

The U.S. Broadband Market Under the Trump FCC:

Four Years of At Best Continuing Market Trends Underway in the Obama Era That Continue to Leave Low-Income Communities and Communities of Color Facing a Persistent Digital Divide

During the past four years, the U.S. broadband market has shown some growth to be sure in deployment, adoption, and network performance. But contrary to FCC Chairman Ajit Pai's constant attempt to take credit for any trends he likes (while ignoring the ones he does not like), much of this progress was set in motion before the Trump era. In many cases, any progress happened in spite of, not because of, Chairman Pai's efforts.

Broadband Adoption

- At the end of 2019, approximately 4 out of every 5 households subscribed to the internet using either a mobile data or a fixed line technology.
 - While overall adoption continues to grow, this adoption growth rate is slowing.
 - Only about 73 percent of households subscribe to an “adequate” broadband service (defined to mean fixed technologies such as cable modem, DSL, fiber-to-the-home, fixed wireless, or satellite). This gap reflects the reality that a growing number of households are reliant on mobile data subscriptions as their sole form of access, and are thus more likely to have an inadequate quality of connectivity and quantity of data especially during these times when many families are working and schooling from home.
- The adoption gap is a far bigger problem than the deployment gap. More than 77 million people in the U.S. lack an adequate home internet connection (*i.e.*, they either have no internet at all or are solely reliant on mobile wireless). This is far greater than the number of people living in an area with no fixed terrestrial broadband services at the FCC's 25 megabits per second threshold.
- The income-related broadband adoption gap persists under Chairman Pai. Dividing U.S. households into five large brackets by income, we can see that while 90 percent of households in the top quintile are online, only two-thirds in the bottom quintile are connected. And these households are overly-reliant on inadequate mobile data services. Only 48 percent of low-income households have a fixed broadband connection (with 44 percent connected via wired technology, and another 4 percent via other fixed technologies).
- The racial and ethnic broadband adoption gap persists under Chairman Pai. While 21 percent of Census-identified “non-Hispanic whites” lack a “fixed” broadband connection at home, that number jumps to 30 percent of Black people, 30 percent of Latinx people, and 34 percent of Native Americans who lack adequate home connectivity (“fixed” connections include wired technologies like cable, DSL and fiber, as well as satellite and fixed wireless services). That's 13 million Black people, 18 million Latinx people, and 13 million Native Americans who do not have the essential telecommunications services they need to fully participate in today's economic and education systems.

Broadband Deployment

- Basic broadband deployment also has slowed during the Pai era. For example, in the two-year period 2015-2016, the number of persons living in a block with 4 Mbps downstream/1 Mbps upstream deployment grew by 10.9 million, a 3.6 percent increase. But in the next two-year period 2017-2018, the number of persons living in a block with 4 Mbps downstream/1 Mbps upstream deployment grew by 7 million, a 2.2 percent increase.
 - Though this slowing rate of deployment is not surprising as the market reaches well above 90 percent deployment, it is a trend that Chairman Pai has not mentioned or claimed credit for, even as he makes rural broadband deployment his top priority.
 - To state the obvious point that Chairman Pai and the current FCC majority try to obscure, confuse, and avoid at all costs in this context and others, this means basic broadband deployment increased more quickly in the last two years of the Obama administration – with Title II classification for broadband internet access service in place – than it did in the next two years, while the Pai FCC planned to and eventually did abandon that proper classification.
- Despite Chairman Pai’s empty boasting, more recent gains in advanced broadband deployment are the result of ISPs’ plans also made and begun during the latter part of the Obama era too.
 - Fiber-to-the-Home deployment observed during Chairman Pai’s tenure is exactly at the levels to be expected, based solely on the deployment trends from the prior 8 years continuing at the same rate. There is no change in the rate of growth in fiber deployment, let alone any change attributable to steps taken by the Trump FCC or to the Trump tax cuts either.
 - Almost all of the increase in U.S. fiber availability during 2017-2019 is due to deployments made by the nation’s top-three legacy telephone providers, the massive incumbent local exchange carriers (or “ILECs”) carrying out investment plans they publicly announced during 2015-2016. As we document below, approximately 92 percent of the Pai-era fiber deployments came from projects that were announced during 2015-2016. The rest of the growth is commensurate with the “natural” greenfield rate of growth driven by new home construction.
 - AT&T’s DirecTV merger commitment accounted for two-thirds of all new household fiber deployments made during Chairman Pai’s tenure. AT&T’s fiber deployments all but ceased upon completion of these Obama-era commitments, which then-Commissioner Pai vociferously opposed; and AT&T’s capital investments have dropped every year during Chairman Pai’s reign.
 - Chairman Pai also has claimed credit for the increase in the availability of very-high speed cable ISP broadband services. But these improvements came from deployments that were likewise planned, publicly announced, or begun before Chairman Pai’s tenure ever began.

Broadband Competition

- Cable ISPs have only increased their market dominance under Chairman Pai.
 - At the start of 2014, cable company ISPs controlled 59 percent of the home internet market's customers. Today, the cable industry's share is above 68 percent.
 - Competition is inadequate even where cable and fiber services are both available. Duopoly ISPs are focusing on offering higher-priced, faster-speed services but not on making sure that affordable offerings are available too. For example, ten years ago in Atlanta, Comcast priced its entry-level tier at a non-promotional monthly price of \$42.95. Today in Atlanta, Comcast charges \$53 per month for the entry-level tier.

Broadband Pricing

- Home internet and wireless prices are on the rise under Chairman Pai, reversing the prior decreases in price seen during the second Obama term.
 - BLS data indicates that quality-adjusted home internet service prices increased slightly from the start of the Obama presidency until the FCC's Title II classification went into effect, then decreased after the Title II classification. But prices began increasing in 2018 after Chairman Pai overturned the prior FCC's Net Neutrality rules and the Title II classification.
 - In the wireless services market, BLS data shows a sustained, quality-adjusted price drop beginning after the FCC's rejection of the AT&T/T-Mobile merger. This trend continued for years, until T-Mobile and Sprint began discussing and negotiating a merger. BLS data indicates wireless prices are now once again on the rise, following the Trump DOJ's and FCC's approval of the T-Mobile/Sprint merger.

Broadband Performance

- Thanks to investments planned and made before 2017, U.S. broadband network speed performance and improvements during the Trump-era continue along their prior trajectory.
 - The growth in average speeds in the Trump era is less than that seen in the Obama era. The average U.S. downstream connection speed increased 136 percent from the end of 2016 to the end of 2019. But that same average increased 176 percent during the prior three-year period (under the second Obama administration).

Broadband Investment

- Aggregate U.S. ISP Broadband investment declined during 2018-2019, with further declines expected in 2020.
- While we do not assert any causality, the reality is that broadband investment at many top ISPs peaked before Chairman Pai's tenure, and declined sharply after his Title II reversal.
 - AT&T's 2019 capital expenditures were 17 percent below its 2016 level.
 - Comcast's capital investments are down 14 percent from 2016.
 - Charter's capital investments are down 10 percent from 2016.
 - CenturyLink's capital investments are down 21 percent from 2016.
 - Cincinnati Bell's capital investments are down 45 percent from 2016.

BROADBAND ADOPTION

The Rate of Growth in Broadband Adoption Has Slowed under Chairman Pai

More than 77 Million People Lack Adequate Connections At Home, and the Adoption Gap That Gets So Little Attention From This FCC Has Not Narrowed Significantly During Pai's Tenure

At the end of 2019, approximately 4 out of every 5 households subscribed to the internet using either a mobile data or a fixed line technology (see Figure 1, and note that in figures presenting household data next to population data, the population percentages will be slightly higher than the household percentages because of the fact that connected households skew younger and tend to have more people and more children in them, while disconnected households skew older and smaller).

While overall adoption continues to grow, it is slowing. And though 80 percent of households are connected, only about 68 percent of households subscribe to a wired broadband service (meaning technologies such as cable modem, DSL, or fiber-to-the-home; see Figure 2. Note that the figures for wired adoption are slightly below those cited elsewhere for “adequate” or “fixed” access, as those figures include all forms of fixed technology such as satellite and fixed wireless in addition to wired service). This gap reflects the reality that a growing number of households are reliant on mobile data subscriptions as their sole form of access (see Figure 3). Mobile service is vital, but mobile subscriptions alone tend to provide an inadequate quality and quantity of connectivity during these times, when many families are working and schooling from home.

Figure 1

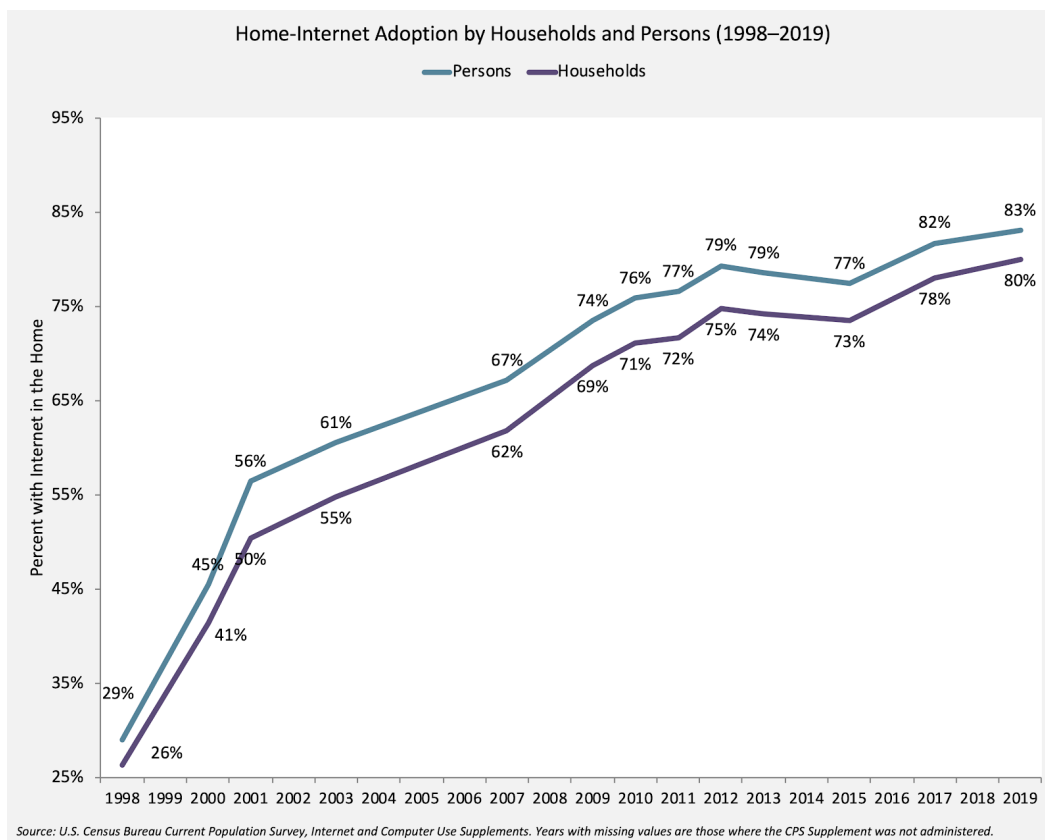


Figure 2

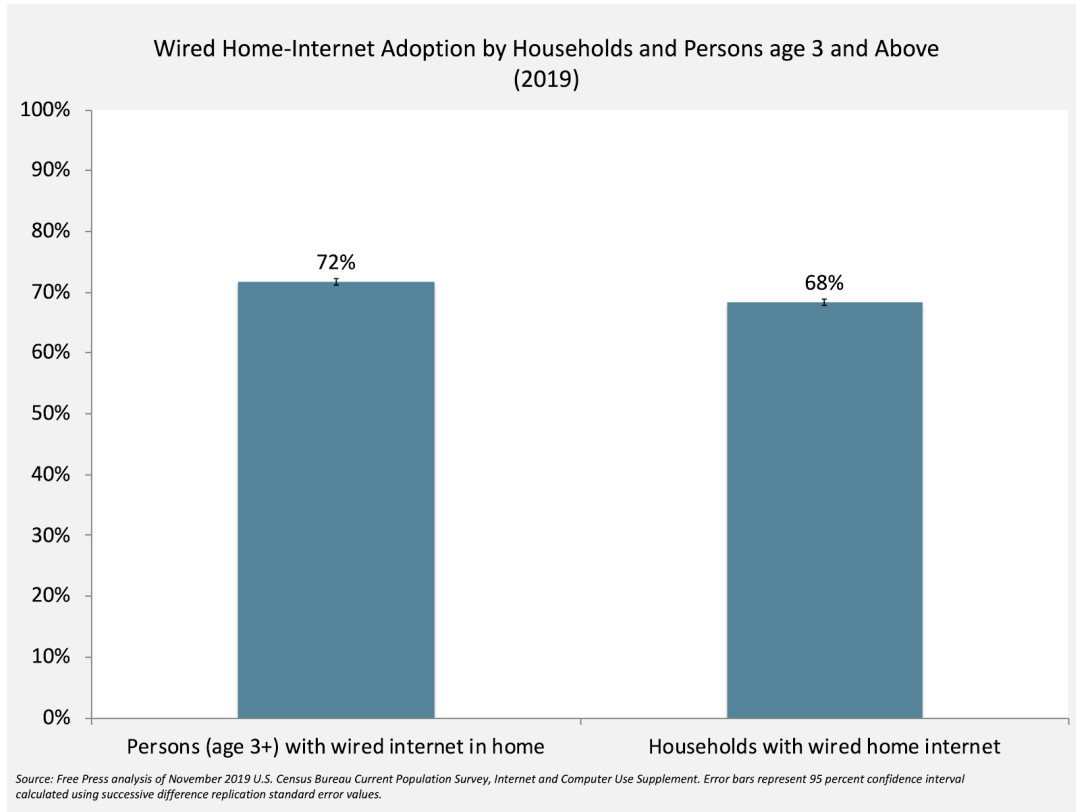
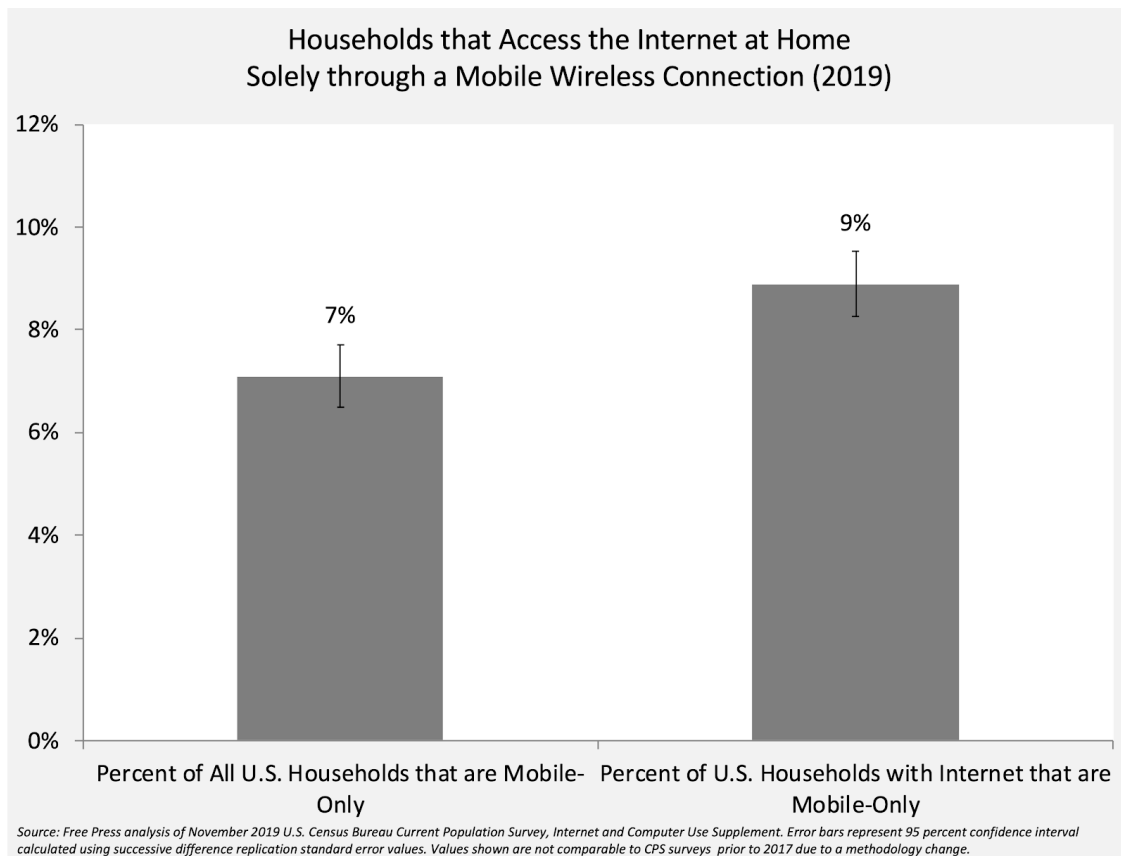
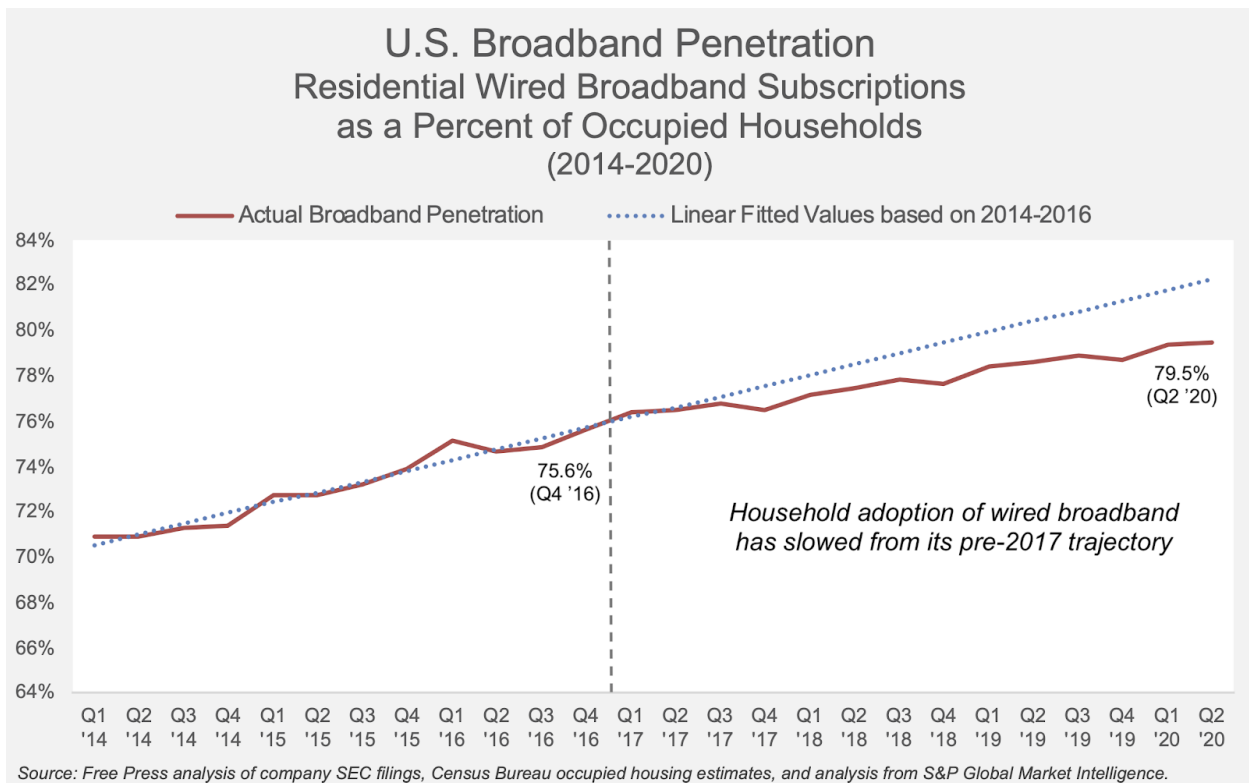


Figure 3



Broadband, like all technologies, follows what’s known as an “S-Curve” of adoption. This refers to the trajectory of adoption over time, where initially uptake is slow, then accelerates upward, then slows again as the market reaches universal adoption (or a saturation level below full adoption). As an essential service that is a mature technology, we should expect broadband adoption to slow as it reaches near-universal levels. And the available data does reflect a slowing of the increase in broadband adoption – particularly wired broadband. The data in Figures 1–3 come from Census surveys of households. Below in Figure 4 we present the trend in “broadband penetration,” calculated as the total number of residential wired lines in service as a percentage of occupied homes. This penetration stat is somewhat higher than the household-level survey data’s value for wired adoption, because it captures lines in vacation homes and secondary lines used for home offices. Yet this penetration data also shows a slowing growth trend. This is troubling, because it is increasingly clear that adequate broadband access at home is as necessary as telephone access at home was for most of the 20th century. But while household-level telephone adoption topped out at about 96 percent, broadband adoption and wired broadband adoption have a long way to go before they reach that level. The growth in broadband adoption has slowed from its pre-Pai trajectory, and adoption overall is plateauing far below 96 percent.

Figure 4



During his tenure as FCC Chairman, Pai has neglected the issue of home internet adoption, and that continues to cost poor families and families of color. While Pai has paid lip service to the issue of the adoption digital divide, he's all but ignored its racial and income aspects. And he's completely ignored the impact that the lack of adequate competition has on broadband prices and adoption.

Nearly all top-quintile income-earning homes are connected to the internet, with 83 percent connected via a wired technology. But only 59 percent of bottom quintile income-earning households are online, and just 44 percent have the wired connection needed to fully engage in distance learning (see Figures 5 and 6. Note that these estimates of wired adoption are slightly below estimates for “adequate” or “fixed” adoption, which include all forms of fixed access such as satellite and fixed wireless, in addition to wired service). And though the internet adoption gap based on income is closing, this is largely due to poorer households adopting mobile. A low-income household is nearly 4-times more likely to be mobile-only than is a top-income quintile household (11 percent vs. 3 percent; see Figure 7).

Figure 5

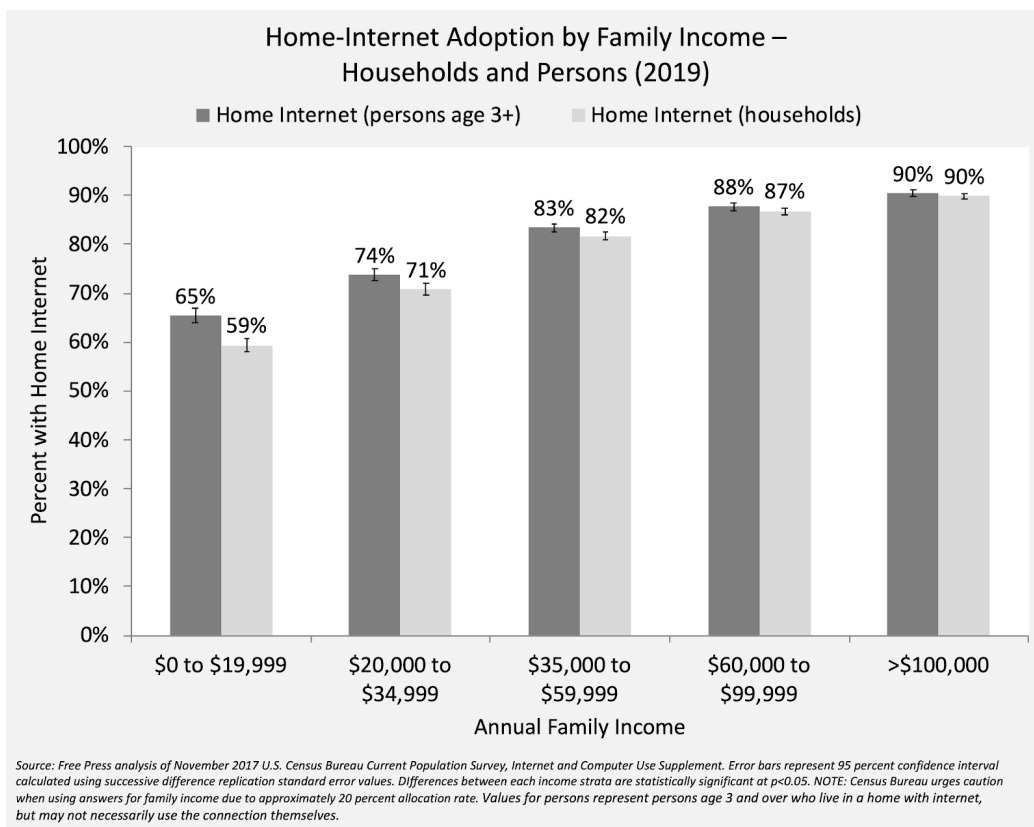


Figure 6

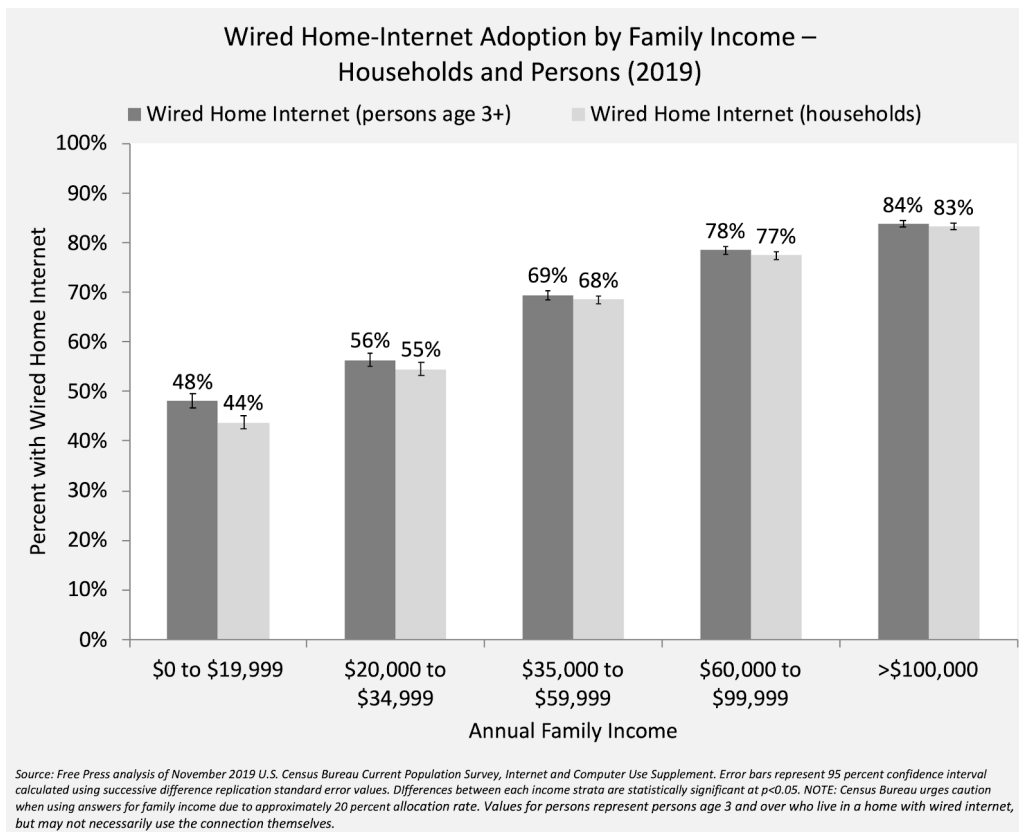
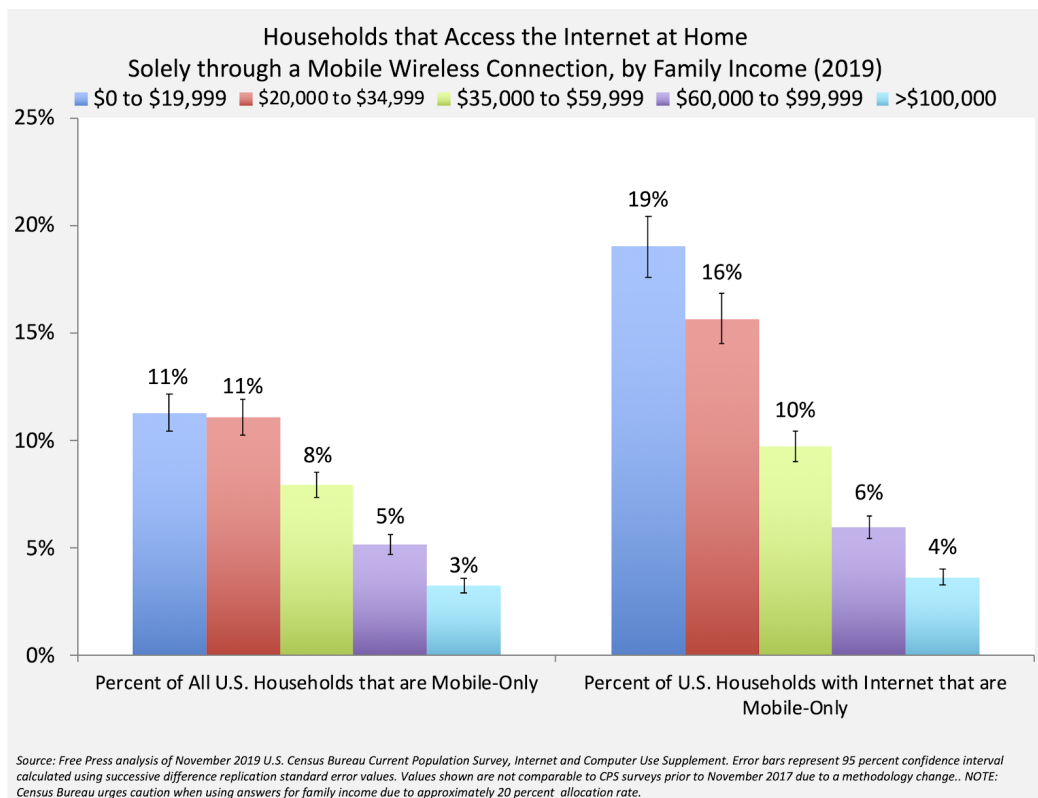


Figure 7



As we previously demonstrated in our 2016 report *Digital Denied*, income disparities contribute to the gap in home broadband adoption between white and non-white people living in the U.S, since non-white communities are disproportionately poorer. But other aspects likewise stemming from systemic racism also contribute to the observed adoption gaps based on race and ethnicity, beyond just the disproportionately lower incomes of BIPOC and Latinx households. For example, differential application of credit checks and different levels of exposure to internet usage at work have resulted in disproportionate adoption between Black and Latinx households, on one hand, and white households on the other. And these gaps persist even when accounting for income and other demographic factors.

Fortunately, these racial and ethnic adoption gaps are slowly closing. But this is largely due to the absolute necessity of broadband, and also to the availability of relatively lower-cost prepaid mobile data services that, as much or more so than other mobile services, may not provide adequate connectivity at home either during the pandemic or the long recovery from it. As of year-end 2019, BIPOC and Latinx people living in the U.S. lagged behind whites in home internet adoption by about 7 percentage points (see Figure 8). But the racial/ethnic gap in wired home internet remains troublingly large. As Figure 9 shows, while three-quarters of Census-identified “non-Hispanic whites” report having a wired connection at home, less than two-thirds of Black, Native American and Hispanic people have such a wired technology like cable modem, DSL, or fiber. (Note that these figures for wired adoption are slightly lower than other data presented herein for “adequate” connectivity, which includes other modes of fixed access such as satellite and fixed wireless in addition to wired service). The wired adoption gap between non-Hispanic white and Black people closed slightly between 2017 and 2019 (going from an 11 percentage point gap to an 8 percentage point gap). But this wired adoption gap increased slightly between non-Hispanic and Hispanic people (rising from 8 percentage points to 9 percentage points).

The overall racial/ethnic home internet adoption gap would be larger, but for the disproportionate reliance on mobile wireless services in households identifying as non-white. For example, as Figure 10 shows, Native Americans are twice as likely as self-identified non-Hispanic white people to rely on a mobile data service as their sole method of getting online at home.

Figure 8

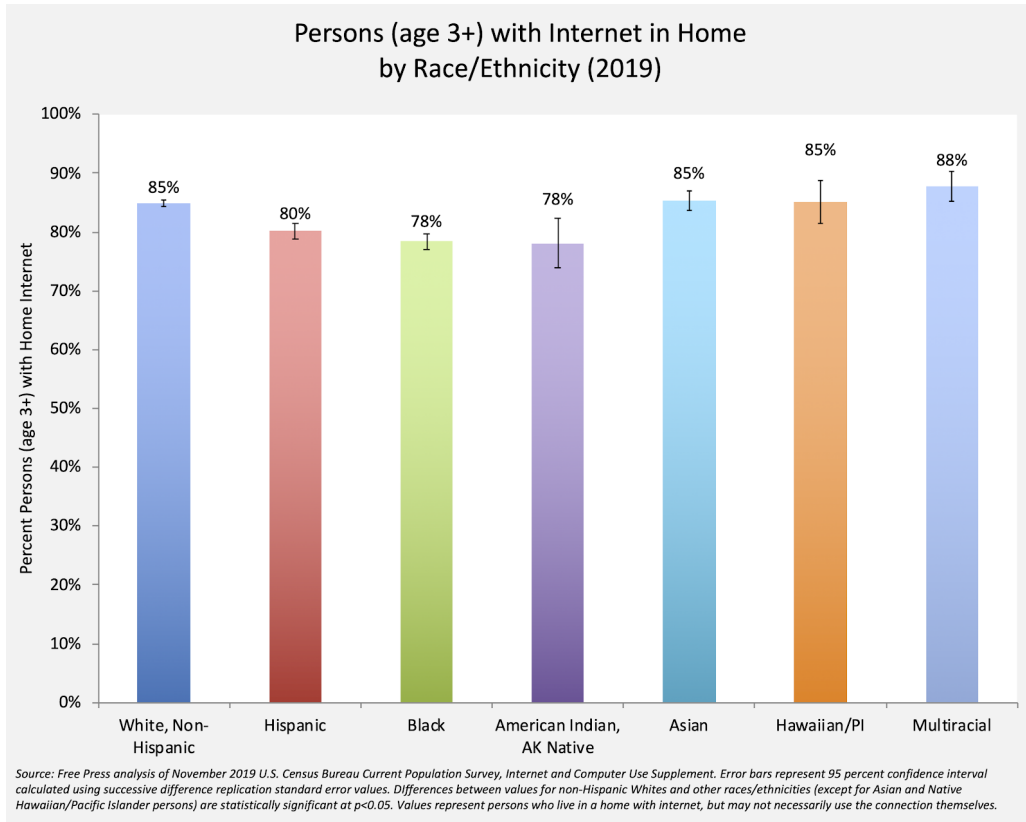


Figure 9

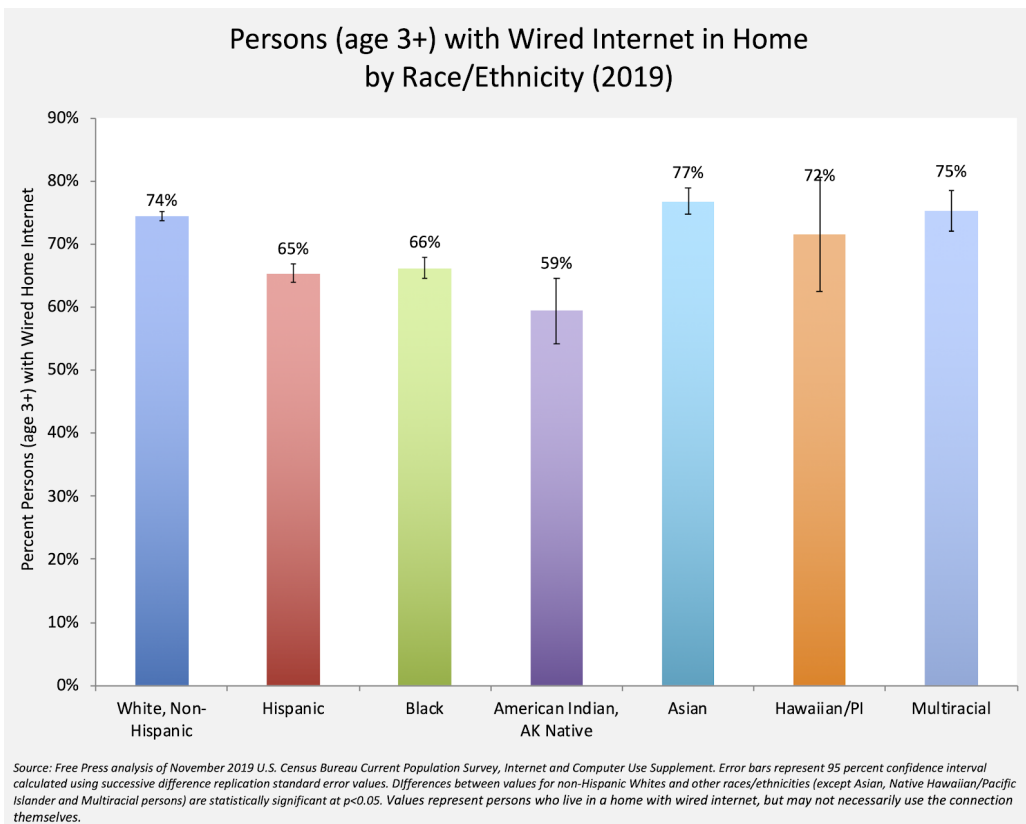
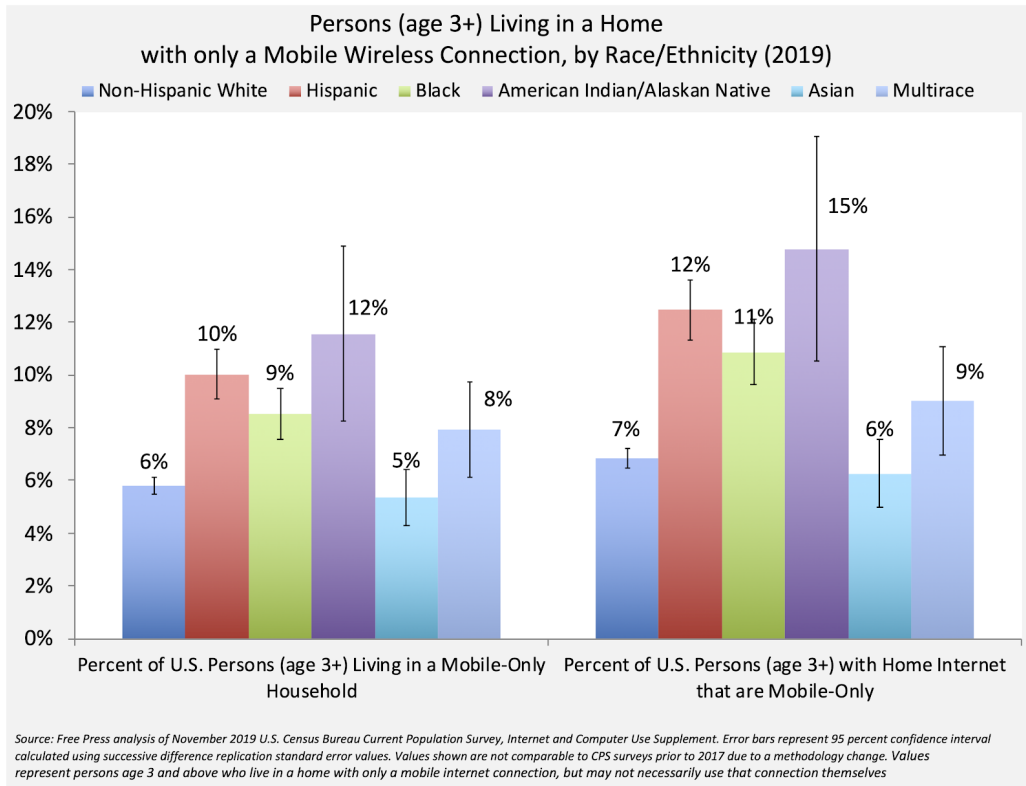


Figure 10



The digital divide in terms of broadband adoption has always been given short shrift by policymakers and the media, whose rhetoric mostly centers the issue of rural deployment. But the adoption problem is far larger, and requires more innovative policymaking to tackle it. According to the most recent Census data, 77 million people in the U.S. lack an adequate home internet connection (i.e., they had no home internet access at all, or were solely reliant on mobile). This is far higher than even the most pessimistic estimates of the gap in deployment of 25 Mbps-level broadband (which range from 17 million according to the June 2019 Form 477 data, to as much as 42 million based on re-evaluations of that FCC data). And the people without adequate home broadband adoption are disproportionately non-white. While 21 percent of non-Hispanic whites lack a fixed broadband connection at home, 30 percent of Black people, 30 percent of Latinx people and 34 percent of Native Americans remain without such adequate home connectivity.¹ That's 13 million Black people, 18 million Latinx people, and 13 million Native Americans who do not have the essential telecommunications services they need to fully participate in today's economic and education systems.

Chairman Pai did not create this shameful digital divide. But he's done nothing to close it, and its harmful consequences are being made plain as he's been forced to beg ISPs to not disconnect their customers for not being able to pay their high bills during a global pandemic.

¹ Note that these figures for fixed non-adoption are slightly higher than other data presented herein for wired non-adoption, as fixed includes other modes of access such as satellite and fixed wireless in addition to wired service, but excludes mobile-only access

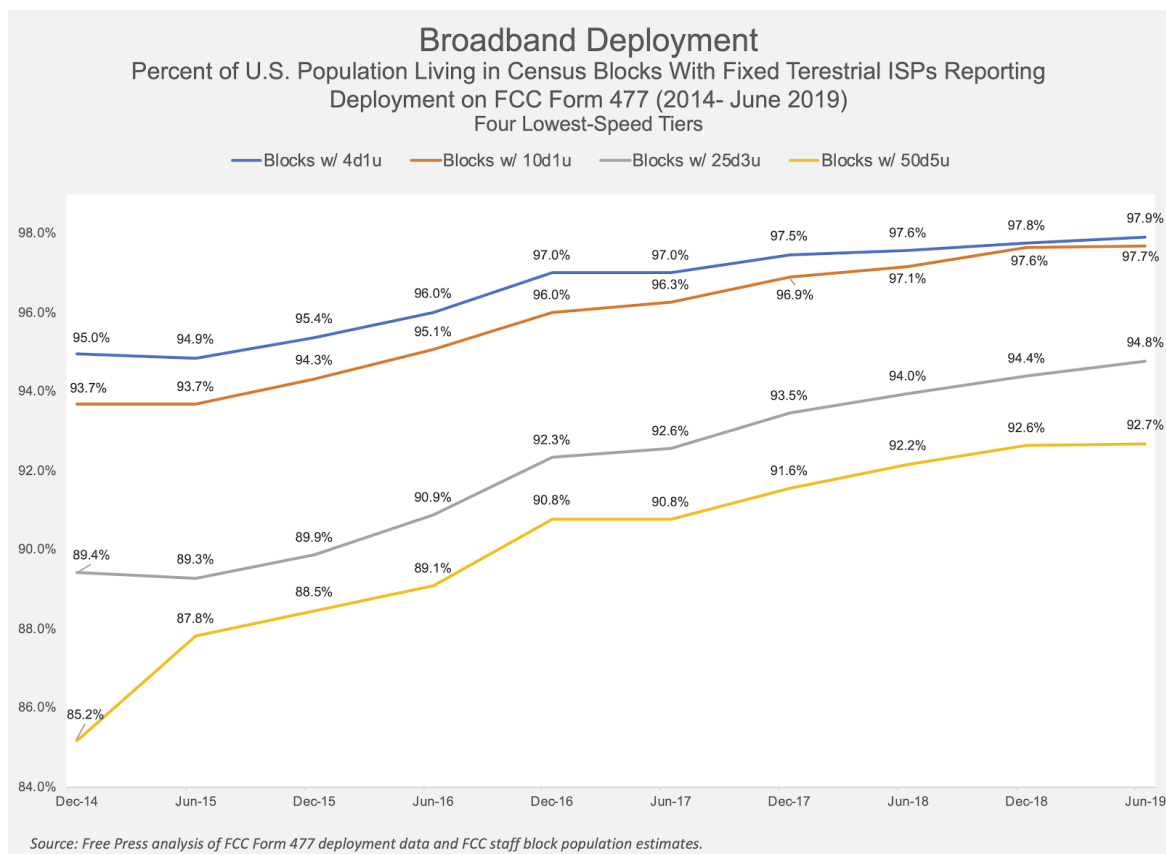
BROADBAND DEPLOYMENT

Basic Broadband Deployment Has Slowed Under Chairman Pai

High-End Deployments of Fiber and Advanced Cable Technologies Have Also Slowed as ISPs Complete Deployment Projects Begun During the Obama Era

Basic broadband deployment has slowed during the Pai era (see Figure 11). And like most of the positive trends in the broadband market, these basic deployment trends in recent years were set in motion during the Obama era. Much of the observed growth in basic deployment is the result of the continuation of investments supported by the Connect America Fund (“CAF”) Phase I and its successor fund (CAF-II), with policies were developed and supported on a bipartisan basis prior to Pai’s tenure as FCC Chairman.

Figure 11



The CAF-I and CAF-II minimum standards, respectively, were 4 Mbps downstream/1 Mbps upstream for CAF-I and 10 Mbps downstream/1 Mbps upstream for CAF-II. Figure 11 shows the trajectory of deployment of these basic services, as well as deployment of 25 Mbps downstream/3 Mbps upstream and 50 Mbps downstream/5 Mbps upstream tiers as well. We see a similar slowing of deployment growth in all of these tiers. Between year-end 2014 and year-end 2016 the number of persons living in a block with 4 Mbps downstream/1 Mbps upstream deployment grew by 10.9 million, a 3.6 percent increase. The equivalent two-year Trump-era comparison shows that between year-end 2016 and year-end 2018, the number of persons living in a block with 4 Mbps downstream/1 Mbps

upstream deployment grew by 7 million, a 2.2 percent increase. The other tiers shown in Figure 11 also show slower growth rates during the Trump-era.²

To be clear, we are not asserting that Chairman Pai’s actions caused this slowing of growth in basic broadband deployment. As previously unserved markets and customers are reached, the few remaining unserved are reached at a slower rate, a reality of the “S-curve” of network propagation that is determined mostly by rural network economics. But this data shows the unclaimed flipside of Chairman Pai’s unearned braggadocio about growth in other areas of the broadband market. As we document below, those trends were the result of policy and deployment decisions made before his chairmanship, and they are nothing more than the expected continuation of the *status quo* trajectory along the S-Curve of deployment. Just as the developments in the higher-end of the broadband market are largely a continuation of the *status quo*, so too are the developments in this basic-tier deployment. So Chairman Pai’s legacy on broadband thus far is unremarkable, though one might not realize this based on his office’s repeated self-congratulatory statements.

Repeating A Trump-Administration Pattern, Chairman Pai Takes Credit for Obama-Era Successes

Earlier this year, Chairman Pai stated: “Since we made the decision [to repeal the Commission’s February 2015 *Open Internet Order*] in December 2017, broadband speeds are up 60 percent according to Ookla, infrastructure investment is up, more Americans are getting connected to the internet than ever before. More fiber was laid in 2019 to homes and businesses in the United States than in any year since they’ve been keeping records, breaking the record we set in 2018.”³

Here we see Chairman Pai falsely taking credit for a four particular outcomes:

1. Ookla’s measured fixed-broadband speed increases (ignoring the fact that these speeds had a higher percentage increase while Title II and the Open Internet rules were in place).⁴

² Between year-end 2014 and year-end 2016 the number of persons living in a block with 10 Mbps downstream/1 Mbps upstream deployment grew by 11.8 million, a 4 percent increase. Between year-end 2016 and year-end 2018 the number of persons living in a block with 10 Mbps downstream/1 Mbps upstream deployment grew by 9.2 million, a 3 percent increase. Between year-end 2014 and year-end 2016 the number of persons living in a block with 25 Mbps downstream/3 Mbps upstream deployment grew by 13.5 million, a 4.7 percent increase. Between year-end 2016 and year-end 2018 the number of persons living in a block with 25 Mbps downstream/3 Mbps upstream deployment grew by 11.1 million, a 3.7 percent increase. Between year-end 2014 and year-end 2016 the number of persons living in a block with 50 Mbps downstream/5 Mbps upstream deployment grew by 22 million, an 8.1 percent increase. Between year-end 2016 and year-end 2018 the number of persons living in a block with 50 Mbps downstream/5 Mbps upstream deployment grew by 10.3 million, a 3.5 percent increase.

³ See Karl Bode, “Ajit Pai Hits CES... To Make Up Some Shit About Net Neutrality,” *TechDirt* (Jan. 9, 2020).

⁴ See section on Broadband Performance below. Chairman Pai and Commissioner Carr have touted increases in the average downstream speeds observed in Ookla’s Speedtest.net data as somehow remarkable evidence of this FCC’s stewardship over the broadband market. But they never mention (and are never asked) what the comparable increases were during prior periods. It is wholly unremarkable in a market with constantly improving technology, particularly one driven by cable’s inexpensive DOCSIS technology, that speeds continue to increase at a relatively predictable rate. While it may sound impressive that the Ookla data during the first three years of the Trump era shows U.S. average downstream speeds increasing 136 percent from the fourth quarter of 2016 to the fourth quarter of 2019 (55 Mbps to 130 Mbps), what conclusions should we draw when comparing that to the 176 percent increase in U.S. average downstream speeds from the prior three-year period? The simple explanation is that these observable speed increases during both periods were driven by the continued growth in cable broadband services, reflecting DOCSIS 3.0 and DOCSIS 3.1 system upgrades.

2. Supposed infrastructure investment increases (which turn out to not be true by any measure. Aggregate industry investment at publicly traded ISPs is a relatively meaningless metric, because these broad averages can easily be skewed by a single firm and the averages obscure variations between different ISPs; but during 2019, these aggregate investments were nearly 5 percent lower than they were during the last year before repeal of the *Open Internet Order*, and capital investment is down sharply at most major carriers, as we detail below).
3. A supposed “record” number of “newly connected” Americans (a vague claim that also is not true; the fixed and mobile broadband markets are saturated, and adoption is at the top of the S-Curve and is naturally slowing as there are fewer remaining people to connect, as we explained above. We hope the Chairman is mistakenly claiming credit for the number of newly connected individuals without drawing proper comparisons to prior periods, as surely he is not so pathological that he would dare to claim credit for the constant new “highs” in the total number of persons online, a figure that would naturally grow over time with population growth even in an economic downturn).
4. Fiber deployment during 2018 and 2019 setting records (but as we explain in detail, almost all of the claimed fiber deployments during 2017-2018 were made by companies that announced their fiber deployment plans during 2015-2016; and the observed trend is completely in-line with expectations based solely on the rate of deployment that preceded Chairman Pai’s tenure).

Chairman Pai’s credit-taking here is shameless. Sometimes he’s outright taking credit for outcomes that didn’t actually happen (*e.g.*, broadband investment didn’t increase during 2018-2019, it declined; there’s not a record number of newly connected internet users); other times, he’s taking credit for trends that were well underway before his Chairmanship, and trends with which the FCC’s policies generally – and the *Open Internet Order* repeal specifically – have absolutely no causal relationship.

Chairman Pai has worked hard to establish a narrative about his supposed powers to shift billions of dollars in private investment. While his sycophants in DC and in the C-Suites of the companies he regulates are eager for him to play the role of deregulatory cheerleader, much of the rest of the world still operates based on facts and logic. And the facts, as we document below are clear: The growth in U.S. fiber deployment during Chairman Pai’s tenure is exactly what would have been expected based solely on continuing the growth trend that occurred during the Obama era. Anyone interested in the truth can also easily do what we do below: use publicly available information to document that almost all of the 2017-2019 increase in U.S. fiber availability came from the nation’s top three ILECs carrying out the deployment plans they publicly announced during 2015-2016.

Chairman Pai’s claim that since the FCC’s December 2017 repeal of the *Open Internet Order* and Declaratory Ruling “[m]ore fiber was laid in 2019 to homes and businesses in the United States than in any year since they’ve been keeping records, breaking the record we set in 2018” is a prime example of his politically-motivated, unearned arrogance. The Chairman yet again made self-serving use of the *post hoc ergo propter hoc* logical fallacy in viewing outcomes he likes, claiming they were solely due to his actions when they were not, as we document extensively below. But here his use of “we” in referring to the number of new fiber lines reflects the Chairman’s unbounded arrogance, like the couch potato sports fan who imagines himself responsible for winning the trophy. The first-person in this accounting narrative should be reserved for those who were in the audience at Pai’s CES speech, and who worked for the companies that made investments in and deployed fiber, not the distant regulator on the stage who merely existed while the *status quo* continued.

First, that there was more fiber deployed in 2019 than 2018, and in 2018 than the years before that, is reflective of nothing more than the normal progression of early-stage mass technology diffusion. That is, the fiber deployment figures cited by Chairman Pai are on the “bottom” part of another technology “S-Curve”: after an initial slow period of deployment (or adoption), there is an acceleration, which after crossing a majority threshold slows down as it reaches market saturation.

The Chairman’s self-serving fiber deployment claims are based on data from the Fiber Broadband Association (FBA) and RVA LLC. They have published this data annually, gathered in part from RVA’s detailed work obtaining information directly from ISPs. Thus we can easily plot the trajectory of fiber deployment before Chairman Pai’s tenure, and compare the continuation of that trajectory at its pre-2017 rate to the observed “record-setting” data during 2018 and 2019. This is presented below in Figure 12, and it shows three things: First, FBA’s/RVA’s observed FTTH deployment for 2009-2016 (Obama-Era in blue); second, their observed FTTH deployment for 2017-2019 (Trump-Era in blue); and third, the predicted values for 2017-2019 based solely on the observed values for 2009-2016 (Obama-Era) continuing at the same rate (green dashed line; which represents a third-order polynomial curve fitted to the 2009-2016 data).

Figure 12



As this data shows, Chairman Pai is taking credit for a trend that was set in motion during Julius Genachowski's and Tom Wheeler's tenures as FCC Chairs. Fiber-to-the-Home deployment observed during Chairman Pai's tenure is exactly at the levels expected based solely on the deployment from the prior 8 years continuing at the same rate. There is absolutely no reason from the outcome data alone, "record-setting" or not, to conclude that Chairman Pai's policies made any impact on fiber deployment.

This trajectory of FTTH deployment is rather unremarkable. It reflects the expected rate of deployment typical of the lower portion of an S-Curve. It is curious that Chairman Pai is so eager to take credit for this S-Curve observation, but somehow takes no credit for the overall slowing of broadband deployment at any speed – which is above 90 percent of the population, and at the leveling-off portion at the top of its own S-Curve. It's also interesting that the Chairman takes credit for the increasing rate of change in fiber deployment, but doesn't take credit for the increasing rate of irritating robocalls.

But even if the rate of fiber deployment during Chairman Pai's tenure did not simply reflect the expected rate of growth based on this S-Curve, it still wouldn't make any sense for Chairman Pai to take credit for this increased availability. That's because the near-entirety of fiber and high-end broadband deployment on his watch is due to completion of construction projects that were planned and publicly announced during 2015-2016.

As we document below, almost all of the increase in U.S. fiber availability during 2017-2019 is due to deployments made by the nation's top three ILECs carrying out investment plans they publicly announced during 2015-2016. Approximately three-quarters of all the growth in the FBA's deployment figures seen in recent years were made by the nations' top 3 ILECs – and all of their Pai-era fiber deployments were planned and publicly announced before Pai's tenure as Chairman began in January 2017. In fact, fiber deployment dramatically slowed during the second half of 2019 upon AT&T's completion of its DTV merger condition buildout.

AT&T's fiber-to-the-home deployments overwhelmingly drive the growth that Chairman Pai pretends he helped to foster. But the reality is that AT&T's fiber deployments were made pursuant to a merger condition that Pai strenuously opposed.⁵

⁵ See *AT&T-DTV Approval Order*, Statement of Commissioner Ajit Pai, Approving in Part and Dissenting in Part ("I cannot support the Commission's decision to place 17 pages of conditions on that Approval. . . the FCC goes much further [than the DOJ], demanding that AT&T satisfy a regulatory wish-list that has nothing to do with the transaction at hand. These conditions are the forced tribute that the company must offer to mollify the Capitol. In this regard, I dissent." (internal pop culture citation omitted). We note the obvious point here that the DOJ and FCC often work together on mergers, with one or the other of the agencies imposing and enforcing certain conditions for merger approvals. Furthermore, the DOJ's review is more narrow than the Commission's, which includes a public interest review and is not limited to a competition analysis.

And now that AT&T has met its merger condition,⁶ it has all but stopped new fiber construction. Of course, Pai is not taking credit for the country's largest ISP halting its fiber deployments now.

Though AT&T's public reporting is somewhat irregular and inconsistently uses the term "customer locations,"⁷ we estimate that its merger commitment-related fiber deployments during 2017-2019 account for 11 million of the 16 million new fiber-passed homes observed in the FBA data.⁸ AT&T's final deadline to meet the DTV merger commitment was in July 2019; on its quarterly investor call that month it indicated it had met the commitment and passed a total of 14 million "customer locations" with fiber-to-the-premises service.

However, after meeting that deadline, AT&T did not continue to deploy fiber at anything other than a "greenfield" pace. During its January 2020 investor call, AT&T indicated its FTTP expansion was largely over, and said it was focusing on increasing customer penetration for the already-deployed

⁶ The final fiber deployment condition stated in part that "within four (4) years of the Closing Date the Company will complete the aforementioned FTTP deployment to all 12.5 million customer locations and the Company will offer speeds of 45 Mbps or more to at least 25.7 million customer locations." The Commission adopted this condition in part to offset concerns about harms to competition and to hold AT&T to its promise made in its Public Interest Statement that "the combination improves the broadband economics so substantially that the combined company will be able to deploy FTTP broadband, its highest-speed fiber connection, to at least 2 million more customer locations than it would have been able to deploy under any plan of record absent the transaction." For the purposes of tracking AT&T's FTTP deployments against the FBA/RVA data in Figure 12 above, it would help to know how many such customer locations AT&T had at the time it made this commitment and at the merger's closing. Unfortunately the FCC redacted this information. However, we can estimate this value from AT&T's public statements and its Form 477 filings. Form 477 data indicates that as of year-end 2014, AT&T FTTH was located in blocks containing 770,000 housing units. AT&T closed the transaction on July 27, 2015. Though they were irregular and often vague, statements made on its quarterly investor calls indicate that AT&T's end-goal for the merger commitment was 14 million total FTTP customer locations. This implies that the 12.5 million commitment was on top of 1.5 million it expected to have at the time of deal closing. For example, on Jan. 26, 2016 AT&T said "we will get to 14 million fiber enabled and, quite frankly, there's a likelihood that we may get to more than that when we're finished." With this starting point, we can look to additional AT&T statements to estimate its deployment progress during 2016-2019. On its Jan. 31, 2018 investor call AT&T said, "[o]ur fiber build continued to go strong. We now reach more than 7 million customer locations and expect to double that in the next 18 months." On this call and others AT&T indicated that it did not begin to market consumer FTTH until late 2016. On the Jan. 30, 2019 call AT&T stated it "also accelerated our fiber deployment, and we now reach 11 million customer locations." It also said that "[o]ur fiber footprint continues to grow. We now pass more than 11 million customers locations with fiber and are on our way to hit the 14 million locations later this year. This will extend our fiber network to 22 million locations when we include business." (emphasis added). Finally, on AT&T's July 24, 2019 call, it indicated it had met the DTV merger commitment and its plans as stated in mid-2015, stating that it "passed an important milestone with our fiber deployment reaching 14 million customer locations and satisfying our fiber build commitments." As we discuss below, on subsequent calls AT&T made it very clear that its pace of FTTP deployment slowed to a "greenfield" level upon completion of its merger commitment.

⁷ The AT&T-DTV merger approval noted that in its Public Interest Statement and other correspondence, AT&T had used the term "customer locations" and households interchangeably (*Order* at n. 1043). And in its investor calls, AT&T sometimes seems to use the term to include business customer locations, while when referring to the merger commitment it uses the phrase to mean housing units. However, in the final commitment, the Commission defined it as "mass-market customer locations, such as those occupied by residences, home offices, and very small businesses (and excluding locations solely occupied by large enterprises and institutions) . . ." (*See Order* Appendix B, p. 155). This definition likely tracks most closely with the FBA/RVA unit of "homes," as both exclude large businesses and commercial locations, but include unoccupied residential housing.

⁸ Based on its merger commitment benchmarks and its statements on its investor calls, AT&T deployed FTTP to approximately 11 million "customer locations" between September 2015 and September 2019 (the FBA/RVA data reflects deployments as of the end of the third quarter of each calendar year). The FBA/RVA data indicates 16 million marginal FTTP "housing units" added during that period.

networks.⁹ Four months later, AT&T's residential fiber availability stood exactly where it was 9 months earlier upon completion of the merger commitment: 14 million customer locations.¹⁰ These comments indicate that much of the number of observable AT&T fiber additions (both on Form 477 and contained in the overall FBA/RVA data) were in fact driven by the DTV-related expansion – and that any of AT&T's fiber deployments after fulfillment of its merger conditions were not accelerated by any of Chairman Pai's policies, but simply occurred at a rate driven by what the company called the “natural growth of the population.”

Thus we see that AT&T's DirecTV merger commitment accounted for more than two-thirds of all new household fiber deployments made during Chairman Pai's tenure. AT&T's fiber deployments all but ceased upon completion of these buildout commitments made to the Obama FCC, over Pai's dissent; and AT&T's capital investments have dropped every year during Chairman Pai's reign.

Put another way, by its own admission, the nation's largest fiber ISP accelerated its deployment because of an Obama-era policy, and reduced it to a crawl under Chairman Pai's governance. Surely AT&T – which more than any other company slammed Obama-era policies and promised massive growth under Trump-era policies – would be the crown jewel in Chairman Pai's deregulatory regalia. But the inarguable fact is that after its merger condition expired, AT&T all but stopped fiber deployment, and its capital investments have dropped every single year since 2016, with its 2019 investments 17 percent below where they were during 2016 (the second year of the restored Title II-era).

Fiber deployments at other top ILECs were minimal during the Pai era, and much of this deployments came from plans put in place before the Pai-era too. Verizon has not altered its consumer fiber deployment plans much at all since its initial aggressive FiOS plans began in 2005 then leveled off a few years later. Frontier did not make any appreciable new deployments during Chairman Pai's tenure (save a few thousand new rural fiber locations paid for with state grant money),¹¹ as it took on massive debt to acquire former Verizon and AT&T territories. Smaller price-cap ILECs like Cincinnati Bell have

⁹ On its Jan. 24, 2020 investor call, AT&T spoke at length about its fiber deployments and its reduction of the pace of deployment to a “greenfield” pace: “On what we do in the fixed space, you should expect that we’re going to continue to add to the wireless – excuse me, the fiber footprint. Right now, as we’ve shared with you, our goal is to get a little better return out of what we’ve deployed because, between consumer and business, we have about 20 million locations we can be aggressively working penetration in. And we think that we need to ensure we’ve got the right business practices and marketing practices to get the return on that footprint that’s there. And as soon as I get indications that the team is actually executing on that well and we have the right formula on it, we’ll probably release the spigot on some additional build. You should expect, just by natural growth of the population, you’ll probably see somewhere between 350,000 to 0.5 million new fiber locations coming into the portfolio. Right now, that is just kind of what I would call the natural growth rate that’s going to happen. If we step that up a little bit, it will be because we feel good about how we’re executing on the embedded footprint we have in place. And we know exactly where the next incremental place [is] as we go and build. And I think it’s entirely possible that this operating team could build another 1 million to 2 million a year if we felt like we had the operating momentum to do that.”

¹⁰ See Comments of John T. Stankey, President and COO, AT&T Inc. (Apr. 24, 2020) (“We also continue to be opportunistic with our fiber build beyond the 14 million household locations we reach today.”).

¹¹ See comments of Sheldon Bruha, CFO, Executive VP & Treasurer, Frontier Communications Corporation, Third Quarter 2019 Investor Call (Nov. 9, 2019) (“We are also building fiber to the home in certain rural markets to a total of 19,000 locations, and we are leveraging state funding programs for these builds. In addition, we are on track to build fiber to more than 30,000 greenfield locations this year as normal – as a normal ongoing element of our capital spend.”).

a documented history of FTTP expansion, though the company's fiber deployment slowed dramatically after Chairman Pai took over leadership of the Commission.¹²

Among all ILECs other than AT&T, CenturyLink's fiber deployments were the most robust during the Pai era. But CenturyLink's FTTP "3-year expansion plan" was first announced during 2016, and then was somewhat influenced by a change in leadership at the company following its late 2017 merger with Level 3 Communications. Indeed, though the Level 3 merger and change in management resulted in a more aggressive tone from CenturyLink leadership on the value of and need to invest in network upgrades, the verifiable reality is that CenturyLink set a 2019-2020 deployment upgrade agenda in 2016. This plan was detailed by then-CEO Glenn Post on the company's second quarter 2016 call, held on August 3, 2016. On this call, Post noted that "[b]y the time we get to year-end 2019, we'll have almost – we expect to have almost 11 – or about 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."¹³ He also stated that "[b]y this time, we also expect to have approximately 3 million addressable units enabled for 1 gigabit and higher speeds across all of our markets."¹⁴

¹² See S. Derek Turner, Free Press, "It's Working: How the Internet Access and Online Video Markets Are Thriving in the Title II Era," at 101-102 (May 2017), (*It's Working*) (documenting the large increase in Cincinnati Bell's deployment of its "Fioptics" FTTH service during the 2015-2016 period, and quoting the company's CEO describing the total lack of impact of the FCC's Title II and Net Neutrality policy on its investment. According to Cincinnati Bell's annual SEC reports, during the 2017-2019 Pai era, the company deployed 90,000 new Fioptics passings (38,800 in 2017, 38,800 in 2018, and 12,400 during 2019). But during the prior three-year period before Pai's tenure (2014–2016) Cincinnati Bell deployed Fioptics to 250,400 new locations (59,000 in 2014, 90,000 in 2015, and 101,400 in 2016).

¹³ CenturyLink's mid-2019 Form 477 report indicates it offered 100 Mbps or higher service in blocks containing just over 7 million households. This indicates that CenturyLink may have fallen substantially short of its 2019 goal that it set in August 2016. We doubt Chairman Pai would claim credit for this shortcoming.

¹⁴ See Comments of Glen F. Post, CEO, President & Director, CenturyLink Inc., Second Quarter 2016 Investor Call (Aug. 3, 2016) ("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% of our top 25 markets, and to reach more than 55% of those markets with more than 100 megabits with a lot of that improvement coming over the next 12 to 18 months. And while not depicted on this chart, across all of our markets, this will represent about 50% of addressable units receiving 40 megabits and higher speeds and more than 30% 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 – we expect to have almost 11 – or about 11 million addressable units, representing 42% of total addressable units across all of our markets capable of receiving 100 megabits and higher. And in our top 25 markets, over 70% 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. And 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.").

According to statements made by CenturyLink on its February 2020 investor call,¹⁵ by the end of 2019 it had “enabled more than 2 million fiber households.”¹⁶ So despite Chairman Pai’s bluster and a very generous tax cut, CenturyLink’s actual fiber deployments during the Trump era fell short of the plans it set out in August of 2016, and its attitude concerning new deployments seems very restrained.¹⁷ And like AT&T, CenturyLink’s capital investments have fallen sharply during Chairman Pai’s tenure, dropping more than 20 percent on an inflation-adjusted basis from their 2016 high.¹⁸

Nevertheless, we see that AT&T and CenturyLink’s entire 2017-2019 deployments were planned ahead of Chairman Pai’s nomination, and these two companies account for more than 80 percent of all new fiber-passed homes observed in the FBA data that Pai boastfully but wrongly cites.

Verizon has not been as detailed in its fiber passings data or plans. But according to Form 477, Verizon’s FTTH census-block footprint increased by about one million housing units between the end of 2016 and mid-2019. During this time, the number of “open for sale” Verizon FiOS customer locations increased by about 1.5 million.¹⁹ This is about twice the level of “natural” or “greenfield” level growth that should be expected based on nothing more than population growth and new construction. Much of Verizon’s expansion outside of this “natural” growth in recent years was planned in 2016, following the company’s acquisition of XO Communications in spring of that year. Shortly following this deal, Verizon announced a new agreement with the city of Boston to replace “its copper-based infrastructure with a state-of-the-art fiber-optic network platform across the city.”²⁰ On its July 26, 2016 earnings call

¹⁵ See Comments of Jeffrey K. Storey, President, CEO & Director, CenturyLink Inc., Fourth Quarter 2019 Investor Call (Feb. 12, 2020).

¹⁶ We note that CenturyLink’s 477-reported FTTH deployment took a very large jump between June 2018 and December 2018, a jump that is far out of line with the company’s statements of its consumer fiber coverage. CTL reported FTTH service in 75,808 blocks containing 2.7 million households as of June 30, 2018. But in its December 31, 2018 report, it indicated FTTH service in 184,422 blocks containing 6.2 million households. Yet in its January 2020 shareholder call and subsequent public statements, CenturyLink indicated that as of the end of 2019 it had “enabled more than 2 million fiber households.” It is likely that the jump in its 477-reported coverage is due to how the company “micro-targets” fiber deployments to specific households in a given area, and due to the fact that the prior Form 477 reporting standard considers an entire block as served if one home in a block is served (with a reporting standard that also directs ISPs to report blocks not only where they currently offer service, but could offer service without extraordinary commitments of resources if requested). But given the company’s sharp decline in capital spending during 2018, and its statements to investors about its deployment activities, it is highly likely that the block-level data analysis based on its most-recent 477 filings results in an overstatement of its actual fiber availability.

¹⁷ Prior to the COVID-19 health and economic crisis, when asked about expansion beyond its 2 million fiber passings, CenturyLink’s CFO stated “So we have a very micro-targeting approach. When we go into an area, we’re doing the analysis at a household level. So as you can imagine, it’s a combination of your build cost and how quickly you can penetrate that asset. So the first phase that we’re focusing on is really high-density areas, mostly aerial.” (emphasis added). See Comments of Indraneel Dev, Executive VP & CFO, CenturyLink, at the Morgan Stanley Technology, Media & Telecom Conference (Mar. 2, 2020).

¹⁸ CenturyLink’s capital intensity (capital expenditures as a percentage of revenues) was 17.1 percent in 2016 (up from 16 percent in 2015), and was 17.5 percent on a pro-forma basis in 2017 (the Level 3 deal closed in November 2017), dipping to 13.5 percent in 2018, before increasing to 16 percent in 2019. During this time however the company’s revenues declined on a pro forma basis sequentially from 2015 through 2019, and its pro forma capital expenditures declined from 2016 to 2017 (after increasing annually prior to that), with a sharp decline from 2017 to 2018, before an increase in 2019 to a level that is still below the company’s Obama-era spending. See Figure 17 below for detailed amounts.

¹⁹ These figures come from Verizon’s SEC “Financial Supplement” filings. They indicate the number of marketable locations, which could reflect prior fiber deployment “passings” that the company did not market service to; and this could explain some of the difference between the “open for sale” figures and the analysis of households where Verizon has deployed FTTH service based on its Form 477 filings.

²⁰ “Mayor Walsh announces partnership with Verizon to transform city’s technology infrastructure,” Verizon Company Release (Apr. 12, 2016).

Verizon stated that it “believe[s] the fiber deployment will create economic growth for Boston, and we are talking to other cities about similar partnerships.” It also remarked on the closing of its deal to sell its Florida, Texas and California assets to Frontier, noting the deal “concentrates our Wireline assets in the Northeast corridor where we can further invest in fiber.” Never once did Verizon mention that Chairman Pai’s actions were responsible for any specific fiber deployments.

Altice USA, the French-owned company that purchased the cable systems of Cablevision and Suddenlink, is unique among its peers in committing to over-building its own cable systems with fiber-to-the-home technology. Though Altice is relatively small compared to the leading ILECs and MSOs, its fiber deployments have impacted the overall availability figures. On Altice’s third quarter 2019 investor call it indicated it was marketing its FTTH service to 500,000 homes. The company indicated this had increased to 600,000 homes on its year-end 2019 call, with its most-recent comment made in April 2020 noting that 700,000 homes could subscribe. But like other large ISPs, Altice also announced its plans to deploy footprint-wide FTTH in 2016.²¹ According to the company, this plan was somewhat slow to start, in large part due to local permitting issues. But its current plan has not changed from its 2016 plan – it will eventually deploy FTTH across its entire former-Cablevision footprint, which is more than 5 million homes, exactly as it announced under the prior administration.

Between AT&T, CenturyLink, Verizon, and Altice, approximately 92 percent of the Pai-era Fiber deployments came from projects that were announced during 2015-2016. The rest of the FBA-observed growth is commensurate with the “natural” greenfield rate of growth driven by new home construction.

Thus, all available evidence demonstrates that Chairman Pai’s actions had no observable impact on the growth in U.S. fiber deployment during his tenure as FCC chair. The near-entirety of fiber deployments during 2017-2019 came from deployment projects announced during 2015-2016, and the remainder is deployment merely coming at the pace of new home construction growth. Yet Pai continues to shamelessly take credit for deployments that demonstrably were planned before his reign, and eschews any blame for the slowdown in fiber deployment at AT&T or the deep decline in overall network investment at AT&T and other top ISPs.

Recent Improvements in Deployment of Very-High Speed Cable ISP Tiers Come From Deployments Planned and Publicly Announced Before Chairman Pai’s Tenure, a Fact the FCC’s Own Staff Publicly Acknowledged

Chairman Pai’s unearned credit-taking goes well beyond his claiming responsibility for fiber deployments that were planned before 2017. He also has taken victory laps for the growth in the availability of higher-speed broadband services generally.²² But as we’ve copiously documented, this increase is almost entirely due to DOCSIS system upgrades at the nation’s cable ISPs – upgrades that were financed, planned, and put into operation before Pai’s tenure as Chairman. Even Pai’s own FCC staff have made this truth clear, though somehow their statements never make it into his boastful press releases or Congressional testimonies.

²¹ See Anita Balakrishnan, “Speedy new rival for Verizon Fios and Google Fiber headed to 20 states,” CNBC (Nov. 30, 2017).

²² See, e.g., “New Data Shows Digital Divide Is Closing And Broadband Competition Is Increasing,” FCC Press Release (Feb. 20, 2020) (containing the context-free observation that “from December 2016 to December 2018, the number of Americans without any options for at least 250/25 Mbps fixed terrestrial broadband service plummeted by 74%, from 181.7 million to 47 million”).

A recent Pai boast centers around the very large increase in the reported availability of 250 Mbps downstream/50 Mbps upstream fixed services. But as the Commission’s Wireline Competition Bureau itself noted, “between 2017 and 2018 the population with zero provider options for 250 Mbps/25 Mbps service fell from 135.676 million (42%) to 47.023 million (14%).” yet “[t]his significant change . . . for this service tier was almost entirely due to upgrades to Charter’s and Comcast’s existing cable footprint to DOCSIS 3.1, and continued fiber deployment by AT&T.”²³

As we documented above, AT&T’s fiber deployment between 2017 and the end of 2018 (the period covered by Pai’s boasts) were entirely planned in mid-2015. And as we’ve documented before, Comcast’s DOCSIS 3.1 upgrades were first announced in the Spring of 2016, and the capital expenditures for the “fiber deep” deployments that enabled the company’s D 3.1 service were made in the period following the 2015 *Open Internet Order*.²⁴ Furthermore, Comcast’s Capital spending peaked in 2017 and declined in 2018 and again in 2019, and it is expected to decline again this year (based on guidance given before the COVID-19 pandemic).²⁵ Charter similarly stated its DOCSIS 3.1 plans in early 2016, indicating it would deploy the technology across its footprint once mass market D3.1 modems became available. Indeed, long before the November 2016 election, Charter laid out its plans to offer gigabit across its entire footprint by the end of 2021.²⁶

In sum, the truth is easy to find for anyone that cares: Chairman Pai has repeatedly taken credit for broadband deployments that were planned and announced during the Title II era, claiming that his reversal of the Title II classification of broadband as a telecommunications service was responsible for the observed growth in fiber and other very-high-speed broadband services. But Pai’s claims are blatantly false. These projects were put into place at the same time Pai was slamming a policy that, as the evidence shows, had no negative impact on deployment or investment.

²³ See “Fixed Coverage Updates as of YE2018, note to Figures D-3 and D-4, Office of Economic Analysis, Federal Communications Commission (rel. Feb. 20, 2020), <https://us-fcc.app.box.com/s/tjhz8cupitst0kg4l8c81dtzdyduu9>.

²⁴ See *It’s Working* at 67–68 (documenting Comcast’s public statements about its network deployments, and noting that in “the two years following the FCC’s February 2015 vote, Comcast’s network investments jumped a whopping 62 percent” over the prior two-year period, as it was pushing its “fiber deep” network upgrade to facilitate network-wide DOCSIS 3.1 service).

²⁵ On its January 2020 investor call, Comcast’s CFO indicated he expected the cable division’s capital intensity would be 50 basis points lower, after declining 190 basis points to 11.9 percent in 2020 on a 10.6 percent lower capital expenditures. See Comments of Michael J. Cavanagh, Senior EVP & CFO, Comcast Corporation, Fourth Quarter 2019 Investor Call (Jan. 23, 2020).

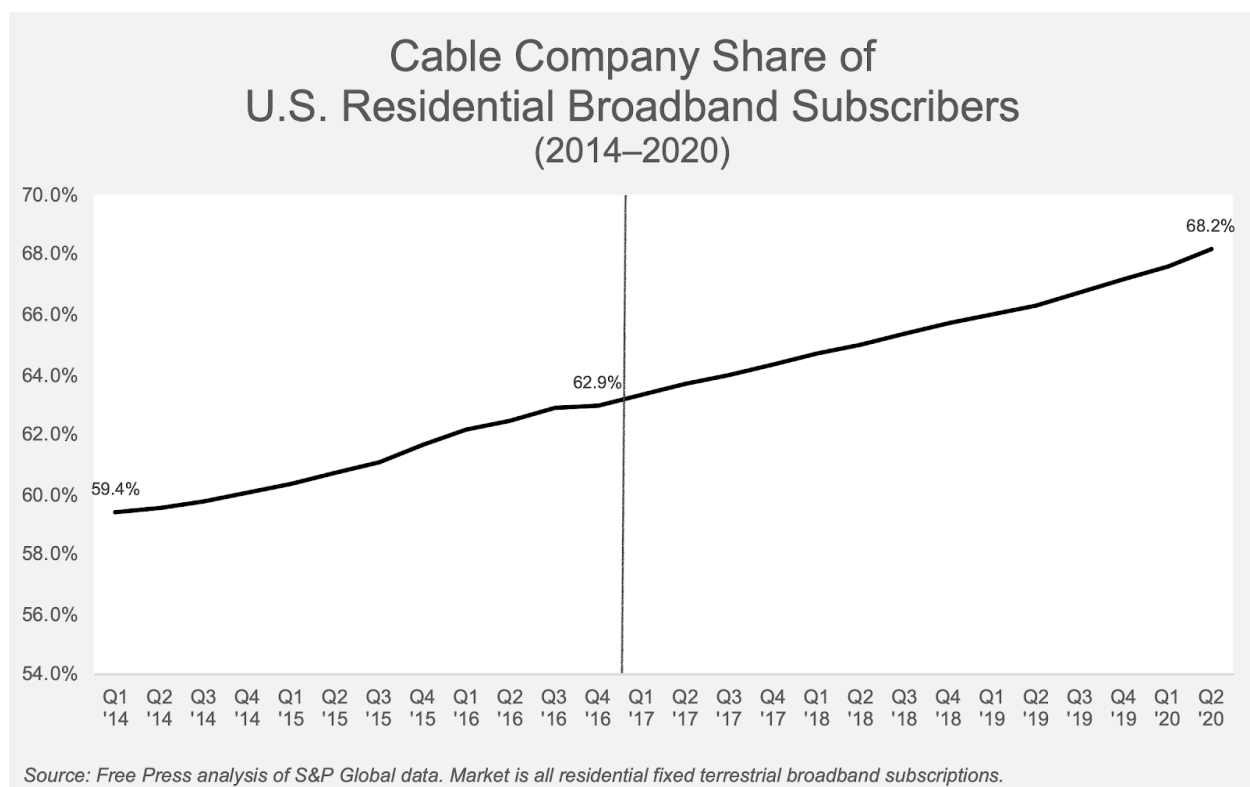
²⁶ See *It’s Working* at 73, notes 170–171.

BROADBAND COMPETITION

Cable ISPs Increased Their Market Dominance Under Chairman Pai

The home internet market is a cable-telco duopoly. Ten years ago, DSL was a viable alternative to cable modem service. But DSL technology has reached a dead-end. Telcos must either undertake substantial fiber investment projects, or risk losing customers to their cable company rivals' lower-cost, higher-capacity DOCSIS-based networks. Though telcos have made some targeted FTTH investments (see deployment section above), they have largely chosen to ride their aging DSL networks into irrelevancy. This has resulted in the telcos continuing to lose market share to their cable rivals. At the start of 2014, cable company ISPs controlled 59 percent of the home internet market's customers. Today the cable share is above 68 percent (see Figure 13).

Figure 13



Despite sometimes paying lip service to a vague notion of “competition,” Chairman Pai has done little to introduce choice into this market or incentivize telco fiber investments. AT&T has stopped its FTTH upgrades and is now only deploying fiber to greenfield builds. CenturyLink’s mildly ambitious FTTH upgrade project announced in late 2016 continues, but it is still a slow rollout that will only reach a fraction of the company’s territory. Verizon, an early pioneer in FTTH, ended its upgrades long ago. Frontier, whose only FTTH networks came from a purchase of former-Verizon assets, is in bankruptcy because of those debt-laden acquisitions. Other smaller telcos have limited FTTH coverage, and too many are not willing to make the long-term investments to future-proof their businesses.

Today, cable companies face FTTH competition at only about 40 percent of the households they pass. This limited competition has resulted in cable companies being able to keep margins high, by focusing their marketing efforts on selling higher-speed and higher-priced tiers, and has enabled them to deploy or reinstate anti-consumer practices like data caps with punitive overage fees. Competition on price is all but gone, and with it a viable market entry point for lower-income families. For example, ten years ago in Atlanta Comcast priced its entry-level 15 Mbps “Performance” tier at a non-promotional monthly price of \$42.95 (\$19.99 promotional). Today in Atlanta Comcast charges \$53 per month (non-promotional; \$30 promotional) for the 25 Mbps entry-level “Performance Starter” tier. This is the same price point Comcast charged in Atlanta in 2010 for its 20 Mbps “Blast” tier.²⁷ Comcast does face some competition from AT&T Fiber in its Atlanta territory. But this duopoly is not enough to result in price competition, particularly for entry-level customers.

The duopoly problem is not new. It has challenged all FCC chairs during the broadband era. Chairman Pai, like most of his predecessors, has chosen to ignore the problems of market power and instead place hope in a potential wireless “third pipe.” FCC chairs dating back to Michael Powell have all made promises of coming-competitive technologies (for Powell it was 3G wireless and the defunct Broadband Over Powerline technology). Perhaps one day, one of these promises of a third-pipe will materialize. In the meantime, cable companies are solidifying their dominance at the expense of the public interest and people’s wallets.

²⁷ Pricing information obtained from SNL Kagan historical reports, and S&P Global Market Intelligence’s First-Half 2020 High Speed Data Pricing Report.

BROADBAND PRICING

Home Internet and Wireless Prices Are On The Rise Under Chairman Pai, Reversing Prior Declines

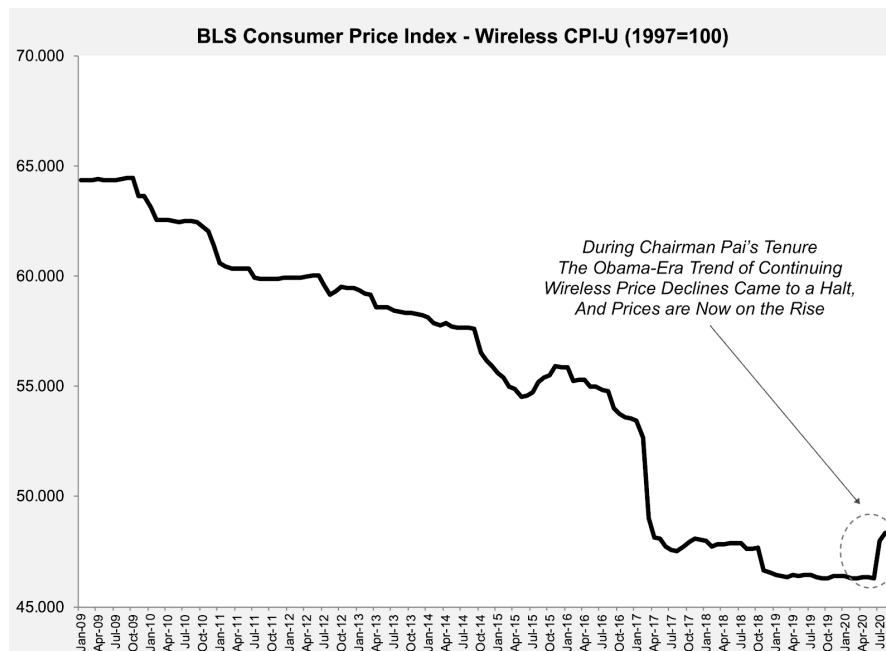
The U.S. broadband market is actually two very distinct markets: the market for home internet access services and the market for mobile telecommunications services. The home internet market is a duopoly, one that is increasingly dominated by cable company ISPs (see above). The mobile services market is more competitive by comparison, but Trump administration actions are reversing years of small but meaningful progress in wireless competition.

Because broadband services are not one-size-fits-all widgets, pricing analysis is complex. To reduce this complexity and provide a sense of how the market's quality-adjusted prices are changing, below we present data from the Bureau of Labor Statistics Consumer Price Indices for Wireless Services (Figure 14) and for Internet Services (Figure 15).

In the wireless services market, the BLS data shows a sustained price drop beginning after the FCC's rejection of the AT&T/T-Mobile merger. This downward price trend continued for years, until T-Mobile and Sprint began discussing then negotiating to merge. In a troubling but predicted development, following the Trump DOJ's and FCC's approval of the T-Mobile/Sprint merger, the BLS data indicates wireless prices are now once again on the rise. Chairman Pai has shown no concern or awareness of this development, satisfied with happy talk about how mergers make competition better.

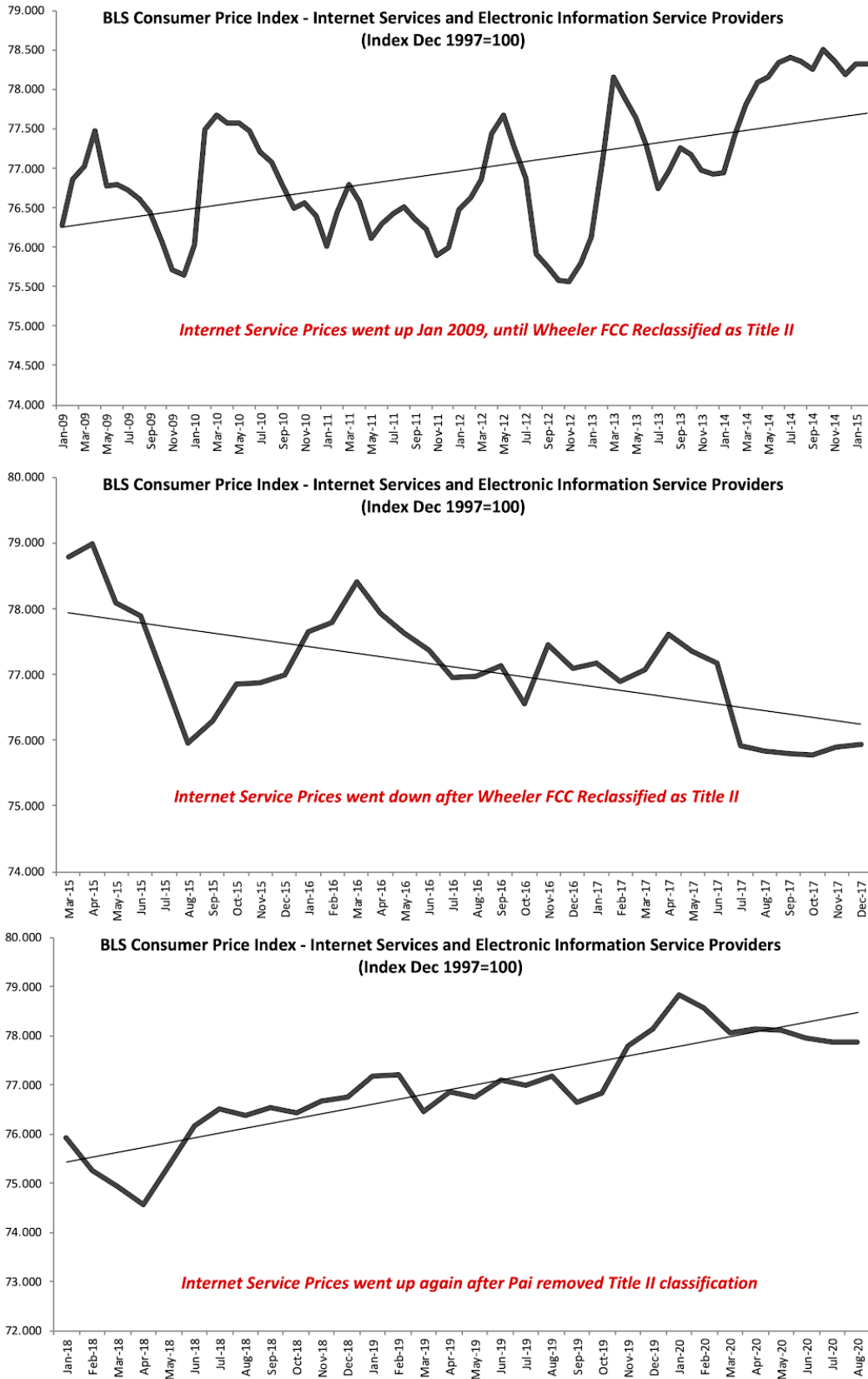
The BLS data indicates that home internet service prices increased slightly from the start of the Obama presidency until the Wheeler FCC's Title II classification went into effect (see Figure 15, top panel). This data shows a reversal of this trend after the Title II classification (see Figure 15, middle panel). But prices began increasing in 2018, after Chairman Pai overturned the prior FCC's Net Neutrality rules and the Title II classification they were grounded in (see Figure 15, bottom panel).

Figure 14: Wireless Services Prices During the Obama and Trump Era



Source: BLS

Figure 15: Internet Services Prices During the Obama and Trump Era



Source: BLS

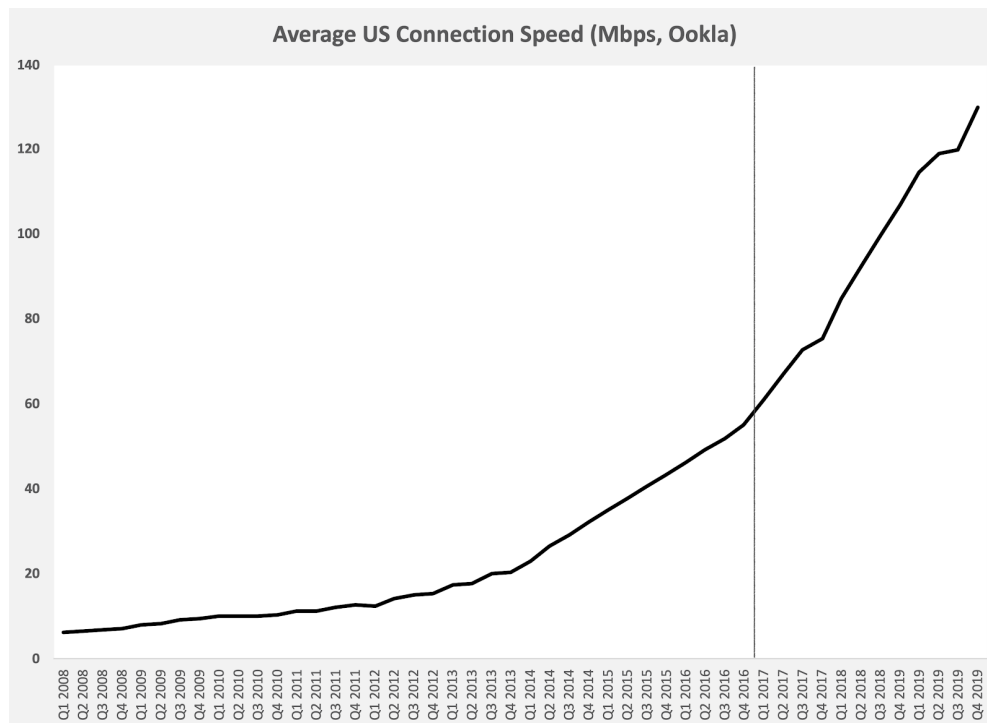
BROADBAND NETWORK PERFORMANCE

Thanks to Investments Made before 2017, U.S. Broadband Network Performance During the Trump Era Continue Along Its Prior Trajectory

Though Chairman Pai likes to tout and take credit for increases in average U.S. broadband speeds, the reality is that any growth in actual speeds during the Trump era is a continuation of the trends in place prior to 2017 (see Figure 16). And the growth in the Trump era isn't as great as what it was in the Obama era. For example, Ookla's average U.S. downstream connection speed increased 136 percent from the end of 2016 to the end of 2019. But the average downstream speed increased 176 percent during the prior three-year period (the last three years of the second Obama administration).

These comparisons aside, it is misleading for Chairman Pai to claim any involvement in the increases in U.S. broadband network speeds, as this growth is entirely due to the DOCSIS 3.x and FTTH deployments that were planned and begun in the Obama era, all when these networks were classified as Title II telecommunications services (see discussion above).

Figure 16



Source: Ookla

BROADBAND INVESTMENT

U.S. ISP Broadband Investment Declined During 2018-2019 With Further Declines Expected in 2020

While we do not assert any causality, the reality is that broadband investment at many top ISPs peaked before Chairman Pai's tenure, and has declined sharply since his Title II reversal. Comparing 2019 investment levels to those in 2016, AT&T's capital expenditures are down 17 percent; Comcast's capital investments are down 14 percent; Charter's are down 10 percent; CenturyLink's are down 21 percent; and Cincinnati Bell's are down 45 percent (all inflation-adjusted values). It's not all bad news for Chairman Pai and his overly-simplistic metric: T-Mobile continued to increase its investments; so too did Altice USA, though these were investments planned before Pai's tenure as Chairman began; Verizon's total company investments ticked back up in 2019, after dropping for years; Sprint's yo-yoing investments ended 2019 higher than they were in 2016, but still below the company's 2015 inflation-adjusted value. The Census Bureau's Annual Capital Expenditures Survey data showed a decline in wired telecom investment each of Pai's first two years as Chair; and though the Census data showed wireless industry capex was up in aggregate during 2017, it declined in 2018 (see Figure 17 below).

These data points and their movement over time are, of course, due to a number of factors, notably the typical technology upgrade cycle reaching a temporary nadir in recent years for many firms. Many of the larger firms are currently in such a lull, while some of the smaller firms are peaking as they finish their own current upgrade cycles. This cyclical nature of deployment and investment resulted in a decline for AT&T during 2015, and that alone caused some downward movement in the debunked capital expenditure aggregate data that Pai used at the time to claim – falsely – that Title II had harmed broadband investment.

Ironically then, AT&T's massive investment pullback in the Pai era is driving much of the decline in the aggregate investment figures too (though Comcast's pullback and Charter's 2019 pullback aren't helping Pai either). But Chairman Pai and his thinktank sycophants were not interested in the truth behind the data in 2016, and show no sign of having any desire to apply a rational, evidence-based view of the broadband market today. Pai seems to embrace a *post hoc ergo propter hoc* approach to policy analysis when the cherry-picked facts suit him, but an immovable adherence to a radical deregulatory ideology when the facts don't fit his preferred narrative.

Figure 17: Publicly-Traded U.S. ISP Company Capital Expenditures
(2012-2019, inflation-adjusted value, \$000s)

Capital Expenditures (\$ thousands, 2019 inflation-adjusted dollars)	2012	2013	2014	2015	2016	2017	2018	2019	2015-2016 Change from 2013-2014 (Wheeler Title II Era)	2017-2018 Change from 2015-2016 (Pai First 2 Years)	2018-2019 Change from 2016-2017 (Pai Post-Title II Era)
Comcast (cable segment)	\$5,473,357	\$5,954,327	\$6,721,347	\$7,614,694	\$8,061,061	\$8,303,633	\$7,880,612	\$6,909,000	23.7%	3.2%	-9.6%
Charter (pro forma)	\$6,018,357	\$6,171,429	\$7,699,633	\$7,537,898	\$8,006,939	\$9,035,327	\$9,311,224	\$7,195,000	12.1%	18.0%	-3.1%
Alice USA (pro forma)	\$1,444,233	\$1,408,204	\$1,390,867	\$1,400,543	\$1,014,183	\$990,180	\$1,177,132	\$1,355,350	-13.7%	-10.2%	26.3%
Mediacom	\$280,246	\$291,365	\$281,236	\$311,775	\$355,694	\$355,715	\$340,537	\$296,597	16.6%	4.3%	-10.4%
Wide Open West	\$175,957	\$244,543	\$275,034	\$250,831	\$305,102	\$313,598	\$320,510	\$247,500	7.0%	14.1%	-8.2%
Cable ONE	\$174,183	\$156,434	\$193,692	\$175,050	\$156,015	\$186,684	\$222,210	\$262,352	-5.4%	23.5%	41.4%
GCI	\$162,430	\$198,978	\$192,282	\$190,622	\$207,446	\$197,095	\$167,245	\$148,481	1.7%	-8.5%	-22.0%
AT&T (pro forma w/ ATN & Leap)*	\$22,503,017	\$23,584,706	\$23,401,337	\$21,648,878	\$23,779,918	\$22,429,592	\$21,684,694	\$19,635,000	-3.3%	-2.9%	-10.6%
Verizon (total company)	\$17,990,561	\$18,298,286	\$18,769,765	\$19,226,020	\$18,103,429	\$17,950,959	\$16,997,959	\$17,939,000	0.7%	-6.4%	-3.1%
CenturyLink (pro forma)	\$4,073,041	\$4,196,571	\$4,320,398	\$4,435,776	\$4,579,184	\$4,397,449	\$3,239,796	\$3,628,000	5.8%	-15.3%	-23.5%
Frontier	\$832,412	\$699,449	\$751,288	\$933,449	\$1,486,776	\$1,236,490	\$1,216,327	\$1,226,000	66.8%	1.3%	-10.3%
Windstream	\$1,224,804	\$926,816	\$858,730	\$1,141,447	\$1,050,400	\$945,686	\$836,939	\$878,500	22.8%	-18.7%	-14.1%
Cincinnati Bell (pro forma)	\$494,852	\$312,087	\$304,629	\$413,869	\$407,766	\$318,277	\$271,363	\$223,800	33.2%	-28.2%	-31.8%
TDS Telecom (Wireline and Cable)	\$176,385	\$163,525	\$187,190	\$207,680	\$172,106	\$209,004	\$236,735	\$316,000	8.3%	17.4%	45.0%
US Cellular	\$930,669	\$812,756	\$608,825	\$576,568	\$473,339	\$488,608	\$525,510	\$710,000	-26.1%	-3.4%	28.4%
Consolidated Comm. (pro forma)	\$299,164	\$289,806	\$271,947	\$270,509	\$257,041	\$240,283	\$249,812	\$232,203	-6.1%	-7.1%	-3.1%
Shenandoah Telecom. Co. (pro forma)	\$99,049	\$128,970	\$74,498	\$75,367	\$183,837	\$152,468	\$139,430	\$138,792	27.4%	12.6%	-17.3%
Alaska Communications System	\$65,503	\$53,088	\$55,941	\$52,434	\$42,768	\$33,915	\$41,005	\$45,503	-12.7%	-21.3%	12.8%
Otelco	\$7,071	\$6,865	\$6,567	\$7,152	\$7,300	\$8,858	\$8,157	\$12,444	7.6%	17.7%	27.5%
Sprint (revised)	\$4,733,714	\$7,699,959	\$6,179,796	\$11,869,837	\$7,915,673	\$10,076,143	\$12,511,224	\$11,660,000	42.5%	14.2%	34.3%
T-Mobile	\$3,226,622	\$4,435,714	\$4,713,459	\$5,109,633	\$4,989,878	\$5,450,755	\$5,654,082	\$6,391,000	10.4%	10.0%	15.4%
Aggregate Total	\$70,385,628	\$76,033,877	\$77,258,461	\$83,450,031	\$81,575,699	\$83,293,657	\$82,992,095	\$79,450,522	7.7%	0.8%	-1.5%
Aggregate Total w/ Historical DirectTV	\$74,110,536	\$80,206,203	\$80,779,635	\$85,137,377	\$81,575,699	\$83,293,657	\$82,992,095	\$79,450,522	3.6%	-0.3%	-1.5%
Aggregate Total Less Sprint and AT&T**	\$43,148,897	\$44,749,212	\$47,677,329	\$49,931,316	\$49,880,108	\$50,787,922	\$48,796,177	\$48,155,522	8.0%	-0.2%	-3.7%
All Wired Telecom Capex - Census Bureau Survey	\$48,561,724	\$54,934,531	\$52,949,714	\$55,355,796	\$56,567,510	\$55,700,327	\$54,001,020	N/A	3.7%	N/A	N/A
All Wireless Telecom Capex - Census Bureau Survey	\$36,647,357	\$37,513,469	\$38,264,510	\$32,632,857	\$33,235,429	\$38,399,878	\$37,470,408	N/A	-13.1%	N/A	N/A
All Other Telecom and Satellite Capex - Census Bureau Survey	\$4,925,020	\$3,694,041	\$3,372,684	\$3,407,143	\$3,222,939	\$4,227,796	\$5,464,286	N/A	-6.2%	N/A	N/A
Total Telecom Industry Capex - Census Bureau Survey	\$90,134,102	\$96,142,041	\$94,586,908	\$91,395,796	\$93,025,878	\$98,328,000	\$96,935,714	NA	-3.3%	N/A	N/A

* AT&T did not report pro forma w/ DTV

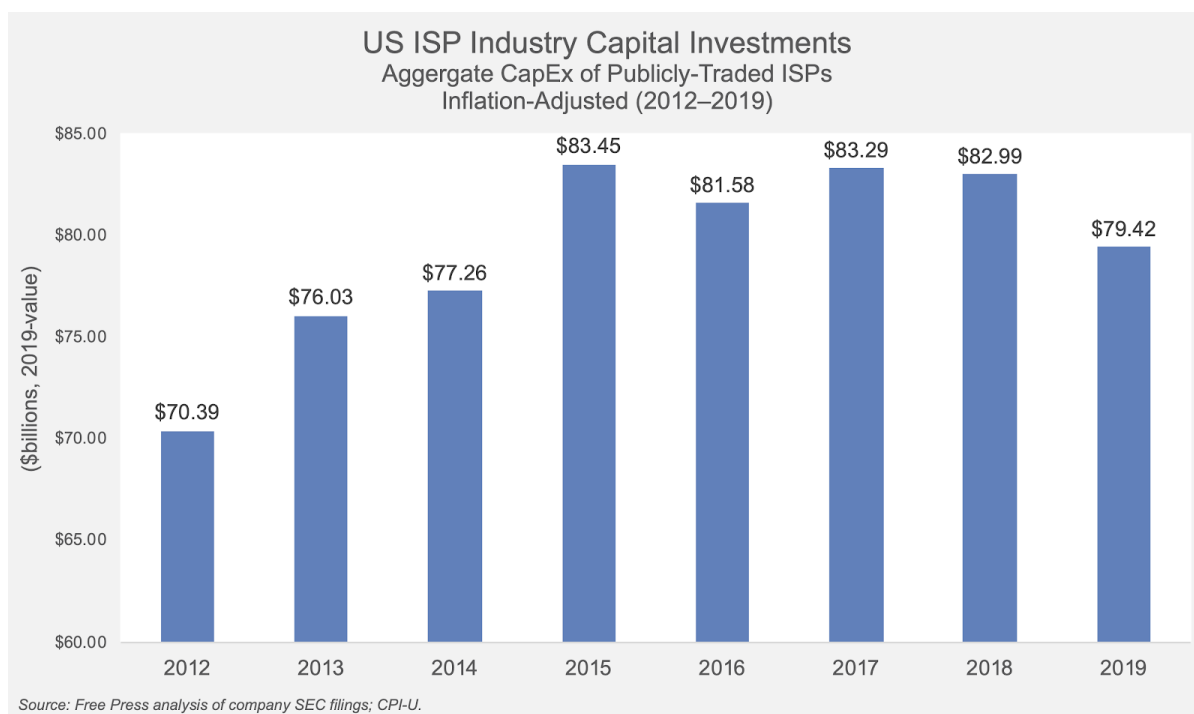
** We present these results because of the accounting complications introduced by the DTV merger and subsequent accounting standard changes impacting a portion of Sprint's capex. We caution against drawing broad conclusions from industry aggregate capital investment trends, particularly those that do not include 100 percent of the industry, and this removal of 2 of the 21 firms demonstrates how the industry aggregate value is impacted by accounting and post-merger issues.

Source: Free Press analysis of company SEC filings; U.S. Census Bureau Annual Capital Expenditures Survey; BLS CPI-U. Values are presented in 2019 inflation-adjusted thousands of dollars. Where possible the most-recent or restated values are presented. Accounting standard changes resulted in Sprint substantially revising its values, but only did so historically beginning with June 30, 2016 results. Prior Sprint periods are Free Press' revised estimates. Values in italics are for companies that have not reported full calendar year 2019 results; these values are based on company guidance or analysts' consensus estimates.

But while Pai is free to live in his Randian-fantasy world, we should live in a world of facts. And the verifiable facts show his magical claims, that Title II's restoration harmed investment and its subsequent elimination increased investment, are totally false. We have repeatedly stated that aggregate industry capital investment figures are meaningless, and that further over-simplifying the movement of those aggregate figures as due to a single "light-touch" regulatory classification is logically unsound.²⁸ But this is the metric Pai hung his anti-Title II hat on, and if he applies it in the same fashion he applied it to his predecessor, then he has quite a bit of explaining to do.

²⁸ See generally *It's Working*; *id.* at 17 ("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.").

Figure 18: Aggregate Capital Expenditures Made by Publicly-Traded U.S. ISPs
(2012-2019, inflation-adjusted value, \$000s)

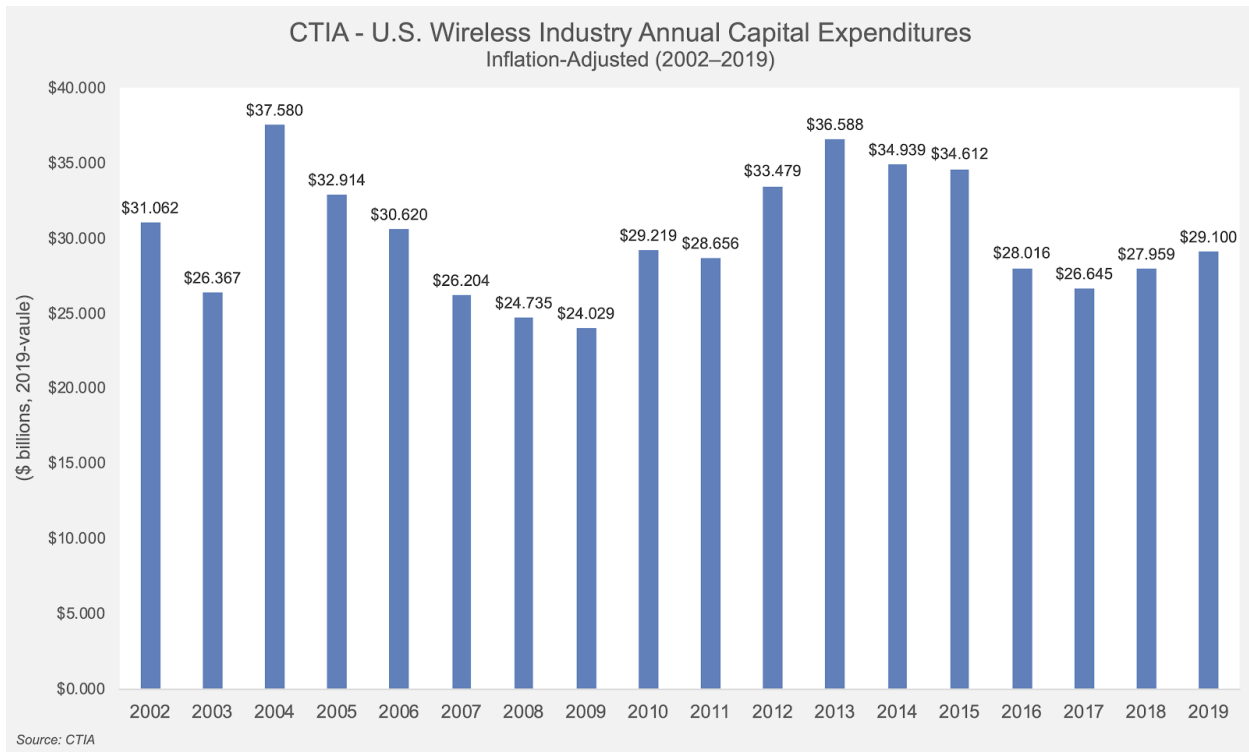


As Figure 17 above indicates, investment is down significantly at many of the nation’s publicly traded ISPs, with the aggregate figure down nearly 5 percent from the last year Title II and the FCC’s Net Neutrality rules were in effect. Indeed, on an inflation-adjusted basis, investment in every year of Chairman Pai’s tenure is below what it was in 2015 (see Figure 18). We draw no conclusions about Chairman Wheeler or Chairman Pai’s influence over these trendlines – for individual firms or especially in the aggregate – because we know from paying attention to the details and to the voluminous statements from the companies and the financial experts who follow this industry that the FCC’s regulations had no impact on network investment. Indeed, as shown above in Figure 17 by the differences in wired vs. wireless company investment, and by the variations in aggregate wireless industry investment below in Figure 19 (using CTIA’s data) show, capital investments are very dependent on technology cycles and vary by company, even for similarly-situated ISPs.

In sum, the data is clear: the proper application of the law reclassifying broadband access services as telecommunications services had no impact on ISP industry investment, and Chairman Pai’s undoing of this classification did not increase investment. The singular focus on aggregate capital spending was always misguided – what matters to the public interest is whether or not companies are innovating, investing, and meeting demand as they would in a competitive market. By this standard, the U.S. market has performed as expected given the underlying market fundamentals and cost-structures.²⁹ Chairman Pai’s policies have not proven to be the investment-boosters he touted.

²⁹ For example, U.S. cable ISPs have made continued upgrades to their DOCSIS-based systems, but these were relatively inexpensive improvements that did not require massive increases in capital spending. Meanwhile U.S. telecom ISPs have only made selective upgrades from xDSL-based technologies to full fiber-to-the-home service, and the bulk of this investment came as a result of FCC-imposed merger conditions.

Figure 19: Aggregate Capital Expenditures Made by U.S. Wireless Carriers
(2002-2019, inflation-adjusted value, \$000s)



CONCLUSION

Chairman Pai has a very different regulatory philosophy from his predecessors, which is very different from the view Congress applied when it amended the Communications Act in 1996. Differing regulatory philosophies are fine and good for public policy making – so long as the FCC is enforcing the law and making policy based on reasoned analysis and actually listening to a wide variety of public views. Chairman Pai, however, seems to have not just a regulatory philosophy, but a deregulatory religion, with himself as the central prime mover. That approach is too extreme for a public servant charged with enforcing the law in the interest of the public. Central to Chairman Pai’s extreme behavior is his repeated distortion of data in the service of his ego. Taking credit for the sun rising is unbecoming for the leader of a public regulatory agency, certainly when the same regulator is not willing to accept responsibility for the sun setting.