U.S. BROADBAND AVAILABILITY: JUNE 2010 – JUNE 2012

A Broadband Brief

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About the *Broadband Briefs* Series

This report on the availability of broadband, authored by the National Telecommunications and Information Administration (NTIA), is the first in a series of Broadband Briefs that uses publicly available data collected by the Department of Commerce to examine broadband availability in greater detail. The U.S. Department of Commerce publishes key economic and demographic data that support effective decision-making by policymakers, businesses, and the American public. Information and Communications Technology is critical to economic growth and the Department plays a leading role in this area by overseeing programs that expand broadband access and adoption and also measure current availability and adoption across the country. The Department makes data available from its broadband-related programs—including the Broadband Technology Opportunities Program (BTOP), the State Broadband Initiative (SBI), and the Current Population Survey (CPS) Computer and Internet Use Supplement—for use by researchers and the public to conduct economic, financial, demographic, and other studies. In addition, the Department conducts its own research and analysis to further examine the availability of broadband and the factors associated with increased broadband deployment.

This report uses current data from the June 30, 2012 State Broadband Initiative (SBI) dataset, which is the same data that populates the National Broadband Map (NBM), as well as historical data from June 2010 and June 2011. NTIA, in collaboration with the FCC, and in partnership with the 50 states, five territories and the District of Columbia, updates the SBI data and publishes the NBM twice a year. Each state, or its designee, collects broadband data by census block or road segment. More information about data collection, verification, and publication is available in the About section of the NBM. All data are publicly available in the Analyze, Developer or Data Download sections of the NBM and all previous datasets are also available on NTIA's website. The description of how NTIA and the FCC process these data is available on the Technical Overview section of the National Broadband Map.

Data Definitions Used in this Report

NTIA's broadband availability dataset contains, among other information, advertised speeds at the census block level. In census blocks larger than two square miles, the data is collected by road segment. For the purposes of NTIA's data collection, broadband is "available" if it can be deployed to a business or consumer within 7-10 business days and without an extraordinary commitment of resources. This definition is in contrast to "adoption," which means that a consumer or business subscribes to or uses broadband at a particular location. The definition of broadband does not specifically include price, latency, bandwidth limitations, or other factors that may impact a user's ability to purchase or use the service.

This report examines broadband availability, from the most basic speed levels, which allow a user to access several basic web tools, to the fastest speeds, for which developers are now beginning to design applications. NTIA begins its analysis at the combined advertised connection of 3 Mbps downstream and 768 kbps upstream, which is the closest combination of speeds for which NTIA collects data that would allow a consumer to "access a basic set of applications that include sending and receiving e-mail, downloading Web pages, photos and video, and using simple video conferencing."[7] Downstream speed measures the rate at which a user can download data from the Internet, including viewing Web pages, receiving emails, or downloading music. Upstream speed measures the rate at which a user can upload data to the Internet, including sending email messages and files. The report also assesses broadband availability at seven download speed tiers, as follows:

- ≥ 3 Mbps and < 6 Mbps;
- ≥ 6 Mbps and < 10 Mbps
- ≥ 10 Mbps and < 25 Mbps
- ≥ 25 Mbps and < 50 Mbps
- ≥ 50 Mbps and < 100 Mbps
- ≥ 100 Mbps and < 1 Gbps
- ≥ 1 Gbps

While the basic speed combination of 3 Mbps/768 kbps allows a consumer to access a basic set of applications, many institutions, such as schools and libraries, and applications, such as distance learning, telemedicine, and high quality video conferencing, require much faster speeds. For example, a November 2010 report published for the U.S. Small Business Administration found that distance learning and telecommuting activities require download speeds of at least 25 Mbps in order for a single user to

[7] Federal Communications Commission. "National Broadband Plan." March 2010. Accessed April 2013. http://www.broadband.gov/plan/8-availability/. The National Broadband Plan calls for actual speeds of 4 Mbps downstream and 1 Mbps upstream. The advertised speed of 3 Mbps downstream and 768 kbps upstream is slower than this benchmark and readers should also consider the availability of at least 6 Mbps as a proxy for a service that is slightly higher than this minimum.

have an "OK" experience, and 50 Mbps for a "Good" experience.[8] In addition, if more than one person shares a connection (for example, two parents and two children in one household), the group will need greater bandwidth to maintain the same experience level that a single user has over the same connection. As households use one device to watch a video and another to comment or take notes through a virtual desktop, they require faster speeds. The speed tiers for which NTIA collects data reflect service levels available to users today.[9] Already, in limited areas, broadband providers are starting to offer super-fast speeds from hundreds of megabits per second to a gigabit per second. For example, in Kansas City, Missouri, Google is deploying gigabit services and recently announced plans for a similar rollout in Austin, Texas.[10] In June 2012, Verizon announced that it would offer a 300 Mbps service over its network.[11] EPB, the local electric company in Chattanooga, Tennessee, also offers broadband service up to 1 Gbps.[12] These speeds may be faster than many users need today, but just as the country advanced from using dial-up speeds to broadband, data trends suggest that the need and demand for faster broadband speeds is growing. For example, in August 2000, only 4.4 percent of households had a home connection to broadband – then considered 200 kbps – but 41.5 percent of households had adopted dial-up connections, at either 28.8 kbps or 56 kbps. In just 10 years, dial-up subscribers declined to 2.8 percent of households in 2010. By contrast, 68.2 percent of households were subscribed to broadband service in that same year.[13]

[8] U.S. Small Business Administration, Office of Advocacy, The Impact of Broadband Speed and Price on Small Business, Columbia Telecommunications Corporation, November 2010. Accessed April 2012. http://archive.sba.gov/advo/research/rs373tot.pdf.

[9] NTIA expects that, in the future, it will be important to disaggregate faster speed tiers in order to reflect the changing availability of broadband services.

[10] Finley, Klint. "Google's Super-Speed Internet Will Hit Austin in 2014." Wired.com. April 9, 2013. Accessed April 10, 2013. http://www.wired.com/wiredenterprise/2013/04/google-fiber-austin-official/.

[11] Stacey Higginbotham. "Why you will need a 300 Mbps broadband connection." Gigaom. June 22, 2012. Accessed April 10, 2013. http://gigaom.com/2012/06/22/why-you-will-need-a-300-mbps-broadband-connection/.

[12] See https://epbfi.com/internet/.

[13] National Telecommunications and Information Administration. "Digital Nation, Expanding Internet Access, NTIA Research Preview." February 2011. Accessed April 11, 2013. http://www.ntia.doc.gov/files/ntia/publications/ntia_internet_use_report_february_2011.pdf.

Broadband Availability as of June 30, 2012

In 2010, when NTIA began collecting broadband availability data, the most basic broadband speeds – the combination of 3 Mbps downstream and 768 kbps upstream – were widely available across the country. Today, basic broadband services are even more widely available and are now nearly universal in many urban areas. In rural communities, there was and still is significantly less available broadband compared to urban areas. Similarly, some counties and states have persistently had less broadband availability than their peers. Across the country, broadband availability at higher speed levels has increased significantly, although these increases are in the tiers that had the most room to grow. Moreover, far fewer providers offer broadband service at faster speeds tiers, particularly those at or greater than 25 Mbps resulting in less availability and less choice among service providers than is available at slower speed tiers. In fact, while broadband providers use a variety of technologies, including mobile and fixed wireless, DSL, and copper, to provide broadband service at slower speed tiers, broadband service for speeds at or above 25 Mbps is offered almost exclusively through cable and fiber to the premises.

- ***Basic Availability:*** Ninety-eight percent of Americans have access to wired or wireless broadband at combined advertised download speeds of 3 Mbps or greater and upload speeds of 768 kbps or greater (referred to as 3/768 here).
- ***Wireline:*** Just over 93% of Americans have access to advertised wireline broadband at speeds of at least 3/768, and almost 93% of Americans have access to at least 6 Mbps. Ninety-one percent of Americans have access at 10 Mbps, but access drops to 78% at 25 Mbps.
- ***Wireless:*** Approximately 81% of Americans can access mobile wireless download speeds of 6 Mbps or greater. Nearly 26% of the population can access fixed wireless download speeds at 6 Mbps.
- ***Technologies:*** At 3/768, 87% of the population has access to broadband via cable, 74% through DSL and 20% through fiber to the premises. Thirty-four percent of the population has access to terrestrial fixed services at 3/768 and 92% has access to terrestrial mobile services at this speed tier. Cable is the primary technology that providers use to offer services of at least 25 Mbps or greater but less than 1 Gbps.
- ***Changes:*** Between June 2010 and June 2012, national broadband availability increased at all advertised speed levels. During both years, the greatest rates of change occurred in the higher speed tiers, beginning with the 25 Mbps or greater tier.
- ***Rural/Urban:*** Almost 100% of urban residents have access to download speeds of at least 6 Mbps, but only 82% of rural communities can access these speeds. Almost 88% percent of urban residents have access to speeds of 25 Mbps. Only 41% of rural residents, less than half those in urban communities, have the same access.
- ***States:*** At 10 Mbps or greater, the top 15 states all registered at least 97% of the population with access; the lowest state percentage in this category was 76%. At 25 Mbps or higher, the 15 states with the most access all reached at least 87% of their populations, while the state with the least access had, in fact, no access. Measured at 50 Mbps or faster, these top states each achieved at least 83% access, while the lowest state reading was, again, zero.
- ***Counties:*** In almost 59% (1,896) of U.S. counties, at least 95% of the population has access to speeds of 3/768; in 30% (976) of counties, at least 95% of the population has access to 10 Mbps or greater; and in just under 10% (317) of counties, at least 95% of the population has access at 25 Mbps.

Speed and Technology

Table 1: Percentage of U.S. Population with Access to Various Advertised Broadband Speeds (Mbps)

	≥ 3/768	≥ 6	≥ 10	≥25	≥ 50	≥ 100	≥ 1 Gbps
All Broadband	98.18%	96.17%	94.39%	78.51%	75.15%	47.09%	3.17%
Wireline	93.41%	92.81%	90.91%	78.11%	74.85%	46.87%	3.17%
Wireless	94.37%	84.17%	80.66%	4.94%	3.03%	1.80%	0.00%

Broadband at the basic speed combination of 3/768 is available to 98.18% of the population, and 94.39% of Americans can subscribe to services of at least 10 Mbps (see Table 1). Almost 17% fewer, or 78.51% of Americans, are able to subscribe to advertised broadband speeds of at least 25 Mbps. Availability drops again, by 37 percent, between access to 50 Mbps (75.15%) and 100 Mbps (47.09%). Speeds of 1 Gbps are available to only 3.17% of the population.

Broadband at the most basic speed combination is widely advertised by both wired and wireless providers (Table 2). As speeds increase, however, access to wireless technology decreases at a much faster rate than to wired access. This effect is a function of the capabilities of the types of technologies and results in an increasing gap in availability to wired and wireless technologies as speeds increase. For example, at the 3/768 tier, access to wired and wireless providers differs by one percentage point (93.41% and 94.37%, respectively).[14] At a download speed that is almost nine times faster, 25 Mbps, 78.11% of the population has access to wired broadband, but only 4.94% has access to these speeds through wireless services, all offered by providers utilizing fixed wireless technologies.

Table 2: Percentage of Population with Access to Broadband Speeds by Technology Type (Mbps)

	≥ 3/768	≥ 6	≥ 10	≥25	≥ 50	≥ 100	≥ 1 Gbps
Cable	86.92%	86.95%	86.15%	76.42%	72.63%	44.20%	0.00%
DSL	73.51%	64.60%	47.39%	7.21%	0.11%	0.01%	0.00%
Fiber	20.20%	20.00%	19.86%	18.72%	18.25%	6.79%	3.16%
Fixed Wireless	34.33%	25.81%	10.89%	4.88%	2.99%	1.78%	0.00%
Mobile Wireless	91.81%	80.58%	78.67%	0.00%	0.00%	0.00%	0.00%
Copper	43.25%	15.37%	14.59%	1.46%	0.27%	0.12%	0.01%

The distribution of technologies by speed further demonstrates that while broadband is accessible through multiple technologies at lower speeds, far fewer technologies offer faster speeds (Table 2).[15] For example, while cable (86.92%), DSL (73.51%), and mobile wireless (91.81%) are all widely available at basic broadband speeds, at 25 Mbps, only cable (76.42%) is widely available, followed next by fiber (18.72%). Mobile wireless providers serve 91.81% of the population at advertised speeds of 3/768, but

[14] Wireless broadband includes both fixed and mobile services.

[15] This graphic, available at http://ctcnet.us/DataSpeeds.jpg, provides a visual depiction of the speed capabilities of various types of broadband technology.

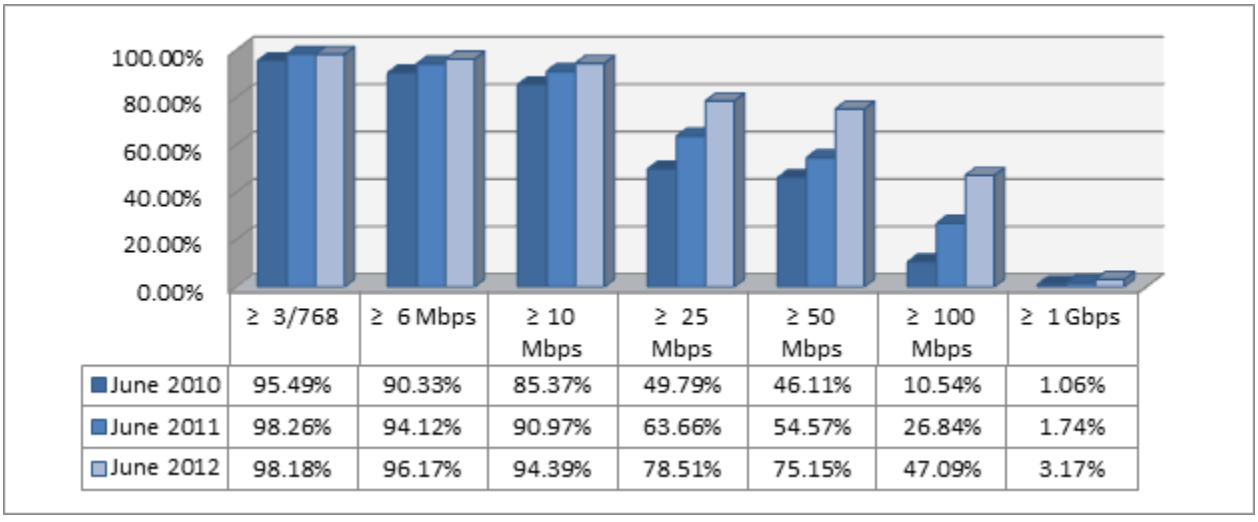
these providers do not even offer service at speeds of 25 Mbps. While it is a positive development that users often have the opportunity to choose between and among wired and wireless services at basic speeds, if a consumer or business wants faster speeds (at least 25 Mbps), they most often will only have a choice of a wireline product, and that wireline product is nearly always cable or fiber.

In addition, some providers specialize in service only to businesses or only to consumers. Thus, while they are "available," a consumer or business may not readily have access to these services. From a practical standpoint, customers often have access to multiple options for entry-level broadband service; however, these options decrease in number - often to just one provider - at higher speeds. Moreover, while increased access to higher speeds is undoubtedly positive for consumers, there are obviously other facets of supply and demand that stakeholders and many policymakers consider when evaluating the broadband opportunities for different communities. Among these are affordability, value, sustained quality of service, and maximum bandwidth allotments.

Changes in Availability: June 2010 - June 2012

In the two years since NTIA completed its first data collection, broadband availability has increased across all seven speed tiers (as described on page two of this report) with the fastest rates of growth occurring in the 25 Mbps or faster tiers. These are the speed tiers that, in June 2010, had the lowest rates of availability and, therefore, presented the greatest opportunity for growth. Below is a table displaying the percentage of the population with access to at least one provider in each speed tier in June 2010, 2011, and 2012:

Figure 1: All Broadband Availability by Speed: June 2010, June 2011, and June 2012



	≥ 3/768	≥ 6 Mbps	≥ 10 Mbps	≥ 25 Mbps	≥ 50 Mbps	≥ 100 Mbps	≥ 1 Gbps
June 2010	95.49%	90.33%	85.37%	49.79%	46.11%	10.54%	1.06%
June 2011	98.26%	94.12%	90.97%	63.66%	54.57%	26.84%	1.74%
June 2012	98.18%	96.17%	94.39%	78.51%	75.15%	47.09%	3.17%

In June 2010, 95.49% of Americans had access to a wired or wireless provider advertising the most basic broadband services (3/768); 90.33% had access to services of at least 6 Mbps; and 85.37% could purchase service at advertised speeds of at least 10 Mbps (Figure 1). Today, access to these advertised speeds ranges between 98.18% (3/768) and 94.39% (10 Mbps) of the population. Access to the most

basic speed combination is almost 3% higher today than in 2010. An additional 6.47% more of the population has access to 6 Mbps services today than in 2010, and 10.57% more has access to 10 Mbps service.

Figure 2 and Table 3, below, demonstrate the growth in broadband availability between June 2010 to June 2012. Three trends are clear: both wireline and wireless broadband availability increased significantly at a number of speed tiers; despite greater growth in wireless availability, the patterns of all broadband availability and wireline in both 2010 and 2012 are very close, and sometimes nearly identical; access to wireless broadband services increased dramatically in the last two years, but wireless speeds were, and remain, significantly lower than the fastest wired speeds.

Figure 2: Percentage of Population with Access to Wire line, Wireless, and All Broadband (June 2010 – 2012)

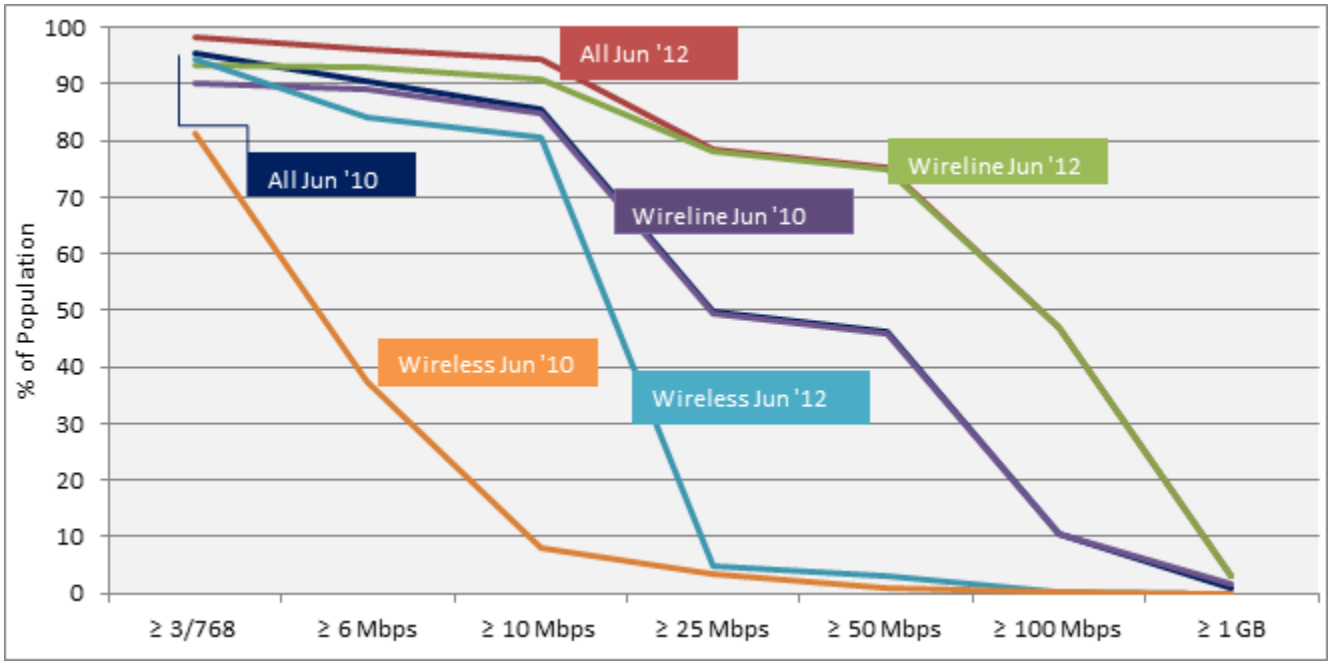


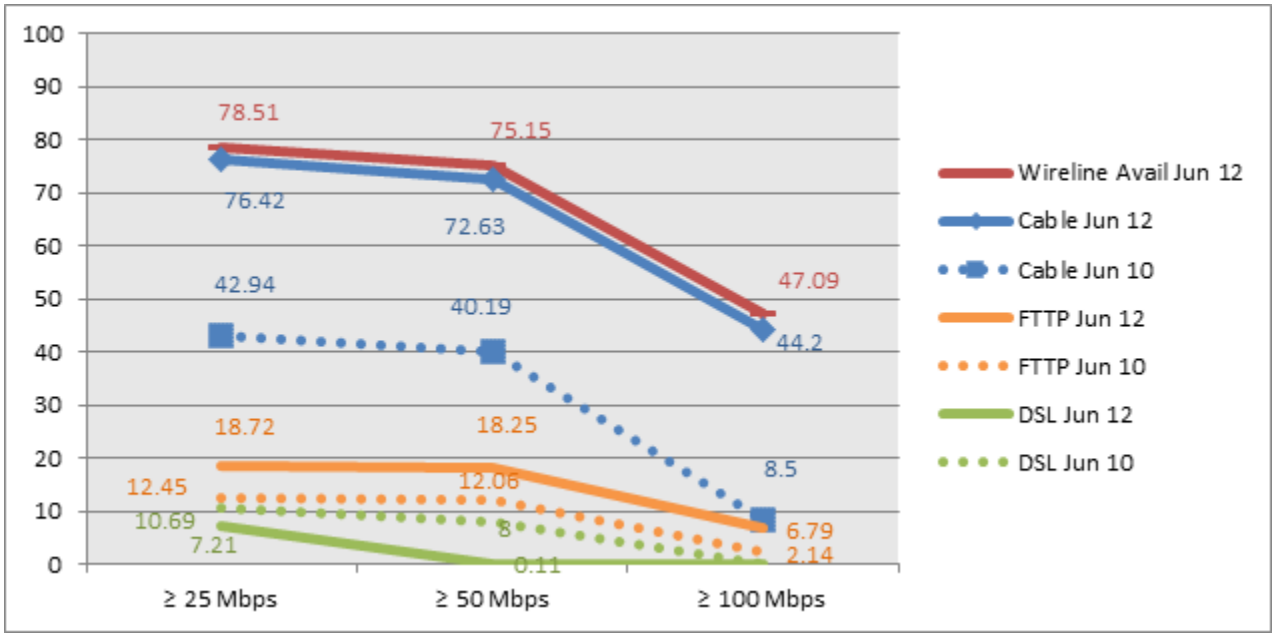
Table 3: Percentage of Population with Access to Broadband (All, Wireline, Wireless)

	≥ 3/768	≥ 6 Mbps	≥ 10 Mbps	≥ 25 Mbps	≥ 50 Mbps	≥ 100 Mbps	≥ 1 Gbps
All Jun 2012	98.18	96.17	94.39	78.51	75.15	47.09	3.17
All Jun 2010	95.49	90.33	85.37	49.79	46.11	10.54	1.06
Wireline Jun 12	93.41	92.81	90.91	78.11	74.85	46.87	3.17
Wireline Jun 10	90.25	89.08	84.81	49.31	45.90	10.36	1.74
Wireless Jun 12	94.37	84.17	80.66	4.94	3.03	0.18	0.00
Wireless Jun 10	81.33	37.50	7.86	3.36	1.12	0.18	0.00

Notwithstanding the significant increase in availability of wireless speeds across all speed tiers, overall broadband availability in 2012 tracks closely, and at some higher speeds, almost identically, with wireline broadband speeds. That the wireline and all broadband figures are so close indicates that there

are few locations where wireless broadband exists but wireline broadband does not. The near absence of wireless speeds at 25 Mbps or higher means that wireline broadband availability is never more than several tenths of a point less than all broadband, meaning that only several tenths of one percent of the entire population has access to wireless speeds where there is no wireline service. Below 25 Mbps in 2012 and 6 Mbps in 2010, a larger gap exists between wireline broadband service and all broadband, meaning that a larger share of the population has access to wireless broadband, but not wireline broadband, at these speed tiers. Though access to basic broadband has increased 2.7 percentage points since 2010, the gap between all broadband and wired broadband has remained about the same. Then and now, approximately 5% of the population lives in areas with basic wireless broadband service, but no wireline broadband service.

Figure 3: Broadband Availability by Wireline Technology at ≥ 25 Mbps (June 2010 vs. 2012)

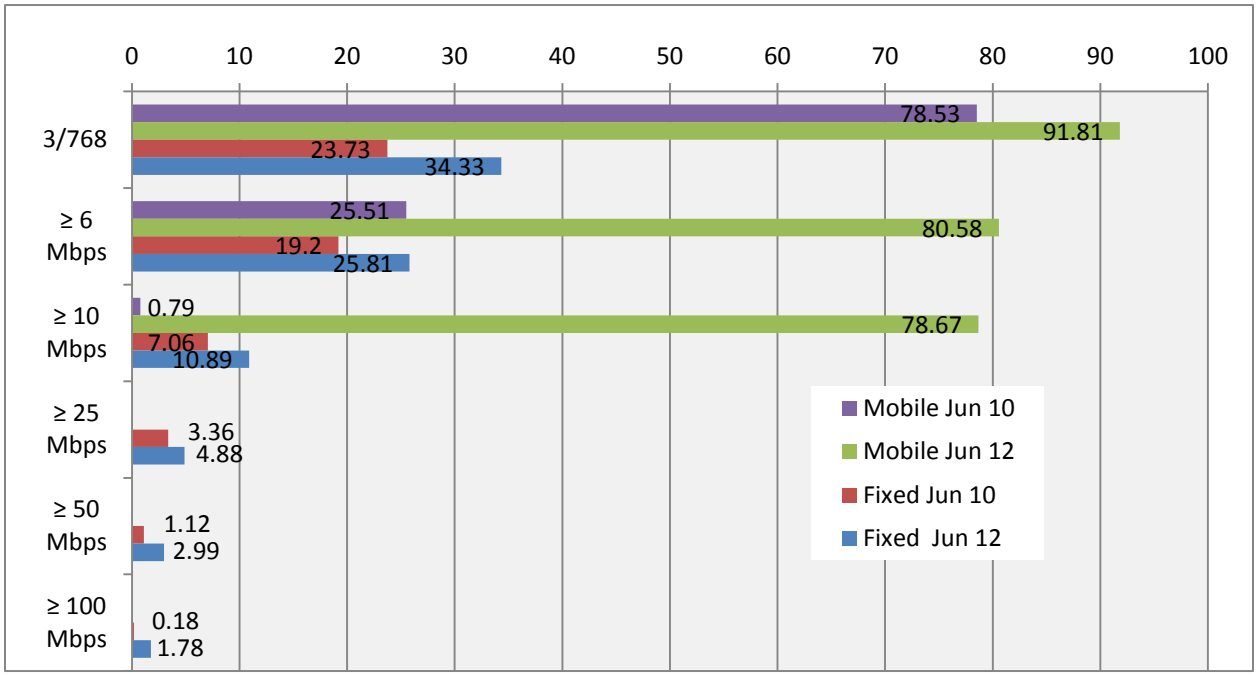


The increase in wireline speeds is primarily a result of an increase in cable speeds, followed by a much smaller increase in fiber deployment (see Figure 3). In the previous two years, cable availability at 25 Mbps has increased 78% (42.94% to 76.42%). At 50 Mbps, it has increased 81% (40.19 to 72.63) and at 100 Mbps or more, availability is 420% of what it was in 2010 (8.5% to 44.2%). As seen in Figure 3, cable availability, defined at these speeds by DOCSIS 3.0 deployment, is only a few percentage points less than total availability, and the gap between the share of the population with access to cable broadband at these speeds compared to other technologies is greater today than it was in 2010.[16] DSL coverage, in fact, actually declined between 2010 and 2012, some of which is attributable to corrections in reported speeds between data collections. Though the rate of increase for fiber to the premises (FTTP) deployment is significant (50% at 25 Mbps, 51% at 50 Mbps, and 217% at 100 Mbps), the total impact on

[16] DOCSIS 3.0 refers to Data Over Cable Service Interface Specifications. It is the current technological standard for cable modems and offers faster broadband service than older standards. See www.broadbandmap.gov/classroom/technology for definitions of other technology types.

broadband availability is less than cable's impact because FTTP had much lower rates of deployment. FTTP deployment ranged between 2.14% at 100 Mbps and 12.45% at 25 Mbps in 2010 and between 6.79% and 18.72% for the same speeds in 2012. FTTP, however, is responsible for all but one-tenth of the 3.17% of the population with access to speeds of 1 GB or more, a category that has seen a 199% increase since June 2010.[17] With the exception of gigabit speeds, however, cable is the primary technology that providers use to offer services of 25 Mbps or greater.[18] Moreover, across all speeds, cable overlaps the deployments of technologies other than cable to a very high degree. To view more information on the speeds and technologies available, visit the NBM's Technology by Speed report.

Figure 4: Percentage of Population with Access to Wireless Broadband Speeds (June 2010 vs. June 2012)



With the deployment of LTE and expansion of HSPA+, mobile wireless broadband service is also much more widely available today than it was two years ago.[19] The most recently available data (June 2012) indicate that 80.58% of Americans now have access to advanced mobile broadband, up from 25.51% (see Figure 4) in mid-2010, assuming that users of these services should be able to enjoy minimum

[17] While many FTTP services are marketed to residential customers, others are primarily intended for businesses. These services are included in this data collection because the service meets the definition of broadband set forth by NTIA for this program (see: http://www.ntia.doc.gov/files/ntia/publications/fr_broadbandmappingnofa_090708.pdf). Data users will see this difference indicated in some of the data available for download on state broadband maps developed by State Broadband Initiative (SBI) grantees. NTIA plans to work make this data more complete in the future.

[18] The NBM also includes data on copper networks, but the data is not displayed on this Table because at 25 Mbps only 1.5% of the population has access to the service. One-tenth of the population has access to gigabit speeds through copper-based technologies.

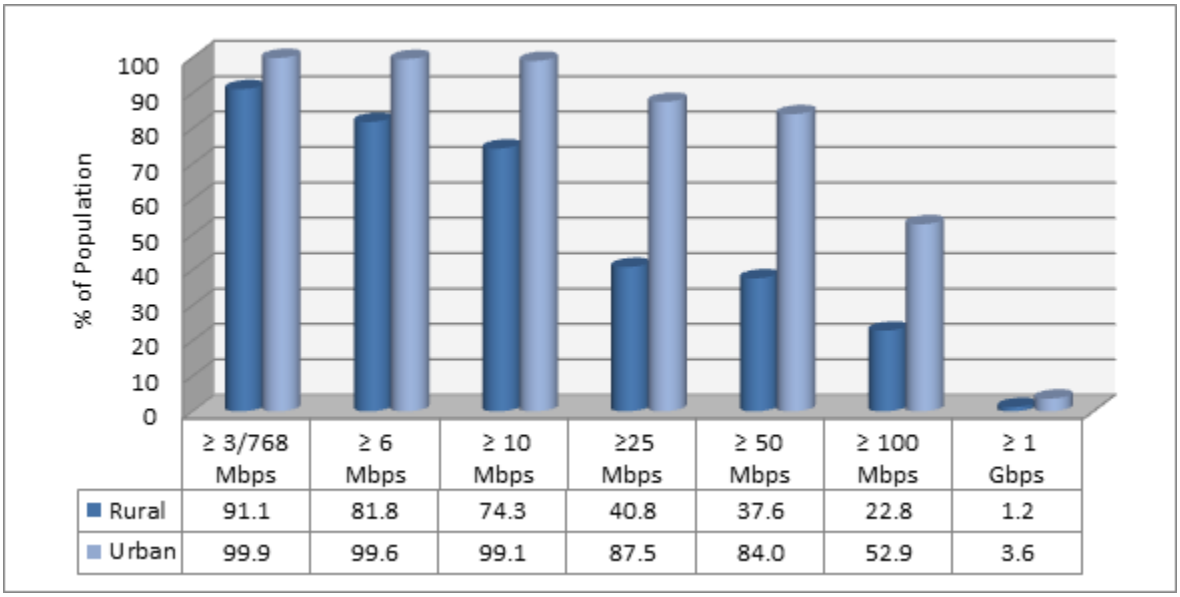
[19] LTE and HSPA+ are two types of Terrestrial Mobile Wireless technologies that offer faster speeds than previous generations and are typically considered "4G" in marketing materials. For more information about technology types, see http://www.broadbandmap.gov/classroom/technology.

"real-world" download speeds (as opposed to intermittent "up to" speeds) of at least 6 Mbps. Opinions differ on what constitutes minimum speeds for "broadband" or "4G" and, under any definition, those threshold speeds must and will increase to better serve the nation's needs.

Fixed wireless broadband services have also increased in availability since 2010, though the share of the population with access to this technology is still far lower than for mobile wireless broadband. Fixed wireless services at basic broadband speeds of 3/768 are now available to just over one-third of the country, up from under one-quarter of the country in June 2010. At advertised speeds of 6 Mbps or more, availability has increased 34%, from 19.20% to 25.81%. In 2010, just over 7% of the country's population was covered by fixed wireless providers offering speeds of 10 Mbps or more. Today, that figure is almost 11%, though just as in 2010, there is a marked decrease in access to speeds above this threshold. Just under 5% of the population lives in areas where fixed wireless providers are offering speeds of 25 Mbps or greater, 2.99% live in areas with access to 50 Mbps service; and 1.78% of the population can access fixed wireless speeds of 100 Mbps or more.

Rural and Urban Disparities

Figure 5: Broadband Availability by Urban and Rural (June 2012)[20]



	≥ 3/768 Mbps	≥ 6 Mbps	≥ 10 Mbps	≥25 Mbps	≥ 50 Mbps	≥ 100 Mbps	≥ 1 Gbps
Rural	91.1	81.8	74.3	40.8	37.6	22.8	1.2
Urban	99.9	99.6	99.1	87.5	84.0	52.9	3.6

A greater proportion of rural Americans continue to lack access to broadband at all speeds compared to their urban counterparts (see Figure 5). At 6 Mbps, for instance, less than 82% of rural Americans have access to broadband, compared to nearly 100% of urban Americans. At 25 Mbps and above, rural Americans have less than half the access of their urban counterparts. This speed deficit is also a technology deficit. In addition to the data in Figure 5, the dataset also demonstrates that the two

[20] The U.S. Census Bureau categorizes each census block in the country as either "rural" or "urban." The criteria defining the 2010 Census urban areas are available at http://www.census.gov/geo/www/ua/fedregv76n164.pdf; see also http://www.census.gov/geo/www/ua/uafaq.html).

technologies that providers currently use to offer the highest speeds, and have the most capacity for faster speeds, are DOCSIS 3.0 and FTTP. DOCSIS 3.0 is available to 87.9% of the urban population, but only 39.7% of the rural population. Similarly, 23.6% of the urban population has access to FTTP, but over three times fewer rural residents (7.5%) have access.

Figure 6:

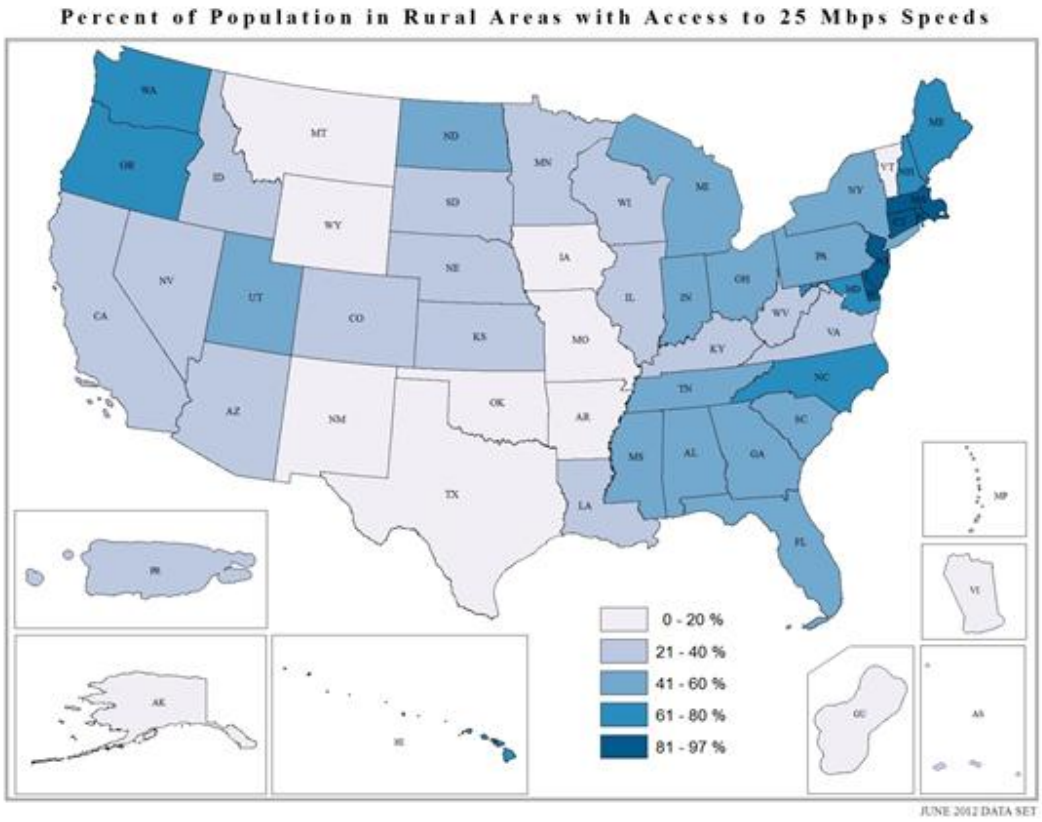


Figure 6 illustrates that access to broadband in rural communities also differs considerably by state. In 10 states and four territories, 20% or less of the rural population has access to speeds of 25 Mbps. In 15 states and Puerto Rico, greater than 20% and less than 40% of the rural population has access to speeds of 25 Mbps. In only 12 states do more than 60% of their populations have access to at least this speed.[21]

[21] The District of Columbia is not included in these figures because all of its population is urban.

State and County Differences in Broadband Availability

Table 4: 15 States with Most Broadband Access at 10, 25, and 50 Mbps

Most Access: ≥ 10 Mbps				Most Access: ≥ 25 Mbps				Most Access: ≥ 50 Mbps		
1	DC	100%		1	Rhode Island	99.62%		1	Rhode Island	99.62%
2	Rhode Island	99.80%		2	Connecticut	99.09%		2	DC	98.27%
3	Connecticut	99.75%		3	DC	98.44%		3	Connecticut	97.08%
4	New Jersey	99.48%		4	New Jersey	97.77%		4	Hawaii	96.94%
5	Delaware	99.29%		5	Hawaii	96.94%		5	Massachusetts	96.55%
6	Massachusetts	99.16%		6	Massachusetts	96.84%		6	New Jersey	96.37%
7	Maryland	98.99%		7	Delaware	95.81%		7	Delaware	95.78%
8	Hawaii	98.70%		8	Washington	95.28%		8	Washington	94.76%
9	Florida	98.47%		9	Oregon	92.73%		9	Oregon	92.20%
10	New York	98.39%		10	California	91.22%		10	New York	90.97%
11	Utah	98.35%		11	New York	91.04%		11	California	89.56%
12	Washington	98.15%		12	Florida	90.71%		12	Utah	89.22%
13	California	97.95%		13	Utah	90.71%		13	Maryland	88.91%
14	Pennsylvania	97.15%		14	Maryland	89.46%		14	Nevada	84.33%
15	Illinois	96.90%		15	Illinois	87.53%		15	Michigan	83.05%

Table 5: Five States with Least Broadband Access at 10, 25, and 50 Mbps

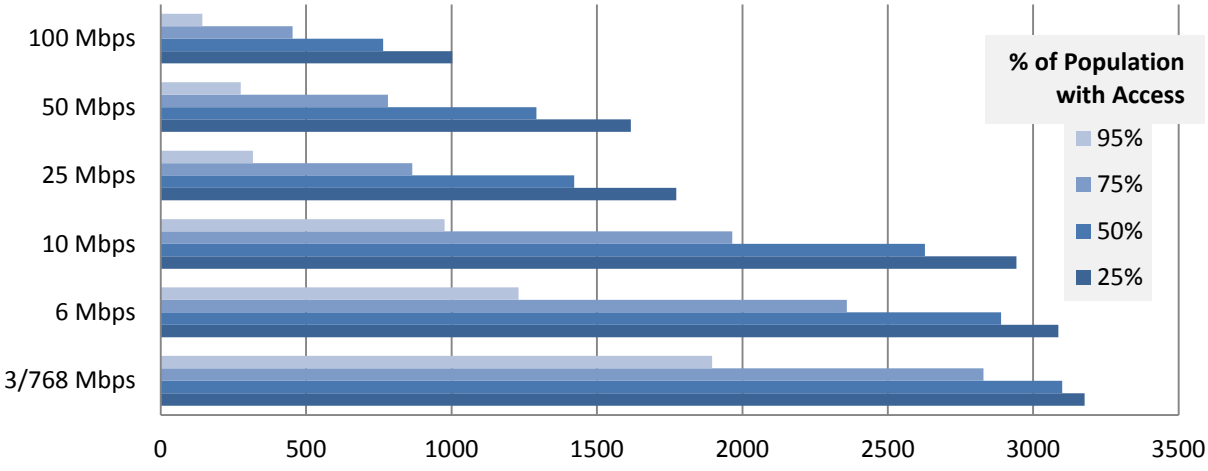
Least Access: ≥ 10 Mbps				Least Access: ≥ 25 Mbps				Least Access: ≥ 50 Mbps		
47	Wyoming	81.58%		47	Arkansas	28.54%		47	Iowa	19.81%
48	Alaska	81.40%		48	Wyoming	22.17%		48	New Mexico	10.85%
49	Mississippi	78.57%		49	Vermont	20.48%		49	Wyoming	2.27%
50	Montana	75.52%		50	Montana	12.71%		50	Montana	1.42%
51	West Virginia	69.69%		51	Alaska	0.06%		51	Alaska	0.00%

Table 4 compares the 15 states that have the greatest populations with access to ≥ 10 Mbps, ≥ 25 Mbps, and ≥ 50 Mbps - the three speed tiers in the middle of the set of data analyzed. The range between the least and greatest level of broadband availability increases at each higher speed interval. At ≥ 10 Mbps, the 15th ranked state has 96.9% access and the most wired state has 100% access. At 25 Mbps, the low is 87.53% and the high is 99.62%. At 50 Mbps, availability ranges between 83.05% and 99.62%. This matches the trend in the dataset as a whole, in which speeds become available to a smaller share of the population as they increase. Additionally, the groupings remain relatively stable across categories, though some re-ordering occurs. Pennsylvania appears only in the ≥ 10 Mbps list, and is replaced by Oregon in the ≥ 25 Mbps rankings. Illinois and Florida appear in the ≥ 10 Mbps and ≥ 25 Mbps lists, but Nevada and Michigan replace them in the ≥ 50 Mbps rankings. For context, we have also provided a list of the states with the least access to these broadband speeds (see Table 5).

The top-ranking states vary in location, population, population density, and urbanization, with several at both ends of the distribution of these dimensions. There is at least one state per region (Northeast,

Midwest, South, and West), though three of nine sub-regions are not represented.[22] The populations of the top-ranking states also differ considerably, ranging from the first most populous state (California) to the 45th (Delaware). Though eight of the total of 18 states (44%) listed in the columns of Table 4 have populations that place them in the top quarter of all states by population, eight of the states are in the bottom half. Population density per square mile differs among the 18 states, but is also concentrated. Nationally, the population per square mile is 87.4; the high is 9856.5 (District of Columbia) and the low is 1.2 (Alaska).[23] Of this group of states, only Utah (33.6), Oregon (39.9) and Nevada (24.6) fall below the national population density level. However, these less densely populated states are all highly urbanized, a measure of population concentration within states. Utah ranks 9th in the country by urbanization; Oregon ranks 19th; Nevada is 4th. In fact, of the top 15 most urbanized states, only two are missing from the list of states with the most broadband in Table 4: Arizona (10th) and Colorado (15th). For comparison, of the nine states with the least broadband appearing in Table 5, all but one (New Mexico) fall into the bottom half of states for urbanization. Additionally, each of these nine states ranks in the bottom half by population density.

Figure 7: Within County Population Access to Various Broadband Speeds



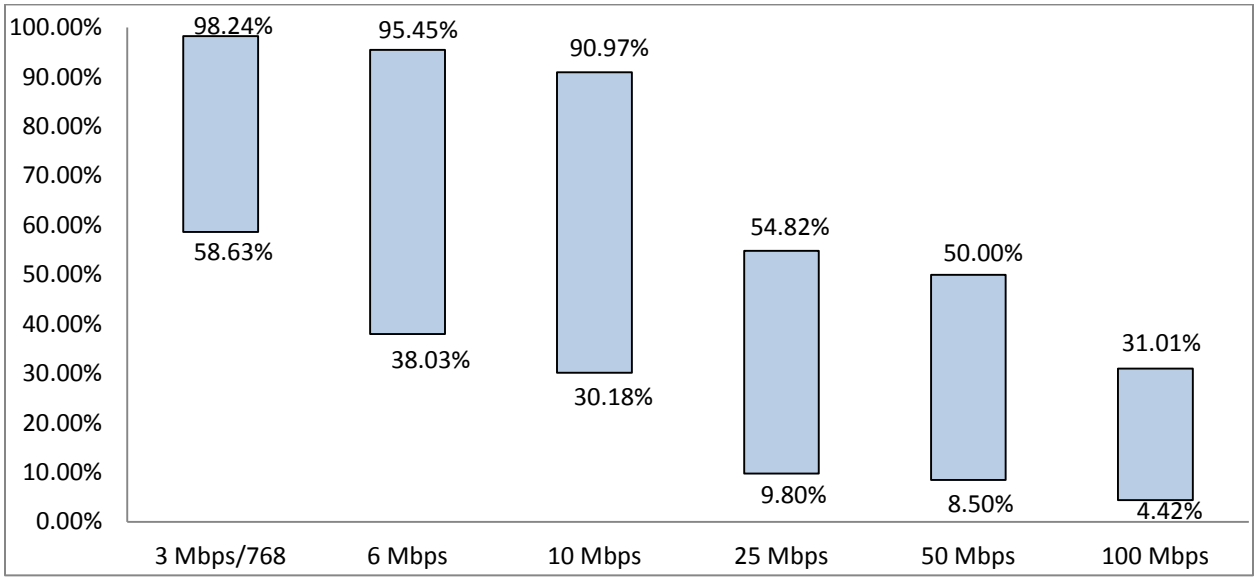
	3/768 Mbps	6 Mbps	10 Mbps	25 Mbps	50 Mbps	100 Mbps
95%	1896	1230	976	317	275	143
75%	2829	2359	1965	865	781	454
50%	3100	2889	2628	1422	1292	765
25%	3177	3087	2942	1773	1617	1003

Number of Counties

[22] See http://www.census.gov/geo/www/us_regdiv.pdf. US Census Bureau. Last visited February 16, 2013. Sub-regions that are not represented are: (1) Region 2 (Midwest), Division 4 (West North Central); (2) Region 3 (South), Division 6 (East South Central); and (3) Region 3 (South), Division 7 (West South Central).

[23] See http://www.census.gov/geo/reference/urban-rural-2010.html. US Census Bureau. Last visited February 16, 2013. (Percent urban and rural in 2010 by state Excel Table, ranked POPCT_URBAN column). This ranks the 50 states and the District of Columbia.

Figure 8: Variation in Within County Broadband Access



The bottom figure in each bar represents the counties in which 95% of the populations have access at that speed. The top figure represents the counties in which 25% of their populations have access.

Broadband access varies greatly across counties at all speed tiers (see Figures 7 and 8).[24] For example, 98.18% of the U.S. population has access to speeds of at least 3/768 (see Table 1), but in only 1,896 (58.63%) counties or their equivalents do 95% or more of the county populations have access to this speed tier. Compared to the 3/768 speed tier, the counties in which 95% of their populations have access to 10 Mbps service declines by almost half to 976 counties, 30.18% of all U.S. counties. More than 80% (2,628) of U.S. counties, however, contain populations in which 50% or more of the residents have access to 10 Mbps service. As expected, there is a sharp decline in availability at the county level between 10 Mbps and 25 Mbps, just as there is for overall availability. Looking at within-county availability to at least 25% of the population, access ranges between nearly 90.97% of counties at 10 Mbps and 54.82% of counties at 25 Mbps. For within-county availability to 95% of the population, access ranges between 30.18% at 10 Mbps to 9.8% of the counties at 25%. To view speed distribution by county, or for a number of other geographies, go to www.broadbandmap.gov/analyze, download the Analyze Table, or use the APIs.

[24] This analysis includes 3,234 counties or their equivalents for all 50 states, the District of Columbia, and the five territories funded by NTIA's State Broadband Initiative.

Conclusion

Until recently, research on broadband availability has typically taken a binary approach, *i.e.*, whether it is or is not available in a certain area. Today, however, consumers, businesses and institutional users have a variety of broadband requirements, and faster speeds are among the most important.[25] While broadband service at the 3/768 speed level may be adequate for some basic uses, like sending and receiving emails, others require significantly higher speeds to access a more advanced set of applications, including real-time video streaming and video conferencing, distance learning, and telemedicine. This variation in user needs underscores the importance of evaluating broadband availability across multiple speed tiers, not just the baseline speed level. To that end, although the data show that industry has made significant progress in expanding broadband availability over the past two years, it is important to note the inconsistency of availability across the country. Broadband service at basic speed levels is now widely available, but even for basic speeds, gaps still persist between rural and urban communities. These gaps between rural and urban broadband availability become larger as speeds increase; and as speeds increase, the overall level of broadband availability decreases, regardless of whether the user is located in an urban or rural area. Similarly, far more providers compete for customers when the service offering is at the lower broadband speeds tiers. Cable dominates the provisioning of broadband service at the higher speed tiers, followed by fiber to the premises. The implication of this finding is important because in areas where the technology deployed today is not capable of providing broadband service at speeds of 50 Mbps, 100 Mbps or a 1 Gbps, most companies or communities will need to significantly upgrade their infrastructure to offer these speeds when consumers, businesses or institutions demand them. While the data itself will not answer the question of "how" to expand broadband everywhere it is needed, it is critical to continue evaluating the data to understand the extent of the gaps in availability across various speeds tiers, and whether the nation continues to make progress in narrowing the availability divide.

[25] As noted elsewhere in the report, price, latency, and bandwidth limitations are all additional factors that merit analysis. This brief focuses on availability by speed because that is the focus of the underlying dataset.