

Broadband Policy: Industry Planning and the Public Interest

Robert Loube

Abstract: Public interest regulation protects society by constraining private economic power, and it promotes the construction of essential infrastructure facilities. The Federal Communications Commission's (FCC) broadband plan supports the deployment of broadband service and the maintenance of an open Internet. The paper uses Harry M. Trebing's public interest paradigm to evaluate the FCC's broadband plan.

Keywords: broadband policy, planning, Trebing

JEL Classification Codes: L5, L9

Institutional economists have long recognized that many economic problems cannot be solved through market activity alone. Instead, there is a need for social action to offset economic power and to guide the outcome of market activities. One type of government action is planning.

Harry M. Trebing (1991) suggested that micro-specific planning should be used to solve the problems of a specific industry.¹ He (1998) also stressed that regulation and industry planning is necessary to offset the power of a duopoly or a tightknit oligopoly, the types of industry structures that tend to exist in previously monopoly-regulated industries.

The Federal Communications Commission (FCC) has recently proposed its National Broadband Plan along with a series of implementation orders that place the agency directly into the infrastructure building decisions of the industry (FCC March 2010). This would be a fundamental change in the way the telecommunications industry has evolved. The plan's goals are: (i) at least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second ("Mbps") and actual upload speeds of at least 50Mbps; and (ii) every American community should have affordable access to at least one gigabit per second broadband

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¹ For further discussion of economic planning by institutionalists, see Richard Colignon (1996), William Dugger (1987), and Allan Gruchy (1984).

service to anchor institutions, such as schools, hospitals, and government buildings. To achieve these goals, the plan focuses on upgrading the facilities of the wireline industry by providing subsidies to build enhanced networks in high-cost areas (FCC, November 18, 2011).

My purpose in this paper is to evaluate the FCC's plan in light of institutionalists' goals of adequate service to meet emerging social values and of a diffusion of power to allow all members of society to enjoy the benefits of the shared technological progress (Klein and Miller 1996). First, I discuss the current status of broadband service in the United States compared to service in other countries. Second, I evaluate the FCC's plan to determine if the plan could achieve the stated goals. Third, I suggest a series of enhancements that are required to achieve the goals of the FCC.

Broadband in America

Broadband service is provided over a variety of technologies. High-speed services are essentially provided over wireline platforms with many wireless devices serving as originating and terminating equipment. Cable providers have transformed their networks from one-way coaxial systems into two-way fiber-coaxial networks, capable of providing voice, data, and video service (Ciciora 1995). Cable providers have captured 58 percent of the wireline broadband market and 73 percent of the market at speeds greater than 10Mbps (FCC October 2014). Traditional telephone carriers and other Internet service companies provide high-speed service using fiber to the home and fiber-copper networks (Baig 2015).

Comparisons between the United States and European as well as other countries center on several factors: (i) high-speed service availability; (ii) basic broadband service availability; (iii) subscription rates; (iv) actual download speeds; and (v) price. The US leads on high-speed service availability, but it lags behind Europe and other countries on other important metrics. The U.S. high-speed networks pass 80 percent of households, while European advanced networks pass only 54 percent of households.² Basic broadband service is available to 97 percent of U.S. households and 99 percent of European households. On a subscription basis, the US is in the middle of a pack, placing sixteenth out of 34 countries on subscriptions per one hundred households. US places only 26 out of 38 countries in a comparison of actual download speeds in urban areas. Finally, the price of triple-play service in the US is higher than the price of that service in 31 of the 34 countries compared, and the price of double-play service is higher than the price of that service in 33 out of the 35 countries (FCC, February 4, 2015a).

² The European statistics define high-speed networks as networks capable of delivering data at 30Mbps, while U.S. statistics define high-speed networks as networks capable of delivering data at 25Mbps. Basic service in Europe starts at 144Kbps. In the U.S., basic service starts at 200Kbps.

The FCC Plan

To meet its goals, FCC has chosen to emphasize the availability issue in high-cost areas of the country served by the price cap carriers where there is no service from a cable provider. The strategy was divided into two phases: Connect America Fund (CAF) Phase I and Phase II. In Phase I, the FCC provided construction grants to carriers. These grants had to be spent to serve locations that are not served at speeds of 768Kbps, are not part of the carrier's current build-out plan, must provide service to those locations within three years at 4Mbps downstream and 1Mbps upstream, and must increase the number of broadband customers served equal to the amount of support accepted divided by \$775 (FCC, November 18, 2011). In the first round of grants, carriers only requested \$115 million of \$300 million allocated in that round (FCC, April 25, 2012). In the second round, carriers requested \$385 million out of \$485, and agreed to provide broadband service to 606,000 customers (FCC, December 5, 2013). During round one, neither AT&T nor Verizon accepted any money. During round two, Verizon still refused to participate, but AT&T did accept money. AT&T complained about the grant requirements and, during the second round, the FCC allowed carriers to self-certify regarding their provision of service (FCC, May 22, 2013). During the second round, AT&T requested \$100 million.

Phase II will provide ongoing revenue support in high-cost areas where there are no unsubsidized providers (cable providers). It determines the amount of the support based on the difference between the cost of service in every census block in the country and a benchmark. The cost is determined using an economic-engineering model that rebuilds the entire network based on current input prices and current technology. The benchmark was set at \$52.50. The benchmark reflects the expected revenue from the customer. Because of a budget constraint, the FCC will also designate an upper benchmark of \$198.60 (FCC, April 29, 2015). Locations with cost above the upper benchmark will not receive model support.

To receive funding, the carrier must agree to meet certain public service obligations. These are: (i) the carrier is required to provide voice telephone as a stand-alone service throughout its designated service territory; (ii) in supported areas, the carrier must provide broadband data transmission with service speed capability of at 10Mbps downstream and 1Mbps upstream and with the ability to provide voice of Internet protocol ("VoIP"); and (iii) the carrier should provide customers with a service bundle that includes at least 100Gbs of service per month (FCC, October 31, 2013; December 18, 2014).

Receiving the money and meeting the public service obligations are voluntary. The price carriers were offered was \$1.7 billion annually to support 4,075,840 locations (FCC, April 29, 2015). The carriers accepted \$1.5 billion, supporting 3,629,996 locations. These locations represent less than 3.0 percent of the 152 million locations served by these carriers (FCC, September 15, 2015). The carriers have six years to meet the public service obligations at the supported locations. There are also interim milestones that must be met. A carrier that does not meet the interim milestones or the final requirement could be penalized.

The FCC also requires that carriers offer broadband services at rates in supported areas that are reasonably comparable to urban rates. Carriers have two ways to meet this requirement. First, carrier can offer service in the supported areas at rates that are equal to service rates in their urban areas. Second, the carrier rates can be equal to or less than the FCC's benchmark for that service. The benchmark is set at two standard deviations above the average urban rate (FCC, October 29, 2014).

Problems with the FCC's Plan

The FCC's plan faces several major problems: (i) it does not address the market power of the broadband providers; (ii) the public service obligation does not match its broadband service goals; (iii) the plan is insufficiently funded; (iv) it relies on a contribution base that is shrinking; and (v) it switches from calculated support to a undefined and inappropriate bidding process.

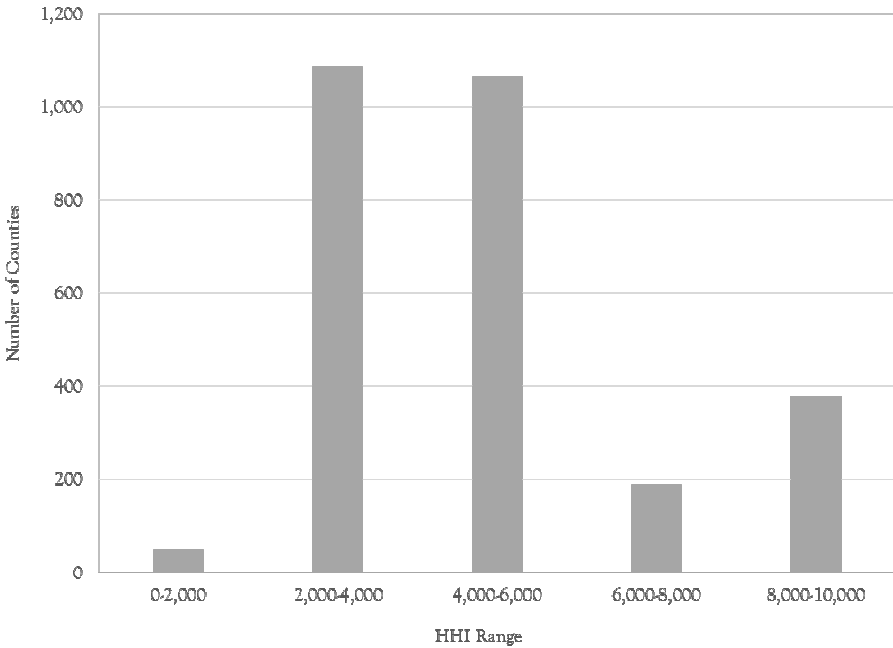
Because the FCC ignores the market power of the broadband providers, the FCC plan does not address the needs of 98 percent of U.S. customers who are not in high-cost areas. For those customers, it assumes that the market is working. Those customers, however, are generally faced with a very small number of providers. The market concentration, as measured by the Hirschman-Herfindahl Index (HHI) constructed based on the number of households able to obtain 10Mbps service in 2,766 U.S. counties, shows that customers in only 48 of those counties live in competitive markets (as measured by the HHI) of less than 2,000 (Figure 1).³ It is questionable whether competition exists even in those 48 markets because many providers within a county only provide service within a franchise boundary and do not compete with other providers within the same county. Service-provider concentration increases at higher delivery speeds. For service at 25Mbps, only 12 percent of Americans have three or more choices of service providers, 27 percent can purchase from two providers, and 45 percent can purchase service from only one provider (FCC, February 4, 2015b). This lack of competition contributes to the high U.S. triple-play prices. The high urban price also guarantees that the price in the supported areas will also be unreasonably high because the reasonableness of the prices in the supported areas is based on their relationship to the urban prices.

Second, the FCC has concluded that meeting the definition of advanced telecommunications capability requires consumers to have access to actual download speeds (i.e., to the customer) of at least 25Mbps and actual upload speeds (i.e., from the customer) of at least 3Mbps (25Mbps/3Mbps). The necessity for these speeds is

³ The provider market share per county is measured by the number of households in each census block in the county where the provider offers service at 10Mbps or greater. The source of the number of households is the www.census.gov and the source for provider services is www.broadbandmap.gov/data-download. The HHI measure is biased downward because (i) the county-wide measure assumes that every cable provider competes against all other cable providers; (ii) every telephone company competes against all other telephone companies; (iii) companies that specialize in business services provide residential service; and (iv) in census blocks with multiple providers, each provider serves an equal share of the customers.

based on the requirements of services, such as down-streams of high definition television programs. These speeds are also recommended by the service providers. Services at these speeds are not available to 53 percent of rural customers, but are available to 92 percent of urban customers (FCC, February 4, 2015b). Overcoming this digital divide cannot be accomplished if the public service obligation is set at the 10/1Mbps level.

Figure 1. Distribution of County HHI Values Based on 10Mbps Service Availability



Third, the FCC has budgeted \$4.5 billion annually for the high-cost portion of its Connect America Fund (support for low-income consumers would be in addition to this amount),⁴ even though it had estimated that the gap between broadband revenue and cost would equal to \$23 billion (FCC March 2010; November 18, 2011). Industry stakeholders had estimated that the high-cost support was \$9.7 billion (Quinn et al. 2011). The FCC limits its support to \$4.5 billion by leaving a portion of the more expensive rural areas with limited or no broadband service.

⁴ The FCC's low-income Lifeline Program supports the purchase of voice telephone services. While the FCC is conducting experiments, investigating how to structure a broadband lifeline program, that program has not been implemented to date.

Fourth, the FCC raises universal service funds as the product of a contribution factor (a percentage) times a contribution base. The contribution base is the interstate revenue associated with retail telecommunications services. These revenues, such as long distance voice service, have been stagnant or declining. Therefore, there has been pressure to increase the contribution factor, which is now at 18.2 percent (FCC, December 11, 2015). The FCC's desire to stay within the \$4.5 billion budget is driven, in part, by its desire not to increase the contribution factor. Broadband transmission and other related services have been excluded from the contribution base. Including those services in the base would increase the contribution base dramatically and tie the contribution base to growing sources of revenue. The additions to the contribution base would allow the FCC to increase its budget. Moreover, given that broadband services are not part of the base and the fund is supporting broadband services, there is a subsidy flowing from voice service customers to broadband service customers.

Fifth, the FCC plan provides support based on the difference between a model cost and a benchmark. The support calculation is only used if the carrier agrees to participate in the program and only for the first six years of the program. If the carrier does not agree to participate, because it believes that the support is insufficient or it does not wish to fulfill the public service obligations, then the FCC will establish a competitive bidding system, where the winner of the bid would receive the support. However, it is not known how many alternative providers, if any, would bid for these areas and when alternative providers would be able to provide service. Moreover, there is a lack of clarity regarding the incumbent carrier's ongoing responsibilities, and whether incumbent carrier would be required to transfer assets to winning bidders.

On the other hand, if the carrier decides to participate in the program, it is provided with support for only six years. At the end of the six years, the FCC plan will rely on a competitive bid to continue to supply service in that territory. Given that one carrier has already received support and has built out in the service territory, it is doubtful if another carrier would be able to bid against the carrier that has received support. Thus, there is no reason to switch from calculated model support to competitive bidding at the end of six years (FCC, November 18, 2011).

Enhancing the Broadband Plan

First, the FCC should act to reduce provider concentration in urban markets by implementing policies that increase the number of providers. These policies can take two forms. To increase the number of facilities-based providers, universal service funds could be reserved for municipal providers. There are currently 165 broadband municipal networks (Zagas 2015). While the FCC has acted to limit state policies that restrict the ability of municipalities to provide broadband service, the FCC has not actively promoted municipal networks. Active promotion would not only provide more facilities carriers, but would also give the FCC and state agencies a yardstick for measuring the activities of the private carriers.

Second, the FCC could require providers of broadband access service to provide that service at a wholesale level. Companies purchasing the wholesale service could bundle voice, data, and video services that would compete with the bundles sold by the facilities providers. The price for the wholesale service could be set equal to the urban average cost generated by the FCC's economic model. Such a service would be similar to the unbundled network elements that generated competition to telephone companies in the period from 1998 to 2004 (FCC, August 21, 2003). However, the FCC has declared that it will forbear from establishing such a system (FCC, March 12, 2015). Reversal of that decision is necessary to enhance competition in urban broadband markets.

Third, the FCC should extend the time period of the subsidy and enhance the support to carriers that agree to build fiber to the home networks. These networks are required to meet the long-term goal of 100Mbps. Without this incentive, carriers might build one network to meet the current obligation and reengineer the network to meet future obligations.

Fourth, the FCC should enlarge the contribution base to include broadband services. This can help fund the enhanced network in high-cost areas rather than just in a limited set of high-cost areas.⁵

Conclusion

It is necessary to enhance the FCC's broadband plan in order to meet the goal of providing affordable high-speed broadband service. To provide affordable service in urban areas, it is necessary to recognize that maintaining competitive markets requires regulatory action. To bring high-speed service to rural areas, it is necessary to establish incentives that lead providers to engineer networks which can meet long-term goals. Through these enhancements, the public interest goals of higher levels of efficiency, universal service, and the lowest prices consistent with the internalization of social costs will be attained (Trebing 1987).

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⁵ In addition to price cap carriers, there are over 800 rate-of-return carriers. The FCC is considering how to reform its universal service program for rate-of-return carriers, but has not finalized those reforms yet.

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