

Regulation in Financial Translation

Investment Implications of the FCC's Open Internet Proceeding

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Executive Summary

As the Federal Communications Commission (FCC) debates how it can best protect the Open Internet, communications investors expect that it will avoid the “nuclear option” of Title II reclassification and will continue to recognize the special challenges that mobile broadband faces.

From the perspective of investors, Title II reclassification makes no sense. It does not solve the problem of paid prioritization that the vast majority of net neutrality advocates are demanding the FCC solve, but it carries the risk of enormous collateral damage to both infrastructure and edge providers. It would bring stultifying regulation that would choke the Internet ecosystem that has become one of the primary engines of economic growth for the U.S. and the world. It would encourage other governments to follow suit, endangering the success of American digital service- and application-providers abroad. By contrast, section 706 provides the FCC with the authority it needs to promulgate revised Open Internet rules without the risks to innovation and investment posed by Title II.

That investment in communications infrastructure is critical to the U.S. Its network providers invested \$75 billion in infrastructure in 2013: \$27 billion from wireline, \$14 billion from cable, and \$34 billion from wireless. On a per-household basis, that is roughly twice the rate of investment in Europe. As a result, despite its lower population density, the U.S. enjoys higher rates of coverage by and adoption of Next Generation broadband technologies than Europe. Coverage by LTE, the most up-to-date mobile broadband technology, is essentially ubiquitous in the U.S., and for most Americans is provided by up to four competing carriers.

U.S. mobile Internet traffic is expected to grow at a compounded annual rate of 50% per year between 2013 and 2018. Keeping up with that traffic will require ongoing capital investments as well as additional spectrum. During 2014-2015, mobile broadband Internet access providers (mobile BIAs) are expected to raise about \$57 billion for spectrum purchases, as indicated by the FCC's reserve price for the 2014 AWS-3 auction and the Greenhill report's valuation of the broadcast spectrum the FCC hopes to sell in early 2016. That \$57 billion is, of course, in addition to the \$68 billion in capital investments that mobile BIAs will spend over those two years. Thus, for the FCC's spectrum auctions to be successful, mobile BIAs will need to raise 84% more funding during 2014-2015 than they do in normal years. With increased price competition and a shrinking revenue base—something the wireline industry has endured for years but that is new to wireless—these companies are facing an increasingly skeptical investment community that will have little tolerance for regulatory shock, on either the fixed or mobile side.

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The Open Internet proceeding: A debate over the means, not the end

On May 15th, the Federal Communications Commission issued a Notice of Proposed Rulemaking (NPRM) asking how it can best protect the Open Internet.² There is bipartisan agreement at the FCC, on the Hill, and within all parts of the Internet ecosystem that the Internet should continue to be open. But there is now an extensive debate about the best means for accomplishing that goal, because the FCC's prior attempt to promulgate Open-Internet rules was vacated in part by the U.S. Court of Appeals for the District of Columbia Circuit (DC Circuit).³

In December 2010, the FCC issued the Open Internet Order (Order) which forbade blocking of legal Internet content (completely on fixed broadband Internet access (BIA) networks and to a more limited extent on mobile BIA networks), forbade unreasonable discrimination in the transmission of legal traffic by fixed BIAs, and required transparency from both fixed and mobile BIAs about their network management practices. In January 2014, the Order was remanded back to the FCC after the DC Circuit found that the FCC's basis for imposing the new regulations did not comport with its jurisdiction.

The court affirmed the FCC's authority to regulate BIAs under Section 706 of the *Telecommunications Act of 1996 (Act)*. However, the court found that the Order's non-blocking rules for BIAs and non-discrimination provisions for fixed BIAs went too far. The court found that the FCC treated the BIAs as if they were common carriers, which it can do only with telecommunications service providers under Title II of the Act. The agency had previously determined that BIAs provided information services under Title I, and information service providers do not qualify as common carriers. The court indicated that the FCC could remedy its jurisdiction problem if it pursued regulation under Section 706 in a manner that did not treat Internet access services as common carrier services and pointed to a precedent for doing so.⁴

Following the court's decision, the FCC published its May 15th NPRM, in which the agency asked about two alternative paths. It asked for comment about its options for modifying Open-Internet requirements so the FCC could act under its Section 706 authority without having the requirements qualify as common carriage. It also asked whether it should, or even could, reclassify BIAs as telecommunications service providers under Title II of the Act rather than as information service

² Federal Communications Commission, *Notice of Proposed Rulemaking in the Matter of Protecting and Promoting the Open Internet*, GN Docket No. 14-28, May 15, 2014. Hereafter referred to as GN docket 14-28.

³ *Verizon v. Federal Communications Commission*, U.S. Court of Appeals for the District of Columbia Circuit, January 15, 2014.

⁴ *Cellco Partnership v. Federal Communications Commission*, U.S. Court of Appeals for the District of Columbia Circuit, December 4, 2012.

providers, so that they could be treated as common carriers.⁵ It also asked whether it should allow some paid prioritization. In addition, the FCC asked whether mobile broadband should receive the same treatment as fixed broadband.

Thus, the issue is not one of goals but one of means. The goal in either case is an Open Internet. The FCC is seeking the appropriate legal framework that will give it the authority it needs to ensure that access to legal content on the Internet is not blocked, that there is no unreasonable discrimination against some traffic, and providers are transparent about the means they use in exercising reasonable network management.

The investment community does not expect--but does fear--Title II reclassification

The immediate reaction to the May 15th NPRM among the investment community was that the FCC would not actually employ the “nuclear option”⁶ of reclassifying BIAs as common carriers under Title II, even though it was asking questions about that option. Michael Rollins of Citi Research wrote: “We view the more likely outcome is for the FCC to revise its Net Neutrality Rules without a Title II designation.”⁷ Joseph Mastrogiovanni of Credit Suisse wrote: “We believe Chairman Wheeler understands that applying Title II to broadband service is likely to result in years of litigation and prolong any progress on net neutrality.”⁸ John Hodulik of UBS wrote: “Title II on the table for broadband, but unlikely to be implemented.”⁹ Adam Ilkowitz of Nomura wrote under the heading “Open Internet: Ominous Questions, expecting Low Impact Answers”: “Title II is on the table, though years of litigation are likely to follow and must be weighed against more expedient regulatory options.”¹⁰

More recent analyst reports, while showing increasing concern about mounting political pressure to apply Title II, are still expecting the FCC to reject that option. A July 9th report by Bernstein Research concluded that Title II reclassification is unlikely, but notes that it would have little impact in any case on the financials of major Internet companies like Google, Facebook, Amazon, eBay, and Netflix whose popularity and/or financial strength provide them with counter-leverage against BIAs.¹¹ At the same time, it noted that investors are in fact concerned about the results should reclassification occur. An October 20th Bernstein report expected the new rules to “Involve some invocation of ‘Title II’ (which

⁵ A detailed history and legal background of the debate and an explanation of the distinctions between information services and telecommunications services as well as between the authority granted under section 706 and Title II can be found in the reply comments of Fred Campbell Jr. of the Center for Boundless Innovation in Technology in the FCC’s GN docket 14-28, September 15, 2014. Hereafter referred to as CBIT.

⁶ That term was coined during the 2010 debate of the same issue.

⁷ Michael Rollins, CFA, and Jason B. Bazinet, “Shaping Market Structure,” Citi Research, May 15, 2014, p. 1.

⁸ Joseph Mastrogiovanni and Michael Baresich, “Telecommunications Services,” Credit Suisse Equity Research, May 15, 2014, p. 5.

⁹ John C. Hodulik, CFA, Batya Levi, Lisa L. Friedman, and Christopher Schoell, “Telecom and Pay TV,” UBS Global Research, May 16, 2014, p. 1.

¹⁰ Adam Ilkowitz, CFA – NSI, and Donald Chen, NSI, “U.S. Telecom and Cable,” Nomura Global Markets Research, May 16, 2014, p. 1.

¹¹ Paul de Sa, D. Phil, Carlos Kirjner, Ph.D., Peter Paskhaver, CFA, Ian Chun, CFA, and Julia Zheng, “U.S. Internet and U.S. Telecoms: Why the Current Net Neutrality Debate Does Not Matter for Investors,” Bernstein Research, July 9, 2014, p. 2 and p. 9.

should not concern investors, despite common fears)” and notes that reaction to such invocation is likely to be “materially negative, at least in the short term.”¹²

Angel and venture capital investors who are betting on edge providers are primarily concerned about paid prioritization and have sent comments to the FCC requesting that ISPs not be allowed to use it. The National Venture Capital Association submitted a follow-up comment in the FCC’s Open Internet docket on September 15th while a group of venture investors submitted a letter on May 8th. Neither group, however, advocated for a specific regulatory path.¹³

Simon Flannery of Morgan Stanley put it quite simply in a note on September 3d in which he downgraded his industry view. Speaking of several pending regulatory issues including the upcoming incentive auctions and the Open Internet proceeding, he asked: “Will the DC Discount Fade?”¹⁴ He wrote that Washington is a “wild card” which is impacting his view of the industry’s prospects negatively and indicated concern about the net neutrality NPRM.

As recently as October 13th, Timothy Horan of Oppenheimer Equity Research noted President Obama’s public comments in support of net neutrality but concluded: “We don’t think this increases the chances that the FCC attempts to bring back Title II given the expected pushback on Capitol Hill.”¹⁵ On the same day, Jessica Reif Cohen of Bank of America/Merrill Lynch wrote that she expects “regulatory relief as (unlikely) Title II fears subside post FCC ruling on net neutrality/New Open Internet Order this fall/winter.”¹⁶

Frank Louthan of Raymond James summed up the bewilderment and frustration of the investment community when he wrote: “the ongoing debate over how to ruin the Internet just will not die.”¹⁷ He added, “the continued push by the protestors [at the May 15th FCC Open Meeting] for 1930s-style regulation of Internet providers would harm consumers and stifle innovation in our view, and we fail to see how this path can be justified or will prevail in court.”¹⁸ He noted that the additional regulation that is being proposed “is unlikely to make the Internet a better place to operate or invest.”¹⁹

¹² Paul de Sa, D. Phil, Ian Chun, CFA, and Julia Zheng, “U.S. Telecom: A Brief Check-In on Net Neutrality,” Bernstein Research, October 20, 2014, p. 1 and p. 4.

¹³ National Venture Capital Association *ex parte* in docket 14-28, September 15, 2014, pp. 1 and 2, and letter by True Ventures, et al, May 8, 2014.

¹⁴ Simon Flannery, Daniel Rodriguez, Arminas Sinkevicius, CPA, CFA, and Lisa Lam, CFA, “2Q14 Trend Tracker: Downgrading Industry View to Cautious on Competition, Valuation, and Regulation,” Morgan Stanley, September 3, 2014, p. 20.

¹⁵ Timothy Horan, CFA, and Jonathan Michaels, “Daily Datatimes, October 13, 2014,” Oppenheimer Equity Research, October 13, 2014, p. 1.

¹⁶ Jessica Reif Cohen and Peter Henderson, “Comcast Corp: A stock for all seasons,” Bank of America/Merrill Lynch, October 13, 2014, p. 1.

¹⁷ Frank G. Louthan IV, Simon Leopold, and Alexander Sklar, CPA, “Results and Repercussions of FCC’s May Meeting,” Raymond James U.S. Research, May 15, 2014, p. 1.

¹⁸ Louthan, p. 1.

¹⁹ Louthan, p. 2.

Funding in 2014-2015 will have to increase sharply to cover spectrum auctions

The infrastructure over which the U.S. communicates requires tremendous ongoing investment. In 2013 alone, the wireline, wireless and cable industries spent a total of \$75 billion in capital expenditures. Of that, \$27 billion came from wireline, \$34 billion from wireless, and \$14 billion from cable.²⁰ For the wireless industry, the demand for capital will increase radically over 2014-2015 to cover the cost of FCC spectrum auctions.

In 2014, the FCC has already held the H-block auction, which raised \$1.6 billion.²¹ Also in 2014, it expects to hold the AWS-3 auction, for which the FCC has set a reserve price of \$ 10.7 billion.²² In early 2016, it hopes to hold the incentive auction in which it will repurpose 600-MHz broadcast spectrum for use by mobile broadband. To prepare for the auction, bidders for the spectrum will have to assure themselves of funding in late 2015.²³ The FCC has circulated a report by Greenhill to explain to broadcasters the opportunities that the incentive auction offers to them. The Greenhill report notes that independent sources have estimated that the auction could raise \$45 billion, but does not itself provide a precise estimate.²⁴

The Greenhill report shows the potential value of the spectrum by broadcaster by Designated Market Area (DMA), providing a maximum and a median value for both full-power and class-A broadcasters.²⁵ It explains that the values were developed by FCC staff, represent auction proceeds net of costs, and the high-end revenue methodology assumes \$1.50 paid by the spectrum-buyers in the forward auction per MHz POP. This presentation assumes that 126 MHz of spectrum would be relinquished in the broadcasters' reverse auction, providing 100 MHz of cleared spectrum that can be sold in the forward auction. Forward auction proceeds would have to cover payments to the broadcasters plus auction costs of up to \$7 billion (\$1.75 billion for repacking, \$0.25 billion for the cost of the auction itself, and up to \$5 billion payment for FirstNet).²⁶

The report does not provide its own estimate of total proceeds, nor does it cite the population to be used in estimating proceeds. However, given that the U.S. population in 2015 will be roughly 320 million POPs, the high-end estimate would amount to auction proceeds of about \$48 billion, using the report's assumptions of \$1.50 per MHz POP on average and 100 MHz POPs cleared for use. But proceeds could vary because they would depend on the mix of full-power v. class-A broadcasters, as well as the

²⁰ Company reports and USTelecom (USTA), National Cable & Telecommunications Association (NCTA), CTIA-The Wireless Association (CTIA) websites.

²¹ FCC, auction website, auction 96 summary.

²² FCC, *Public Notice*, AU Docket No. 14-78, July 23, 2014, ¶ 187-188.

²³ On October 24, 2014, Gary Epstein, Chair of the FCC's Incentive Auction Task Force, stated in a posting on the FCC's blog that the FCC "now anticipates accepting applications for the auction in the fall of 2015 and starting the auction in early 2016." While the payment for the spectrum will be made in 2016, the companies will have to assure themselves of the funding in late 2015, ahead of the auction.

²⁴ Greenhill, "Incentive Auction Opportunities for Broadcasters," prepared for the Federal Communications Commission by Greenhill, October 2014, p. 11.

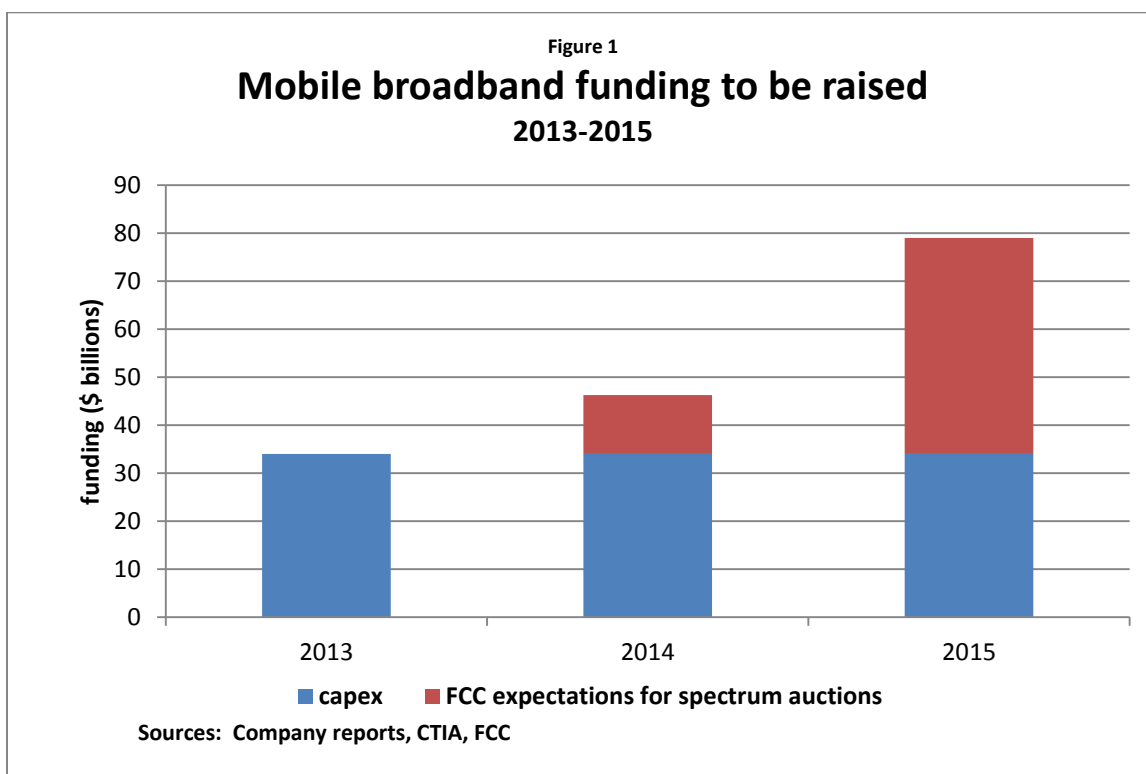
²⁵ Greenhill, pp. 30-33.

²⁶ Greenhill, p. 34. Although Greenhill points out that it is likely that FirstNet's cost would be covered by the H-block and AWS-3 auctions

amount of spectrum broadcasters are willing to sell. Analysts have used the \$45 billion figure for 100 MHz,²⁷ so we use it as well.

The key point, of course, is that the incentive auction's goal is to free up as much spectrum as possible for use by mobile broadband, especially in the most densely populated markets where broadcasters are least likely to want to sell. That is the reason the FCC, as UBS puts it, is "pitching lucrative payouts for broadcasters in upcoming incentive auction."²⁸ But there are several factors that are likely to make it difficult to raise the amount necessary for maximum broadcaster participation.

Spending on spectrum purchases is in addition to annual capital investment (capex), of course. For the wireless industry in 2014-2015, that means spending \$68 billion for capex plus raising another \$57 billion for spectrum: \$1.6 billion for the H-block, \$10.7 billion for AWS-3, and \$45 billion for the incentive auction. That means a total funding of \$125 billion to be raised over this two year period. To help put this in perspective, the very successful 700 MHz auction in 2008 raised \$19 billion and was neither preceded nor followed by another auction of equal or greater size.



²⁷ UBS notes that the FCC points to a study which expects \$45 billion in proceeds for 100 MHz cleared. UBS estimates that the 2014 AWS-3 auction will raise \$10-\$15 billion and the 2015 incentive auction of 600 MHz spectrum will raise \$34-\$48 billion, depending on whether the latter clears 80 MHz or 100 MHz. John C. Hodulik, CFA, Batya Levi, Lisa L. Friedman, and Christopher Schoell, "Wireless Telecommunications," UBS Global Research, October 2, 2014, p. 1. However, an earlier note by UBS (April 21, 2014, p. 2) placed the value of the broadcast-spectrum auction proceeds at \$18-\$30 billion for 80 MHz, depending on the format of the auction (how much of the spectrum might be restricted). A Nomura note dated October 2d expects \$17 billion in proceeds from AWS-3. A Citi note also dated October 2d places the AWS-3 proceeds in a range of \$20 billion to \$28 billion.

²⁸ UBS, October 2, 2014, p. 1.

The picture is even worse if one looks at 2015 separately. To meet the \$45 billion funding goal for the broadcast-spectrum auction while spending \$34 billion on capex, the wireless industry in 2015 will have to raise \$79 billion.²⁹ That is 2.3 times as much funding as it raises in a normal year. The UBS report notes that “likely expenditures will strain balance sheets.”³⁰

That task will not be made easier by the sharply competitive pricing environment which has emerged in the last few months and is expected to continue. Given that the industry is now seeing considerable pricing compression, investors are less enthusiastic about it than they have been in some time. UBS is “neutral on wireless amid rising competition.”³¹ Jennifer Fritzsche of Wells Fargo Securities summarizes the current sentiment as “negative to apathetic” and says: “We heard a lot of ‘Why do I even need to own these stocks?’ type of questions during our meetings.”³² Morgan Stanley recently downgraded the industry to “Cautious” from “In-line” based on rising competition combined with free cash flow pressures, eroding valuation support, and regulatory risks.³³

The pressure is likely to be much greater on the incentive auction than on AWS-3 for several reasons. Broadcasters have now been encouraged to expect \$45 billion out of the auction, which means that roughly four times as much funding has to be raised by the incentive auction as by AWS-3. The AWS-3 auction has the added advantage that it is completely open to any entity that wants to participate, while the incentive auction is placing restrictions on the participation of the two largest wireless networks. The AWS-3 auction will also have the advantage of being first in line for whatever funds spectrum-buyers can raise. Given strained balance sheets, the more funds are spent on AWS-3, the tougher the job of raising maximum funding for the later incentive auction will be. Perhaps most important, AWS-3 is being held before the FCC issues its new Open Internet rules, while the incentive auction will be held after the new rules are issued.

If the FCC issues Open Internet rules that concern wireless investors, it could become very difficult for those companies to raise the funds needed for maximum broadcaster participation in the auction. It is worth noting that the impact of the Open Internet rules is not necessarily short-term or one-time. If the FCC reclassifies BIA and mobile-BIA under Title II, investors will face repeated shocks: when the Order is issued by the FCC, when the FCC itself and state commissions act on the basis of the Order, and each time a court responds to a federal or state commission ruling. But the greatest investor reactions are likely to come when the Order is issued, when the court either does or does not stay the Order, and when it rules on the Order and any attempt it makes at blanket forbearance. The timing of those events couldn’t be worse for the incentive auction. Investors are likely to focus on the court just when the FCC would like them to open their pockets for the incentive auction.

²⁹ Were the auction delayed further into mid- or late-2016, the industry’s funding problem would simply be pushed back from late 2015 to early 2016, when a Title II appeal (and other ensuing litigation) would still be likely to be active.

³⁰ UBS, October 2, 2014, p. 1.

³¹ UBS, October 2, 2014, p. 1.

³² Jennifer M. Fritzsche, “Wireless/Wireline Industry Sentiment ‘Gut’ Check,” Wells Fargo Securities, October 3, 2014, p. 1.

³³ Simon Flannery, Daniel Rodriguez, Armintas Sinkevicius, CPA, CFA, and Lisa Lam, CFA, “September Chart Book” Morgan Stanley, October 1, 2014, p. 20.

The explosively growing demand for mobile data and video cannot be satisfied without ongoing capex and new spectrum. If funding dries up—thanks to a combination of strained cash flows and nervous investors—then not only the incentive auction but mobile networks’ ability to provide ever-increasing capacity and quality to U.S. consumers are threatened. This is not an environment that can withstand the addition of regulatory shock.

Of course, the fixed broadband access providers—wireline and cable—also need to be able to continue to raise funds for their ongoing capital investments. The need is particularly acute for the wireline providers, who supply roughly two-thirds of the BIA fixed infrastructure investment.³⁴ Simon Flannery of Morgan Stanley points out in a recent report³⁵ that wireline carriers’ cash flow faces several challenges: loss of voice access lines, a broadband market that is maturing with potential subscribers—but not traffic—approaching their limit, and increasing competition. He posits that they must invest in fiber to remain competitive, and highlights the resulting squeeze on free cash flow.

Thus, in total, for 2014 and 2015, the BIAs will need to raise \$207 billion to cover on going wireline, cable, and wireless capital investments plus the spectrum-auctions.³⁶ That is 44% more than BIAs had to raise in 2012-2013, when they spent a whopping \$144 billion on capex.³⁷

The BIA industry is the most capital intensive in the U.S. A report by Diana Carew and Dr. Michael Mandel, which looks specifically at investment in the U.S. by U.S. owned companies, shows that telecom/cable spends almost three times as much as the utilities and almost seven times as much as the transportation industry. It spends twice as much as the Internet/technology industry, and four times as much as the Internet industry itself.³⁸

It is also worth noting that the U.S. BIAs invest in their communications networks at a far higher rate than do their European and OECD counterparts. A study by Christopher Yoo shows that between 2007 and 2012, U.S. investment per household was roughly twice as much as European investment per household, averaging \$575 per year in the U.S. v. \$288 in the European Union (EU).³⁹ OECD data for the period 2009-2011 shows that average annual U.S. telecommunications investment per capita of \$223.4 exceeded the OECD average of \$148 by 51%. The OECD data for that period also shows that average

³⁴ Some of the wireline investment is still being spent on legacy infrastructure, increasing the amount the wireline providers have to be able to fund. See Anna-Maria Kovacs, Ph. D, CFA, “Telecommunications competition: the infrastructure investment race,” Internet Innovation Alliance, October 8, 2013, p. 20.

³⁵ Simon Flannery, Spencer Gantsoudes, CFA, and Arminas Sinkevicius, CFA, CPA, “Wireline Broadband – High Fiber Regimen,” Morgan Stanley, October 13, 2014, p. 1.

³⁶ That assumes that capex is held steady at the 2013 level by all three industry sectors, i.e. at a total of \$75 billion per year, and an additional \$57 billion is raised for spectrum.

³⁷ Capex in 2012 was \$69 billion and in 2013 was \$75 billion. Company reports, USTA, NCTA, CTIA websites. There were no spectrum auctions in 2012 and 2013 that required major capital commitments.

³⁸ Diana Carew and Dr. Michael Mandel, *U.S. Investment Heroes of 2014: Investing at Home in a Connected World*, Progressive Policy Institute, September 2014, figures 1 and 2. Because this study examines only US-owned companies, and omits mobile networks like Sprint and T-Mobile, it shows a lower total capex than our totals, which include all companies in the industry that operate in the U.S.

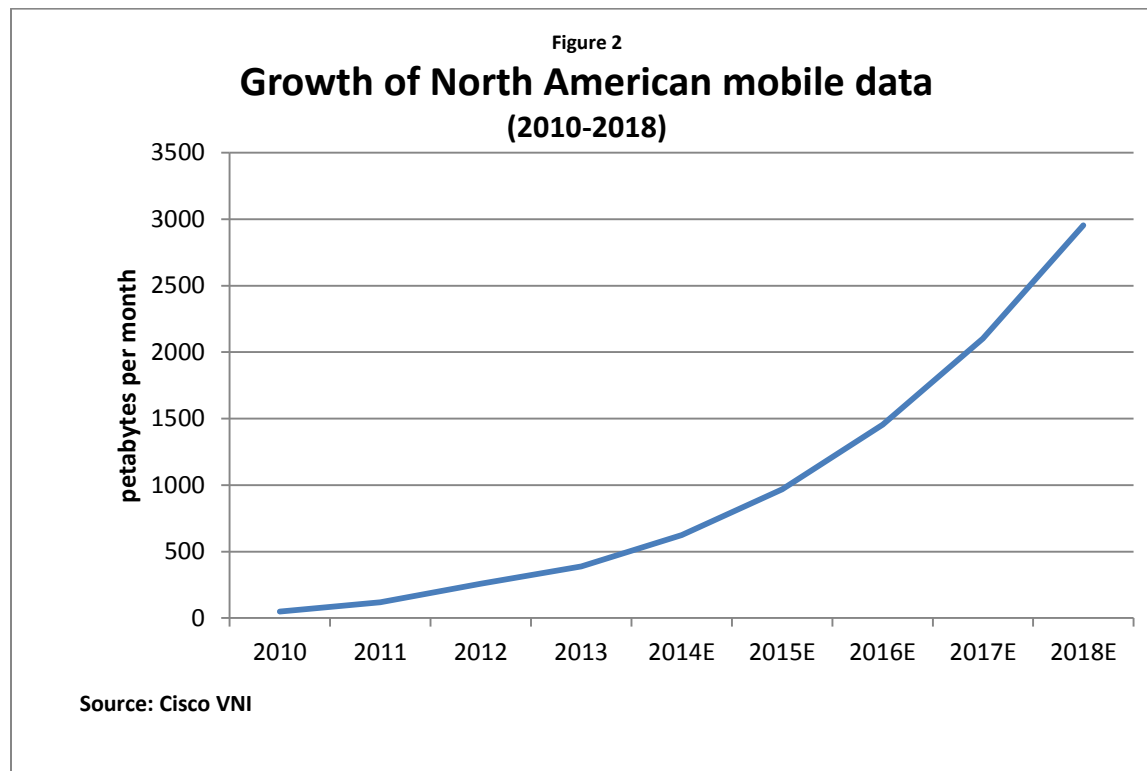
³⁹ Christopher Yoo, *U.S. v European Broadband Deployment: What Do the Data Say?*, Penn Law and CTIC, June 2014, figure 5, p. 13.

annual U.S. telecommunications investment per total communication access path of \$137.1 exceeded the OECD average of \$89.7 by 53%.⁴⁰

What does the U.S. get for all that investment?

Traffic growth

Mobile data traffic is growing very rapidly. Cisco VNI shows that between 2010 and 2013, mobile data in North America grew 7.9 times, from 49 petabytes (PB) per month to 389 PB per month.⁴¹ During that time, very little new spectrum was made available for commercial mobile wireless. Thus, carriers compensated by upgrading to new technologies—particularly to LTE, increasing the number of cell sites, increasing the amount of fiber in their backhaul, employing network densification, and increasing network offloading. All of these efforts to cram more mobile data traffic into essentially the same spectrum required tremendous capital investment.



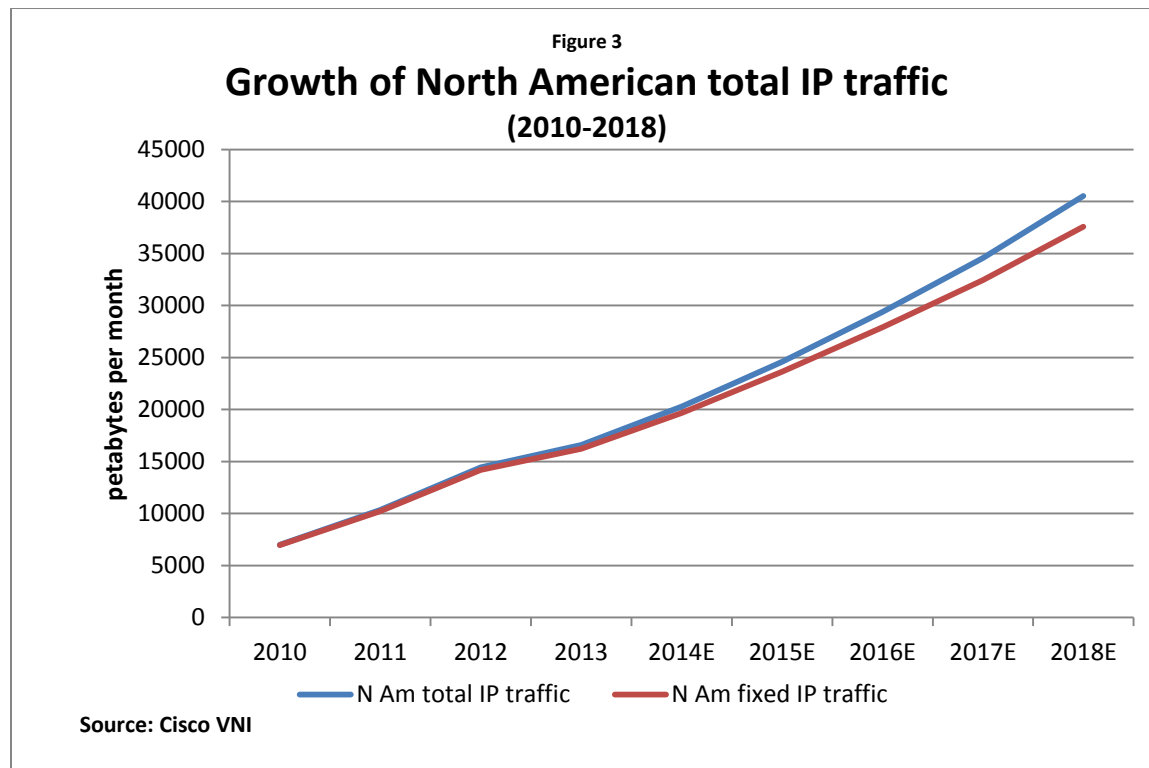
⁴⁰ OECD, *OECD Communications Outlook 2013*, OECD Publishing, tables 3.10 and 3.11, pp. 85 and 86. The most recent data in the report covers 2011. One reason the OECD average is higher than the EU average is that the OECD includes data on Australia, Canada, and New Zealand, which have also invested heavily in telecommunications infrastructure.

⁴¹ Cisco, *Cisco Visual Networking Index: Global Mobile Data Traffic Update*, for 2010-2015 on p. 15, for 2011-2016 on p. 24, for 2012-2017 on p. 27, and for 2013-2018 on p. 34. Cisco provides only limited statistics for the U.S. and more comprehensive ones for North America (U.S. and Canada). Since the U.S. constitutes the vast majority of North American traffic, we use it as a proxy for the U.S. in our graphics.

To some extent, capital investment can compensate for lack of spectrum, and the U.S. wireless industry is making that investment. However, the growth of the traffic continues essentially unabated. By 2018, mobile data is expected to reach 2954 PB per month, 7.6 times the 2013 level, a compounded annual growth rate of 50%.⁴²

While the FCC is making tremendous efforts to make more spectrum available for mobile broadband, and is planning two major auctions in 2014 and early 2016, those auctions will at best increase the amount of usable spectrum by a third and there is nothing obvious in the pipeline after 2016. To accommodate 7.6 times the traffic by 2018 with only one third more spectrum, carriers will have to use capex to increase capacity per megahertz of spectrum by a factor of 5.7 times. Having already completed the LTE rollout and engaged in network densification to meet the onslaught of traffic in 2010-2013, they have already used the best tools at their disposal. The next five years will strain capex even more.

Of course, total IP traffic is also growing quickly, albeit not as rapidly as mobile data. According to Cisco VNI, total North American IP traffic grew 2.4 times from 2010 to 2013, and is expected to grow 2.4 times again by 2018, a compounded annual growth rate of 20%.⁴³ As can be seen in figure 3 below, the vast majority of North American IP traffic is fixed. In 2013, only 2% of the traffic was mobile, and even in 2018 only 7% is expected to be mobile.



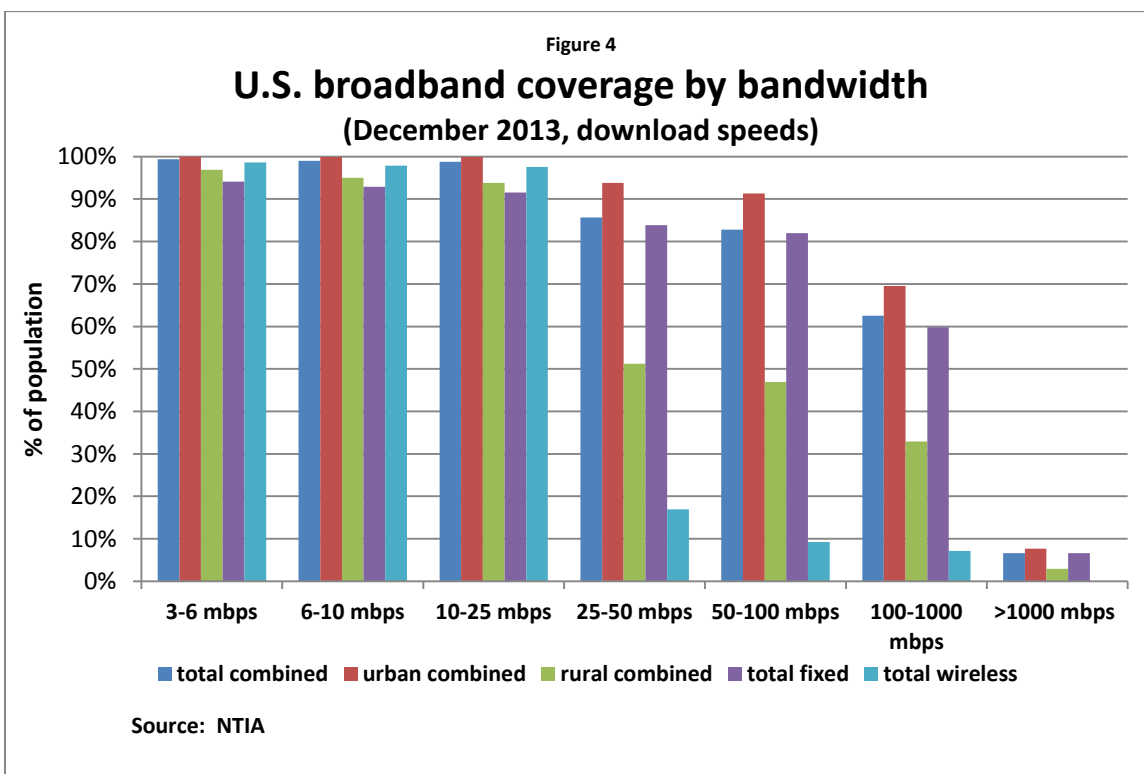
⁴² Cisco VNI's projection tool shows U.S. mobile data traffic growing at 50% CAGR during 2013-2018, i.e., eight-fold.

⁴³ Cisco VNI, *The Zettabyte Era: Trends and Analysis*, for 2010-2015 on p. 15, for 2011-2016 on p. 16, for 2012-2017 on p. 18, for 2013-2018 on p. 23.

Any change in Open Internet rules that would make it easy for edge providers to shift even a few additional percent of traffic onto mobile broadband networks would greatly strain them. While incremental capex can help up to a point, beyond that point service quality could suffer, and that would hurt consumers. Because of the constraints created by limited amounts of spectrum, and because of other issues that are unique to mobile networks,⁴⁴ network management is far more difficult for mobile networks and abrupt and unexpected traffic shifts may be impossible to accommodate quickly and smoothly. Thus, investors in mobile networks are concerned about the possibility that the FCC will treat mobile networks as if they were similar to fixed networks.

Broadband coverage, speed, and penetration

The National Telecommunications and Information Administration’s (NTIA) blog accompanying its release of 2013 broadband data summarizes: “Faster Broadband, Reaching More.”⁴⁵ As figure 4 below shows, at year-end 2013, broadband at 3 to 6 mbps download speed reached 99% of the U.S.



population.⁴⁶ Fixed broadband at that speed reached 93% of the population. Broadband at 25 to 50 mbps reached 86% of the population, with fixed broadband at that speed reaching 84%. 83% of the

⁴⁴ Rysavy Research, *Beyond LTE: Enabling the Mobile Broadband Explosion*, August 2014. Also, Dr. Jeffrey H Reed and Dr. Nishith D. Tripathi, *Net Neutrality and Technical Challenges of Mobile Broadband Networks*, September 4, 2014.

⁴⁵ Anne Neville, “Faster Broadband, Reaching More,” NTIA blog, July 17, 2014.

⁴⁶ The discussion of NTIA statistics in this paper is based on NTIA, *Broadband Statistics Report: Broadband Availability in Urban v. Rural Areas*, data as of December 2013, published July 2014, and NTIA, *Broadband Statistics Report: Access to Broadband Technology by Speed*, data as of December 2013, published July 2014.

population was covered by broadband at 50 to 100 mbps, and 63% was covered by broadband at speeds of 100 mbps to 1 gigabit, with 7% getting a rate over 1 gigabit. Among rural Americans, 94% had speeds up to 10 mbps, and roughly half had speeds up to 100 mbps, with a third enjoying speeds in the 100 mbps to 1 gigabit range.

We noted earlier that the U.S. BIAs spend about twice as much as their EU counterparts on capex. That investment is paying off, especially in rural areas. In the U.S., 84% of the population and roughly 50% of the rural population enjoys broadband coverage at NextGen speeds,⁴⁷ while only 62% of the population and 18% of the rural population does so in the EU.⁴⁸ What is particularly striking in the EU is the limited deployment of the highest-speed technologies, DOCSIS 3.0 and fiber. In the U.S., DOCSIS 3.0 is available to 81% of the population⁴⁹ and fiber is available to 22%, providing speeds of at least 50 mbps. In the EU, DOCSIS 3.0 is available to only 41% of the population and fiber to 16%.⁵⁰ The LTE trends only exacerbate that picture. In the U.S., 97% of the population enjoys LTE coverage, with almost all Americans served by at least two LTE providers and, based on recent company reports, about two thirds served by four. In the U.S., 84% of the rural population is covered by LTE.⁵¹ In the EU, LTE has reached only 59% of the population and only 15% of the rural population.⁵²

The contrast between the U.S. and the EU is particularly striking because the population density of the U.S. is much lower. The EU's population density is 116 people per square kilometer while that of the U.S. is 34, and only 15% of households in the EU live in rural areas while 19% do so in the U.S.⁵³

The U.S. also leads in broadband penetration. The FCC's recently released report entitled *Internet Access Services: Status as of December 31, 2013*, both confirms that leadership and indicates that the NTIA's motto of more reach and faster speed applies to adoption as well as deployment.

The FCC report shows that the U.S. had 247 million residential broadband connections at year-end 2013, up from 140 million at year-end 2010.⁵⁴ Of these, 87 million were fixed, representing household penetration of 72%, with fixed connections above 3 mbps penetrating 65% of households and fixed connections above 25 mbps--i.e., NextGen connections--penetrating 25% of households. Only 6.3% of the EU population, equating to about 16% of households, enjoys NextGen fixed subscriptions.⁵⁵ Thus,

⁴⁷ The EU defines NextGen as 30 mbps and above. NTIA's closest category is 25-50 mbps.

⁴⁸ European Commission, *Broadband Markets, Digital Agenda Scoreboard 2014*, p. 4.

⁴⁹ 81% is NTIA's figure as of year-end 2013. NCTA claims that figure is now 85%.

⁵⁰ European Commission, p. 2.

⁵¹ Even if one assumes that the entire 3% of the U.S. population that is not covered by LTE is rural, given that 19% of the U.S. population is rural, that means that 84% of the U.S. rural population is covered by LTE.

⁵² European Commission, p. 2.

⁵³ Christopher Yoo, p. 23 for EU population density and p. iii for percentage rural households.

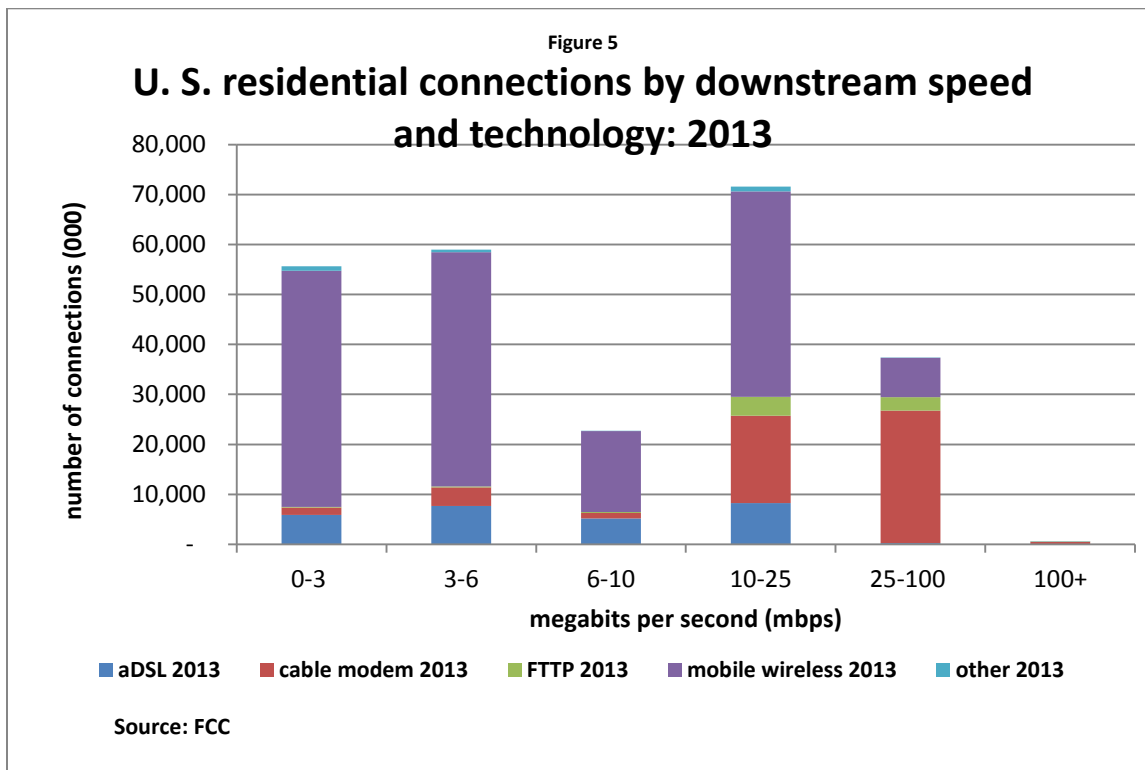
⁵⁴ FCC, *Internet Access Services: Status as of December 31, 2013*, table 11, p. 31 for number of connections and table 13, p. 34 for number of households, and *Internet Access Services: Status as of December 31, 2010*, table 13, p. 32 for number of connections. The report's nomenclature of aDSL covers a range of speeds that is often referred to as xDSL (e.g. including vDSL).

⁵⁵ European Commission, p. 9. Note that the EU does not provide separate residential data, so the EU figure is somewhat overstated relative to the U.S. in that respect.

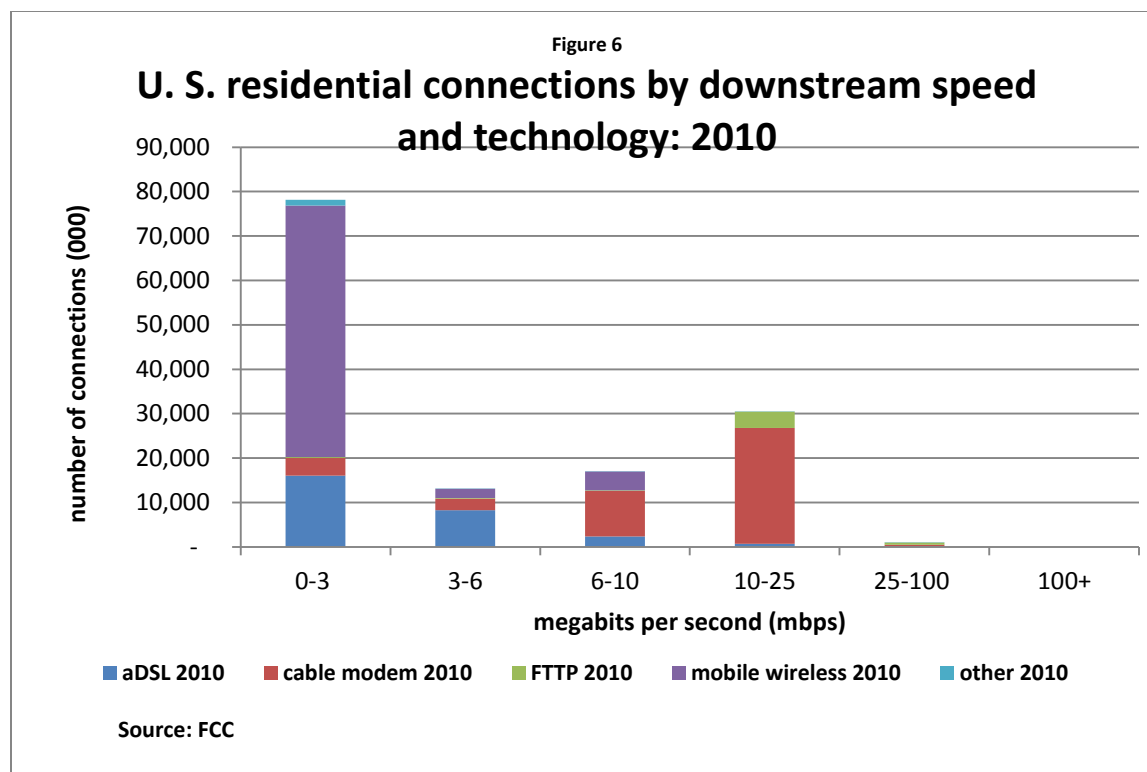
the contrast between the U.S. and the EU is even more striking when one considers broadband penetration than when one considers coverage.

Not only did the U.S. have roughly twice as many broadband connections as households by year-end 2013, there were also far more connections at higher speeds than there had been at the end of 2010. In 2010, there were 78 million connections operating below 3 mbps. The vast majority—57 million—were wireless. But low-speed aDSL was also a major factor. In 2010, there were 16 million aDSL lines operating at speeds below 3 mbps. There were also 4 million cable-modem connections below 3 mbps in 2010

By 2013, 10 million of those low-speed aDSL connections had moved up to higher speeds, so that only 6 million aDSL connections below 3 mbps remained. Indeed, roughly half of the aDSL connections in 2013 were operating above 6 mbps, and 8 million were operating above 10 mbps. Cable connections also migrated up, with the vast majority of cable connections in 2013 operating above 10 mbps, and roughly half of the 51 million cable connections operating above 25 mbps.



But the biggest change by far was in the wireless arena. There were 88 million new mobile broadband connections between 2010 and 2013, bringing the 2013 total to 159 million mobile broadband connections. Of those total mobile broadband connections, 70% operated above 3 mbps, and 31%



operated above 10 mbps. As figure 5 shows, in 2013 there were far more mobile broadband connections than fixed broadband connections at every speed below 25 mbps. In fact, in 2013 there were 1.8 times as many mobile broadband connections as there were fixed broadband connections, and even in the 10-25 mbps category there were 1.3 times as many mobile as wired connections. These mobile wireless trends should be even more striking by the end of 2014, when LTE deployment by all four national carriers will be complete.

It is worth highlighting that while there is clearly a preference for more rather than less speed, that preference appears limited to speeds below 25 mbps. On the fixed side, only 34% of subscribers opted for a speed above 25 mbps, although cable offered speeds over 100 mbps to 85% of the U.S., according to NCTA⁵⁶ and to 81% over 50 mbps according to NTIA. Looking at the total picture, including mobile, only 15% opted for a connection above 25 mbps.

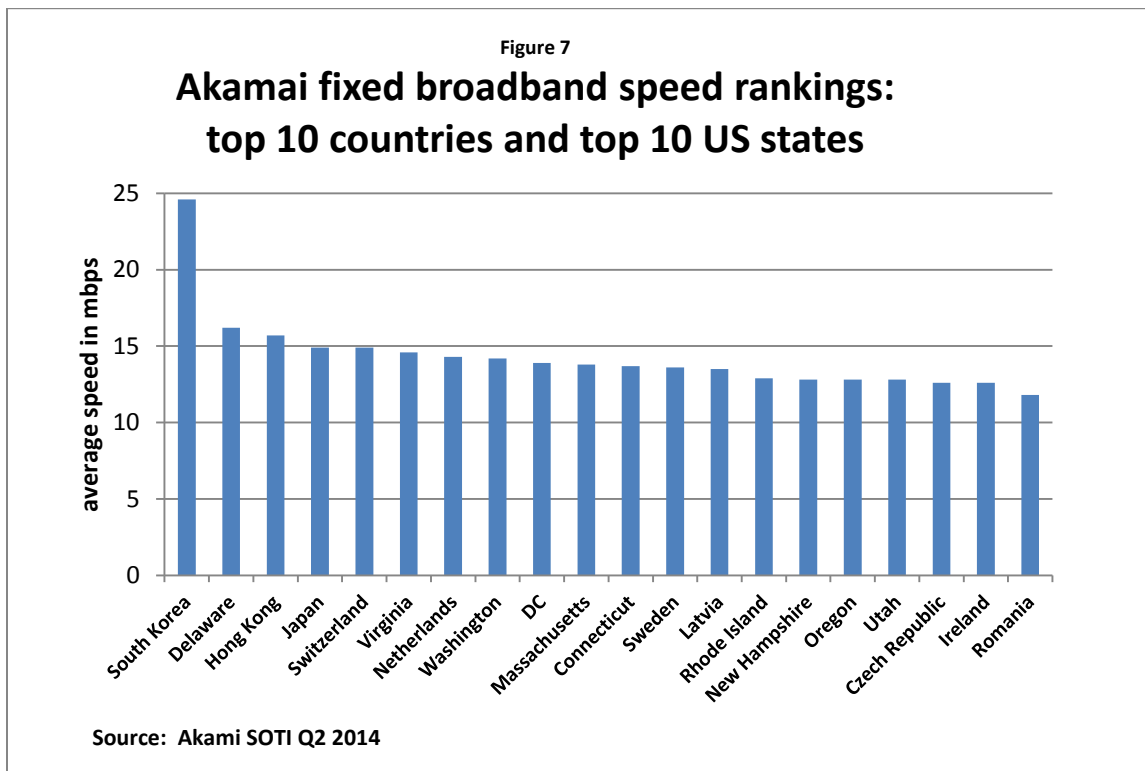
The U.S. is often compared to other countries in terms of the speed that is achieved on various speed tests. The second quarter 2014 *Akamai State of the Internet* report shows the U.S. in fourteenth place,⁵⁷ which is considerably better than one might expect given that its population density is in 24th place among the countries being tested.⁵⁸ Given that all of the countries that perform better than the U.S. are relatively small and most have a higher population density, it is interesting to compare the top-ten-performing countries to the top-ten-performing U.S. states. As figure 7 below shows, all of the top ten

⁵⁶ NCTA, Industry Statistics, NCTA website.

⁵⁷ Akamai, *State of the Internet*, Q2 2014, pp. 20-22, 26-28, and 64.

⁵⁸ Estimates of population densities of states based on U.S. Census data, and of countries based on Infoplease.com, *Area and Population of Countries*.

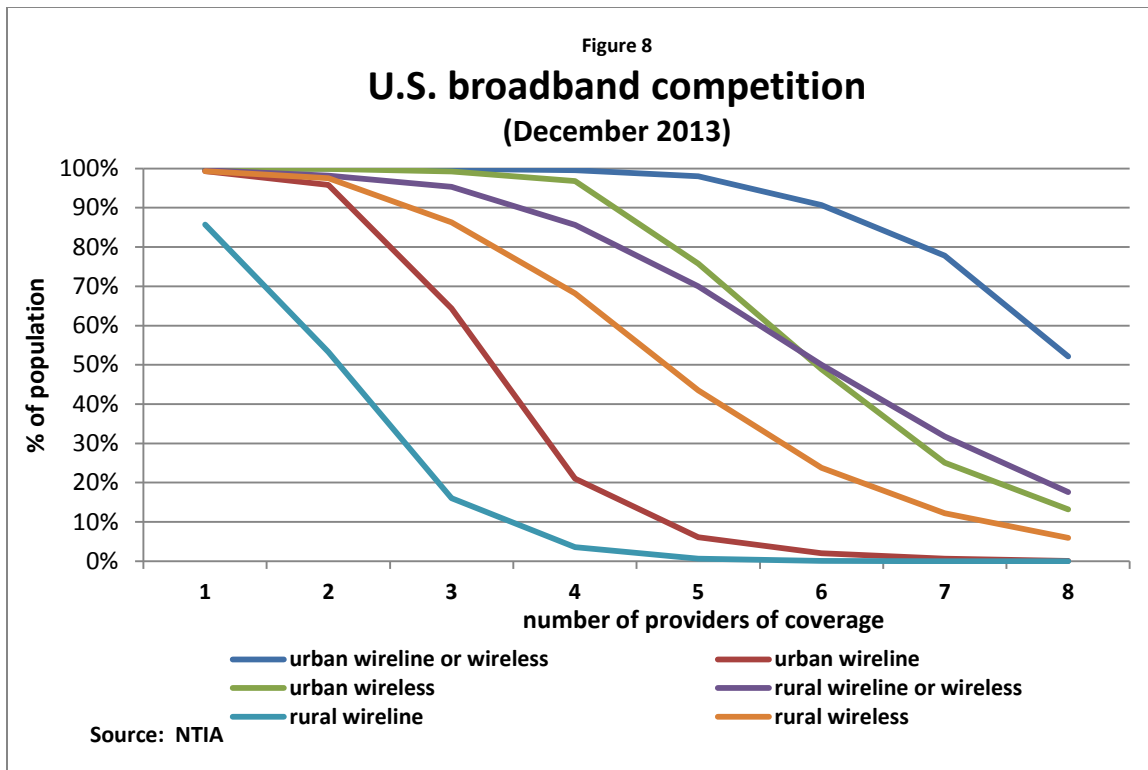
U.S. states⁵⁹ have speeds that fit within the range of the top ten countries. Several of those states are very rural, indicating that the disproportionate investment made by the U.S. BIAs is, indeed, bringing faster broadband and reaching more Americans.



Broadband competition

That high level of investment in the U.S. is also creating a very competitive broadband environment. As figure 8 below shows, again based on the NTIA data, just about all urban Americans have access to five or more broadband providers, and 91% have access to six, including multiple wireline (fixed) as well as wireless providers. 99.6% of rural Americans are covered by at least one broadband provider, 99% are covered by two, 95% are covered by three, and 86% are covered by four. Given that 86% of rural Americans are covered by at least one fixed broadband provider, that coverage by four providers includes at least one fixed provider and several wireless. While far fewer rural than urban Americans can choose among six providers, 51% can do so, and 70% can choose among five providers.

⁵⁹ Akamai includes DC with the states, as do we.



Questions naturally arise about the degree to which fixed and mobile broadband are competitive rather than complementary. Given that most households choose to subscribe to fixed-broadband speeds below 25 mbps, i.e. speeds within the LTE range, and given that even more choose to subscribe to mobile speeds at or below LTE range, LTE can clearly meet the needs of the majority of American consumers in terms of speed. The size of the data plans offered is more limited on the mobile side, but according to Sandvine’s *Global Internet Phenomena report 1H 2014*,⁶⁰ median fixed-broadband monthly consumption in North America is 19.4 GB (gigabits), which is within the range of LTE family plans now being offered. Bottom line, it is fair to say that LTE offers an appealing choice to many households as a stand-alone connectivity service, but for the high-volume users it is more likely to serve as a supplement providing mobility.

Impact on the broader economy

There is no question that the broadband Internet ecosystem is critical to the economy. A letter from 33 infrastructure manufacturers and suppliers informs the FCC that “The high-tech manufacturing industry has created more than 600,000 jobs in the past four years, contributing nearly \$450 billion to the U.S. economy in 2012 alone.”⁶¹ The Progressive Policy Institute estimates that there are 752,000 app-economy jobs in the U.S.⁶² The U.S. International Trade Commission’s report on Digital Trade in the U.S. and Global Economies, Part 1, points out that U.S. exports of digitally enabled services in 2011 reached

⁶⁰ Sandvine, *Global Internet Phenomena Report 1H 2014*, table 1, p. 5.

⁶¹ Letter from ACS Solutions and others, in docket 14-28, September 9, 2014, p. 2. This industry group is writing to oppose Title II reclassification, which it believes to endanger future infrastructure investment.

⁶² Michael Mandel, Progressive Policy Institute blog, July 8, 2013.

\$356.1 billion and that digital trade benefits small- and medium-sized businesses as well as consumers.⁶³ The report notes: “ Studies that have quantified the economic contributions of the Internet have generally found that it has made significant contributions to U.S. output, employment, consumer welfare, trade, innovation, productivity, and corporate financial performance.”⁶⁴ All of those industries and jobs depend, of course, on the BIAs’ infrastructure and their investment in that infrastructure.

The history of Title II and investment: the post-1996 boom and bust cycle

It is into this environment of ever-increasing broadband speeds, extensive competition, tremendous investment, and extreme demands for capital in 2014-2015 that the debate over the means to protect the Open Internet has exploded, to the dismay of the investment community.

Telecom investors are, of course, all too familiar with the impact of regulation on investment. Having seen the boom and bust in wireline investment that followed the passage of the *Telecommunications Act of 1996*, they are not eager to relive the kind of heavy-handed regulatory intervention that Title II invites.

The initial euphoric anticipation of the benefits of competition in 1996 resulted in an enormous increase in infrastructure investment, among both RBOCs⁶⁵ hoping to enter the long-distance market and CLECs and IXCs hoping to enter the ILEC market. As figure 9 shows, at its peak in 2000, wireline capex had roughly doubled to \$79 billion from \$39 billion in 1996. However, in 2001, wireline investment began to collapse.⁶⁶ By the time it bottomed out in 2004 at \$25 billion, wireline investment had been cut to a mere 32% of its peak and 64% of its 1996 level.

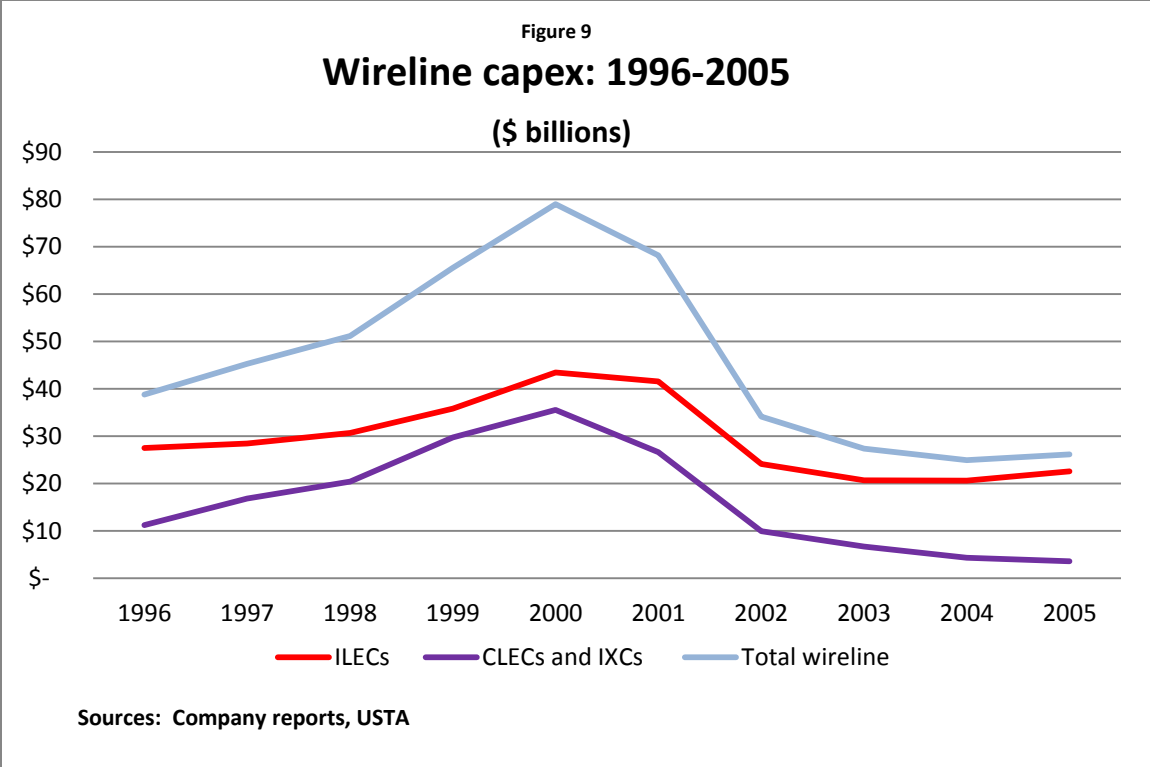
The collapse was even more dramatic for the CLECs/IXCs than for the ILECs. Between 1996 and 2000, ILECs had increased their annual capex by 58%, while CLECs/IXCs had more than tripled theirs. In 2001, ILECs reduced their capex by 4% while CLECs/IXCs reduced theirs by 25%. The reductions in 2002 were much sharper for both groups, 42% for the ILECs and 63% for the CLECs/IXCs. By 2003, when ILEC investment bottomed, annual ILEC capex was 75% of what it had been in 1996. By 2005, when the two largest CLECs/IXCs were bought by ILECs, CLECs/IXCs capex had fallen to about 10% of what it had been at its peak and to 32% of what it had been in 1996.

⁶³ U.S. International Trade Commission, *Digital Trade in the U.S. and Global Economies, Part 1*, July 2013, p. i.

⁶⁴ U.S. International Trade Commission, p. i.

⁶⁵ ILEC stands for incumbent local exchange carrier, i.e. local phone company, CLEC stands for competitive local exchange carrier, and IXC stands for inter-exchange carrier, i.e., long distance company, and RBOC stands for Regional Bell Operating Company, a subset of the ILECs. Many companies like the old AT&T and MCI were both IXC and CLEC, so we refer to the category as CLECs/IXCs, look at their combined financials, and do so through 2005, when traditional-AT&T and MCI, the two largest, were acquired by ILECs. While there are still CLECs/IXCs operating today, from 2006 on, it is increasingly difficult to make pro-forma comparisons to earlier years.

⁶⁶ The calculations of capex for wireline carriers are based on company reports and data from USTA (USTelecom), for wireless carriers on data from CTIA, and for cable companies on data from NCTA.



Wireline capex began to revive in 2005, after the FCC removed many requirements for unbundling fiber and hybrid-fiber loops, packetized switching, and UNEP.⁶⁷ In this new and much less extreme cycle, wireline capex peaked in 2008 at \$32 billion. Just as this second cycle did not have an extreme peak, neither did it have an extreme trough. In 2009, during a recession that was both deeper and longer than that of 2001, wireline capex dropped only 13% and has remained essentially flat at about \$28 billion since then.

The extreme gyrations of 1996-2005 accompanied the FCC's attempt to implement the resale, unbundling, and interconnection provisions of Title II. Beginning in August 1996, there were innumerable lawsuits, remands, and disputes between the ILECs and the IXCs/CLECs at the FCC, in state commissions, and in the courts. The underlying problem was fairly simple. Residential retail prices had been kept artificially low and subsidized by business prices to make residential rates affordable to low-income consumers. Thus, basic residential rates were not cost-based, and there was not enough margin in them for the ILECs, much less for both the ILECs and the competitors who were leasing or unbundling their networks. Conversely, business rates were artificially above cost, inviting cherry-picking by CLECs/IXCs. However, IXCs who needed to protect their residential long-distance market could not avoid the residential local market.

As the depth of the discounts they would have to offer became obvious to the ILECs, their incentive to invest diminished. One of the more extreme examples was the line-sharing order in late 1999, which

⁶⁷ FCC, *Triennial Review Remand Order*, voted December 15, 2004 and issued February 4, 2005. Unbundling of some copper loops was still allowed.

was followed by rulings from several states that the ILECs provide the high-frequency portion to their competitors for free. But the problem was more pervasive than that. According to a report by Commerce Capital Markets in November 2001, by that time the Regional Bell Companies (RBOCs) recovered only between 39% and 52% of their average retail revenues from UNEP. They recovered only between 49% and 66% of their average total operating costs from UNEP.⁶⁸

In theory, local entry at such deep discounts should have resulted in tremendous success for CLECs/IXCs. Instead, while the discounts damaged the ILECs' earnings and cash-flow, they were not enough to support many of the CLECs, whose non-UNE costs were higher than those of the ILECs. It also did not help that UNEP prices were different in every state (as well as between density zones within states), which made it difficult to provide national pricing plans for combined local and long-distance service. The large IXCs by 2001 were facing RBOC entry into the long distance market, a process that gained steam rapidly in 2002 and was completed in 2003. Long-distance rates as well as IXC market shares came under pressure. The wireline industry turned into a less-than-zero-sum game.

It was only after the courts affirmed the FCC's 2005 *Triennial Review Remand Order (TRRO)*, which greatly reduced the ILECs' unbundling obligations, especially with respect to fiber, hybrid-fiber, and packetized switching, and UNEP, that ILEC investment finally began to grow again. The post-Triennial period saw Verizon deploy FIOS and AT&T deploy U-verse, two high-speed broadband technologies that also allow them to provide video in competition with the cable industry. Investment in those technologies not only benefitted from the TRRO, but also from their classification in 2005 as information services, which freed them of Title II obligations.⁶⁹

Meanwhile, ILEC offerings that have been regulated under Title II have been abandoned by the vast majority of ILEC customers. In 1999, ILECs served 181.2 million switched access lines. In 2013, they served 66.1 million switched access lines.⁷⁰ Yet ILECs' attempts to respond to their customers, to shift investment from areas customers are abandoning to areas they are demanding, have been thwarted or slowed by requirements that they seek permission from regulators.

Thus, for investors, the lesson of the post-1996 era is that heavy-handed regulation, particularly under Title II, can be very harmful. It has led to distorted pricing that is not sustainable unless an industry is a monopoly. It has led to radical misallocation of capital. It has prevented companies from responding nimbly to rapidly changing market requirements, thus harming both consumers and investors. The possibility that such regulation might be extended to areas that have been free of it dismays investors, as the analyst reports cited above show.

⁶⁸ Anna-Maria Kovacs, CFA, et al, "Status and Implications of UNE-Platform In Regional Bell Markets," Commerce Capital Markets, November 12, 2001, table 1, p.5. These averages include both business and residential markets. Both retail rates and UNE rates varied from state to state.

⁶⁹ On August 5, 2005, the FCC adopted an Order that declared wireline Internet access service to be an information service.

⁷⁰ ILECs also served 9 million interconnected VOIP lines. FCC, *Local Telephone Competition: Status as of December 31, 2013*, figure 4, p. 5 and *Local Telephone Competition at the New Millennium*, table 4.

Evolution of the Internet without Title II

From the perspective of the investment community, it makes sense for the FCC to rely on section 706 rather than reclassify broadband Internet access under Title II. The Internet has grown phenomenally and has become a critical underpinning for the U.S. economy. The U.S. government is vigorously opposing governmental control of the Internet abroad, and Title II reclassification within the U.S. would make that opposition a travesty. But the most important point is that section 706 allows the FCC to write on a clean slate, while Title II would bring with it a multitude of rules from which it may well not be able to forbear and which could reach not only BIAs but edge providers. The FCC would have far more control over its own actions and risk far less collateral damage using section 706. And, Title II would not prevent paid prioritization, since Title II does not forbid reasonable discrimination.

In the 19 years since the Internet was privatized in 1995, there have only been a handful of complaints about blocking or throttling of traffic or about interconnection.⁷¹ By contrast, telecommunications services under Title II have seen thousands of disputes over various issues at the FCC, in various state commissions, and in the courts, as well as numerous international settlement disputes. Because of the dearth of actual Open-Internet problems and because the FCC has been able to deal well with those few without Title II, the investment community doesn't see any reason for the FCC to deploy the "nuclear option" of Title II reclassification.

Switched traffic which is regulated under Title II has stagnated and ILEC switched access lines have decreased from 181 million in 1999 to 66 million in 2013.⁷² Global Internet traffic, on the other hand, has grown from less than 100 Gigabytes of traffic per hour in 1997 to 29,000 Gigabytes per second in 2013.⁷³ It has evolved from four dial-up links between university computers in 1969 to a network consisting of tens of thousands of networks, that interconnect for the most part based on handshake agreements.⁷⁴ The Internet has accommodated new technologies, such as mobile, both at the core and at the edges just as it has accommodated new types of traffic, such as video.

The concern expressed by Frank Louthan of Raymond James about "the ongoing debate about how to ruin the Internet"⁷⁵ is framed in more elegant language by several members of the State Department who are battling similar issues at the International Telecommunications Union (ITU). On the world stage, the U.S. has vigorously defended the traditional multistakeholder--rather than governmental--governance structure of the Internet. As Daniel Sepulveda, Christopher Painter, and Scott Busby, who are, respectively, U.S. Coordinator for International Communications and Information Policy, Coordinator for Cyber Issues, and deputy assistant secretary of state for democracy, human rights and labor, recently posted on the State Department's website:

⁷¹ The May 15th NPRM ¶ 18 and ¶40-41.

⁷² FCC, *Local Telephone Competition at the New Millennium*, table 4 for 1999 data and *Local Telephone Competition: Status as of December 31, 2013*, tables 4 and 5, pp. 15 and 16 for 2013 data.

⁷³ Cisco VNI, *The Zettabyte Era: Trends and Analysis*, for 2013-2018, p. 4.

⁷⁴ Bill Woodcock and Vijay Adhikari, "Survey of Characteristics of Internet Carrier Interconnection Agreements," Packet Clearing House, May 2, 2011, p. 2.

⁷⁵ Louthan, p. 1.

“For those of us privileged enough to have access to the Internet over robust networks, it has become a part of our daily lives, making us more productive, more connected, and better informed. It has made our civil society stronger, and it has been an important driver of innovation, economic prosperity, and security. Most of us take the Internet’s open and global architecture for granted. But the Internet operates that way by design, not by accident. Its open and global architecture and governance structure is organic, bottom-up, and driven by the Web’s most active and engaged communities such as engineers, software developers, academics, the private sector, civil society, and government representatives. Known as the ‘multistakeholder approach,’ it creates and enables the innovative, open network of networks that we call the Internet.”

They go on to say:

“But there are some who want to manipulate or change the mandate of the ITU in ways that would purport to give governments the sole authority over the Internet’s content, technologies, or services. The U.S. government categorically rejects this proposal.”⁷⁶

Were the FCC to invoke Title II, it would undercut the efforts of the State Department and the international ramifications would be very damaging to investment in the Internet ecosystem abroad. Intel explained in its reply comments to the FCC: “Therefore reclassification of broadband services under Title II could abet the efforts of certain regulators to adopt prescriptive regulations on the ICT industry more broadly, adversely affecting many U.S. companies with international operations. The international impact cannot be confined to any intended limits of Title II reclassification in the U.S.”⁷⁷

The potential effects of section 706 v. Title II

For investors, the primary difference between section 706 and Title II is the degree of control the FCC can hope to have over the consequences of its own actions. Section 706 consists of two paragraphs that give the FCC and state commissions authority to encourage the deployment of advanced telecommunications capability and, if the FCC finds that it is not being deployed in a reasonable and timely fashion, to accelerate deployment by removing barriers to infrastructure investment and by promoting competition in the telecommunications market. Using this authority, the FCC would create those—and only those—rules it needs to ensure that the Internet remains open. Its rules would be subject to judicial review. That potential for review provides comfort that the FCC’s authority under 706 would not be unbounded, but it does leave the FCC considerable room to act.

By contrast, Title II automatically invokes price regulation, resale and interconnection obligations, customer privacy rules, and numerous other obligations, which have been implemented via many

⁷⁶ Daniel A. Sepulveda, Christopher Painter, and Scott Busby, “U.S. Supports Inclusive, Open Internet,” U.S. Department of State, blog entry dated September 26, 2014. They are, respectively, U.S. Coordinator for International Communications and Information Policy, Coordinator for Cyber Issues, and deputy assistant secretary of state for democracy, human rights and labor.

⁷⁷ Intel Corporation, reply comments in docket 14-28, September 15, 2014, p. 8.

thousands of regulations at the FCC and various state commissions. That the vast majority of rules that Title II would automatically bring into effect are both irrelevant and damaging is obvious from the eagerness with which Title II advocates claim that the FCC would be able to forbear from them.⁷⁸ And the delay and uncertainty caused by the process is highlighted by the Internet Association's suggestion that the easy path to forbearance would be for the FCC to not act on forbearance petitions for a year to invoke the deemed-granted option.

While the FCC is allowed to forbear from some of those obligations if it can justify the forbearance to the courts, investors who have watched the attempts of ILECs to obtain forbearance are all too aware of the difficulties of that process. For example, investors have watched ILECs lose most of their market share yet still be treated by the FCC and state commissions as if they were dominant carriers for PSTN voice service.⁷⁹ As a result, they have little faith that the FCC would apply Title II to BIAs but then forbear from all the regulations that come with that.

Even if the FCC wanted to do so, it would face appeals from various parties who want regulations applied, and the precedents it has established would make it difficult to withstand such appeals in court.⁸⁰ State commissions that might want to regulate broadband access pricing, its quality, or the privacy of customers' information could litigate any attempt the FCC might make to forbear from regulation. So could various industry participants.

To envision the contrast, imagine the FCC trying to create an ice sculpture. Under the section 706 approach, it would take a block of ice and carve until it achieves the shape it desires. Under the Title II plus forbearance approach, it would climb Mt. Everest and set off explosions to remove snow, hoping that ultimately only the desired shape would remain. The chances of achieving the desired result and of avoiding collateral damage are obviously greater under the section 706 approach than under the Title II approach.

Professor John Mayo of Georgetown University summarizes the advantages of section 706 over Title II from an economist's perspective: "Section 706 provides for a congruence between legal authority and sound economic policymaking. By setting the FCC's sights on output, Section 706 actually enables the FCC to both spur investment and innovation along the Internet value chain, and to guard against anticompetitive behaviors... Importantly, an output-centric 706 approach allows the nation to move forward without the *ex ante* Title II regulatory rules imported from an era of public-utility regulation of

⁷⁸ In its reply comments advocating for reclassification under Title II and dated September 10, 2014, p. 11, the Internet Association writes: "The Commission could forbear from applying virtually all provisions of Title II, except as necessary to adopt strong open Internet requirements... Indeed, the Commission can undertake the required forbearance simply through the device of failing to rule on a petition for such forbearance 'within one year after the Commission receives it.'"

⁷⁹ For example, the 2006 and 2008 decisions to refuse forbearance to Verizon and Qwest (now Centurylink) in several markets where they had lost substantial market share.

⁸⁰ George S. Ford, Ph.D., and Lawrence J. Spiwak, "Tariffing Internet Termination: Pricing Implications of Classifying Broadband As a Title II Telecommunications Service," Phoenix Center Policy Bulletin No 36, September 2014. Discusses the difficulties the FCC would face if it wanted to forbear from tariffing Internet termination services. Intel's reply comments in docket 14-28 on p. 9 also explain the conflict between the criteria required to reclassify under Title II and those required for forbearance.

telephone service. Imposing such *ex ante* rules risks proscribing novel, but output-enhancing, business practices, sweeping them in with anticompetitive practices that should be halted. And, such extensions of the traditional regulatory apparatus to innovative services that blend voice, data and video features would create the profound risk of stifling the rich innovation that has become the hallmark of the high-tech sector.”⁸¹

That collateral damage could easily engulf edge companies, some of whom are ironically advocating for Title II reclassification. Robert Litan points out that “Reclassifying Internet access as a ‘telecommunications service’ within the meaning of Title II, as supplemented by the provisions of the Telecommunications Act of 1996, opens up the possibility that other tech services meet the same test.”⁸² Litan notes that the linkage to an advertiser’s website from a search engine, or Kindle’s device and service might qualify as telecommunications services if broadband Internet access does. Other examples of the danger of blurring the distinction between information services and telecommunications services are platforms like YouTube, Shutterfly, Facebook, Netflix, Twitter, Twitch, Skype, Vonage, Nook, and others which arguably use telecommunications to transmit information of the user’s choice, between and among points specified by the user, and offer the service to the public for a fee.⁸³ Telecommunications services do not have to be facilities-based, as resellers well know. Were a court to find that Title II applies to these edge services, forbearance of its provisions could not be guaranteed for the same reasons that it cannot be guaranteed for BIAs.

It is likely that various parties will want to apply Title II to edge providers. For example, state commissions may want to impose privacy regulations using CPNI as a lever—that would endanger the current ad-based business model. Content providers who are unhappy with their current split of ad revenues could ask the FCC or states to force YouTube or others to offer their platforms at tariffed rates, potentially subject to state or federal rate-setting. Content delivery networks (CDNs) could be forced to interconnect. Companies like Google that offer collocation today to their major partners could be forced to accept anyone who wants collocation space.

The danger to edge providers is flagged in the FCC’s record and elsewhere. Under the heading “The problematic demarcation between information service and telecommunications service,” Intel warns, “Important demarcation issues would be implicated in any Title II reclassification, and the Commission is

⁸¹ John W. Mayo, Ph.D. , “The Economics and Law of Net Neutrality,” Economic Policy Vignette, Georgetown Center for Business and Public Policy, June 1, 2014, pp. 2-3.

⁸² Robert Litan, *Regulating Internet Access as a Public Utility*, Economic Studies at Brookings, June 2014, p. 2.

⁸³ CBIT explains well why BIAs don’t fit that definition of telecommunications services. However, if the definition were stretched to encompass them, it would then easily encompass edge platforms that relay voice, data, and/or video with little modification, make the service available widely, and accept ad revenues as payment. At a minimum, that argument would be raised by parties want to regulate such platforms (e.g. for privacy, or for a higher cut of revenues), and uncertainty over the outcome of the ensuing litigation would overhang these companies and their stocks for years.

not working from a clean slate.”⁸⁴ It notes that various other services, applications, and content providers could be swept under Title II reclassification.

Larry Downes, author of *Big Bang Disruption*, writes, “under a Title II regime, every element of network engineering could come under the scrutiny of federal and state regulators, reaching all the way to content providers and other ‘edge’ services, who are, after all, themselves frequently accused of violating nebulous and expanding ‘net neutrality’ principles.”⁸⁵

Jeff Pulver, who founded Free World Dialup and Vonage and still invests in startups, writes that “applying Title II means declaring everything telecom... I can attest I have no idea how to judge the difference between IP transmission and IP services for the purposes of my next startup. I will not be able to explain it to investors, because the line exists entirely in the mind of whoever happens to be Chairman of the FCC. Applying Title II to IP networks creates a new Federal Computer Commission with authority to weigh in on everything connected to an IP network, in other words—everything.”⁸⁶

The danger would, of course, be greatest to the newest and smallest startups, which lack lawyers, large teams or major revenues with which to fight regulatory battles in courts and commission hearing rooms around the country. A group of investors in early-stage companies wrote to the FCC on May 8th to argue that investors will be deterred by paid prioritization: “Creators will have to ask permission of an investor or corporate hierarchy before they can launch. Ideas will be vetted by committees and quirky passion projects will not get a chance. An individual in dorm room or a design studio will not be able to experiment out loud on the Internet. The result will be greater conformity, fewer surprises, and less innovation.”⁸⁷ It would be difficult to find a better description of the likely fate of edge providers who find themselves classified as telecommunications service providers subject to Title II obligations and have to face federal and state commissions and courts in multiple jurisdictions.

Ironically, Title II reclassification would not be responsive to the very issue that has become the flashpoint of the net neutrality debate—paid prioritization, aka “fast lanes.” There is nothing to prohibit telecommunications service providers from reasonable discrimination in the treatment and pricing of classes of service, as long as there is not discrimination within members of a class that are similarly situated. For example, phone companies were traditionally encouraged by their regulators to price business lines at higher prices than residential lines, they could price off-peak traffic at lower prices than peak traffic (nights and weekends vs. daytime), they could provide volume discounts, they could provide various enterprise services, etc. By the same token, under Title II reclassification, BIAs could justify providing paid prioritization, and pricing it differently depending on the volumes of traffic involved.

⁸⁴ Intel, reply comments in docket 14-28, September 15, 2014, p. 6. Cisco’s comments on July 17, 2014, p. 22-27 discusses the deleterious effects that Title II would have on investment in the broadband ecosystem. A letter to the Secretary of Commerce dated September 9, 2014 and signed by 33 manufacturers and providers of various edge services notes: “Because Title II allows for so little flexibility and innovation, it would undercut substantially the broadband providers’ incentives to make the investments necessary to fund network deployment and upgrades.”

⁸⁵ Larry Downes, comments in docket 14-28, Georgetown Center for Business and Public Policy, July 14, 2014, p. 4.

⁸⁶ Jeff Pulver, “Fear and Loathing as Telecom Policy,” the Blog, Huff Post, August 6, 2014.

⁸⁷ True Ventures *et al*, p. 2.

Summary

Thus, Title II reclassification threatens investment by both network and edge providers. At a time when more funding than ever before is needed to meet the explosive growth of mobile and fixed Internet traffic, it would subject investors to a series of regulatory shocks. Reclassification does not solve the paid-prioritization issue that the vast majority of net neutrality advocates are demanding the FCC solve, but it carries the risk of enormous collateral damage to both infrastructure and edge providers. It would bring stultifying regulation that would choke all levels of the Internet ecosystem that has become one of the primary engines of economic growth for the U.S. and the world. It would encourage other governments to follow suit, endangering the success of American digital service and application providers abroad. By contrast, section 706 provides the FCC with the authority it needs to promulgate revised Open Internet rules without the risks to innovation and investment posed by Title II.