

Free Press Action Fund wrote the book on broadband investment and deployment under Net Neutrality. We analyzed ISP spending and results under the Title II legal framework adopted in early 2015, then tossed away by the current FCC in 2017. And we did it all using ISPs' own financial data and disclosures. Here are the key points proving that the 2015 order didn't dampen broadband investment or deployment.

Aggregate Investment Went Up While the 2015 Open Internet Rules Were In Place

Publicly-traded broadband internet access service providers' own data shows that, comparing the two years preceding the Commission's February 2015 vote adopting open internet rules to the two years following that vote, the investment total for all of these publicly-traded ISPs together increased by 5.3 percent.

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

Even if these manipulated aggregate figures were correct (and they're not), a myopic focus on raw dollars spent ignores the Commission's statutory mandate to promote deployment. And the overwhelming evidence shows that deployment continued (and even improved in many areas) following the vote.

Most Individual ISPs Invested More During That Timeframe Too

The aggregate total is easily swayed by changes in either direction at any large firm, and obscures changes in investment decisions, cycles, and strategies by all the individual firms making up the aggregate.

Looking at those individual results, the majority of publicly traded broadband providers (in their own financial disclosures) reported investment increases after the vote. If we compare 2014 (the year prior to the vote) with the two years that followed it, we see that twice as many individual ISPs increased their capital spending as the relative few that decreased it. (See the last table in this primer.)

Individual ISPs increased their capital spending by as much as 56 percent in one case, and by double digits in others (including Comcast's), with an average company capital expenditure growth rate of 6.8 percent.

Any Individual ISP Investment Decreases Are Easily Explained By Other Factors

There is no reason to think that the relatively few individual ISPs reporting less capital spending during this time period decreased it due to Title II. In fact, as AT&T itself made clear in filings in earlier proceedings:

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

That is still true today. And broadband providers have spoken at length since the 2015 vote and reclassification decision about how they are leveraging technological advances to deploy higher capacities at a lower capital cost than was required in prior upgrade cycles. For instance, ethernet and fiber are cheaper than older wired technologies, while 4G is cheaper than older wireless technologies.

In the few instances when analysts asked these executives how Title II (or its potential repeal) impacted their companies' investments, these executives did not say that Title II had a concrete impact on their own numbers, nor quantify how its repeal would impact their spending.

Deployment Rather Than Dollars Spent Is What We Care About, And Deployment Improved Too

The Commission's Form 477 deployment data shows a remarkable level of new, higher capacity broadband deployments in the two years after the vote, across a range of different service territories and different technological platforms. The broadband industry's general trajectory was unaltered by the return to the proper classification of broadband as a telecom service.

Cable companies completed DOCSIS 3.0 upgrades and increased capital spending to push fiber deeper into their networks in preparation for DOCSIS 3.1-powered gigabit deployment. ILECs ramped up short-loop fiber-fed and full fiber-to-the-home ("FTTH") deployments to remain relevant in the face of cable's speed advantages as streaming video demand grows. Wireless carriers completed 4G LTE rollouts and 4G LTE-Advanced and other interim (and less costly) enhancements, then set about readying for the pending pre-5G network densification – an upgrade cycle that will once again require higher capital spending.

While we continue to stress that this does not mean broadband deployment is satisfactory in every area, nor certainly that every person in America has access to affordable and robust service, the deployment metrics and milestones in the Commission's own data and other sources for 2015 and 2016 show that:

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

Edge Investments Matter Too

Broadband investment and deployment are just one area of concern. ISPs are thriving in terms of their own finances and performance, but the rest of the internet ecosystem including online video and edge computing saw historic growth, competition, and innovation too under Title II and strong Net Neutrality rules.

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

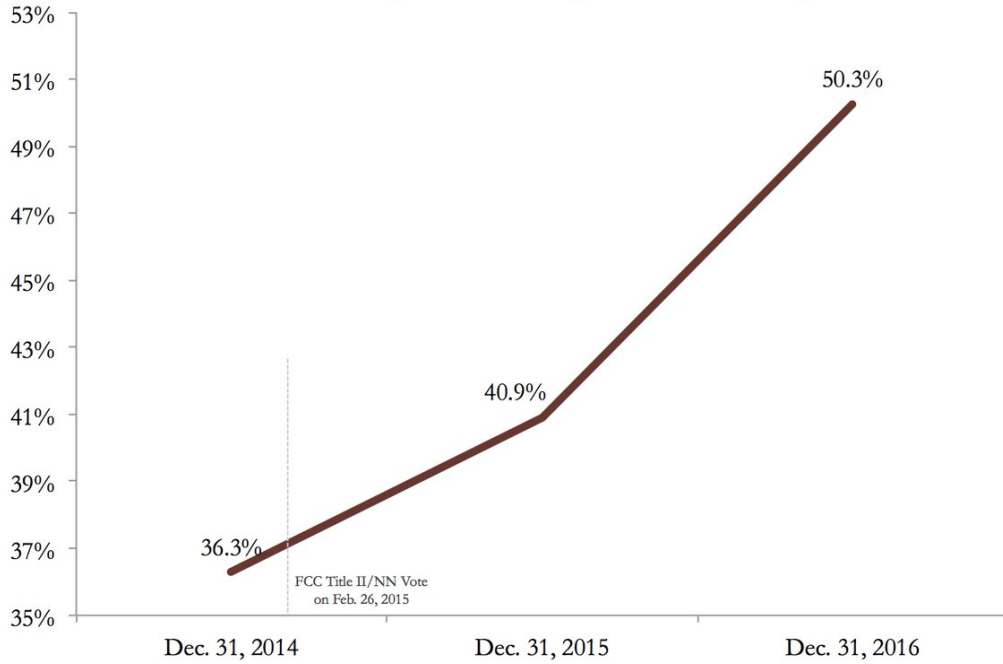
In the first year following adoption of the 2015 rules, census data showed a \$3.5 billion jump in capital spending in "data processing, hosting, and related services." That 26 percent increase came in a sector that includes app hosting like Amazon Web Services ("AWS") and video streaming services like Netflix.

Over-the-top ("OTT") video services, including those with the potential to compete against cable TV and other legacy multichannel video services, saw remarkable growth on the whole. The two years following restoration of Title II saw a 133 percent increase in new OTT services compared to the two years prior to the vote, with more U.S. OTT video services launching than in the seven preceding years combined.

This growth came not only from companies like Netflix and Amazon, but from new entrants too, as well as incumbent multichannel video providers like AT&T and DISH developing new OTT services delivered for the first time outside of their physical footprints and sold to customers of other ISPs. For instance, the fact that a Comcast or Verizon broadband subscriber can now purchase a "skinny bundle" cable TV replacement from AT&T-owned DirecTV Now is remarkable, and it was made possible with Net Neutrality in place.

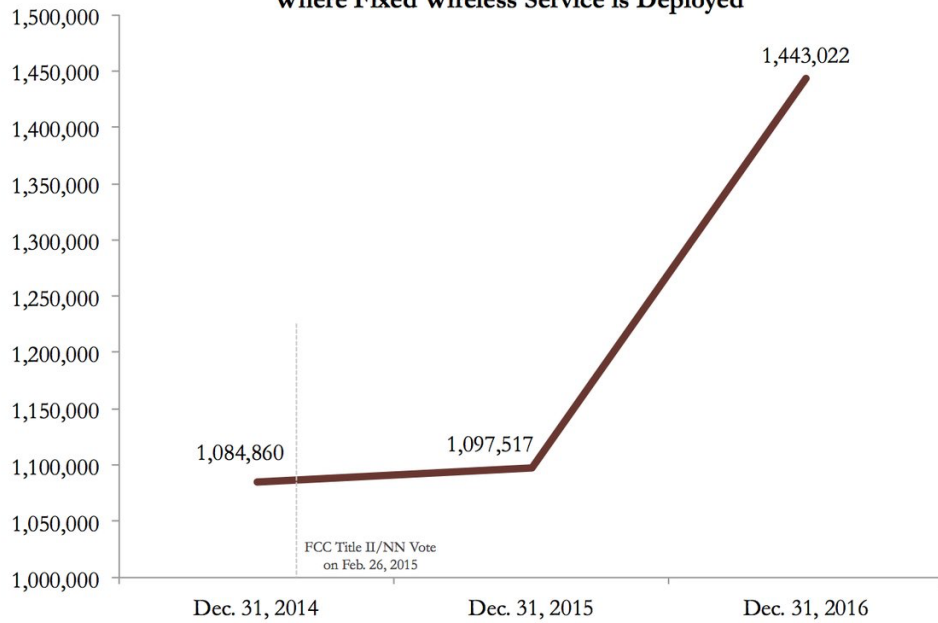
Rural Broadband Improvements Continued With Title II Net Neutrality Rules In Place

Percent of U.S. Rural Population Residing at Location Served by an ISP Offering Downstream Speeds above 100 Mbps



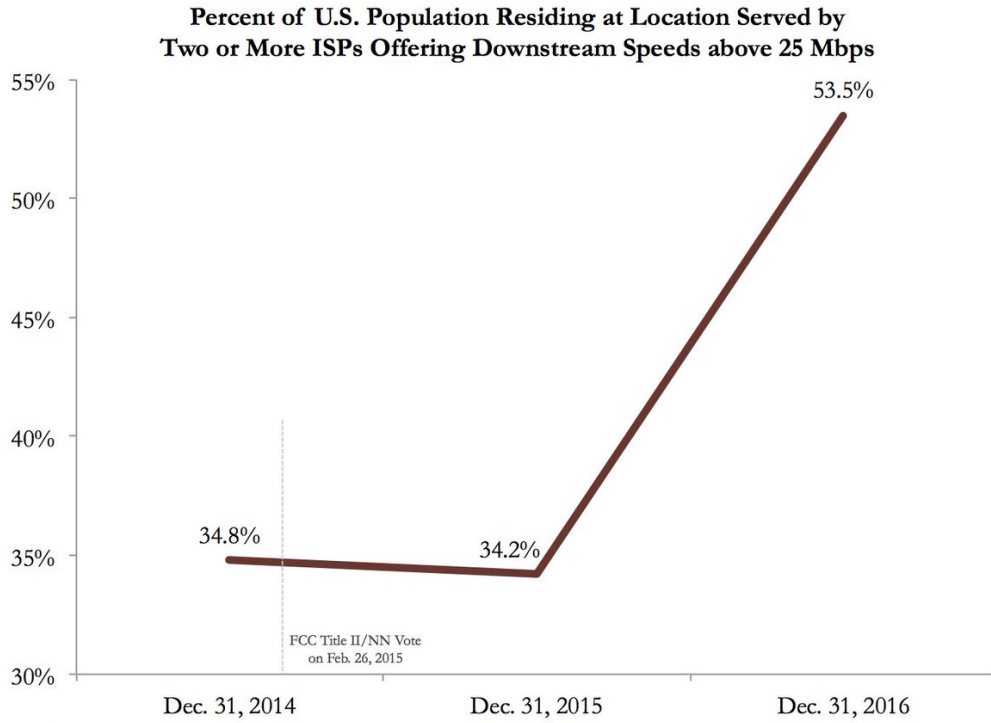
Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2); as of Dec. 31, 2015 (version 2); and as of Dec. 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts as reported for the 2010 Census.

Total Number of Rural Census Blocks Where Fixed Wireless Service is Deployed

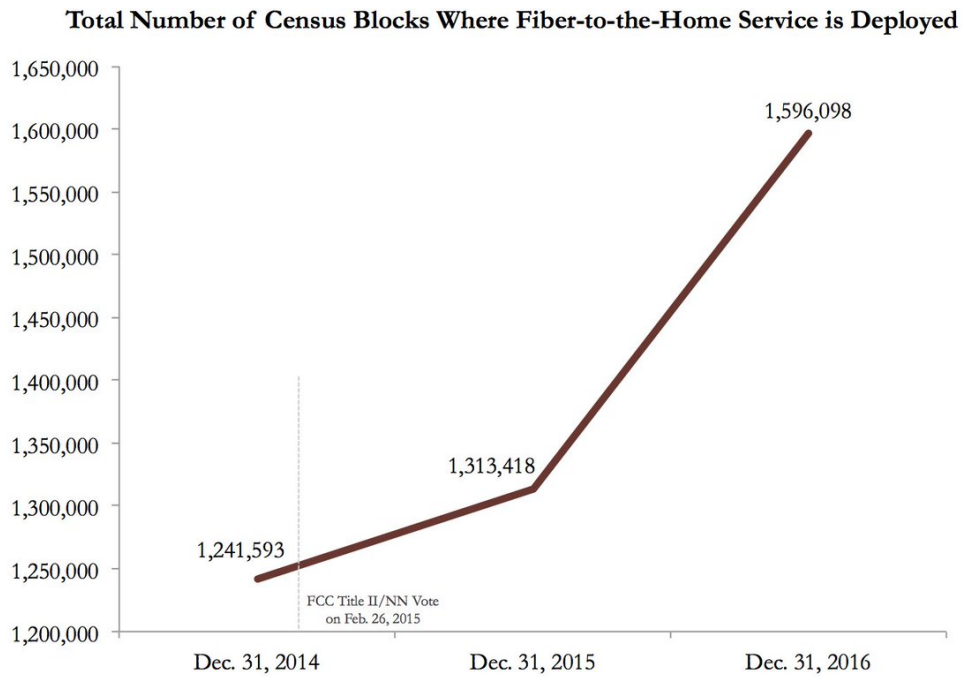


Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2); as of Dec. 31, 2015 (version 2); and as of Dec. 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts as reported for the 2010 Census.

Broadband Choices Continued to Expand With Title II Net Neutrality Rules In Place



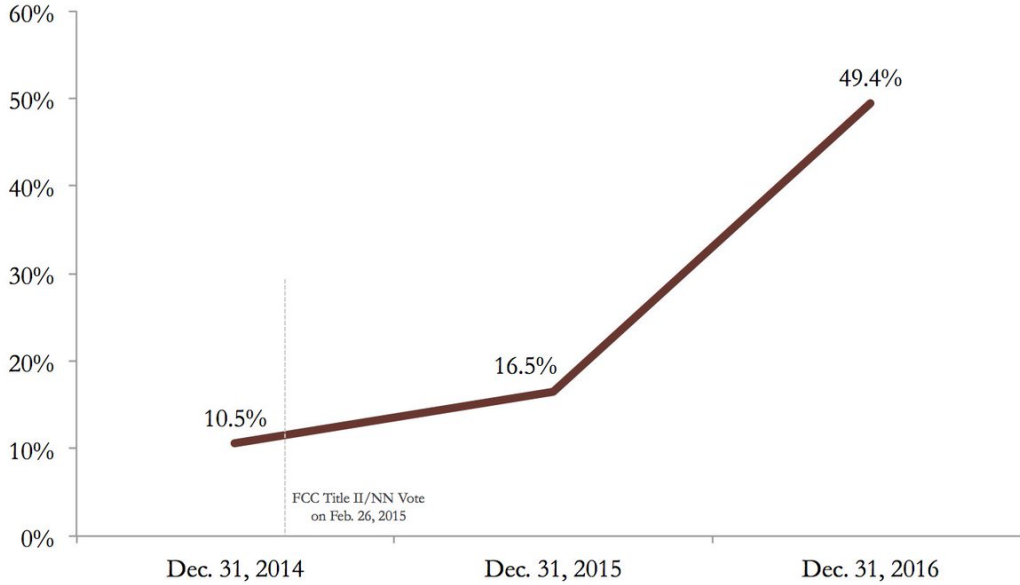
Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2); as of Dec. 31, 2015 (version 2); and as of Dec. 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts as reported for the 2010 Census.



Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2); as of Dec. 31, 2015 (version 2); and as of Dec. 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts as reported for the 2010 Census.

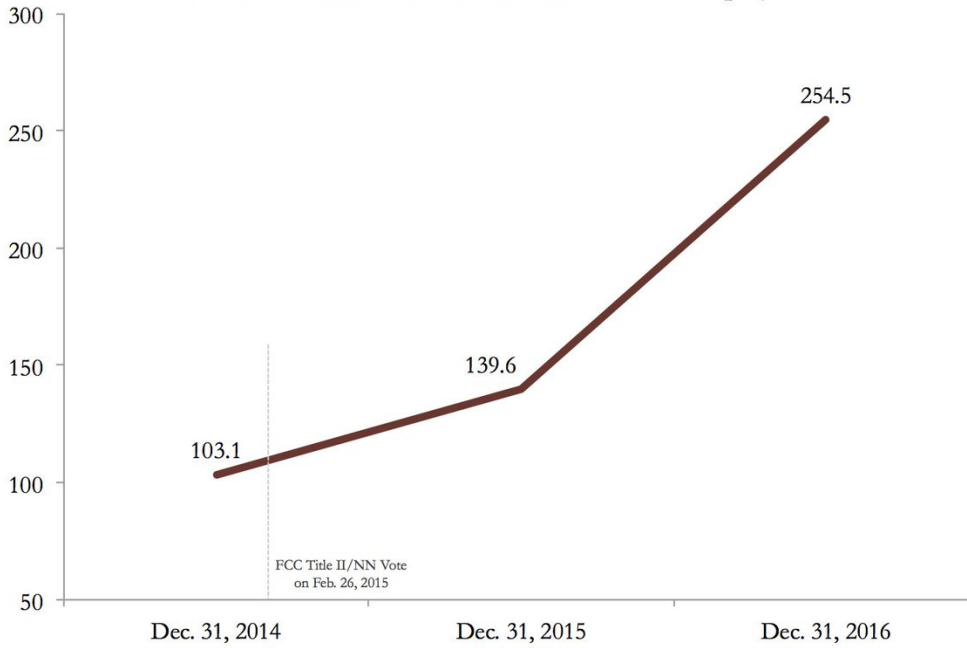
Broadband Speeds Continued to Increase With Title II Net Neutrality Rules In Place

Percent of U.S. Population Residing at Location Served by an ISP Offering Downstream Speeds above 300 Mbps



Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2); as of Dec. 31, 2015 (version 2); and as of Dec. 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts as reported for the 2010 Census.

Average Maximum Available Downstream Speed (Mbps) in Census Blocks Where Fixed Broadband is Deployed



Source: Free Press analysis of FCC Form 477 deployment data, as of Dec. 31, 2014 (version 2); as of Dec. 31, 2015 (version 2); and as of Dec. 31, 2016 (version 1). Values are based on U.S. Census Bureau's Block-level population counts as reported for the 2010 Census.

Capital Expenditures

by Publicly Traded Broadband Providers

(2013–2016)

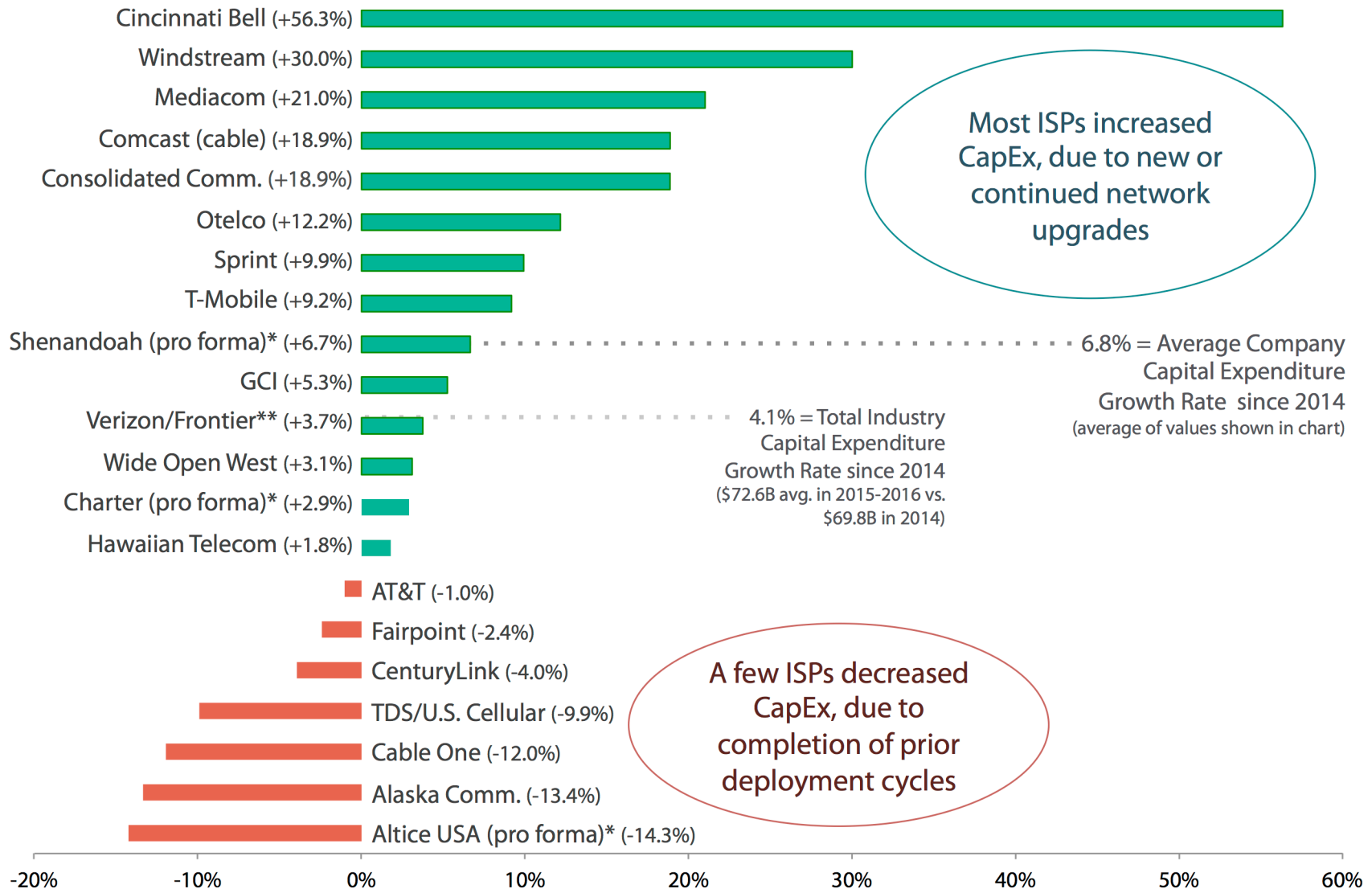


Capital Expenditures (\$ thousands)	2013	2014	2015	2016	2013-2014	2015-2016	Percent Change (2015–2016 vs. 2013–2014)
Comcast (cable)	\$5,403,000	\$6,156,000	\$7,040,000	\$7,596,000	\$11,559,000	\$14,636,000	26.6%
Charter+TWC+BHN (pro forma)	\$5,573,000	\$7,052,000	\$6,969,000	\$7,545,000	\$12,625,000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

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

ISP Capital Expenditure Growth Following Title II Open Internet Order

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



Most ISPs increased CapEx, due to new or continued network upgrades

A few ISPs decreased CapEx, due to completion of prior deployment cycles

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

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

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

ADDITIONAL SOURCES & RESOURCES

Free Press Report, *It's Working*, May 2017:

<https://www.freepress.net/sites/default/files/legacy-policy/internet-access-and-online-video-markets-are-thriving-in-title-ii-era.pdf>

Free Press July 2017 Net Neutrality Comments filed with FCC:

https://www.freepress.net/sites/default/files/legacy-policy/free_press_title_ii_comments.pdf

Free Press August 2017 Net Neutrality Reply Comments filed with FCC:

https://www.freepress.net/sites/default/files/legacy-policy/free_press_reply_comments_open_internet_proceeding.pdf

Publicly-Traded ISPs' company-specific and aggregate investment chart, 2013 to 2016:

https://www.freepress.net/sites/default/files/legacy-policy/capital_expenditures_by_publicly_traded ISPs.pdf

Comments of AT&T in 2010 Wireless Competition Report Docket, on cyclical nature of investments (at page 34):

<https://ecfsapi.fcc.gov/file/7020652183.pdf>

AT&T December 2015 Investor Conference Transcript excerpts regarding declining costs for increased capacity with new technologies:

https://www.freepress.net/sites/default/files/2018-05/ATT_on_fcc_net_neutrality_rules_excerpt_1.pdf