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U.S. Broadband Availability Mid-2016

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Research Brief
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U.S. broadband providers continue to deploy and upgrade networks rapidly, bringing consumers across the nation ever-faster service and competitive choice, according to a USTelecom and CensusNBM analysis of the most current Federal Communications Commission (FCC) broadband availability data. As of mid-2016, 96 percent of Americans had at least one wired broadband network platform available to them and 84 percent had at least two wired options. Competitive availability at higher speeds is growing rapidly as providers upgrade their widely deployed broadband networks.

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U.S. broadband providers continue to deploy and upgrade networks rapidly, bringing consumers across the nation ever-faster service and competitive choice, according to a USTelecom and CensusNBM analysis of the most current Federal Communications Commission (FCC) broadband availability data. Ongoing, widespread deployment of competitive broadband networks is the result of substantial capital investment in a dynamic, evolving market. Wireline, wireless, and cable providers invest more than $75 billion annually and have spent more than $1.5 trillion over two decades to build competitive networks.

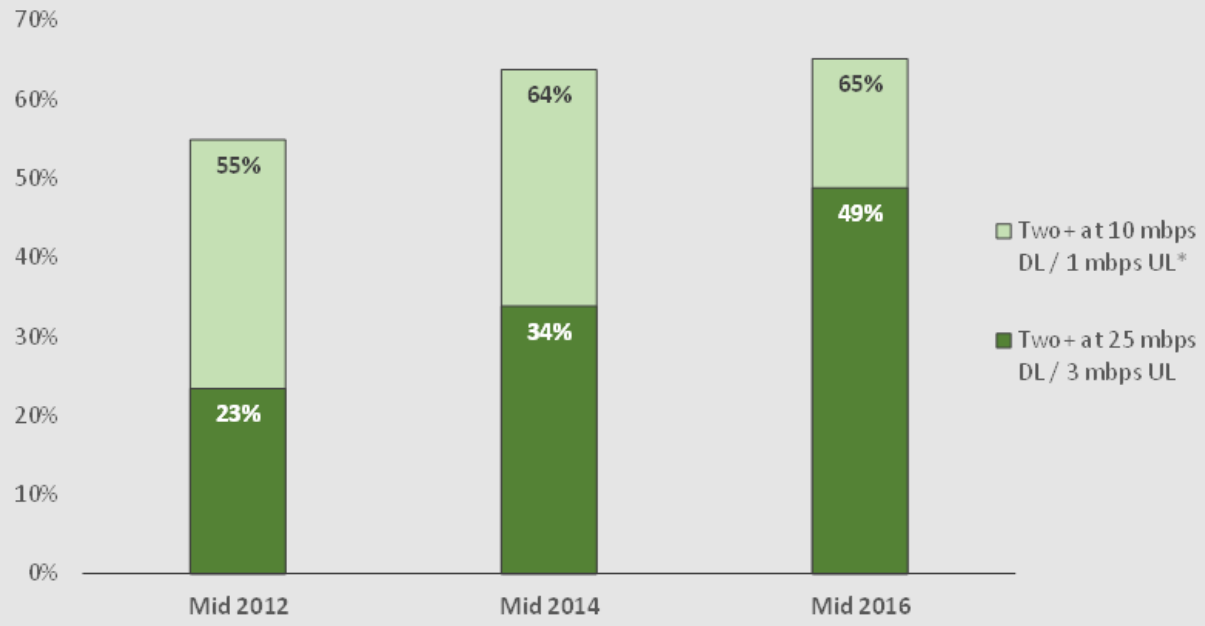
As of mid-2016, 96 percent of Americans had at least one wired broadband network platform available to them and 84 percent had at least two wired options. Competitive availability (at least two wired options) at 10 megabits per second download and 1 megabit per second upload to households was 65 percent and at 25 megabits per second download and 3 megabits per second upload was 49 percent. Competitive availability at higher speeds is growing rapidly as providers upgrade their widely deployed broadband networks. See Chart 1.

Chart 1

U.S. Broadband Competition: Services Deployed Widely and Speeds Growing Rapidly

(% of U.S. Housing Units with Two or More Wired Broadband Options Available at Selected Speed Tiers, Mid 2012 to Mid 2016)

Two or more wired broadband providers are available to 84 percent of Americans and at least one option is available to 96 percent. Competition occurs dynamically over time as providers upgrade network speed and quality. In addition to wired options from telecom, cable, and others, multiple satellite and wireless options are available to nearly all Americans.



Sources: FCC, NTIA, USTelecom, and Telcodata CensusNBM.com.

*10 megabit per second download / 1 megabit per second upload estimated for 2012 and 2014 based on 10m download / 768 kilobit upload data available from NTIA. Data were adjusted proportionately according to FCC 2016 reported data for 10m DL / 1m UL and 10m DL / 768k UL.

The FCC categorizes broadband as either fixed or mobile. The most current available data from the FCC are for mid-2016 for fixed broadband and year-end 2015 for mobile wireless broadband. Fixed broadband consists of wired broadband and fixed wireless broadband. Wireless Internet Services Providers (WISPs) use terrestrial fixed wireless technology to deliver broadband services. For the purposes of the analysis below, USTelecom uses the term fixed broadband to refer to *terrestrial* fixed broadband, which excludes satellite broadband. Wired broadband is a subset of fixed broadband, and it predominantly consists of broadband over fiber, digital subscriber line, and cable modem technologies. Mobile wireless broadband is separate from fixed wireless and fixed broadband.

This research brief starts with an analysis of broadband availability at any speed and technology, the availability at different speed tiers and the competitive and technological dynamics at the national level. It also includes a discussion of rural and non-rural availability and a comparison of the U.S. to Europe.

Broadband Availability at Any Speed and Any Technology

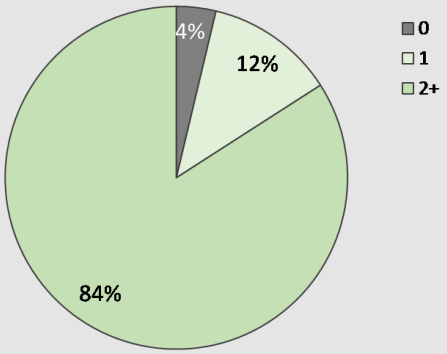
Any assessment of broadband availability and competition must start with an examination of broadband at any speed using any wired broadband technology. This reflects the foundational deployment of competitive facilities. Snapshots based on selective speed thresholds and technologies at a single point in time will understate the availability and competitiveness of broadband. A more accurate view takes into account all speeds and all technologies, as well as the dynamics of deployment and technological advancement over time.

As of mid-2016, 96 percent of Americans had wired broadband at any speed available to them. Among this group, 84 percent of Americans could choose from two or more wired providers and 12 percent had only one provider. See Chart 2. While four percent had no wired broadband option, there are several non-wired options – fixed wireless, mobile wireless, and satellite – discussed below.

According to the FCC data, of the 84 percent of Americans that had a choice of two or more wired broadband providers, 17 percent had a choice of three or more. It is unclear from the data what portion consists of facilities-based competitors. We can identify at least one-third as full facilities-based providers: former cable over-builders, such as Wide Open West and RCN, covered at least 5.5 million housing units; identifiable municipal network operators covered at least 1.5 million housing units; and Google Fiber covered approximately 620,000 housing units. Together these account for availability to approximately six percent of Americans. The remaining two-thirds may include providers using their own facilities, providers who partially resell others' facilities, or some combination of these.

Chart 2

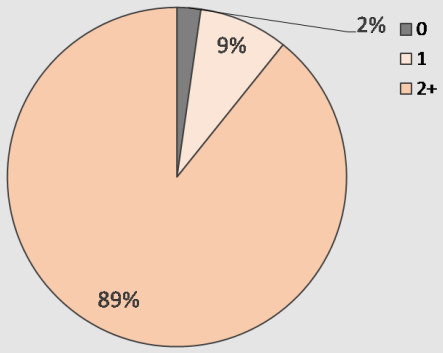
U.S. Wired Broadband Choices Available at Any Speed
(% of Housing Units, Mid 2016)



Source: FCC, USTelecom, and Telcodata CensusNBM.com.

Chart 3

U.S. Fixed Broadband Choices Available at Any Speed
(% of Housing Units, Mid 2016)



Source: FCC, USTelecom, and Telcodata CensusNBM.com.

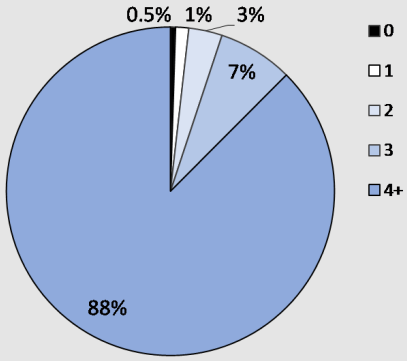
As of mid-2016, fixed wireless service at any speed was available to 37 percent of Americans. Fixed broadband availability – wired plus fixed wireless –is only slightly greater than wired broadband availability: as of mid-2016, 98 percent had at least one fixed provider. This breaks down as follows: 89 percent had a choice of two or more fixed providers; 9 percent had only one fixed provider available; and 2 percent had no choice. See Chart 3.

The reported portion of Americans with three or more fixed broadband providers available is significantly greater than for wired broadband, due to the inclusion of fixed wireless. Three or more fixed broadband options at any speed were available to 41 percent of Americans as of mid-2016, compared to 17 percent for wired broadband only, according to the FCC data.

Mobile broadband from multiple providers is also widely available throughout the U.S. The most current mobile broadband data available from the FCC are for year-end 2015. As of 2015, mobile broadband using fourth generation (4G) Long Term Evolution (LTE) wireless technology was available to 99.5 percent of Americans and 98 percent had a choice of two or more providers. Four or more LTE mobile broadband options were available to 88 percent of Americans, 7 percent could choose among three LTE providers, and 3 percent had a choice of two. See Chart 4. While these data are from 2015, availability was likely the same or greater in 2016.

Chart 4

U.S. Wireless LTE Broadband Choices Available
(% of Housing Units, 2015)



Source: FCC, USTelecom, and Telcodata CensusNBM.com.

Some consumers are choosing mobile broadband only. Pew Internet reported that 12 percent of adults surveyed in 2016 had smartphones but no fixed home broadband. According to Pew, some portion of consumers who have chosen only smart phones report having adequate fixed broadband alternatives. It is difficult to draw hard conclusions as to how consumers view fixed and mobile broadband choices since factors such as income may influence the decision. Nonetheless, this is a trend worth watching. For voice telephony, the portion of U.S. households who have come to rely on wireless-only telephone service grew from 3 percent in 2003 to more than 50 percent as of 2016. Some portion of consumers use smart phones only, and this cohort may grow significantly with the deployment of fifth generation (5G) wireless in coming years. Moreover, recent moves by cable operators to provide wireless and telecom providers to provide content underscores the dynamic nature of the marketplace and the usefulness of drawing conclusions based on technologically limited and static snapshots.

Broadband Availability and Deployment at Different Speeds over Time

As discussed above, it is necessary to analyze broadband deployment and competition in the context of broader industry dynamics. U.S. providers have been deploying broadband infrastructure with a range of technologies for more than two decades. Basic competitive infrastructure from multiple providers is available in the vast majority of the country. Once providers have deployed the foundational infrastructure to offer broadband, increasing speed and quality is a matter of upgrading networks. Broadband technologies are also constantly evolving and successive generations are becoming increasingly powerful. In a process of competitive and technological leapfrog, certain providers deploy advanced technologies and upgrade their networks, then others follow suit, driving a competitive process of ever-expanding network capabilities.

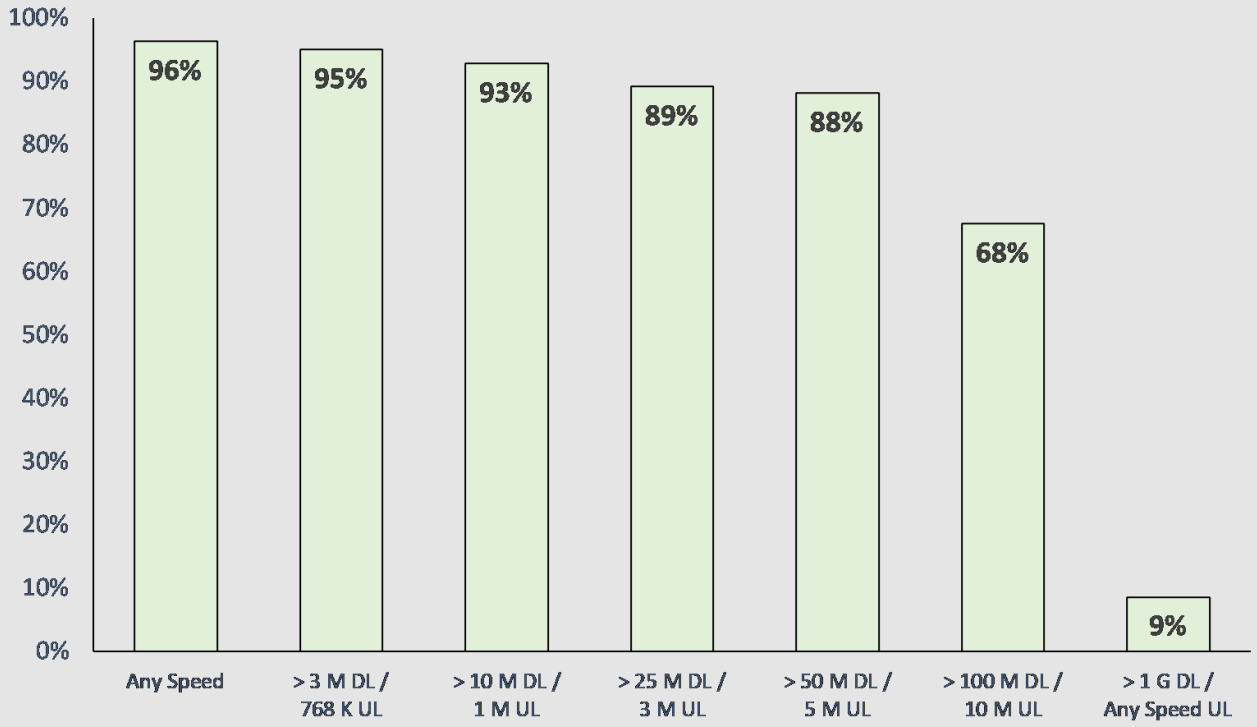
The process of technological evolution and competitive deployment is costly and time consuming, as the more than $1.5 trillion dollars in broadband provider investment over the last couple of decades testifies. It is not realistic to expect instantaneous advancement by multiple providers across a wide geographic area such as the U.S. Simple snapshots using arbitrary speed thresholds do not reflect this dynamic reality. Therefore, it is more instructive to look at both current and historical speed data across technologies.

Given the competitive and technological dynamic discussed above, the FCC data for mid-2016 not surprisingly show that the broadband availability rates at higher speeds is lower than availability rates at lower speeds at a given point in time. This is the case whether looking at wired broadband or the broader category of fixed broadband. See Chart 5 and Chart 6. However, the availability of higher speed services grows over time, as shown in Chart 7 below. Moreover, the *competitive* availability of higher-speed services grows over time, as shown in Chart 1 above.

Chart 5

U.S. Wired Broadband Availability by Speed, Mid 2016

(Percentage of Housing Units)



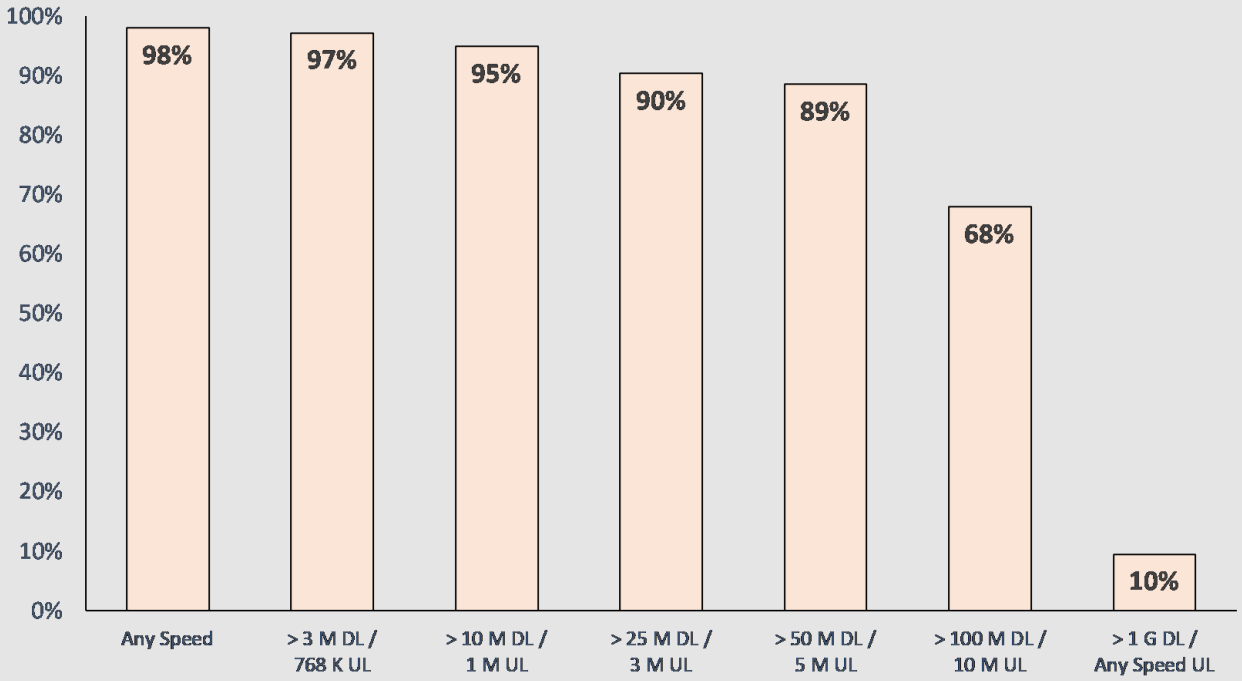
Source: FCC, USTelecom, and Telcodata CensusNBM.com

For wired broadband as of mid-2016 (Chart 5):

- 96 percent of Americans could get broadband at any speed;
- 95 percent at 3 megabits per second (mbps) download (DL) and 768 kilobits per second upload (UL);
- 93 percent at 10 mbps DL and 1 mbps UL;
- 89 percent at 25 mbps DL and 3 mbps UL;
- 88 percent at 50 mbps DL and 5 mbps UL;
- 68 percent at 100 mbps DL and 10 mbps UL; and
- 9 percent at 1 gigabit per second (gbps) DL and any speed UL.

Chart 6

U.S. Fixed Broadband Availability by Speed, Mid 2016
(Percentage of Housing Units)



Source: FCC, USTelecom, and Telcodata CensusNBM.com

For fixed broadband as of mid-2016 (Chart 6):

- 98 percent of Americans could get broadband at any speed;
- 97 percent at 3 megabits per second (mbps) download (DL) and 768 kilobits per second upload (UL);
- 95 percent at 10 mbps DL and 1 mbps UL;
- 90 percent at 25 mbps DL and 3 mbps U;
- 89 percent at 50 mbps DL and 5 mbps UL;
- 68 percent at 100 mbps DL and 10 mbps UL; and
- 10 percent at 1 gigabit per second (gbps) DL and any speed UL.

These data show that as of mid-2016, fixed broadband at any speed was available to 98 percent of Americans and wired broadband was available to 96 percent of Americans. The FCC currently defines advanced services based on a speed threshold of 25 mbps DL and 3 mbps UL. Approximately 90 percent of Americans had fixed broadband available and 89 percent had wired broadband available at the FCC's current speed threshold.

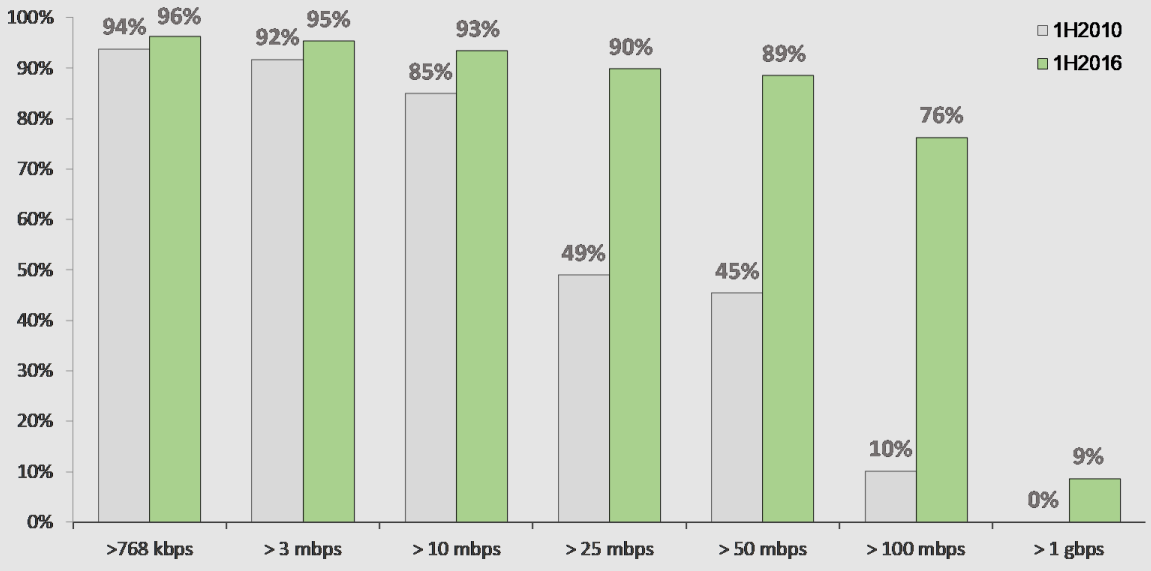
These data show that as of mid-2016, fixed broadband at any speed was available to 98 percent of Americans and wired broadband was available to 96 percent of Americans. The FCC currently defines advanced services based on a speed threshold of 25 mbps DL and 3 mbps UL. Approximately 90 percent of Americans had fixed broadband available and 89 percent had wired broadband available at the FCC's current speed threshold.

Chart 7 shows wired broadband availability by download speed from 2010 to 2016. Wired broadband across all speed categories grew from 2010 to 2016. Availability of broadband at 25 mbps DL grew from 49 percent in 2010 to 90 percent in 2016 while broadband at 50 mbps DL showed similar growth. Availability of broadband at 100 mbps DL grew from 10 percent in 2010 to 76 percent in 2016. Gigabit broadband, which did not exist in 2010 as a practical matter, was available to 9 percent of households in mid-2016, and continues to grow.

The 2010 data did not include a fixed broadband category that aggregated fixed wireless and wired technologies, but they did include an aggregate wired broadband category. Since companies reported fixed wireless differently in the 2010 and 2016 data collections, it is infeasible to compare fixed wireless broadband over time. The 2010 data also did not report the same download-upload combinations as the more current data. As a result, at an aggregate level, it is only feasible to compare download speeds for wired technology over this period. The download-only results in Chart 7 will not match download-upload results in Charts 5 and 6. Also since the 25 mbps DL /3 mbps UL and 50 mbps DL / 5 mbps UL are so similar, throughout the remainder of this research brief, USTelecom will not report the 50 mbps DL and 5 mbps UL figures.

Chart 7

Broadband Availability by Download Speed for Wired Technologies , 2010-2016
(Percent of Housing Units)



Source: NTIA National Broadband Map, USTelecom, and Telcodata CensusNBM.com. Percentages in bar chart are cumuliatve.

Chart 1 at the beginning of this research brief shows *competitive* availability of wired broadband by two or more providers at various speeds using data available back to 2012. These data are available for broadband at any speed and available upload-download combinations: 25 mbps DL / 3 mbps UL and 10 mbps DL / 1 mbps UL. For the 10 mbps DL / 1 mbps UL, USTelecom to make estimates for 2012 and 2014 because the historic data were available for 768 kbps or 1.5 mbps UL speeds. USTelecom adjusted the 10 mbps DL / 768 kbps UL reported for 2012 and 2014 in proportion to ratio of 10 mbps DL / 768 kbps UL to 10 mbps DL / 1 mbps UL, which were both available for mid-2016. The analysis indicates that competitive wired infrastructure – telecom fiber or DSL, cable, and others – are competitively available to 84 percent of American homes. Availability of wired broadband at 25 mbps DL / 3 mbps UL from two or more providers grew from 23 percent of home in mid-2012 to 49 percent of homes in mid-2016 and the trend is growing. Availability of wired broadband at 10 mbps DL / 1 mbps UL from two or more providers grew from an estimated 55 percent of homes in mid-2012 to 65 percent of homes in mid-2016 and the trend is growing.

To summarize, as of mid-2016, 84 percent of the Americans were within reach of network infrastructure from multiple wired network providers – 89 percent when including fixed wireless services. At higher speeds, availability is growing rapidly, demonstrating the dynamic nature of broadband competition and investment. As of mid-2016, wired broadband service at 10 megabits per second download and 1 megabit per second upload was available to 93 percent of Americans; availability of wired broadband from two or more providers at 10 megabits per second download and 1 megabit per second upload was 65 percent, up from an estimated 55 percent four years earlier. As of mid-2016, wired broadband at 25 megabits per second download and 3 megabits per second upload was available to 89 percent of Americans; and availability of wired broadband from two or more providers at 25 megabits per second download and 3 megabits per second upload was 49 percent, up from 23 percent four years earlier.

Additionally, mobile broadband tells a similar story of competitive investment and growth. For assessing growth over time, data challenges make direct comparisons from 2010 to the present difficult, but not impossible. With 4G LTE technology, mobile carriers first began to report service at 10 mbps or greater DL. According to National Broadband Map (NMB), as of mid-2010, mobile broadband at 10 mbps DL or greater was available to less than one percent of Americans; by mid-2014 it was available to 98 percent. The FCC measures mobile wireless broadband speeds differently than the NBM, so speed-based comparisons are not feasible. However, the FCC does report mobile broadband availability by technology. By year-end 2015, mobile broadband over LTE – a good proxy for 10 mbps or greater service – was available to 99.5 percent of Americans. In other words, mobile broadband at 10 mbps DL or greater grew from near zero to near 100 percent availability in six years. Moreover, nearly all Americans today have multiple choices for 4G mobile broadband, as discussed and shown above in Chart 4 above.

Collectively, the current and historical data demonstrate that consumers are reaping the benefits of ever-faster broadband services from the tens of billions of dollars competing wired, fixed, and mobile broadband providers invest each year to deploy and upgrade their networks.

Broadband Availability in Rural and Non-Rural Areas

Broadband deployment across the diverse and expansive geography of the United States presents many challenges. In rural areas, costs are high and population densities low, so the cost per user can be extremely high. The economics of providing broadband at affordable and nationally comparable rates in many rural areas is difficult and in some cases prohibitive for wired providers who must deploy facilities all the way to end user locations. As a result, broadband is not surprisingly more widely available in non-rural areas than in rural areas and, due to the timing of upgrade cycles, typically at higher speeds.

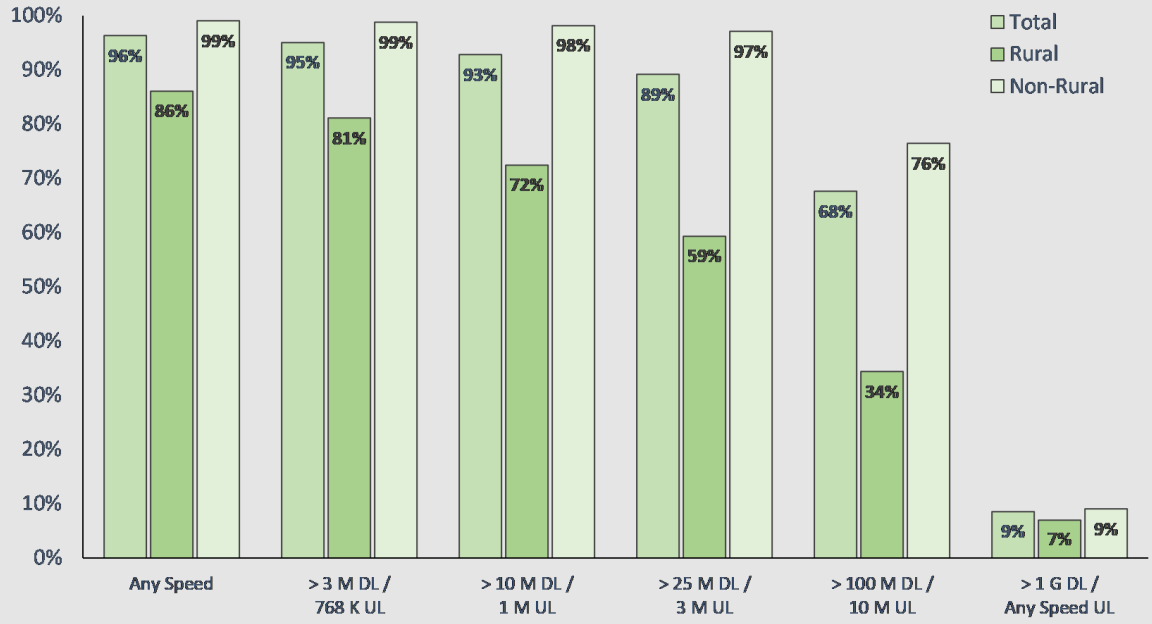
Rural Broadband Availability Overall

The analysis that follows shows that there is variation between rural and non-rural areas, but also within rural areas. In the calculations that follow, deployment is given as a percentage of housing units. Approximately 79 percent of housing units are non-rural and 21 percent are rural according to the 2010 Census.

As of mid-2016, wired broadband at 10 mbps DL and 1 mbps UL was available to 98 percent of Americans in non-rural areas and 72 percent in rural areas. Wired broadband at 25 mbps DL and 3 mbps UL was available to 97 percent of Americans in non-rural areas and 59 percent of Americans in rural areas. Wired broadband at 100 mbps DL and 10 mbps UL was available to 76 percent of Americans in non-rural areas and 34 percent of Americans in rural areas.

Chart 8

U.S. Wired Broadband Availability by Speed and Geographic Area, Mid 2016
(Percentage of Housing Units)



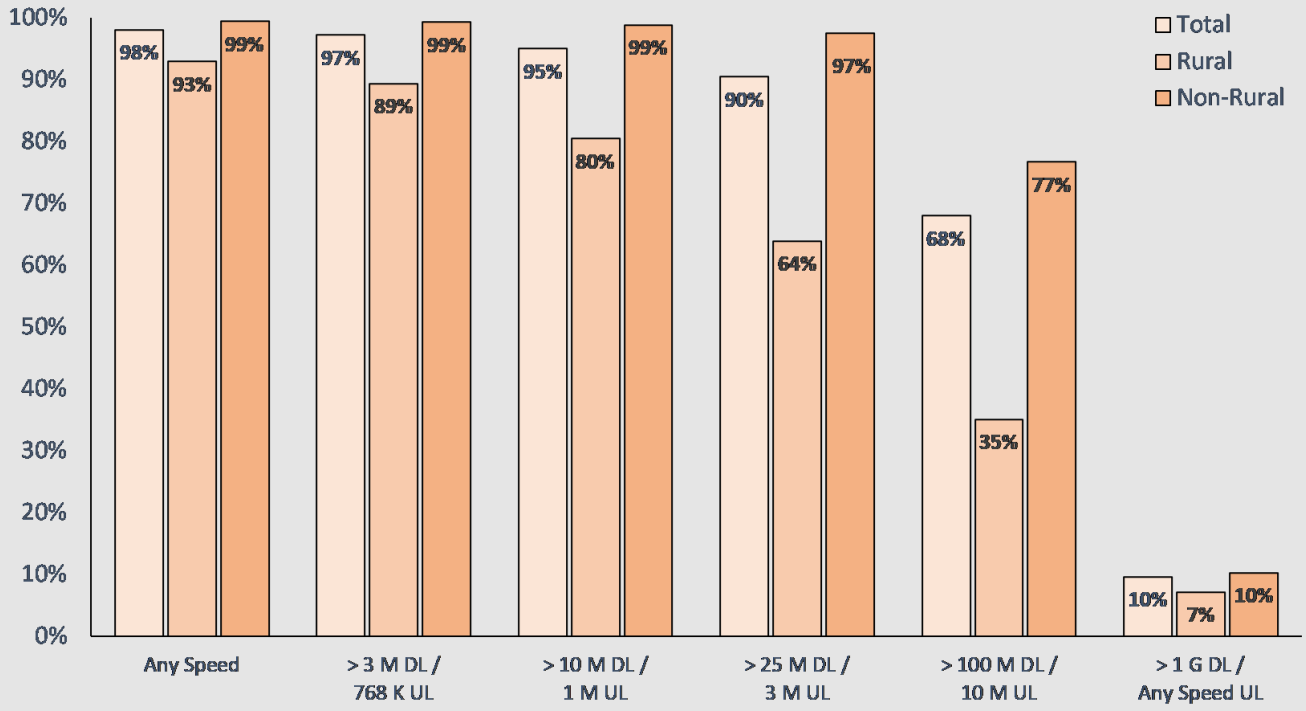
Source: FCC, USTelecom, and Telcodata CensusNBM.com

Including fixed wireless in the analysis results in slightly greater availability estimates in rural areas than wired broadband alone, especially in the mid-range of speeds. Fixed broadband at any speed is available to 99 percent of Americans in non-rural areas and 93 percent of Americans in rural areas (vs. 89 percent for wired broadband). See Chart 9. As of mid-2016, fixed broadband at 10 mbps DL and 1 mbps UL was available to 99 percent of Americans in non-rural areas and 80 percent in rural areas (vs. 72 percent for wired broadband alone). Fixed broadband at 25 mbps DL and 3 mbps UL was available to 97 percent of Americans in non-rural areas and 64 percent of Americans in rural areas (vs. 59 percent for wired broadband alone). Fixed broadband at 100 mbps DL and 10 mbps UL was available to 77 percent of Americans in non-rural areas and 35 percent of Americans in rural areas (vs. 34 percent for wired broadband alone).

Chart 9

U.S. Fixed Broadband Availability by Speed and Geographic Area, Mid 2016

(Percentage of Housing Units)



Source: FCC, USTelecom, and Telcodata CensusNBM.com

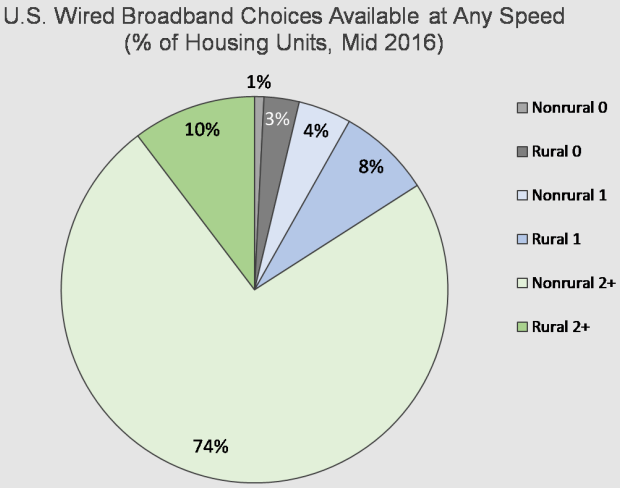
USTelecom does not provide a separate analysis for rural and non-rural deployment of mobile wireless broadband or satellite broadband. As shown in Chart 4 above, as of the end of 2015, 4G LTE mobile wireless broadband was available to 99.5 percent of Americans, and the vast majority of Americans, including those in rural areas, had 4G mobile broadband available to them from multiple competitive providers.

Competitive Availability: Rural and Non-Rural Components

At mid-2016, wired broadband at any speed was available to 84 percent of Americans from two or more providers, with 12 percent having one option and four percent having no wired broadband option. See Chart 2. The 84 percent with two or more wired broadband options consisted of 74 percent in non-rural areas and 10 percent in rural areas. The 12 percent with one option consisted of four percent in non-rural areas and eight percent in rural areas. The four percent that did not have a wired broadband provider consisted of one percent in non-rural areas and three percent in rural areas. See Chart 10.

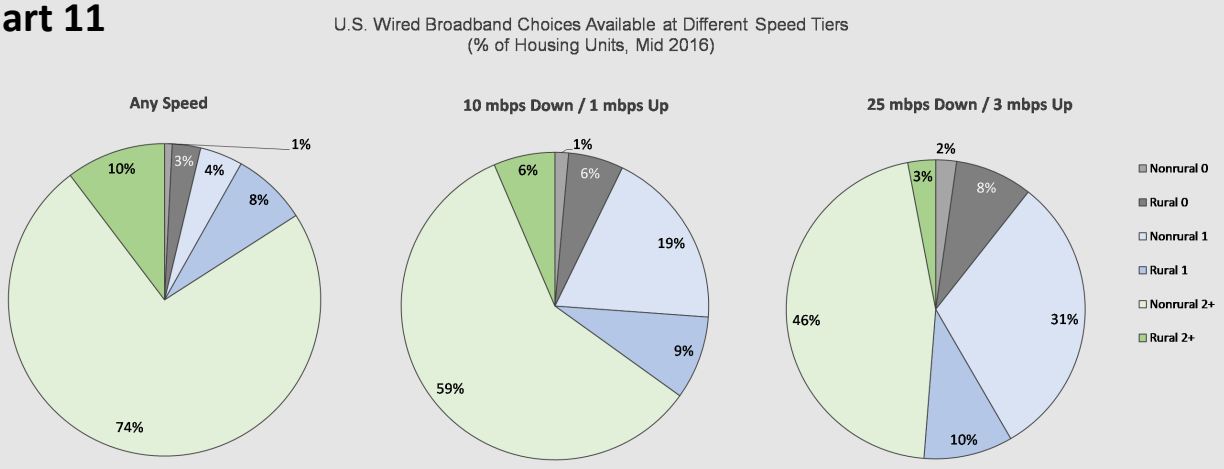
At any point in time, competitive availability appears lower at higher speeds since they reflect more recent upgrade cycles. See Chart 11. This result is expected; and it reflects a dynamic, competitive marketplace. While core wired infrastructure is competitively available to 84 percent of Americans, networks are at different stages of upgrading to higher-speeds. As of mid-2016, 65 percent of Americans could get 10 mbps DL and 1 mbps UL, while 49 percent could get 25 mbps DL and 3 mbps UL. As Chart 1 demonstrates, deployment at higher speeds by multiple providers is growing rapidly as competition drives upgrades.

Chart 10



Source: FCC, USTelecom, and Telcodata CensusNBM.com.

Chart 11

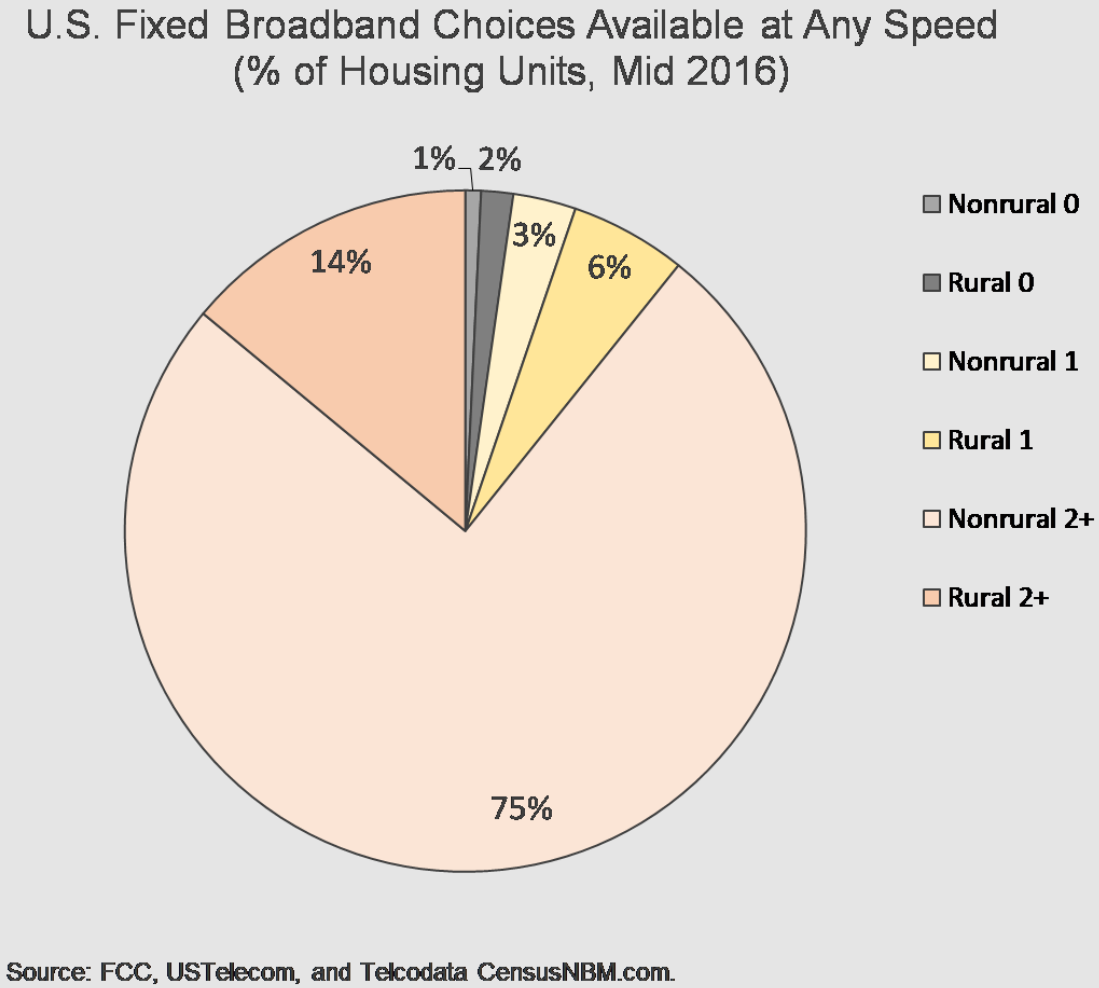


Source: FCC, USTelecom, and Telcodata CensusNBM.com.

As of mid-2016, fixed broadband – including wired and fixed wireless –at any speed was available to 89 percent of Americans from two or more providers, with nine percent having one option and two percent having no fixed broadband option. See Chart 3. The 89 percent with two or more fixed broadband options consisted of 75 percent in non-rural areas and 14 percent in rural areas. The nine percent with one fixed broadband option consisted of six percent in non-rural areas and three percent in rural areas. The two percent that did not have a fixed broadband provider consisted of less than one percent in non-rural areas and just over one and a half percent in rural areas. See Chart 12.

As with wired broadband, competitive availability estimates for fixed broadband are lower at higher speeds due to competitive dynamics and upgrade cycles. See Chart 13. Including fixed wireless yields slightly higher estimates than wired broadband, especially at the 10 mbps DL and 1 mbps UL speed tier, where an additional 8 percent of Americans – 5 percent in non-rural areas and three percent in rural areas – had two or more fixed broadband offerings available as of mid-2016. In rural areas, fourteen percent more homes (three percent out of the 21 percent of homes that are in rural areas) have multiple options due to fixed wireless.

Chart 12

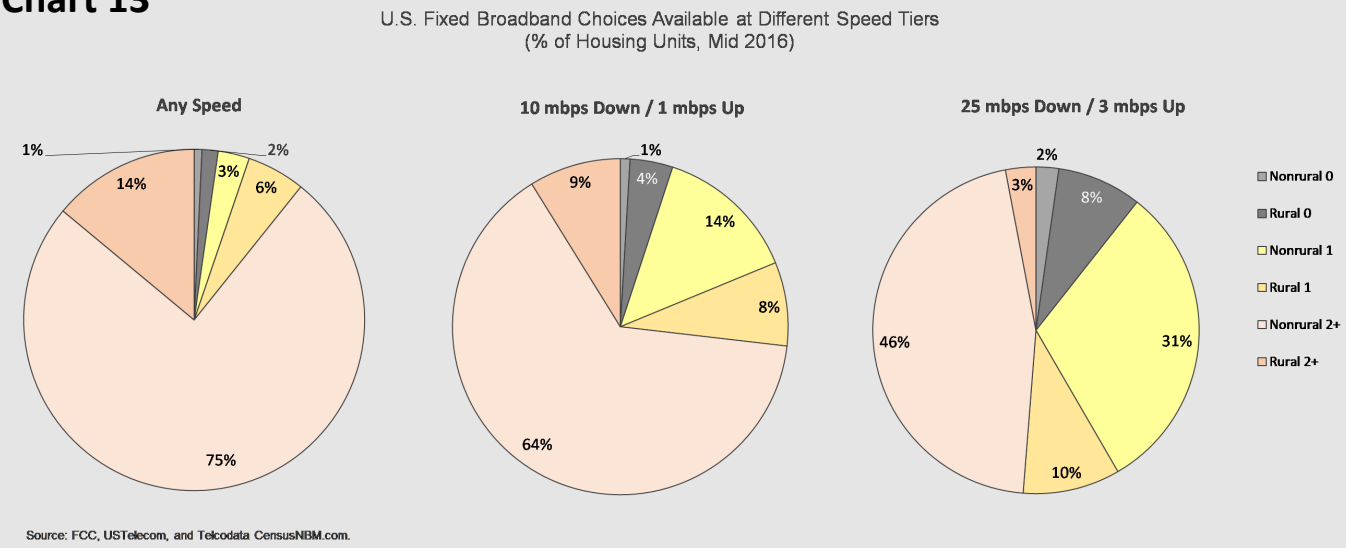


Source: FCC, USTelecom, and Telcodata CensusNBM.com.

"The" Rural Broadband Gap?

Rural broadband is not monolithic. The data show that there is variation across rural areas in terms of deployment, speeds, and competition. While there are gaps in rural broadband, there is no single "rural broadband gap." Rather, gaps exist in specific rural areas either where broadband is not available due to challenging economics or areas where there is only one provider and either demand, industry technology trends, or subsidies are not driving sufficient upgrades.

Chart 13



Almost half of rural areas, where 10 percent of Americans reside, had two or more wired networks deployed, as of mid-2016. More than 37 percent of rural areas, where 8 percent of Americans reside, had just one wired provider. Combined with those areas that had two or more providers, almost 86 percent of rural Americans had at least one provider available to them. Of these, 72 percent could get services at 10 mbps DL and 1 mbps UL; 59 percent could get service at 25 mbps DL and 3 mbps UL; and 34 percent could get service at 100 mbps DL and 10 mbps UL. See Chart 7. If you include fixed wireless and relax the upload requirement, these figures rise to 81 percent for 10 mbps DL; 64 percent for 25 mbps DL; and 35 percent for 100 mbps DL. See Appendix B.

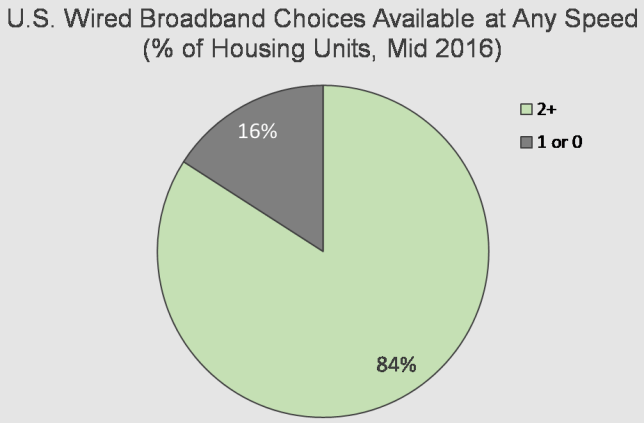
The remainder may be unserved, depending on technology assumptions. Almost 14 percent of rural areas where three percent of Americans reside did not have a wired broadband option as of mid-2016. This falls to less than 7 percent of rural areas, or 2 percent of all Americans, if fixed wireless is included in the analysis. The unserved portion falls to about 2.5 percent of rural areas and 0.5 percent of all Americans if 4G mobile wireless is included in the analysis, conservatively assuming nearly all uncovered areas for 4G mobile wireless are in rural America. Satellite eliminates most of the gap if it is included in the analysis, although the FCC has noted that latency, or delays in data transmission arising from the distances between users and satellites, may affect perceived quality of real time interactive applications. Nonetheless, in the very highest cost areas, satellite may be the most economical option for fixed broadband.

USTelecom believes that every American should have the opportunity to connect to the Internet through sufficiently robust broadband service. For some areas, this may require government support. The FCC's Connect America Fund provides a good starting point. Further progress will require targeted and flexible policies. Policies should target support to specific areas where the economics do not support deployment or upgrades. They must also be sufficiently flexible to allow for the most cost effective solutions rather than adhering to rigid technology or speed requirements; and, of course, sufficient funds must be made available.

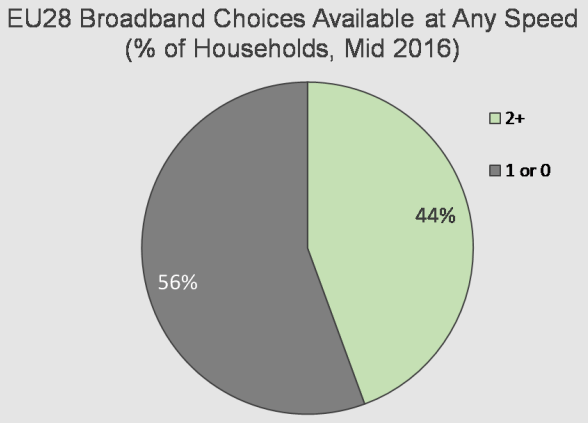
U.S. and European Broadband Availability

According to European Union data, U.S. consumers enjoy greater competitive choice among facilities-based wired broadband providers than their counterparts in Europe. As detailed above, as of mid-2016, wired broadband from two or more providers was available to 84 percent of housing units in the U.S. By contrast, as of mid-2016, wired broadband was available to an estimated 44 percent of households in the EU's 28 member states (EU28), assuming that telecom providers cover most of Union and the cable footprint largely overlaps these providers.

Chart 14



Source: FCC, USTelecom, and Telcodata CensusNBM.com.



Source: European Union, USTelecom, and IHS Markit.

Conclusion

As of mid-2016, 96 percent of Americans had at least one wired broadband infrastructure available to them – 98 percent, if fixed wireless is included in the analysis. Moreover, there are competing wired broadband infrastructures in 84 percent of the country – 89 percent, if fixed wireless is included in the analysis. Nearly all Americans could get broadband service via mobile wireless and satellite.

While the FCC 477 data are not perfect, they are the best available and the risk of overstatement is minimal at broad geographic levels of aggregation. These broadband availability data highlight that U.S. broadband providers continue to deploy and upgrade networks rapidly, bringing the vast majority of consumers across the nation ever-faster service and choice in a reasonable and timely fashion. There is no paucity of competition, and there is no systemic market failure when it comes to deploying broadband in the U.S.

The presence of facilities-based competition is spurring ongoing investment in network upgrades across the nation, and as a result, both fixed and mobile broadband speeds are growing. There is not a monolithic broadband gap, but a range of areas that do not have sufficient broadband available to them. Policies must be targeted, addressing specific problem areas, and must be flexible to allow for economically efficient solutions. Overbroad claims of authority based on non-availability of broadband in a small subset of the country are contrary to the spirit of the Communications Act and are bad policy. So are statistical market snapshots that arbitrarily understate the extent of broadband availability and competition in order to justify broad policy intervention.

Methodology

Data and Analysis

USTelecom worked with consultant, Telecodata, to produce this research. Telcodata's broadband research service, CensusNBM (CensusNBM.com), compiled the data for this analysis by combining the Federal Communications Commission's (FCC) broadband availability and US Census housing unit data that is filed at the granular census block detail level and then consistently aggregated by Telcodata analysts to produce statistics for all 50 states plus DC. CensusNBM uses the 2010 Census, the last period that the Bureau produced a full tabulation of housing units, households, and population. For mapping and compatibility purposes, CensusNBM computed the broadband availability and Census information at the census block level in order to produce consistent broadband availability ratios. Census housing units and households track very closely, but housing units is a broader measure: it includes occupied homes, vacant homes and vacation homes; the household measure would include only occupied housing units.

The FCC has reported broadband availability data semi-annually using data collected using its Form 477 since year-end 2014. The most current FCC data available – and the data in this analysis – are for mid-2016. The FCC reports broadband availability at the census block level by provider and by technology type, with maximum download/upload speeds.

The FCC reports the following fixed technology categories based on its Form 477 data collection:

- Asymmetric xDSL
- ADSL2
- VDSL
- Symmetric xDSL
- Copper
- Fiber
- Cable DOCSIS 3.0
- Cable DOCSIS 1 - 1.1 - 2.0
- Cable Other
- Terrestrial Fixed Wireless
- Satellite

To enable certain analyses at higher levels than possible with the FCC-reported technology categories, CensusNBM created several broader groupings using. For example, CensusNBM created categories for all Cable technologies and all DSL technologies. It also created categories for Any Wired Technology except Cable – a category intended in include all wireline telecommunications provers; Any Wired Technology, which includes wireline telecommunications and cable providers; and Any Fixed Technology except Satellite, which combined Any Wired Technology and Terrestrial Fixed Wireless categories.

The following list represents the hierarchy of fixed broadband groupings and sub-groupings (see Appendices):

- Any Fixed Technology except Satellite
  - Any Wired Technology
    - Any Wired Technology except Cable
      - DSL
        - > Asymmetric xDSL
        - > ADSL2
        - > VDSL
        - > Symmetric xDSL
      - Copper
      - Fiber
    - Cable
      - DOCSIS 3.0
      - DOCSIS 1 - 1.1 - 2.0
      - Cable Other
  - Terrestrial Fixed Wireless
- Satellite

The process for creating the broader categories eliminates duplication when appropriate, such as instances where a single provider reported multiple technologies in the same area, or where multiple types of providers in a broader category reported facilities in the same area. For example, since the FCC's Form 477 requires ISPs to record each broadband technology in a census block and its associated download/upload speeds, there can be duplicate records for a single provider. Therefore, when calculating the number of housing units with “Any Wired Technology except Cable” as a category, CensusNMB counts the number of housing units in census blocks where a single ISP reports both DSL and Fiber just one time – not once for fiber and once for DSL. Similarly, when calculating the number of housing units with “Any Wired Technology” as a category, CensusNBM counts the number of housing units in census blocks where both wireline telecommunications and cable operators report facilities just one time.

History

The National Telecommunications and Information Administration (NTIA) collected broadband availability data semi-annually for the "national broadband map" from mid-2010 to mid-2014. Those data are similar to, but not the same as, the broadband availability data the FCC collects using its Form 477. As a result, it is not possible to produce precise consistent time series between the NTIA data and the FCC data; but it is possible to create some rough comparisons over time using high-level data.

As part of the national broadband map, NTIA produced several reports detailing results by discrete technology and speed categories. Thus far, the FCC has released a great deal of raw data, and has used selected data in its Section 706 broadband deployment reports, but has not provided reports similar to those NTIA previously provided. USTelecom worked with CensusNBM to develop several reports similar to, though not identical, to the NTIA technology and speed reports. See Appendixes.

With the FCC data, CensusNBM has flexibility to create speed tiers, technology aggregates, and other reports. It does not have as much flexibility with the NTIA data. Below is a discussion of some of the relevant differences between the NTIA and the FCC data.

- The NTIA only provided speed data in ranges, such as "1.5 mbps to 3.0 mbps." Certain speed thresholds that have become standards, like upload speeds "greater than 1.0 mbps" are not possible to ascertain with the NTIA data. In contrast, the current FCC 477 data specifies unique maximum advertised speeds, such as "1.0 Mbps." With such data points, as opposed to pre-defined ranges, it is possible for CensusNBM to create its own ranges or thresholds.

- The FCC 477 report identifies residential and business census blocks and further differentiates residential maximum advertised speeds from business/government maximum contracted speeds. Since the NTIA filings did not distinguish residential from business advertised speeds any comparison over time between the NTIA and FCC are not precisely compatible. Since the NTIA data also include business broadband deployment, earlier data will show relatively higher broadband availability results than the FCC 477 at comparable maximum advertised speeds.

- The NTIA data has only seven categories of fixed technologies, while the FCC data has 10.

- Unlike NTIA, the FCC data treats mobile wireless broadband differently than fixed broadband (currently the FCC does not provide broadband speed data for mobile wireless broadband), so it is now not possible to report mobile data in the same manner as fixed broadband.

Geography

These data are national (50 states plus DC) with breakouts for rural and non-rural areas based on Census classification of census blocks. In terms of housing units, approximately 79 percent are in non-rural areas and 21 percent are in rural areas.

Appendix A – Mid 2016 Broadband Availability by Housing Units, Download and Upload

US Broadaband Availability by Technology and Speed, Mid-Year 2016, Selected Download and Upload Speeds (Percentage of Housing Units)

All Areas

Technology	Total HU Any Speed	Total HU > 768 K DL / 200 K UL	Total HU > 3 M DL / 768 K UL	Total HU > 10 M DL / 1 M UL	Total HU > 25 M DL / 3 M UL	Total HU > 50 M DL / 5 M UL	Total HU > 100 M DL / 10 M UL	Total HU >1 gbps DL
Any Fixed Technology Except Satellite	98.1%	97.9%	97.2%	95.0%	90.4%	88.6%	68.0%	9.6%
Any Wired Technology	96.3%	96.1%	95.1%	92.8%	89.2%	88.1%	67.6%	8.6%
Any Wired Technology Except Cable	92.2%	91.7%	84.6%	69.5%	49.3%	39.2%	20.8%	6.0%
DSL	87.8%	87.2%	78.7%	58.2%	31.8%	22.8%	4.0%	0.1%
Asymmetric xDSL	66.1%	65.1%	51.2%	14.9%	3.5%	1.3%	0.0%	0.1%
ADSL2	34.6%	34.0%	28.2%	19.2%	1.5%	0.1%	0.0%	0.0%
VDSL	37.5%	37.5%	34.7%	32.8%	28.4%	21.5%	3.9%	0.0%
Symmetric xDSL	0.8%	0.8%	0.4%	0.3%	0.1%	0.0%	0.0%	0.0%
Copper	2.3%	2.3%	2.0%	1.9%	0.3%	0.2%	0.1%	0.0%
Fiber	22.7%	22.7%	22.7%	22.7%	21.8%	18.0%	17.2%	6.0%
Cable	87.2%	87.2%	87.2%	87.0%	86.2%	85.6%	64.1%	2.7%
DOCSIS 3.0	86.3%	86.3%	86.2%	86.2%	85.7%	85.3%	64.0%	2.7%
DOCSIS 1 - 1.1 - 2.0	2.1%	2.1%	2.1%	2.0%	1.4%	0.5%	0.4%	0.0%
Cable Other	0.9%	0.9%	0.9%	0.8%	0.7%	0.5%	0.3%	0.0%
Terrestrial Fixed Wireless	36.3%	36.0%	33.9%	28.2%	14.9%	6.7%	3.9%	1.0%
Satellite	100.0%	100.0%	100.0%	100.0%	21.2%	0.0%	0.0%	0.0%

Rural Areas

Technology	Rural HU Any Speed	Rural HU > 768 K DL / 200 K UL	Rural HU > 3 M DL / 768 K UL	Rural HU > 10 M DL / 1 M UL	Rural HU > 25 M DL / 3 M UL	Rural HU > 50 M DL / 5 M UL	Rural HU > 100 M DL / 10 M UL	Rural HU >1 gbps DL
Any Fixed Technology Except Satellite	92.9%	92.4%	89.3%	80.5%	63.9%	58.2%	35.0%	7.1%
Any Wired Technology	86.1%	85.1%	81.1%	72.5%	59.4%	57.1%	34.4%	7.0%
Any Wired Technology Except Cable	79.2%	77.5%	68.9%	49.5%	22.3%	19.2%	10.0%	5.4%
DSL	75.0%	73.0%	63.7%	42.2%	12.4%	9.8%	1.4%	0.0%
Asymmetric xDSL	49.4%	47.2%	37.2%	12.6%	3.5%	3.0%	0.1%	0.0%
ADSL2	43.1%	41.2%	35.2%	23.1%	0.6%	0.3%	0.0%	0.0%
VDSL	16.7%	15.4%	13.6%	13.4%	8.5%	6.6%	1.2%	0.0%
Symmetric xDSL	1.0%	1.0%	0.7%	0.5%	0.3%	0.1%	0.1%	0.0%
Copper	1.5%	1.5%	1.1%	0.9%	0.4%	0.4%	0.0%	0.0%
Fiber	12.6%	12.6%	12.5%	12.5%	11.2%	10.3%	8.9%	5.4%
Cable	52.5%	52.5%	52.3%	51.9%	49.7%	48.6%	28.0%	1.7%
DOCSIS 3.0	50.2%	50.2%	50.1%	49.9%	48.8%	48.1%	27.7%	1.7%
DOCSIS 1 - 1.1 - 2.0	2.5%	2.5%	2.4%	2.1%	0.9%	0.7%	0.5%	0.0%
Cable Other	1.5%	1.4%	1.4%	1.3%	0.8%	0.6%	0.3%	0.0%
Terrestrial Fixed Wireless	38.9%	38.4%	33.6%	24.3%	10.6%	2.8%	1.4%	0.1%
Satellite	100.0%	100.0%	100.0%	100.0%	16.8%	0.0%	0.0%	0.0%

Nonrural Areas

Technology	Nonrural HU Any Speed	Nonrural HU > 768 K DL / 200 K UL	Nonrural HU > 3 M DL / 768 K UL	Nonrural HU > 10 M DL / 1 M UL	Nonrural HU > 25 M DL / 3 M UL	Nonrural HU > 50 M DL / 5 M UL	Nonrural HU > 100 M DL / 10 M UL	Nonrural HU >1 gbps DL
Any Fixed Technology Except Satellite	99.4%	99.4%	99.3%	98.8%	97.5%	96.7%	76.7%	10.2%
Any Wired Technology	99.0%	99.0%	98.8%	98.2%	97.1%	96.4%	76.4%	9.0%
Any Wired Technology Except Cable	95.7%	95.5%	88.8%	74.8%	56.5%	44.6%	23.6%	6.2%
DSL	91.3%	90.9%	82.7%	62.4%	37.0%	26.3%	4.7%	0.1%
Asymmetric xDSL	70.5%	69.9%	54.9%	15.5%	3.6%	0.9%	0.0%	0.1%
ADSL2	32.3%	32.0%	26.3%	18.1%	1.7%	0.0%	0.0%	0.0%
VDSL	43.0%	43.4%	40.3%	37.9%	33.6%	25.4%	4.6%	0.0%
Symmetric xDSL	0.7%	0.7%	0.3%	0.2%	0.1%	0.0%	0.0%	0.0%
Copper	2.5%	2.5%	2.3%	2.1%	0.2%	0.2%	0.1%	0.0%
Fiber	25.4%	25.4%	25.4%	25.4%	24.6%	20.0%	19.4%	6.1%
Cable	96.5%	96.5%	96.4%	96.4%	95.9%	95.4%	73.7%	2.9%
DOCSIS 3.0	95.9%	95.9%	95.9%	95.8%	95.5%	95.2%	73.7%	2.9%
DOCSIS 1 - 1.1 - 2.0	2.1%	2.1%	2.0%	2.0%	1.6%	0.5%	0.4%	0.0%
Cable Other	0.8%	0.8%	0.8%	0.7%	0.7%	0.5%	0.3%	0.0%
Terrestrial Fixed Wireless	35.6%	35.4%	34.0%	29.2%	16.0%	7.7%	4.6%	1.2%
Satellite	100.0%	100.0%	100.0%	100.0%	22.4%	0.0%	0.0%	0.0%

Source: FCC, USTelecom, and Telcodata CensusNBM.com

Appendix B – Mid 2016 Broadband Availability by Housing Units, Download Only

US Broadaband Availability by Technology and Speed, Mid-Year 2016, Download Speeds Only (Percentage of Housing Units)

All Areas

Technology	Total HU Any Speed	Total HU >768 kbps DL	Total HU >1.5 mbps DL	Total HU >3 mbps DL	Total HU >6 mbps DL	Total HU >10 mbps DL	Total HU >25 mbps DL	Total HU >50 mbps DL	Total HU >100 mbps DL	Total HU >1 gbps DL
Any Fixed Technology Except Satellite	98.1%	98.0%	97.6%	97.4%	96.6%	95.4%	91.1%	89.0%	76.5%	9.6%
Any Wired Technology	96.3%	96.3%	95.7%	95.3%	94.7%	93.4%	89.9%	88.5%	76.2%	8.6%
Any Wired Technology Except Cable	92.2%	92.2%	88.3%	85.3%	81.8%	71.3%	52.6%	39.9%	21.3%	6.0%
DSL	87.8%	87.8%	83.6%	79.7%	73.0%	60.4%	35.7%	23.6%	4.5%	0.1%
Asymmetric xDSL	66.1%	65.5%	56.1%	52.1%	44.2%	15.1%	4.2%	1.4%	0.5%	0.1%
ADSL2	34.6%	34.5%	29.9%	28.9%	26.9%	21.6%	6.2%	0.1%	0.0%	0.0%
VDSL	37.5%	37.5%	37.2%	34.8%	34.7%	32.8%	29.9%	22.1%	3.9%	0.0%
Symmetric xDSL	0.8%	0.8%	0.7%	0.4%	0.3%	0.3%	0.1%	0.0%	0.0%	0.0%
Copper	2.3%	2.3%	2.1%	2.0%	1.9%	1.9%	0.3%	0.2%	0.1%	0.0%
Fiber	22.7%	22.7%	22.7%	22.7%	22.7%	22.7%	21.9%	18.0%	17.3%	6.0%
Cable	87.2%	87.2%	87.2%	87.2%	87.1%	87.1%	86.3%	85.9%	73.5%	2.7%
DOCSIS 3.0	86.3%	86.3%	86.3%	86.3%	86.2%	86.2%	85.8%	85.5%	73.3%	2.7%
DOCSIS 1 - 1.1 - 2.0	2.1%	2.1%	2.1%	2.1%	2.1%	2.0%	1.4%	0.5%	0.4%	0.0%
Cable Other	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.7%	0.7%	0.4%	0.0%
Terrestrial Fixed Wireless	36.3%	36.0%	34.2%	34.0%	30.4%	28.2%	14.9%	6.7%	3.9%	1.0%
Satellite	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	21.2%	0.0%	0.0%	0.0%

Rural Areas

Technology	Any Speed	>768 kbps DL	>1.5 mbps DL	>3 mbps DL	>6 mbps DL	>10 mbps DL	>25 mbps DL	>50 mbps DL	>100 mbps DL	>1 gbps DL
Any Fixed Technology Except Satellite	92.9%	92.7%	91.1%	90.2%	86.8%	82.6%	66.3%	59.1%	44.6%	7.1%
Any Wired Technology	86.1%	86.0%	83.8%	82.3%	79.7%	75.2%	62.0%	58.0%	44.0%	7.0%
Any Wired Technology Except Cable	79.2%	79.0%	73.7%	70.6%	65.1%	54.7%	27.4%	19.7%	11.3%	5.4%
DSL	75.0%	74.8%	69.2%	65.8%	59.2%	48.0%	17.9%	10.1%	2.3%	0.0%
Asymmetric xDSL	49.4%	48.8%	42.5%	39.0%	31.9%	13.3%	4.6%	3.1%	1.2%	0.0%
ADSL2	43.1%	42.9%	37.5%	36.5%	34.6%	29.3%	5.8%	0.3%	0.0%	0.0%
VDSL	16.7%	16.7%	16.5%	15.1%	14.9%	13.6%	10.3%	6.9%	1.2%	0.0%
Symmetric xDSL	1.0%	1.0%	0.8%	0.7%	0.5%	0.5%	0.3%	0.1%	0.1%	0.0%
Copper	1.5%	1.5%	1.1%	1.1%	1.1%	0.9%	0.4%	0.4%	0.0%	0.0%
Fiber	12.6%	12.6%	12.6%	12.5%	12.5%	12.5%	11.3%	10.5%	9.1%	5.4%
Cable	52.5%	52.5%	52.5%	52.5%	52.1%	51.9%	50.2%	49.3%	38.2%	1.7%
DOCSIS 3.0	50.2%	50.2%	50.2%	50.2%	50.0%	49.9%	49.2%	48.6%	37.9%	1.7%
DOCSIS 1 - 1.1 - 2.0	2.5%	2.5%	2.5%	2.4%	2.3%	2.1%	0.9%	0.8%	0.5%	0.0%
Cable Other	1.5%	1.4%	1.4%	1.4%	1.4%	1.3%	1.0%	0.8%	0.4%	0.0%
Terrestrial Fixed Wireless	38.9%	38.4%	34.4%	33.7%	28.1%	24.3%	10.7%	3.0%	1.4%	0.1%
Satellite	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	16.8%	0.0%	0.0%	0.0%

Nonrural Areas

Technology	Any Speed	>768 kbps DL	>1.5 mbps DL	>3 mbps DL	>6 mbps DL	>10 mbps DL	>25 mbps DL	>50 mbps DL	>100 mbps DL	>1 gbps DL
Any Fixed Technology Except Satellite	99.4%	99.4%	99.3%	99.3%	99.2%	98.9%	97.7%	96.9%	85.0%	10.2%
Any Wired Technology	99.0%	99.0%	98.9%	98.8%	98.7%	98.2%	97.3%	96.6%	84.8%	9.0%
Any Wired Technology Except Cable	95.7%	95.7%	92.2%	89.3%	86.2%	75.7%	59.4%	45.3%	24.0%	6.2%
DSL	91.3%	91.2%	87.4%	83.4%	76.7%	63.7%	40.5%	27.1%	5.0%	0.1%
Asymmetric xDSL	70.5%	70.0%	59.8%	55.6%	47.5%	15.6%	4.1%	0.9%	0.3%	0.1%
ADSL2	32.3%	32.3%	27.9%	26.9%	24.8%	19.6%	6.3%	0.1%	0.0%	0.0%
VDSL	43.0%	43.0%	42.7%	40.0%	39.9%	37.9%	35.1%	26.2%	4.6%	0.0%
Symmetric xDSL	0.7%	0.7%	0.7%	0.3%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%
Copper	2.5%	2.5%	2.3%	2.3%	2.2%	2.1%	0.2%	0.2%	0.1%	0.0%
Fiber	25.4%	25.4%	25.4%	25.4%	25.4%	25.4%	24.7%	20.0%	19.5%	6.1%
Cable	96.5%	96.5%	96.5%	96.5%	96.4%	96.4%	96.0%	95.7%	82.9%	2.9%
DOCSIS 3.0	95.9%	95.9%	95.9%	95.9%	95.8%	95.8%	95.6%	95.3%	82.7%	2.9%
DOCSIS 1 - 1.1 - 2.0	2.1%	2.1%	2.1%	2.1%	2.0%	2.0%	1.6%	0.5%	0.4%	0.0%
Cable Other	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.7%	0.6%	0.4%	0.0%
Terrestrial Fixed Wireless	35.6%	35.3%	34.1%	34.0%	31.0%	29.2%	16.0%	7.7%	4.6%	1.2%
Satellite	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	22.4%	0.0%	0.0%	0.0%

Source: FCC, USTelecom, and Telcodata CensusNBM.com

Appendix C – Mid 2016 Broadband Availability by Population, Download and Upload

US Broadaband Availability by Technology and Speed, Mid-Year 2016, Selected Download and Upload Speeds (Percentage of Population)

All Areas

Technology	Total Pop Any Speed	Total Pop > 768 K DL / 200 K UL	Total Pop > 3 M DL / 768 K UL	Total Pop > 10 M DL / 1 M UL	Total Pop > 25 M DL / 3 M UL	Total Pop > 50 M DL / 5 M UL	Total Pop > 100 M DL / 10 M UL	Total Pop >1 gbps DL
Any Fixed Technology Except Satellite	98.3%	98.2%	97.5%	95.4%	91.1%	89.4%	69.1%	9.4%
Any Wired Technology	96.6%	96.3%	95.4%	93.2%	89.9%	88.9%	68.7%	8.5%
Any Wired Technology Except Cable	92.5%	91.9%	84.9%	70.0%	50.6%	40.1%	21.2%	6.0%
DSL	87.9%	87.4%	78.9%	58.2%	32.8%	23.2%	3.9%	0.1%
Asymmetric xDSL	66.6%	65.5%	51.5%	14.7%	3.8%	1.3%	0.0%	0.1%
ADSL2	33.7%	33.1%	27.3%	18.5%	1.7%	0.1%	0.0%	0.0%
VDSL	38.3%	38.3%	35.6%	33.5%	29.1%	21.9%	3.9%	0.0%
Symmetric xDSL	0.8%	0.8%	0.3%	0.2%	0.1%	0.0%	0.0%	0.0%
Copper	2.1%	2.1%	1.9%	1.8%	0.3%	0.2%	0.0%	0.0%
Fiber	23.2%	23.2%	23.2%	23.2%	22.4%	18.4%	17.7%	5.9%
Cable	88.1%	88.1%	88.1%	88.0%	87.1%	86.6%	65.4%	2.6%
DOCSIS 3.0	87.2%	87.2%	87.2%	87.2%	86.7%	86.3%	65.3%	2.6%
DOCSIS 1 - 1.1 - 2.0	1.9%	1.9%	1.9%	1.8%	1.3%	0.5%	0.4%	0.0%
Cable Other	0.9%	0.9%	0.9%	0.9%	0.7%	0.5%	0.3%	0.0%
Terrestrial Fixed Wireless	36.8%	36.5%	34.6%	28.9%	15.3%	6.8%	3.8%	0.9%
Satellite	100.0%	100.0%	100.0%	100.0%	21.7%	0.0%	0.0%	0.0%

Rural Areas

Technology	Rural Pop Any Speed	Rural Pop > 768 K DL / 200 K UL	Rural Pop > 3 M DL / 768 K UL	Rural Pop > 10 M DL / 1 M UL	Rural Pop > 25 M DL / 3 M UL	Rural Pop > 50 M DL / 5 M UL	Rural Pop > 100 M DL / 10 M UL	Rural Pop >1 gbps DL
Any Fixed Technology Except Satellite	93.5%	93.1%	90.2%	81.5%	65.2%	59.5%	36.3%	7.2%
Any Wired Technology	86.6%	85.5%	81.6%	73.1%	60.4%	58.3%	35.5%	7.0%
Any Wired Technology Except Cable	79.6%	77.8%	69.0%	49.4%	22.6%	19.5%	10.2%	5.3%
DSL	75.2%	73.4%	63.9%	42.0%	12.6%	10.0%	1.4%	0.0%
Asymmetric xDSL	49.8%	47.6%	37.5%	12.6%	3.5%	3.0%	0.0%	0.0%
ADSL2	42.8%	40.9%	34.7%	22.6%	0.6%	0.3%	0.0%	0.0%
VDSL	17.1%	17.0%	15.1%	13.5%	8.7%	6.8%	1.2%	0.0%
Symmetric xDSL	0.9%	0.9%	0.6%	0.5%	0.2%	0.1%	0.1%	0.0%
Copper	1.4%	1.4%	1.1%	0.9%	0.5%	0.4%	0.0%	0.0%
Fiber	12.7%	12.7%	12.6%	12.6%	11.3%	10.4%	9.0%	5.3%
Cable	53.8%	53.8%	53.6%	53.2%	51.1%	50.1%	29.4%	1.8%
DOCSIS 3.0	51.6%	51.6%	51.4%	51.3%	50.3%	49.6%	29.2%	1.8%
DOCSIS 1 - 1.1 - 2.0	2.4%	2.4%	2.3%	2.1%	0.9%	0.8%	0.5%	0.0%
Cable Other	1.5%	1.5%	1.4%	1.3%	0.8%	0.6%	0.3%	0.0%
Terrestrial Fixed Wireless	40.2%	39.7%	35.1%	25.5%	11.1%	3.0%	1.4%	0.1%
Satellite	100.0%	100.0%	100.0%	100.0%	17.0%	0.0%	0.0%	0.0%

Nonrural Areas

Technology	Nonrural Pop Any Speed	Nonrural Pop > 768 K DL / 200 K UL	Nonrural Pop > 3 M DL / 768 K UL	Nonrural Pop > 10 M DL / 1 M UL	Nonrural Pop > 25 M DL / 3 M UL	Nonrural Pop > 50 M DL / 5 M UL	Nonrural Pop > 100 M DL / 10 M UL	Nonrural Pop >1 gbps DL
Any Fixed Technology Except Satellite	99.4%	99.4%	99.2%	98.7%	97.4%	96.6%	76.9%	9.9%
Any Wired Technology	98.9%	98.9%	98.7%	98.0%	96.9%	96.3%	76.6%	8.8%
Any Wired Technology Except Cable	95.5%	95.3%	88.7%	74.9%	57.3%	45.0%	23.9%	6.1%
DSL	91.0%	90.7%	82.4%	62.0%	37.7%	26.4%	4.6%	0.1%
Asymmetric xDSL	70.6%	69.8%	54.8%	15.2%	3.9%	0.9%	0.0%	0.1%
ADSL2	31.5%	31.2%	25.5%	17.5%	1.9%	0.0%	0.0%	0.0%
VDSL	43.4%	43.4%	40.4%	38.3%	34.0%	25.5%	4.5%	0.0%
Symmetric xDSL	0.7%	0.7%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%
Copper	2.3%	2.3%	2.1%	2.0%	0.2%	0.2%	0.1%	0.0%
Fiber	25.7%	25.7%	25.7%	25.7%	25.0%	20.3%	19.7%	6.0%
Cable	96.3%	96.3%	96.3%	96.3%	95.7%	95.3%	74.0%	2.8%
DOCSIS 3.0	95.8%	95.8%	95.7%	95.7%	95.4%	95.1%	73.9%	2.8%
DOCSIS 1 - 1.1 - 2.0	1.8%	1.8%	1.8%	1.8%	1.3%	0.5%	0.4%	0.0%
Cable Other	0.8%	0.8%	0.8%	0.7%	0.7%	0.5%	0.3%	0.0%
Terrestrial Fixed Wireless	36.0%	35.7%	34.5%	29.7%	16.3%	7.7%	4.4%	1.1%
Satellite	100.0%	100.0%	100.0%	100.0%	22.9%	0.0%	0.0%	0.0%

Source: FCC, USTelecom, and Telcodata CensusNBM.com

Appendix D – Mid 2016 Broadband Availability by Population, Download Only

US Broadaband Availability by Technology and Speed, Mid-Year 2016, Download Speeds Only (Percentage of Population)

All Areas

Technology	Total Pop Any Speed	Total Pop >768 kbps DL	Total Pop >1.5 mbps DL	Total Pop >3 mbps DL	Total Pop >6 mbps DL	Total Pop >10 mbps DL	Total Pop >25 mbps DL	Total Pop >50 mbps DL	Total Pop >100 mbps DL	Total Pop >1 gbps DL
Any Fixed Technology Except Satellite	98.3%	98.2%	97.9%	97.7%	96.9%	95.8%	91.7%	89.8%	77.5%	9.4%
Any Wired Technology	96.6%	96.5%	96.0%	95.6%	95.0%	93.8%	90.5%	89.3%	77.3%	8.5%
Any Wired Technology Except Cable	92.5%	92.4%	88.6%	85.6%	82.1%	71.6%	53.8%	40.7%	21.7%	6.0%
DSL	87.9%	87.9%	83.7%	79.7%	72.9%	60.1%	36.5%	23.8%	4.4%	0.1%
Asymmetric xDSL	66.6%	57.0%	56.3%	52.3%	44.3%	15.0%	4.5%	1.3%	0.5%	0.1%
ADSL2	33.7%	29.4%	29.0%	28.0%	26.0%	20.8%	6.0%	0.1%	0.0%	0.0%
VDSL	38.3%	38.0%	38.0%	35.6%	35.5%	33.5%	30.6%	22.5%	3.9%	0.0%
Symmetric xDSL	0.8%	0.7%	0.7%	0.3%	0.3%	0.2%	0.1%	0.0%	0.0%	0.0%
Copper	2.1%	2.1%	1.9%	1.9%	1.8%	1.8%	0.3%	0.2%	0.0%	0.0%
Fiber	23.2%	23.2%	23.2%	23.2%	23.2%	23.2%	22.4%	18.4%	17.8%	5.9%
Cable	88.1%	88.1%	88.1%	88.1%	88.0%	88.0%	87.3%	86.9%	74.7%	2.6%
DOCSIS 3.0	87.2%	87.2%	87.2%	87.2%	87.2%	87.2%	86.8%	86.5%	74.5%	2.6%
DOCSIS 1 - 1.1 - 2.0	1.9%	1.9%	1.9%	1.9%	1.9%	1.8%	1.3%	0.5%	0.4%	0.0%
Cable Other	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.7%	0.7%	0.4%	0.0%
Terrestrial Fixed Wireless	36.8%	36.5%	34.8%	34.6%	31.0%	28.9%	15.3%	6.8%	3.8%	0.9%
Satellite	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	21.7%	0.0%	0.0%	0.0%

Rural Areas

Technology	Any Speed	>768 kbps DL	>1.5 mbps DL	>3 mbps DL	>6 mbps DL	>10 mbps DL	>25 mbps DL	>50 mbps DL	>100 mbps DL	>1 gbps DL
Any Fixed Technology Except Satellite	93.5%	93.4%	91.9%	91.0%	87.7%	83.5%	67.5%	60.4%	45.7%	7.2%
Any Wired Technology	86.6%	86.4%	84.1%	82.7%	80.2%	75.7%	62.9%	59.1%	45.1%	7.0%
Any Wired Technology Except Cable	79.6%	79.4%	73.9%	70.7%	65.2%	54.6%	27.5%	20.0%	11.4%	5.3%
DSL	75.2%	75.0%	69.2%	65.7%	59.0%	47.6%	17.8%	10.2%	2.4%	0.0%
Asymmetric xDSL	49.8%	44.6%	42.7%	39.3%	32.1%	13.3%	4.6%	3.0%	1.2%	0.0%
ADSL2	42.8%	38.6%	37.0%	36.0%	34.1%	28.7%	5.6%	0.3%	0.0%	0.0%
VDSL	17.1%	16.8%	16.8%	15.2%	15.1%	13.6%	10.4%	7.0%	1.2%	0.0%
Symmetric xDSL	0.9%	0.9%	0.8%	0.6%	0.5%	0.5%	0.2%	0.1%	0.1%	0.0%
Copper	1.4%	1.4%	1.1%	1.1%	1.1%	0.9%	0.5%	0.4%	0.0%	0.0%
Fiber	12.7%	12.7%	12.7%	12.6%	12.6%	12.6%	11.4%	10.6%	9.2%	5.3%
Cable	53.8%	53.8%	53.8%	53.7%	53.4%	53.2%	51.6%	50.8%	39.5%	1.8%
DOCSIS 3.0	51.6%	51.6%	51.6%	51.6%	51.4%	51.3%	50.6%	50.0%	39.1%	1.8%
DOCSIS 1 - 1.1 - 2.0	2.4%	2.4%	2.4%	2.4%	2.2%	2.1%	0.9%	0.8%	0.5%	0.0%
Cable Other	1.5%	1.5%	1.4%	1.4%	1.4%	1.3%	1.0%	0.8%	0.5%	0.0%
Terrestrial Fixed Wireless	40.2%	39.7%	35.9%	35.3%	29.3%	25.5%	11.2%	3.2%	1.4%	0.1%
Satellite	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	17.0%	0.0%	0.0%	0.0%

Nonrural Areas

Technology	Any Speed	>768 kbps DL	>1.5 mbps DL	>3 mbps DL	>6 mbps DL	>10 mbps DL	>25 mbps DL	>50 mbps DL	>100 mbps DL	>1 gbps DL
Any Fixed Technology Except Satellite	99.4%	99.4%	99.3%	99.3%	99.1%	98.8%	97.5%	96.8%	85.1%	9.9%
Any Wired Technology	98.9%	98.9%	98.8%	98.7%	98.6%	98.1%	97.1%	96.5%	84.9%	8.8%
Any Wired Technology Except Cable	95.5%	95.5%	92.1%	89.2%	86.1%	75.7%	60.0%	45.7%	24.2%	6.1%
DSL	91.0%	90.9%	87.1%	83.0%	76.2%	63.0%	40.9%	27.1%	4.8%	0.1%
Asymmetric xDSL	70.6%	59.9%	59.6%	55.4%	47.2%	15.4%	4.4%	0.9%	0.3%	0.1%
ADSL2	31.5%	27.3%	27.0%	26.1%	24.0%	18.9%	6.1%	0.1%	0.0%	0.0%
VDSL	43.4%	43.0%	43.0%	40.5%	40.4%	38.3%	35.5%	26.2%	4.5%	0.0%
Symmetric xDSL	0.7%	0.7%	0.7%	0.2%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%
Copper	2.3%	2.3%	2.1%	2.1%	2.0%	2.0%	0.2%	0.2%	0.1%	0.0%
Fiber	25.7%	25.7%	25.7%	25.7%	25.7%	25.7%	25.1%	20.3%	19.8%	6.0%
Cable	96.3%	96.3%	96.3%	96.3%	96.3%	96.3%	95.8%	95.6%	83.1%	2.8%
DOCSIS 3.0	95.8%	95.8%	95.7%	95.7%	95.7%	95.7%	95.5%	95.2%	83.0%	2.8%
DOCSIS 1 - 1.1 - 2.0	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.3%	0.5%	0.4%	0.0%
Cable Other	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.7%	0.6%	0.4%	0.0%
Terrestrial Fixed Wireless	36.0%	35.7%	34.6%	34.5%	31.4%	29.7%	16.3%	7.7%	4.4%	1.1%
Satellite	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	22.9%	0.0%	0.0%	0.0%

Source: FCC, USTelecom, and Telcodata CensusNBM.com