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The National Broadband Plan

By Gregory L. Rosston

The American Recovery and Reinvestment Act of 2009 (ARRA) directs the Federal Communications Commission (FCC) to formulate a plan that “shall seek to ensure all people of the United States have access to broadband capability and shall establish benchmarks for meeting that goal.”

In March 2010, the FCC will deliver its National Broadband Plan to Congress, but fulfilling Congress’ mandate literally and narrowly would be a mistake—the FCC’s Broadband Task Force reported that it would cost \$350 billion to connect every home in the United States to fiber optic cable (not including operating costs). Notwithstanding the recent large government stimulus packages and high consumer demand for broadband, this magnitude of public spending is improbable. Thus, the

Broadband Task Force is likely to offer a set of options and policies for the country to increase the reach and uptake of broadband, but it will not propose to connect *all people* to *high-capacity* broadband networks.

There is some debate about how much, if anything, the government should do. Currently, about 10 years after broadband first became available, 63 percent of households subscribe to some form of broadband and about 93 percent have access to wireline broadband service. This policy brief will examine some of the challenges facing the FCC, including interpreting specific terms in the legislation such as “all people” and “broadband” that will affect the cost and effectiveness of its plan. Given

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About The Author

Gregory Rosston is the Deputy Director of SIEPR and the Public Policy Program. Rosston’s research has focused on industrial



organization, antitrust and regulation. He has written numerous articles on competition in local telecommunications, implementation of the Telecommunications Act of 1996, auctions and spectrum policy. Prior to joining Stanford University, Rosston served as Deputy Chief Economist of the Federal Communications Commission and helped with the design and implementation of the FCC’s spectrum auctions.

SIEPR *policy brief*

the potentially large costs, any government plan to increase broadband penetration should minimize subsidy distortion by only using subsidies targeted at low-income households; increase the availability of spectrum to the market; and harness competition to deliver benefits and service to consumers.

Definitions and Challenges

“Broadband”

The first part of the FCC’s job is to define “broadband.” For several years, the FCC has been ridiculed in the technology community for its historic definition of broadband as 200kbs transmission speed. With its upcoming report, the FCC will likely offer a new definition. Again, it is likely the Internet community will criticize the FCC’s decision. But what is the correct answer? Is it 1MBPS (enough to watch YouTube videos and make Skype calls); 5MBPS (enough for high-quality video like Hulu and advanced 2-way gaming); 10MBPS (enough for high-quality video conferencing and remote medical consultation); or much more as some advocate (enough for multiple video feeds and more)? If the FCC sets the bar low, it will be criticized by the Internet community for

failing to provide the necessary infrastructure for participation in 21st-century society. A high bar, by contrast, will raise costs and expectations substantially and could have the unintended consequence of causing providers to terminate their lowest cost plans thereby hurting low-income consumers and reducing connections.

Information about what consumers value can help the FCC think about the appropriate definition. Last month, Scott Savage and Donald Waldman of the University of Colorado and I conducted an online survey funded by the FCC. We provided users examples of “fast” and “very fast” service and found that they value “fast” service and “reliable” service, but they would not be willing to pay much more for “very fast” service. New Internet users, not surprisingly, valued broadband much less than long-term users.

To complicate matters, speed is not everything—latency and jitter (the time it takes for the signal to travel and the consistency of that time) matter as well. For example, even if a geostationary satellite service is able to provide high-speed broadband service at 5MBPS, it takes about one third of a second or more for the signal to travel to the satel-

lite and return to the Earth in each direction. This short delay does not cause problems for many applications but will make video conferencing difficult and response-sensitive interactive gaming nearly impossible. Therefore, while satellite broadband is an attractive mechanism for providing broadband service to remote areas because of its cost characteristics (\$50 to \$80 for retail service anywhere in the continental U.S.), some may object because it will not provide full functionality comparable to other broadband connections.

If the FCC tries to define broadband, it should incorporate cost characteristics in different areas. Just as other market-provided goods and services are not “one size fits all,” broadband service should depend on user preferences that are a function of characteristics and cost. For example, it may not be reasonable to subsidize 10MBPS service in areas where costs are \$500 per month per household.

“All People”

The ARRA speaks of extending access to “all people of the United States.” Past attempts to increase telephone penetration have been very expensive and inefficient and provide guidance on what not to do. There are two types of



telephone subsidies: 1) about \$4 billion per year of “high-cost” subsidies and 2) about \$700 million in low-income subsidies. In addition, the National Telecommunications and Information Agency (NTIA) and Rural Utilities Service (RUS) have about \$7 billion in one-time stimulus grants to fund broadband infrastructure as part of the ARRA.

It is difficult to determine what subsidy is necessary to induce people to subscribe to broadband service. While it may be possible to rank households in order of the cost of providing service, it is more complicated to rank them in terms of the cost of inducing them to subscribe to the network. For example, it may cost \$75 to provide service to a semi-rural house and \$10 per month to provide the same service to an urban apartment. However, the rural resident may be willing to pay \$100 per month to subscribe without any subsidy, whereas a low-income urban resident may value broadband at only \$6 per month and require a \$4 per month subsidy to connect.

Ultimately, high-cost subsidies reduce prices for consumers who would connect to the network in the absence of a subsidy, including many high-income

consumers. As a result, high-cost subsidies are mainly untargeted income-transfer programs, while low-income subsidies target people who are the most likely to need subsidies to connect to the network.

Even at current prices, it may not be necessary to provide subsidies for serving many “high-cost” areas. Cable television and wireless companies provide telephone service without any subsidy in many “high-cost” areas where incumbent telephone companies receive large subsidies.

Because the telephony mechanisms are incredibly inefficient, and in many cases completely unnecessary, the FCC could achieve similar or better results for substantially less money. Focusing subsidies on broadband may mean even more money is at stake, so the FCC must avoid creating the same inefficiencies.

Pending House and Senate legislation would extend low-income subsidies to broadband service on a trial basis. Randomized experiments would allow for easy and accurate evaluation to determine how effective these programs are at increasing penetration.

Under current telephony subsidies, both high-cost and low-income subsidy programs

give money to companies rather than consumers. Because the subsidy does not follow the customer under this system, companies can continue to receive subsidy dollars even when they lose customers. A better approach would be to provide vouchers for consumers to give to the provider of their choice. Providers could then cash in the vouchers from customers they “won.” As it stands, incumbent local phone companies reap the rewards of high-cost subsidies even as they lose customers to competitors, so they are not provided the incentive to compete as vigorously and consumers lose.

Ultimately, not all Americans will connect to a broadband network. Some simply do not want it. Others find the cost of connection is too high. Because \$350 billion is too expensive to connect every household in the U.S., the Broadband Task Force should also estimate the cost of subsidy programs necessary to reach various different levels of penetration—say 90 percent, 92 percent, 94 percent, etc. Then policymakers could evaluate the trade-off of connecting additional households and the cost of connecting those households. Ultimately, the best way to serve customers

depends on adopting efficient mechanisms like vouchers, competitive bidding, and a focus on low-income rather than high-cost subsidies.

Policies to Promote Broadband

While the previous two sections have been bleak about the prospects for increasing broadband penetration, there is hope. In particular, the Broadband Task Force can enable market mechanisms to increase broadband availability, lower prices, and increase innovation. By making more spectrum available to the market, committing to a wise competition policy, and protecting consumers, the FCC and antitrust agencies can increase broadband penetration and quality efficiently.

Spectrum Policy

New generations of wireless technology may provide a competitive alternative to cable and DSL broadband, increasing the number and variety of competitive alternatives that may in turn provide the price reductions or quality increase necessary to induce more households to subscribe to broadband service.

For the past 15 years, the FCC has been moving in fits and starts toward a more market-based approach to governing the frequencies that form the basis for wireless communications. Despite a reasonable amount of newly available flexible use spectrum, demand for wireless service has also increased rapidly, so that market value of spectrum is still very high.

The Broadband Task Force has recognized the scarcity value of suitable spectrum and made efforts to identify areas where there is spectrum that is currently engaged for low-value uses and could be repurposed for higher-value use. The two bands most frequently mentioned in conjunction with repurposing are government spectrum and television broadcast spectrum. Some government spectrum has been reclaimed and auctioned for commercial wireless service. In addition, reclaimed UHF television spectrum provided the initial cellular licenses (channels 70–83) in the 1970s and the recent “700 MHz” frequencies (channels 50–69).

Repurposing government spectrum is difficult because it raises national security issues and implicates bureaucratic interests. Facing similar

challenges, the U.K. government imposed spectrum fees on government agencies to economize on spectrum use and make more available to the market. Similar initiatives might be beneficial in the U.S.

More promising at this point, however, is the opportunity to repurpose even more of the television broadcast spectrum. Historically, television broadcasters have opposed any reduction in the amount of broadcast spectrum, so repurposing could prove politically difficult—especially since broadcasters tend to be powerful and politically connected. Nonetheless, market mechanisms may make it possible to redistribute the spectrum more efficiently and allow broadcasters to reap some of the benefits.

Competition Policy

Broadband does not exhibit characteristics of a “textbook,” perfectly competitive market because of high fixed costs in the form of infrastructure investment. As a result, it is likely that there will be a limited number of differentiated suppliers. The United States Telecom Association (a trade group representing the interests

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of incumbent telephone companies) claims that 80 percent of U.S. households have a choice of wired broadband providers—typically cable or DSL. In addition, two satellite companies provide service, although the price of \$50 to \$80 is substantially higher than the typical price charged by the wireline providers for similar service. It remains to be seen whether terrestrial wireless companies will provide a competitive alternative to wired broadband service.

While wireless is one possible avenue for additional broadband competition, one concern is that the two major wireless companies, AT&T and Verizon, are also two of the largest wireline broadband providers in the country. If wireless were potentially a competitive alternative, Verizon and AT&T might have less incentive to cannibalize their own wired service than an independent wireless competitor. As a result, the FCC and antitrust authorities should be careful about consolidation and also about instituting rules when it makes more spectrum available to the market. For example, in 1994 the FCC instituted spectrum caps in conjunction with the PCS auction

to prevent the incumbent cellular companies from buying the new large blocks of spectrum and thereby ensure new competitive entry. It is not clear if spectrum caps will be necessary or useful, but the FCC should investigate the competitive implications.

Consumer Information

Economics recognizes that information is necessary for competition, meaning that more accurate information that allows consumers to make better choices is crucial for a well-functioning broadband market. While “full disclosure” about Internet service, as proposed by some, may have the perverse consequence of forcing revelation of sensitive competitive information, some basic disclosure and truth-in-advertising requirements could help improve market choices.

For example, advertisement of broadband “up to” a certain speed may lead to better consumer choice if there is additional disclosure. With shared network infrastructure, speeds may vary greatly. As a result, it may be useful to have some clear, simple standardized benchmark reports, like those required for mutual funds, available for broadband

customers. They might include measures like average speed, latency, jitter, and downtime. While some of the detail may admittedly be of limited use to individual consumers, consumer advocacy groups that scrutinize communications services could provide the discipline necessary to ensure that firms are rewarded for providing high-quality service.

Conclusion

Overall, Congress’ challenge to the FCC is daunting—how to connect a diverse nation of more than 100 million homes, including those in rural Alaska and downtown Manhattan, including high- and low-income households, including people with high and low desires for connection, and including some who favor mobility over speed. The best way is for the government to facilitate competition and thereby empower consumers to choose the service they think will best serve their needs. This means minimizing subsidies, except perhaps to low-income households, and allocating more spectrum, so that firms have the ability to use it to compete to provide pervasive broadband service.

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A publication of the
Stanford Institute for Economic Policy Research
Stanford University
579 Serra Mall at Galvez Street
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