Regulation in financial translation

Policy and investment: perspectives on two FCC broadband reports

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The Federal Communications Commission (FCC) has recently issued two Reports to Congress on broadband in the U.S. On May 20th, the full FCC issued its Seventh Broadband Progress Report and Order on Reconsideration (706 Report). On June 17th, it issued Chairman Genachowski’s Bringing Broadband to Rural America: Update to Report on a Rural Broadband Strategy (Rural Report).

The 706 Report is required under section 706 of the Telecommunications Act of 1996, as amended by the Broadband Data Improvement Act of 2008. The FCC must conduct an annual inquiry about the availability of broadband to all Americans, and determine whether it is being deployed in a reasonable and timely fashion. Aside from the data itself, this annual 706 Report’s primary practical significance is that a determination by the FCC that broadband is not being deployed in a reasonable and timely manner obliges the FCC to act to accelerate deployment by removing barriers to infrastructure investment and by promoting competition in the telecommunications market. Thus, a determination of lack of adequate progress provides the FCC with a legal foundation for action on broadband-related issues.

The Rural Report is required by the 2008 Farm Bill, which directed the Chairman of the FCC to provide to Congress a rural broadband strategy in 2009 and an update in 2011. Because the two Reports rely on the same data sources and shed considerable light on each other, it is helpful to analyze the two in conjunction.

For policy-makers, these reports provide at least two things: data about broadband availability, and building blocks for policy that will be manifested in various future reports and orders. Investors ask a very different set of questions: What do these reports say about market opportunities? What will the FCC do based on the mandate that it derives from this 706 Report? Will its actions make the market more or less appealing and investable?

Summary of the Reports:

Using NTIA data, and defining broadband as operating at a speed of 4 Mbps down and 1 Mbps up (4/1), the 706 Report finds that 26.2 million individuals in 9.2 million households live in areas that are not served by broadband today. As explained below, that number varies greatly, depending on the measures used. For example, the 706 Report notes that including mobile broadband would reduce it to 14 million people in 5 million households. The 706 Report also comments that, based on the FCC’s own
data, between the 2010 and 2011 706 Reports 14 million people moved from unserved to served. The 706 Report highlights other bright spots. For example, it points to nearly 100 million homes to which speeds of 50 Mbps or more are available. However, the 706 Report also expresses a concern that roughly a third of Americans choose not to adopt broadband even when it is available to them. It points out that for some of those, affordability and digital literacy are issues, and takes the position that access is not merely a function of deployment but of factors like affordability that impact an individual’s ability to adopt broadband. Balancing all these factors, the 706 Report concludes that despite enormous investment by the private sector, some $7.2 billion in Stimulus funding, and action by regulators, broadband is not being deployed in a reasonable and timely fashion to all Americans.

Chairman Genachowski’s statement summarizes the majority’s conclusion that there is still work to be done to increase broadband availability for all Americans and that deployment has not been timely and reasonable. In contrast, FCC Commissioner McDowell argues vigorously in his dissent that great strides have been made in broadband deployment and that the 706 Report overlooks data showing that progress has been timely and reasonable. He points to the exclusion of data about mobile broadband as particularly disappointing, but also expresses concern that the 706 Report’s new emphasis on affordability ignores the statute’s plain language.

The Rural Report is not required to and does not take a position on the timeliness or reasonableness of progress. It does use some of the same data sources that were used for the 706 Report to shine a spotlight on the availability and adoption of broadband in rural areas. The key insight the Rural Report adds to the 706 Report is that roughly 75% of the unserved population and households in the U.S. are in rural areas.

**Analysis of the 706 Report’s methodology and findings:**

The 706 Report does an outstanding job of explaining the data sets on which it relies and the issues those raise, both in the body of the text and in Appendix F. As the 706 Report itself repeatedly points out, it is based on several data sources whose definitions, methodologies, and underlying data sets vary significantly, resulting in factual findings that vary considerably, in turn. It relies on the NTIA’s SBDD (State Broadband Data and Development) data to reach its conclusions, but supplements it with FCC Form 477 data for perspective and continuity with previous 706 Reports.

**Methodology:**

- The 2011 706 Report, unlike prior 706 Reports, takes adoption and affordability into consideration in determining the timeliness and reasonableness of progress in broadband deployment. The 2010 706 Report, in turn, raised the standard for broadband to 4 Mbps down and 1 Mbps up (4/1). In other words, the standard by which progress is measured has changed significantly in each of the last two 706 Reports.

- The data set that is the foundation of the FCC’s 706 Report and conclusion is the NTIA’s SBDD, which was collected through the states for NTIA’s broadband mapping effort. The advantage of
this data set is that it examines broadband availability at the census block level, providing information at a more granular level than previous studies. That also makes it possible to correlate against demographic data that has been gathered at the census block level. However, there are also some problems. Because the SBDD was collected and analyzed by different organizations under contract to each of the fifty states, there is no guarantee of uniform methodology, common understanding of key definitions, or homogeneity of the data within the SBDD itself [NTIA website FAQs on SBDD and broadband mapping, 706 Report].

- The FCC then compares the data from the SBDD to that collected in response to its own Form 477. Carriers are the ultimate source of both SBDD and Form 477 data, but fewer carriers responded to SBDD than to Form 477: 3400 v. 4650, respectively. The geographic unit for which data is collected also varies—census-block in the case of SBDD vs. census-tract for From 477. SBDD data is aggregated to the census-tract level for comparison to From 477 data, and Form 477 data is also aggregated to county-level for comparison with prior 706 Reports that relied on Form 477 and used county as the key geographic unit [Appendix F, footnote 30].

- The 706 Report was issued in May of 2011, but the data on which it relies was collected in late 2009-early 2010 in the case of SBDD and in mid-2010 in the case of Form 477.

- While the FCC defines broadband as a connection that provides speed of 4000/1000 kbps (4/1), the 706 Report is actually based on the availability of broadband at 3 mbps down/768 kbps up (3000/768 kbps), because that speed tier was used in the SBDD and Form 477, while 4/1 was not [706 Report ¶10, 25, 30, Appendix F ¶16, notes 2, 111, F-1].

- The 706 Report ignores mobile broadband in reaching its conclusion, although the results of including mobile, which are provided in two tables, are significant. At 768/200 kbps, the unserved population is cut from 15.8 million to 5.2 million, at 3000/768 kbps it is cut from 26.2 million to 14 million, and at 6000/1500 kbps it is cut from 62.3 million to 58.3 million. In other words, at the FCC’s 4/1 standard only 4.5% rather than 8.4% of the population is unserved when mobile is taken into consideration [706 Report tables 10 and 11].

  - The 706 Report explains that it does so for two reasons. One, data on mobile broadband is collected at the state level, which does not sync with either the census tract or county levels the FCC is using. Two, the FCC was concerned that EV-DO and HSPA, the mobile broadband technologies prevalent in mid-2010, did not reliably sustain speeds at the 3000/768 kbps threshold of the 706 Report. It is not clear why the 706 Report did not aggregate at the state level as well as the census tract and county levels, nor is it clear why the issue of sustained v. peak speed is more of a concern for mobile than for other shared technologies like cable, which also vary substantially depending on number of users and load at any given time [706 Report ¶26, 27, 33, tables 10 and 11, notes 116 and F-61].
- One of the unfortunate side-effects of ignoring mobile in the report is that none of the demographic analyses that were done for fixed broadband were done for mobile.

- It is encouraging, however, that the 706 Report invites comment on how to include mobile broadband in future 706 Reports, indicating that the FCC recognizes an inflection point, with 4G mobile broadband playing an increasingly critical role in broadband availability.

- Between the FCC’s 2010 and 2011 706 Reports, measured at the county level, 14 million people in 458 counties moved from unserved to served. The 706 Report ignores this statistic in reaching its conclusion, treating it simply as a data problem that is difficult to explain, because it reflects only 369,332 new residential subscriptions in the 18 months between December 2008 and June 2010, when the data were collected for the two 706 Reports. It is unclear, however, whether this is an anomaly or simply the most obvious manifestation of the problems created by the 706 Report’s methodology, e.g. the de minimis calculation described below which could result in wild gyrations based on small changes. Commissioner McDowell points out in his statement that this is the only period-to-period comparison, it shows that the number of households served grew from 92% to 96% and the number of unserved households was cut in half, and he expresses great concern that this metric is ignored [706 Report ¶34, 35, 36].

- Another key factor is the de minimis threshold. The definition of served that is used in the 706 Report is that at least 1% of the people (or households) in the geographic unit have access to broadband and are subscribing. The number of unserved is derived by subtracting out the population of the served units from the total population in the area being measured [706 Report ¶31, note 128, note 105, ¶6 of Appendix F].

  - None of the statistics provided are the actual number of people who are unserved. In analyzing the SBDD data, the FCC usually, but not invariably, determines a census tract’s or county’s unserved population by subtracting from the tract’s total population some or all of the population of each census block that has at least 1% of its households served by broadband.

  - As a purely hypothetical example of the 1% de minimis calculation: Imagine a census tract that includes 10,000 people living in 10 census blocks of 1000 people each. If each block has 10 broadband subscribers, i.e. 1% of each block, the entire 10,000 people in that census tract could be classified as served even though only 100 people actually are, because all 10 blocks would count as served. Alternately, if 100 people in one census block subscribed, but the other 9 blocks had no subscribers, the census tract could be classified as having 9,000 unserved people, because only one block would count as served.

Unlike some other methodological decisions in this report, which arguably resulted in under-reporting progress, the de minimis standard of 1% arguably results in over-reporting progress.
Findings:

- The SBDD data aggregated to the census tract level show 26.2 million individuals unserved in 9.2 million households—the finding on which the FCC relies to conclude that broadband deployment to all Americans is not reasonable and timely. Form 477 data at the census tract level finds 23.9 million people in 8.9 million households unserved. By either of these calculations, that amounts to roughly 8% of the U.S. population. However, when the FCC 477 data is aggregated at the county level, it finds only 12.2 million people unserved in 4.6 million households, amounting to about 4% of the U.S. population.

- All the data above are based on a de minimis threshold of at least 1% of the population in the measured unit being served (i.e., broadband is available at 4/1 and they subscribe to it). However, when measured using a definition of 5% served, the FCC’s 23.9 million people unserved becomes 51 million people unserved, and at a 25% definition it becomes 145.3 million people unserved [706 Report Table 9].

- When one takes into account mobile broadband, that unserved number is reduced to 14 million people in 5 million households [706 Report Tables 10 and 11] at the 4/1 and 1% de minimis standard. The mobile broadband data was not used in reaching the 706 Report’s conclusion regarding reasonableness and timeliness of progress.

- Similarly, the demographic data that the 706 Report includes varies by source and level of aggregation (all at the 4/1 standard, 1% de minimis):
  
  - The average population density is much lower in unserved than served areas, as one would expect, when measured at the census tract level. Average population density (pop./sq. mile) of unserved areas is 1247 for SBDD census tracts, 1061 for Form 477 census tracts, and 316 for Form 477 counties, vs. 8228, 5939, and 303 respectively for served areas [706 Report Table 6].

  - Nevertheless, the population density range for unserved areas is enormous. SBDD data at the census block level shows 782,267 unserved census blocks out of a total of 4.5 million. Aggregated to the census tract level, the density ranges from 82 in South Dakota to 8234 in D.C. The Form 477 at census tract level shows the lowest population density for Oregon at 11 and highest for Massachusetts at 39,921. The Form 477 at county level shows a low of 1 in Alaska and a high of 15,964 in American Samoa [706 Report Appendix B, D, C].

  - Average per capita income in unserved areas is $24,587 for SBDD census tracts, $18,873 for Form 477 census tracts, and $18,128 for Form 477 counties. These correspond to average poverty rates of 14.2%, 21.9%, and 22.5% respectively for these sources [706 Report Table 5].
o Average portion of population that is non-white (minority rate) in unserved areas is 16.9% per SBDD census tract, 24.6% per Form 477 census tract, and 21.6% per Form 477 counties [706 Report Table 6].

o Average portion of population with at least an associate’s degree is 29.3% per SBDD census tract, 23.1% per Form 477 census tract, and 21.6% per Form 477 counties [706 Report Table 6].

o The data not only differ between SBDD and Form 477, they can lead to differing conclusions. SBDD indicates that unserved census tracts have both lower poverty rates and much lower minority populations than served tracts. Form 477 data, in contrast, indicate that unserved areas have much higher poverty rates (at both the census tract and county levels). But Form 477 shows a slightly lower minority rate in unserved areas at the census tract level, but a much higher minority rate at the county level [706 Report Table 5].

- SBDD’s poverty rate of 14.2% in unserved census tracts is lower than its 16.2% rate in served census tracts. In contrast, the Form 477 poverty rate of 21.9% in unserved census tracts is much higher than the 14.7% rate in served census tracts. Form 477 data at the county level is similar to that at the census tract level, at 22.5% in unserved v. 14.8% in served.

- SBDD’s minority rate of 16.9% in unserved compares to 32.9% in served census tracts. In contrast, Form 477’s minority rate of 24.6% unserved compares to 26.8% in served census tracts. Form 477 at the county level shows 21.6% in unserved v. 15% in served counties.

o For perspective, it may be worth considering some data from the most recent Pew Research Center Home Broadband 2010 Report [August 11, 2010], while pointing out that Pew’s definition of broadband and its methodology both differ from the FCC’s and SBDD’s. Pew found that 67% of non-Hispanic Whites, 56% of non-Hispanic Blacks, and 66% of English-speaking Hispanics subscribed to broadband, and that adoption by Blacks was growing quickly, moving from 46% in 2009 to 56% in 2010. Pew also found both education and household income to be meaningful determinants of broadband adoption.

- The 706 Report reaches no conclusion about schools, but states that many may be unserved or underserved by broadband.

- Bottom line, the data is enormously sensitive to the level of aggregation, the definition of served, the de minimis standard and methodology, as well as to the underlying data set (SBDD v. Form 477). The larger the unit being measured, the more likely it is to include a sub-unit that is served, so that unit’s population will not appear unserved. The lower the percentage of the
population served that is used to classify the area as served (de minimis), the more likely that unit is to appear served. And, of course, the SBDD data that includes mobile wireless shows far fewer unserved individuals and households than the data that relies only on fixed technologies.

- Could the problems be eliminated by gathering more data? The Justice Department, for example, has written a letter to the FCC recommending that the FCC gather specific data regarding services provided within particular census blocks, and the net effective pricing for those services within the same blocks (letter dates June 2, 2011) in order to facilitate competitive analysis. But even such granular data could be subject to all the ills that befall data-gathering, including design of the survey, reliability of data sources, methodological consistency across areas and from period to period, decisions about exclusion of data, and rapid obsolescence of data.

**Analysis of the Rural Report’s methodology and findings:**

The *Rural Report* relies, as relevant, on the same data sources as the *706 Report*, and the same advantages and disadvantages described above apply to it.

The key findings, as displayed in Tables 1, 2, and Appendix C of the *Rural Report*, are that the vast majority of the unserved are in rural areas. At a speed of 768/200 kbps or higher, 85% of the unserved population is in rural areas. At 3000/768 kbps (the effective 4/1 measure in these reports), 73% of the unserved population is rural, and at 6000/1500 kbps, 56% of the unserved population is rural.

Viewed inversely, 28% of the rural population does not have access to broadband at 3000/768 kbps or higher, vs. 3% non-rural and 8% of the US population as a whole. SBDD data indicate that even at the lowest tier of 768/200 kbps 20% of the rural population is unserved, vs. 1% non-rural. At the highest tier of 6000/1500 kbps 52% of the rural population is unserved vs. 11.3% of the non-rural.

This point is particularly important in light of the demographic variations highlighted in the *706 Report*. As we noted above, there are some unserved areas with high population densities, e.g. DC and American Samoa. But even when those are taken into account, the unserved population is overwhelmingly rural.

The key policy question this raises is whether the broadband problem—if one agrees there is one—is a nationwide problem or almost entirely a rural problem.

**Investment perspective: Questions raised by these reports**

When investors look at an issue, one key test they apply is the impact on net free cash flow. That, in turn, breaks down into a series of questions about the components of cash flow: what does this mean for capital investment, for cost, and for revenue opportunities? Will incremental revenue be higher or lower than incremental cost, including the amortized cost of new investment? What will happen to existing revenue and cost—e.g. will pricing on the existing base remain stable?

**What data do these reports provide that is relevant to those issues?**
The answer, as is so often the case with statistics, depends on the question asked. Depending on the data source, geographic area, technology, speed threshold, and de minimis standard used, there are arguably anywhere from 5.2 million to 145.3 million unserved Americans [SBDD fixed and mobile at census tract level at 768/200 kbps at 1% de minimis vs. Form 477 at census tract level at 4/1 at 25% de minimis].

The specific question the 706 and Rural Reports asked was whether broadband at 3000/768kbps (effectively 4/1) was available in an area, as demonstrated by at least 1% of the population having subscribed to it. The logic behind this formulation is that if 1% can subscribe then the homes of their neighbors are also passed by the technology. The answer to that question was that in rural America, it is available in areas that house roughly 72% of the population while in non-rural America it is available in areas that house roughly 97%.

Given that this data reflects both deployment and adoption, the key result for investors appears to be confirmation that broadband of some sort, at least at 3000/768 kbps, has been deployed essentially everywhere outside of some rural areas. In those rural areas, the initial upgrade to broadband remains to be accomplished. But outside those rural areas, any additional capital invested will go to further upgrade of already existing broadband or to competitive networks, not initial to deployment of a primary network. That has some capital spending implications, which vary with technology: fiber extension, node splitting, cell splitting, need for more spectrum, etc.

The other interesting issue for investors, of course, relates to revenue opportunities. When an analyst looks at revenues, the questions are how many more units can be sold, and what happens to pricing for existing units as well as the new ones?

The report’s bottom line statistic indicating that 8% of the population is unserved would imply that few new units remain to be sold, although there is substantial potential for upgrade (implied by the different results at different speed tiers and at different de minimis levels). That is in contrast with adoption studies like the Pew study that indicate that a roughly a third of Americans remain as potential new buyers. Of course, investors also have other sources of information, via company and analyst reports, that provide info on actual subscribers through the latest quarter, but in the aggregate rather than with the sort of geographic cuts that the FCC is able to take thanks to the SBDD and Form 477 databases. Putting all of these together, one possible implication for investors is that increasing adoption will not come from entry to new geographic areas but from pushing harder at penetrating areas where the easy part of the job has already been done.

This leads to what may well be the central question: Given that most of the remaining deployment job is upgrade, can higher revenues be obtained to offset the capital cost spent for upgrade? In plain English, will it be possible to charge existing customers more for higher speeds? If not, if higher speeds have to be sold at the same price as current speeds, then how
can the new capital be justified for upgrade? There are at least three key sets of factors at play here: the consumer’s demand curve, the level of competition, and potential regulatory intervention. The report does not address the first two questions, and investors are likely to focus on the third—do these reports indicate what the FCC is likely to do?

**What will the FCC do with regard to affordability?**

- The *706 Report*’s emphasis on affordability becomes particularly significant to investors. The FCC has made some efforts to reduce prices to raise penetration levels. It is looking at extending Lifeline-LinkUp to broadband as a way of accomplishing the goal for the low-income population. Merger conditions in the case of Comcast-NBCU and CenturyLink-Qwest will also result in lower prices for some low-income groups, but in a very targeted way to which the companies agreed.

- But the real issue this report raises for investors is whether the practice might become more widespread. Were the FCC to put pressure on broadband-access pricing, the whole investment equation would change. At least some investors would shift their investments to more profitable industries. Finding capital for upgrade of existing networks would become more difficult for companies, and finding capital for starting new networks would become still more problematic.

- Given the emphasis on affordability in these reports, investors are likely to pay particular attention to signals from the FCC about its intentions with regard to pricing—targeted and voluntary moves or more general regulation?

**What will the FCC do with regard to lower costs and remove deployment barriers?**

- As the *706 Report* points out, the FCC has taken a number of actions to remove barriers to deployment, e.g. via its action on pole-attachments, rights-of-way, and cell-siting. It is encouraging to broadband infrastructure investors that it continues to seek such opportunities.

**What will the FCC do with regard to rural areas?**

- The issue of USF/ICC reform has haunted investment in rural carriers for several years now, since a failed reform attempt in 2008 under the previous FCC. Both reports make it very clear that reform of the Universal Service Fund (USF) and intercarrier compensation (ICC) is a high priority for this FCC, but they give somewhat mixed messages. It is not clear whether the greater emphasis is now on adoption and affordability—in which case more of the total USF might be devoted to Lifeline-LinkUp—or on rural deployment.

**How does mobile wireless fit into all this?**  **What will the FCC do with regard to spectrum?**

- Investors are well aware of the rapid roll-out of fourth generation mobile technologies (4G). WiMAX, HSPA+, and LTE—all of which provide speeds well above the *706 Report*’s standard of
4/1—are transforming the mobile broadband market. As their various financial filings, investor presentations, and/or marketing literature indicate, Clearwire claims its WiMAX covers 130 million Americans, Sprint is partnering with Clearwire on WiMAX deployment and may add LTE later, Verizon is deploying LTE widely now and will cover its complete wireless footprint by the end of 2013, AT&T has deployed HSPA+ widely now and has vowed to bring LTE to 80% of the U.S. population by the end of 2013, and potentially to 97% of the US if it merges with T-Mobile, and T-Mobile itself has begun an HSPA+ upgrade.

- The omission of mobile broadband is particularly puzzling because it impacts both deployment and adoption. The AT&T/T-Mobile LTE commitment would go a long way toward solving the rural availability issue, without any action or spending by government. The combination of LTE’s very high speed with relatively cheap but sophisticated devices such as tablets could help change the adoption picture rapidly throughout the U.S., but particularly among minorities.

- Given all that, it is bewildering to investors that the FCC would ignore mobile wireless in its assessment of the broadband market. This Commission has put tremendous emphasis on freeing up spectrum as has the Administration. Congress is working on legislation that would facilitate that process. How does this set of reports fit in with that commitment?

How does the FCC view investment?

- Private investment provides $60 - $70 billion dollars per year for infrastructure deployment, a figure that dwarfs the roughly $7 billion that is being spent once via NTIA and RUS grants and loans. The FCC’s desire to raise adoption could be a real positive for investment, depending how it is accomplished. Organic growth in adoption—in response to innovative edge services, or in response to widespread deployment of mobile 4G—would be most welcome to infrastructure investors, but suggestions of pricing regulation would cause concern.

- For investors in providers of services that ride the broadband infrastructure, increased adoption that fosters healthy infrastructure investment is equally crucial. Edge providers would like as large a potential audience as possible, so they too would benefit from increased penetration. In the short run, they may focus on growing adoption at any price. Longer term, they also need networks that support their innovations, i.e., networks whose quality and capacity stays a step ahead of edge providers’ requirements. Thus, continued capital investment in infrastructure upgrades is critical to edge providers, although they are not making those investments themselves.

Summary:

At a conceptual level, investors understand that regulators impact their investments, just as regulators understand conceptually that their policies cannot take effect without the capital provided by investors. At a practical level, investors and regulators not only speak different languages but structure their thinking completely differently: quantitative model vs. law and precedent, bottom line vs. process.
Because public policy relies so heavily on investment to fulfill its goals, it is essential that policy-makers understand the way investors interpret their decisions, just as investors need to understand when and how regulators will impact the results of their investments.

For the policy-makers, the 706 and Rural Reports are repositories of data and building blocks for future decisions. For investors, they raise questions about future capital investment, revenues, costs, and net free cash flow. Learning to translate across that abyss is one step toward lessening uncertainty.

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