecommunications	\$3,487	\$2,760	\$4,200	\$3,740	\$4,428	\$3,352	\$3,089	\$3,212
	517	Telecommunications	\$80,651	\$67,262	\$70,223	\$73,531	\$81,038	\$87,240	\$86,631	\$87,184
Revenues (\$ mil., nominal)	5171	Wired telecommunications carriers, cable and other program distribution, broadband internet services providers	\$293,473	\$282,508	\$281,149	\$284,810	\$285,663	\$288,647	\$296,792	\$306,384
	5172	Wireless telecommunications carriers (except satellite)	\$182,581	\$188,042	\$199,235	\$214,361	\$225,397	\$233,123	\$251,766	\$254,406
	5174, 5179	Telecommunications resellers, satellite, and other telecommunications	\$30,228	\$30,141	\$30,115	\$31,319	\$34,534	\$37,165	\$39,614	\$41,180
	517	Telecommunications	\$506,282	\$500,691	\$510,499	\$530,490	\$545,594	\$558,935	\$588,172	\$601,970
Capital Intensity (capital expenditures as a percent of revenue)	5171	Wired telecommunications carriers, cable and other program distribution, broadband internet services providers	17.7%	15.5%	15.3%	15.6%	15.3%	17.3%	16.3%	16.7%
	5172	Wireless telecommunications carriers (except satellite)	13.8%	11.0%	11.6%	11.8%	14.6%	14.6%	13.9%	12.9%
	5174, 5179	Telecommunications resellers, satellite, and other telecommunications	11.5%	9.2%	13.9%	11.9%	12.8%	9.0%	7.8%	7.8%
	517	Telecommunications	15.9%	13.4%	13.8%	13.9%	14.9%	15.6%	14.7%	14.5%

Source: U.S. Census Bureau, Annual Capital Expenditures Survey, Services Annual Survey.

Figure A13: Percent of Cable ISP's Passed 2010 Census Households Where it Offers Consumer-Class Broadband Service (by Technology and Downstream Speed) (Year-End 2014 vs. Mid-2016)

Cable ISP	Date	Percent of ISP's Passed 2010 Census Households Where it Offers Consumer-Class Broadband Service (by Technology and Downstream Speed)								
		DOCSIS 2.0	DOCSIS 3.0	FTTN	≥3 Mbps	≥10 Mbps	≥25 Mbps	≥50 Mbps	≥100 Mbps	≥300 Mbps
Abry (i.e. RCN)	Dec. 31, 2014	62.4%	95.8%	57.4%	100.0%	98.9%	98.9%	98.4%	98.3%	22.5%
	June 30, 2016	47.0%	96.6%	19.4%	99.8%	99.7%	99.7%	99.7%	99.7%	44.7%
Acquisitions (i.e. Atlantic)	Dec. 31, 2014	5.5%	94.5%	0.0%	100.0%	100.0%	94.5%	94.5%	32.5%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	99.9%	0.0%
Altice	Dec. 31, 2014	0.1%	99.9%	0.0%	98.0%	97.8%	96.9%	95.5%	91.8%	13.6%
	June 30, 2016	0.0%	100.0%	0.0%	99.7%	99.0%	97.7%	96.3%	96.0%	23.9%
Armstrong	Dec. 31, 2014	0.0%	97.1%	0.0%	100.0%	98.6%	97.1%	97.1%	97.1%	0.0%
	June 30, 2016	0.0%	97.3%	0.0%	100.0%	98.9%	97.3%	97.3%	97.3%	97.3%
Block Comm.	Dec. 31, 2014	1.3%	98.7%	0.0%	100.0%	100.0%	98.7%	98.7%	69.2%	0.0%
	June 30, 2016	0.0%	98.7%	1.3%	100.0%	100.0%	100.0%	100.0%	69.1%	0.0%
Cable One	Dec. 31, 2014	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	99.8%	99.8%	99.8%	99.8%	23.6%
Charter	Dec. 31, 2014	5.6%	92.5%	0.0%	100.0%	100.0%	99.9%	92.5%	53.2%	17.8%
	June 30, 2016	0.4%	99.7%	0.0%	100.0%	100.0%	99.7%	99.5%	63.4%	28.8%
Comcast	Dec. 31, 2014	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	99.5%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	99.9%	99.5%	2.5%
Cox	Dec. 31, 2014	0.0%	100.0%	0.0%	100.0%	100.0%	99.9%	99.9%	99.9%	0.0%
	June 30, 2016	0.0%	100.0%	0.0%	100.0%	100.0%	99.9%	99.9%	99.9%	74.0%
General Comm.	Dec. 31, 2014	3.1%	95.9%	0.0%	99.9%	96.5%	90.0%	90.0%	90.0%	0.0%
	June 30, 2016	3.1%	95.9%	0.0%	99.8%	96.4%	95.8%	95.8%	95.8%	89.9%
Mediacom	Dec. 31, 2014	4.4%	95.8%	0.0%	100.0%	100.0%	95.8%	95.8%	95.8%	2.9%
	June 30, 2016	1.5%	98.6%	0.0%	100.0%	100.0%	98.6%	98.6%	98.6%	5.6%
Midcontinent	Dec. 31, 2014	75.5%	99.3%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
	June 30, 2016	61.6%	99.7%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
Pencor (i.e. Blue Ridge)	Dec. 31, 2014	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	June 30, 2016	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Shenandoah	Dec. 31, 2014	1.5%	80.9%	6.7%	100.0%	98.5%	87.6%	87.2%	87.2%	0.0%
	June 30, 2016	0.0%	91.2%	6.7%	100.0%	100.0%	96.0%	95.6%	95.6%	0.0%
Wave	Dec. 31, 2014	0.6%	98.3%	0.0%	99.9%	99.9%	99.4%	99.4%	99.4%	2.6%
	June 30, 2016	0.6%	97.7%	0.0%	100.0%	99.9%	99.4%	99.4%	99.4%	3.0%
WOW!	Dec. 31, 2014	2.9%	97.0%	0.0%	100.0%	99.9%	97.0%	97.0%	0.0%	0.0%
	June 30, 2016	2.9%	97.0%	32.6%	100.0%	99.9%	97.0%	97.0%	0.0%	0.0%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.

Figure A14: Percent of Telephone Company ISP's Passed 2010 Census Households Where it Offers Consumer-Class Broadband Service (by Technology and Downstream Speed) (Year-End 2014 vs. Mid-2016)

Local Exchange Carrier ISP	Date	Percent of ISP's Passed 2010 Census Households Where it Offers Consumer-Class Broadband Service (by Technology and Downstream Speed)									
		ADSL	ADSL2	VDSL	FTTH	≥3 Mbps	≥10 Mbps	≥25 Mbps	≥50 Mbps	≥100 Mbps	≥300 Mbps
Alaska Comm.	Dec. 31, 2014	0.0%	42.2%	57.8%	0.0%	100.0%	99.9%	20.8%	6.3%	0.0%	0.0%
	June 30, 2016	0.0%	40.2%	59.8%	0.0%	100.0%	99.6%	39.9%	7.3%	0.0%	0.0%
AT&T	Dec. 31, 2014	9.8%	7.6%	81.1%	1.4%	87.6%	78.3%	3.4%	0.3%	0.3%	0.3%
	June 30, 2016	81.4%	28.2%	65.4%	1.4%	84.4%	60.1%	52.4%	39.5%	0.9%	0.9%
CenturyLink	Dec. 31, 2014	21.5%	66.1%	61.5%	2.1%	93.7%	81.8%	55.7%	30.5%	21.7%	1.5%
	June 30, 2016	10.6%	63.3%	53.3%	7.4%	94.6%	84.0%	60.3%	40.2%	25.2%	6.3%
Cincinnati Bell	Dec. 31, 2014	49.2%	55.0%	43.0%	41.6%	100.0%	90.9%	69.8%	41.6%	41.6%	41.6%
	June 30, 2016	42.8%	40.6%	37.4%	63.2%	100.0%	88.7%	78.6%	62.2%	62.2%	62.2%
Consolidated Comm.	Dec. 31, 2014	8.8%	42.4%	0.0%	41.5%	99.9%	98.6%	54.4%	50.5%	34.0%	33.5%
	June 30, 2016	10.0%	52.9%	3.6%	38.7%	99.9%	97.5%	44.1%	44.1%	39.2%	33.0%
Fairpoint	Dec. 31, 2014	30.2%	93.7%	3.9%	8.6%	97.0%	76.3%	21.5%	7.2%	5.2%	0.0%
	June 30, 2016	30.8%	96.2%	8.7%	8.8%	98.4%	86.7%	57.4%	16.9%	5.7%	0.9%
Frontier	Dec. 31, 2014	64.9%	73.3%	18.8%	8.8%	90.5%	57.3%	25.8%	22.2%	7.2%	7.2%
	June 30, 2016	89.6%	76.4%	23.5%	29.7%	95.0%	87.1%	37.6%	7.9%	7.9%	0.0%
Google	Dec. 31, 2014	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	June 30, 2016	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Hawaii Telcom	Dec. 31, 2014	91.0%	98.4%	73.4%	29.3%	99.9%	87.4%	45.9%	29.3%	29.3%	29.3%
	June 30, 2016	97.9%	94.1%	72.1%	46.9%	100.0%	86.5%	56.5%	46.9%	46.9%	46.9%
Otelco	Dec. 31, 2014	81.1%	0.0%	0.0%	0.0%	88.3%	61.6%	8.9%	1.3%	1.2%	0.0%
	June 30, 2016	83.2%	0.0%	0.0%	7.3%	98.9%	88.5%	62.1%	8.7%	7.4%	0.0%
TDS	Dec. 31, 2014	71.9%	23.7%	12.7%	7.2%	83.5%	41.4%	30.3%	20.0%	20.0%	6.5%
	June 30, 2016	70.7%	22.4%	13.9%	10.2%	83.8%	42.2%	34.1%	30.9%	24.1%	12.8%
Verizon	Dec. 31, 2014	85.6%	0.0%	0.0%	56.5%	98.2%	82.9%	56.5%	56.5%	56.5%	0.0%
	June 30, 2016	89.4%	0.0%	0.0%	57.9%	98.2%	84.3%	57.9%	57.9%	57.9%	0.0%
Windstream	Dec. 31, 2014	99.7%	0.0%	0.0%	0.0%	83.1%	83.1%	83.1%	0.0%	0.0%	0.0%
	June 30, 2016	99.1%	0.0%	0.0%	1.6%	97.0%	59.7%	59.7%	17.8%	17.8%	2.1%

Source: Free Press Analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2) and as of June 30, 2016 (version 2). Values reflect wired consumer broadband services in Census Blocks with non-zero population as of 2010 and does not include any blocks that were unpopulated as of 2010 that now have ISPs offering service.