

# **The State of Broadband Availability in the United States - 2010**

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## Executive Summary

Availability of broadband in the United States has been a topic of significant interest recently as evidenced by the Broadband Stimulus Programs, the National Broadband Plan and the FCC's recently released Sixth Broadband Deployment Report. In this most recent report on the state of broadband in the U.S., the FCC altered the long-standing definition of broadband, and in doing so, has sparked some rigorous debate.

Until this most recent report, the FCC had defined broadband as someone having 200 kilobits (kbps) of download and upload speed. In the most recent report, the FCC changed their threshold to 4.0 megabits per second (Mbps) of download speed and 1.0 Mbps of upload speed. The FCC acknowledged that this change was critical and more accurately reflects what broadband is and where it is heading, as well as being consistent with what was laid out in the recently released National Broadband Plan.

By adopting this new definition, the FCC subsequently changed how they determined whether areas are 'served' and 'unserved' with broadband, and reported their findings at the county level. A key finding is that, of the 3,230 counties in the United States, 1,024 are currently un-served, representing 24 million Americans living in 8.9 million households. The report goes on to describe how rural counties and lower-income counties are more likely to be unserved.

As has become the norm when faced with evidence of broadband shortcomings, various contingencies have attacked the report as well as the intentions of the FCC. In times such as these, communities, stakeholders, government officials and agencies can benefit from a credible third-party source of data to assess the validity of claims and counter claims. We felt it was important for us to weigh in on what we see regarding broadband availability.

In doing the analysis and comparing to the FCC report, we were in no way recommending or endorsing the FCC's methodology. We are simply taking an independent look at the approach to see if our data supports those findings. What we found through our analysis supports the FCC's recent findings. The remainder of this white paper walks through those findings, as well as serves up some very interesting questions.

## Methodology

The FCC's Sixth Broadband Deployment Report was developed by information collected from the National Broadband Plan as well as information supplied to the FCC on Form 477 by carriers nationwide. This information was then summarized at a county level to determine if a particular county was served or unserved. At a high level, a county was deemed to be 'served' if at least 1% of the households in that county had an Internet service provider offering 4 Mbps of download speed and 1 Mbps of upload speed.

BroadBand Scout<sup>sm</sup> is a comprehensive database of Internet connectivity. It was developed from more than 100 million Internet transactions that connect a consumer's physical address to their Internet service provider. After going through the FCC's report, we used their revised definition of broadband to run a BroadBand Scout analysis.

We looked to mimic that methodology as best we could to make our comparisons. Here is a description of that methodology.

- We started with the residential version of Broadband Scout that has access to approximately 15% of all Internet households in the United States.
- We then looked at the 'actual' download and upload speeds for the associated Internet Protocol (I.P.) addresses.
- We then categorized those subscribers that met both the old definition of broadband (200 kbps in both directions) and the revised definition (4.0 Mbps download speed and 1.0 Mbps upload speed).
- We then summarized all subscribers to the county level.
- If a county had over 1% of households that met the old definition of broadband we determined that this county was served – under the old definition.
- If a county had over 1% of households that met the revised definition of broadband we determined that this county was served – under the revised definition.

Once we summarized BroadBand Scout down to the county level, we then analyzed the results. To summarize, our results were consistent with those revealed by the FCC, though we found slightly more unserved counties, 1,205 (versus the FCC's 1,024) that represent 37 million Americans and 13.9 million households. We also saw consistency with respect to demographics, namely that unserved areas are more likely to have lower incomes and are more rural.

## Analysis Results

We first wanted to assess the FCC’s conclusions. From there, we took a deeper dive on national broadband coverage. In doing so, we analyzed information at a state level, briefly reviewed broadband availability by type of connection, and then looked at associated demographics.

### Unserviced Report – Revised Definition

Examining data at the county level, we can now assess various statistics related to which counties are served versus unserved. This first report is based on the FCC’s revised definition of broadband (4.0 / 1.0).

Table 1.

Served	Counties	Households	Population
Yes	2,025	90,601,371	241,689,703
No	<b>1,205</b>	13,867,921	36,686,831
<b>TOTAL</b>	<b>3,230</b>	<b>104,469,292</b>	<b>278,376,534</b>

Note: All demographics, households and population statistics based on 2000 and 2008 Census Bureau Statistics.

In this first view, we see that of the 3,230 counties in the United States, over a third (1,205) are determined to be unserved. Further, we see that these unserved counties represent 13.9 million households and 37 million people. Likewise, we see that the served counties represent 90.6 million households and 241.7 million people.

The results are fairly consistent with the results from the FCC, though we do see slightly more counties being unserved with more people and households. We believe there are several primary reasons for this discrepancy. First, the information reported on Form 477 does not exactly translate into 4.0 Mbps download and 1.0 Mbps upload. As such, the FCC adopted a more conservative definition of 3.0 Mbps download and 768 Mbps upload. Second, when analyzing the categorization, Scout is reporting **actual** speed versus **advertised** speed.

Another compelling reason is that the revised definition of broadband drew the line in the sand at 1.0 Mbps of upload speed. This is interesting as DSL is typically offered or advertised at 1.0 Mbps of upload. Most of the time, actual speeds do not meet advertised speeds. So it is common that an advertised DSL speed of 1.0 Mbps will result in actual speeds of less than 1.0 Mbps. At a macro level this has the effect of minimizing DSL connections that meet the broadband definition, and DSL represents nearly 40% of all Internet connections in the United States.

### Unserved Report – Old Definition

For comparison purposes, we also looked at the old definition of broadband (200 kbps download and upload). In doing so, we see some very stark differences.

Table 2.

Served	Counties	Households	Population
Yes	3,119	104,362,292	278,089,704
No	<b>111</b>	107,000	286,830
TOTAL	3,230	104,469,292	278,376,534

Under the old definition, only 111 counties would be deemed unserved, which only represent 107,000 households and 287,000 people. Going from the old definition of broadband to the revised definition has significant impact on what we call unserved. Fundamentally, this makes sense, but you can also see how this has contributed to the vigorous debate on the overall state of broadband. Once you draw the line with regards to what constitutes broadband, you will get a different answer – and often an answer that some people do not want to hear.

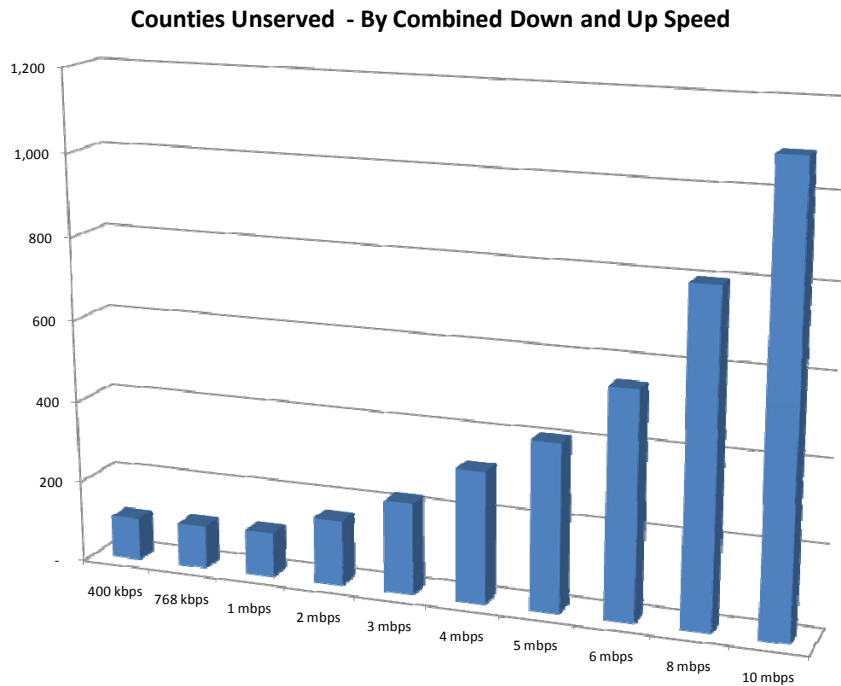
As we looked deeper at comparing the old definition to the revised definition of broadband, we also noticed some very interesting differences with respect to ‘type’ of internet connection. What we found was that under the old definition, 46% of all Internet users in that unserved area are dial-up users. Under the revised definition, that figure drops to only 16% of users. Also, under the revised definition, we see that cable and DSL providers have a majority of users even in unserved areas.

### Unserved Report – A Continuum

The last finding in the previous section alludes to an issue more important than our validation of the FCC’s findings. A change in definition of broadband reveals a very different broadband picture, both in terms of which and how many counties are classified as unserved, and also in the breakdown of what types of broadband consumers are using.

While we looked at the FCC’s old and revised definitions of broadband, we took additional steps and looked at usage under various other definitions of broadband. BroadBand Scout gives us an accurate assessment regardless of where we draw the line in the sand. We simply looked at various combinations of download and upload speeds and then determined how many counties would be deemed unserved.

For this analysis, we looked at combined download and upload speeds of 400 kbps, 768 kbps, 1.0 Mbps, 2.0 Mbps, 3.0 Mbps, 4.0 Mbps, 5.0 Mbps, 6.0 Mbps, 8.0 Mbps and 10.0 Mbps. We then said a county was unserved at each definition if less than 1% of households in that county reach this combined actual speed.



For example, when we draw the line at 400 kbps (a combined download and upload speed of 400 kbps), we see that only 103 counties would be deemed unserved. The number of counties that are unserved remains fairly constant until we get up to around 2 Mbps, where we jump up to 160 counties being unserved. It is not until we get to 10.0 Mbps that we see over 1,000 counties unserved.

This is very interesting when you consider the earlier statistics where we saw 1,205 counties unserved under the revised definition. In some respects, it is counter-intuitive. Upon further analysis, we realize how important the definition really is. By drawing the line at 1.0 Mbps of upload speed, this has many implications, especially considering DSL, which usually operates around 1.0 Mbps of upload. The point is: we need to be very careful when drawing our lines in the sand, as it will yield different answers.

### Demographics

In its Sixth Annual Report, the FCC mentioned that unserved areas were more likely to be rural and have lower incomes. Specifically, the FCC stated the following differences between unserved areas and the overall U.S. Population:

#### **FCC Findings**

Table 3.

<b>Demographic</b>	<b>Average for Unserved Areas</b>	<b>Average for Overall United States</b>
Population	23,479	95,481
Population Density (per square mile)	138	284
Per Capita Income	\$14,565	\$17,232

As we can see, unserved areas have a lower population and population density as well as Per Capita Income than the Average for the country.

When we looked at what we observed to be served versus unserved, we saw similarities, but differences as well:

#### **BroadBand Scout Findings**

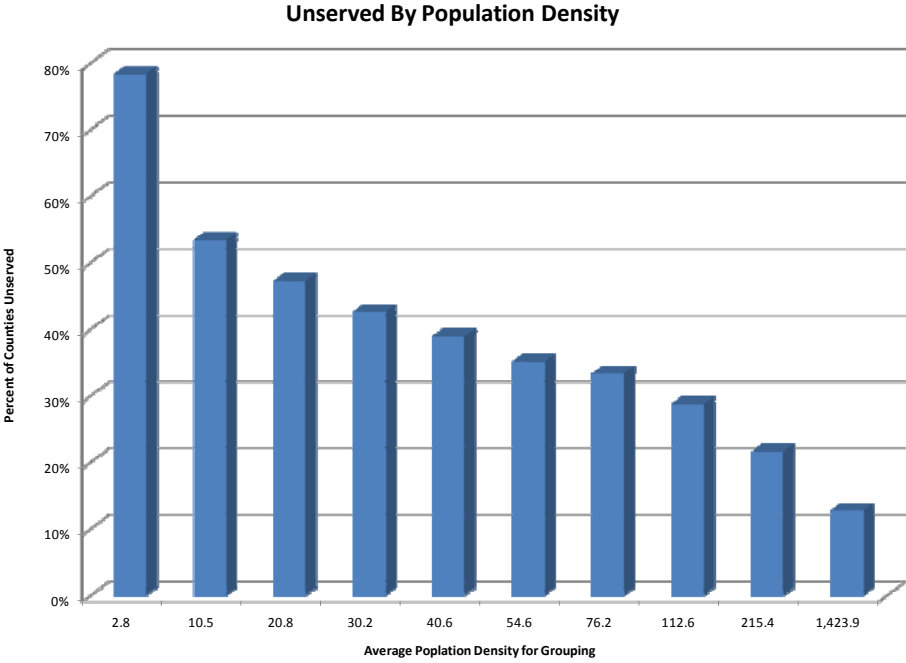
Table 4.

<b>Demographic</b>	<b>Average for Unserved Areas</b>	<b>Average for Served Areas</b>
Population	30,446	125,946
Population Density (per square mile)	78	276
Per Capita Income	\$16,219	\$18,751

The first thing to keep in mind is that we did not compare the demographics for unserved areas to the overall U.S. averages, but to the served areas. This provides a more distinct understanding between those with broadband access and those without. As you can see, we find a wider spread between rural and non-rural. The average population density for unserved areas is 78 people per square mile, while served areas have more than 3.5 times as many people per square mile, at 276.

Interestingly enough, we saw a more subtle difference when considering Per Capita Income. The FCC report indicates a wider spread between the unserved and served. We only observed a \$2,500 difference.

To pursue this a little more deeply, we took a slightly different look at how demographics impact being served and unserved. To do this, we took the 3,230 counties and broke them into 10 separate groupings depending on their demographics. For example, for Population Density, we divided the 3,230 counties into 10 groupings of 323 counties each based on their population density ranking. We then analyzed the percentage of counties for this grouping that were unserved. This can be seen below.

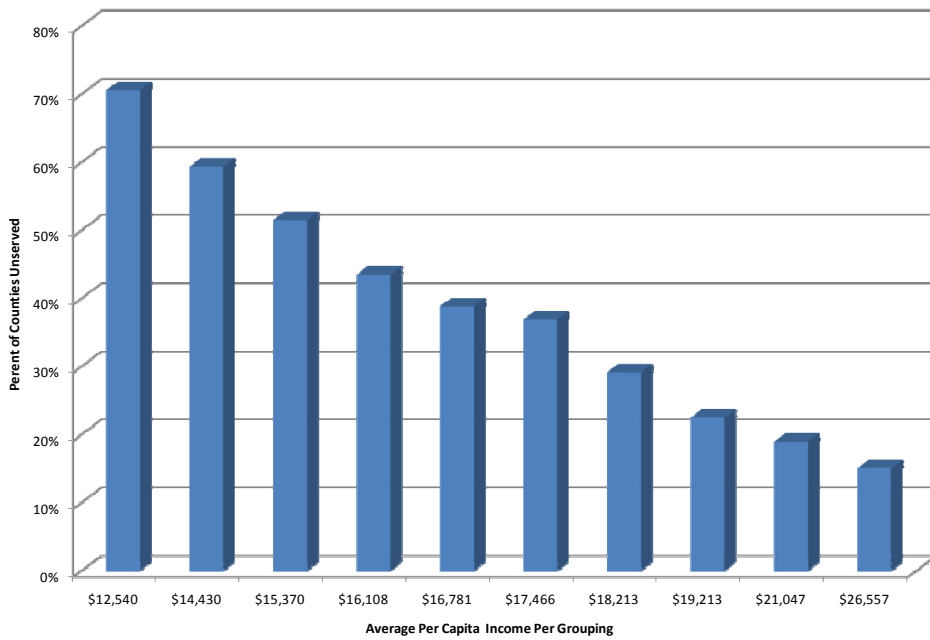


The x-axis represents the ten groupings. The y-axis represents the percentage of counties (for that grouping) that are unserved. For example, the left-most column in the chart represents the 10% of counties that have the lowest population density in the country. On average, these most rural counties have a population density of 2.8 people per square mile. When we look at the y-axis, we see that nearly 80% of these most rural 323 counties are unserved.

By looking to the right, you can see a distinct relationship between population density and unserved. For the most densely populated 323 counties on the far right, we see that only about 10% of these counties are unserved.

Next, we looked at Per Capita Income.

Unservd By Per Capita Income



While we did observe a difference overall between served and un-served counties overall, this shows a much more pronounced relationship between served and unserved with respect to income. The lowest 10% Per Capita Income counties in the nation have an average Per Capita Income of \$12,540 and nearly 70% of these counties are unserved. While this is not as significant as Population Density where nearly 80% of most rural counties were unserved – it is still significant.

Likewise, we see that the 10% of counties with highest Per Capita Income have an average Per Capita Income of \$26,557, with only 15% of those counties being un-served. Clearly, there are meaningful relationships between demographics and having access to broadband.

## Conclusions

The most recent FCC Broadband Deployment Report was a major departure from the previous reports with respect to what constitutes broadband. This is a very important discussion and we felt the need to share our findings, whether this was consistent or inconsistent with the FCC's findings. We observed that the results of analyzing Broadband Scout are very consistent and make sense.

In doing this analysis, we understand that how we define broadband can yield starkly different answers. Under the old 1999 definition of broadband, there are very few counties and people without access. With the new revised definition – it is a much different story. Likewise, there is a mandate to not only look at the state of broadband, but also the underlying demographics. It is very clear that there is a very clear linear relationship between certain demographics and broadband access. This should come as no surprise.

There are several issues and questions that our analysis raises which policymakers, national and local government officials, community stakeholders and private-sector organizations should consider:

1. How broadband is defined in terms of speed has a direct impact on which counties and communities are defined as served, unserved and underserved. Where and how literally billions of dollars and countless resources are committed to broadband deployment subsequently is impacted by how broadband is defined.
2. To date it may be unclear to some stakeholders how definitions of broadband and subsequent goals for achieving it are established, but does it make sense to have this definition be flexible to evolve as technology and end users' (consumers, businesses, anchor institutions) needs change? Flexibility based not just on the passing of time, but also the constituency being assessed for broadband need.
3. How will, or should, federal agencies as well as state and local governments establish means to accurately assess broadband coverage data (e.g. advertised versus actual speeds, type of broadband coverage) both before and after deploying broadband?
4. Will mobile broadband change the way in which broadband is defined, measured and validated? Within urban areas in particular, the increasing use of smartphones and similar devices, changing work/commute patterns and other factors are affecting mobile computing.

Being able to plan our broadband future requires us to understand our current situation. Over the past few years, there have been major efforts to improve broadband in the U.S., whether through federal policy, state broadband initiatives, mapping grants, local broadband efforts, etc. In any process of this magnitude, there will be substantial costs, issues, questions and debate. In our discussions with state and federal government, carriers and stakeholders, it is clear that there are many gaps to fill in our knowledge of the state of broadband.

## About the Author

### Adam Elliott, ID Insight

Prior to launching ID Insight in 2003, Adam Elliott was the President of ChexSystems<sup>SM</sup>, the recognized leader in providing risk and fraud solutions for the retail banking industry. Adam has also held analytic leadership roles at Deluxe, Time Warner and Fingerhut. A recognized name in the analytics area, Adam has won numerous awards for marketing and training. He is a former board member for the National Center for the Prevention of Economic Crime.

### About ID Insight

Northfield, Minn.-based ID Insight, the innovator in Access-Point Intelligence, combines its massive collection of data on people and access points with patent-pending analytics to help companies research new markets, prevent fraud, reduce costs and capture more business. ID Insight provides next-generation market research, verification, authentication, and fraud solutions to financial services companies, credit issuers, retailers, online merchants and broadband providers nationwide. For more information, visit [www.IDInsight.com](http://www.IDInsight.com).