PERSPECTIVES

PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES

Justifying the Ends: Section 706 and the Regulation of Broadband

George S. Ford, PhD* Lawrence J. Spiwak, Esq.

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Introduction

Over the last several years, we have seen the Federal Communications Commission put forth a rather clever argument to expand its regulatory authority over broadband services. The argument goes basically like this: Under Section 706(a) of the Communications Act, the Commission "shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans ... by utilizing ... price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment." As part of its mandate, requires Section 706(b) Commission to conduct a regular inquiry into "whether telecommunications advanced capability is being deployed to all Americans in a reasonable and timely fashion" and, if the agency's determination is negative, then "the Commission shall take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment by promoting competition in telecommunications markets."1 (Emphasis supplied.) So, stating it plainly, if the Commission reasons that deployment is not "reasonable and timely", then the agency reasons it has the legal authority to impose broad-reaching regulation over advanced services.2

By the FCC's own estimates of the revenues and costs of broadband deployment, ubiquitous availability of terrestrial (i.e., wireline and wireless) broadband networks cannot be justified on rational grounds and is thus unreasonable.

For the first five Section 706 Reports, the agency refused to take the bait and concluded that deployment, though not ubiquitous, nonetheless "reasonable and timely."3 Genachowski, Chairman Julius however, couldn't resist the temptation. The Sixth Report (issued July 2010) reversed this pattern and concluded that broadband deployment was not "reasonable and timely."4 The Commission's determination hung on the standard of universal broadband availability,5 and since "we have not achieved this goal today,"6 the agency declared that deployment is not "reasonable and timely."⁷ Following its interpretation of Section 706, the agency has since used this determination to motivate implementation of the National Broadband Plan and to justify the regulation of broadband services in decisions such as the Open Internet Rules⁸ and the Data Roaming Order.⁹

Given the breadth and scope of the Commission's willingness to use its new-found

legal authority in Section 706, the purpose of this PERSPECTIVE is to apply some scrutiny to the Commission's initial determination that broadband deployment was not "reasonable and timely." As we show below, there is a profound defect with the Commission's argument.

Specifically, the Commission's own financial analysis conducted as part of its National Broadband Plan (released four months prior to the Sixth Report) shows that the cost of ubiquitous availability via terrestrial networks (i.e., wired and wireless) exceeds any plausible measure of the benefit (as discussed below). In fact, the National Broadband Plan explicitly recognized that the cost of ubiquitous coverage of terrestrial broadband could not be justified, the use of "satellite recommended broadband" as an alternative since it is ubiquitously available.¹⁰ Obviously, if the agency wanted to use Section 706 as the foundation for an aggressively regulatory agenda, then it needed to exclude satellite Internet service from the definition broadband. Not surprisingly, the Commission did so. By ignoring its own evidence and by carefully defining broadband service, the FCC had successfully rigged the game to permit expansive broadband regulation under Section In so doing, the legal and factual predicates for the agency's aggressive regulatory agenda stand on shaky ground.

Is Ubiquitous Terrestrial Deployment "Reasonable"?

In making its determination in its *Sixth Report* on the reasonableness and timeliness of broadband deployment, the FCC employed an embarrassingly simple argument. Specifically, the agency observed, "[t]he goal of the statute, and the standard against which we measure our progress, is universal broadband availability." ¹² Since universal availability was not achieved at the time, the agency concluded deployment was not "reasonable and timely." ¹³

In assessing the reasonableness of deployment, the term "reasonable" must be defined. A pertinent legal definition of reasonable is, "the way a rational and just person would have acted." Normally, when we think of rational behavior, we envision a comparison of costs and benefits, with proper action being taken when the benefits exceed the cost. So, the question to ask is whether the reasonably prudent business person could justify a business case of universal availability as envisioned by the FCC.

By ignoring its own evidence and by carefully defining broadband service, the FCC had successfully rigged the game to permit expansive broadband regulation under Section 706.

Today, recent estimates suggest broadband is available to an impressive 95% the of households in the United States.15 As the Commission explicitly observes, most of this deployment has been accomplished with private sector investment. Yet, as the Commission's has also recognized, private sector incentives will be insufficient to ensure universal deployment. In the Sixth Report, the agency opines, "market forces alone are unlikely to ensure that the unserved minority of Americans will be able to obtain the benefits of broadband anytime in the near future."16 According to the agency, the lack of sufficient private incentive is reasonable, in that "service providers in [areas with low population density] cannot earn enough revenue to cover the costs of deploying and operating broadband networks, including expected returns on capital, there is no business case to offer broadband services in these areas."17 Private firms operate, by necessity, within the confines of a cost-benefit framework, though both costs and benefits are measured in terms of private values alone.18 In the agency's

own words, ubiquitous available is not a reasonable expectation absent government subsidy (i.e., funding the "gap").¹⁹ Notably, the Commission's analysis of private-sector deployment is an explicit cost-benefit approach to the question of reasonable expectations.

Given the lack of sufficient private incentive, serving "all Americans in all locations" will require some government support. If deployment is "unreasonable and untimely" simply because it is not ubiquitous, and ubiquity is not a reasonable expectation for private sector investment alone, then the blame for the "unreasonable and untimely" deployment of broadband services must then land in the lap of government.

The need for government support ... does not imply that universal availability is something that must be accomplished today (or ever). It may not be reasonable even for the government, given existing to fund universal technologies, availability. The desire that all **Americans** have broadband available does not a fortiori mean that availability should come at any cost.

The need for government support, however, does not imply that universal availability is something that must be accomplished *today* (or ever). It may not be reasonable even for the government, given existing technologies, to fund universal availability. The *desire* that all Americans have broadband available does not *a fortiori* mean that availability should come at *any* cost. Congress has not written the FCC (or any other party) a blank check to expand deployment to "all Americans." ²⁰ (In fact, the

Commission recently took bold steps to attempt shrink the Universal Service Fund burden.21) The right-minded social planner makes cost-benefit calculations, though the costs and benefits are measured on social rather than purely-private grounds. Thus, whether one considers private or social incentives to expand broadband availability, the question is whether such expansive deployment is supported by a costbenefit calculation. While the FCC concludes (without financial analysis) in its Sixth Report that deployment was not reasonable and timely because it was not ubiquitous, the agency's own financial analysis released a few months earlier rejects its conclusion that terrestrial ubiquity is reasonable.

The Unreasonable Cost of Terrestrial Ubiquity

The National Broadband Plan, authored and released by the Federal Communications Commission in March 2010, states that "[a]ll Americans should have access to broadband service with sufficient capabilities."22 Following up on the National Broadband Plan, Commission released a paper providing the technical details of its modeling effort to size the "broadband investment gap," or the additional amount of funding required to serve all homes where broadband is now unavailable.23 Using statistical methods and available data, the Gap Report estimates that approximately 7 million U.S. households do not have access broadband service. In 2009, there were about 129 million homes in the U.S., so the unavailability rate is about 5.4% of households.24 This estimate was subsequently supported by the National Broadband Map.25

With an estimate of the lack of access, the *Gap Report* turns to estimating the cost of closing that availability gap. Employing standard investment analysis, the gap was computed as the net present value ("NPV") of the investment in broadband infrastructure in the unserved markets.²⁶ This figure includes capital expenditures and on-going costs, and reflects the expected revenue associated with providing

service over the life of the broadband asset.²⁷ The discount rate is assumed to be 11.25% and the planning horizon is 20 years.²⁸ Broadband service is assumed to be a 4 Mbps download and 1 Mbps upload service.²⁹ This definition of broadband had the effect of excluding satellite broadband technology.

In the benchmark case, the *Gap Report* estimates a \$23.5 billion investment gap required to serve the estimated 7 million homes without broadband availability today.³⁰ Importantly, the \$23.5 billion investment gap is not equal to the total cost of serving the unserved homes. This "gap" measures the additional investment required on top of the private investment and market expenditures. The total cost of the project is about \$32.4 billion, with the gap reflecting the \$8.9 billion in revenues over the project life.³¹

Even by today's standards, \$23.5 billion is a lot of money, particularly to serve just 7 million homes. On average, the gap estimated by the Commission is \$3,357 per home passed. averages be deceiving, However, can particularly when costs vary considerably across geography. The Gap Report provides a little taste of this cost heterogeneity by dividing the entire 7 million homes into two groups. According to the Gap Report, \$13.4 billion of the total investment gap - more than half - is required to expand availability to only 250,000 of the highest cost homes (0.19% of all U.S. homes). Thus, over half the total gap is devoted to very few homes, each requiring, on average, about \$53,600 in gap investment. Excluding the cost of serving these 250,000 homes, the remaining 6.75 million homes has an average investment gap of about \$1,500 per home passed.

In light of these numbers, we must ask—is ubiquitous terrestrial availability reasonable? If the Commission is correct in its assumptions, then the answer is "No." Spending \$50,000 or more to make broadband available to a single household, which may or may not subscribe to

the service, is obviously unreasonable. Nevertheless, we will do the math on the benefits to confirm the intuition.

In light of these numbers, we must ubiquitous ask-is terrestrial availability reasonable? If the Commission is correct in assumptions, then the answer is "No." Spending \$50,000 or more to make broadband available to a single household, which may or may not subscribe to the service, is obviously unreasonable.

The *social* benefits of a broadband connection can be divided into three pieces: (1) the profits plus the fixed cost from providing the service; (2) the consumers' surplus from the service; and (3) any social premia from the service (i.e., external effects, externalities, and so forth). Assuming a normal return for the sellers (the 11.25% cost of capital assumption), the first part is measured directly in the *Gap Report* as revenues, so the remaining societal benefits required to offset the investment gap include only the latter two types of social benefits.

Turning to consumers' surplus, which is item (2) on the list, we draw evidence from the study by Dutz, Orszag and Willig (2009).³² In that study, which is cited in the *Gap Report*, total surplus (that is, expenditures plus consumers' surplus) is, on average, about twice revenues.³³ Marking up the *Gap Report*'s revenue assumption of \$8.9 billion implies an additional private surplus of about \$1,300 per home passed over the planning horizon.³⁴ For all 7 million homes, this leaves a gap of about \$2,060 per home unmatched by social benefits. For the social premia to offset this loss it would need to be a preposterously large 80% of gross consumer value (surplus plus expenditures) of broadband service. As such,

the cost-benefit calculus remains highly unfavorable.

Dividing the homes into the lower cost 6.75 million homes and higher cost 250,000 homes presents a slightly improved picture for the lower cost homes. For these, the additional of consumer surplus comes close to covering the gap (\$1,271 in surplus versus \$1,500 in gap). In contrast, the high cost homes we still have a \$52,330 shortfall of benefits to offset the cost of a build out. For the most costly 250,000 homes, the social costs are many times even the full Even assuming externalities social benefits. private many times gains (which preposterous), the cost-benefit test fails.35 By the FCC's own estimates of the revenues and costs broadband deployment, availability of terrestrial (i.e., wireline and wireless) broadband networks cannot be justified on rational grounds and is thus unreasonable.

A Solution, Rejected

Both the *National Broadband Plan* and the *Gap Report* conclude satellite broadband may be the technology of choice for these areas due to the extremely high cost of terrestrial broadband technologies (i.e., both wired and wireless) and the resultant burden such costs would put on a broadband universal service fund.³⁶ Specifically, the plan observes, "[t]he FCC should consider alternative approaches, such as satellite broadband, for addressing the most costly areas of the country to minimize the contribution burden on consumers across America."³⁷ Additionally, the director of the *National Broadband Plan*, Blair Levin, observed:

Ultimately, it will be too expensive to provide service to the last .2 percent of homes, so those homes should be served by satellite broadband.³⁸

Using satellite for very high-cost areas seems to be a reasonable if not necessary option, and one explicitly proposed by the Commission. These recommendations for alternatives are a direct result of the financial analysis conducted by the FCC for the *Gap Report*.

Satellite broadband is today, for all practical purposes, ubiquitously available. As noted in the National Broadband Plan, "satellite-based broadband service is available in most areas of the country from two providers."39 Obviously, then, for purposes of the Sixth Report, satellite broadband was not considered a "broadband" service. While the National Broadband Plan does list satellite broadband as "broadband," 40 the service level thresholds of 4 Mbps download and 1 Mbps upload service excluded the service from consideration at the time.41 This exclusion of satellite services from the "reasonable and timely" analysis of the Sixth Report occurred despite recognition in the National Broadband Plan that new satellite technologies may soon be available that could satisfy this service threshold.42

... the absence of such a rational analysis from the Sixth Report has a ready explanation: the "unreasonable and untimely" determination was intended to serve as a factual predicate for much of the agency's expanded regulatory agenda.

A more reasonable approach to satellite broadband would have been to ask: if it costs \$50,000 to provide a 4:1 Mbps terrestrial wired or wireless service to a household, then is it reasonable to accept a lower service level that can be provided at a substantially lower cost and, in fact, is already provided? In our opinion, a reasonable and rational analysis would conclude "Yes."

Why didn't the FCC employ such logic? We believe that the absence of such a rational analysis from the Sixth Report has a ready explanation: the "unreasonable and untimely" determination was intended to serve as a factual predicate for much of the agency's expanded regulatory agenda. As the Sixth Report concludes, "[i]f the Commission finds that broadband is not being deployed in a reasonable and timely manner, it must take immediate action to accelerate deployment. ... already begun."43 Indeed, the Sixth Report has provided the impetus for implementing the recommendations of the National Broadband Plan. And, as noted above, the FCC's determination also served as the cornerstone of the agency's highly regulatory Open Internet Rules and Data Roaming Order. A rational analysis of deployment and satellite broadband did not serve the agency's pre-determined conclusion to interpret Section 706 as a regulatory mandate.

Misreading the Statute

In addition to ignoring its own evidence and excluding satellite broadband, the agency also adopted a distorted interpretation of the statute. Section 706 of the Communications Act requires "determine the Commission to advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion."44 The statute does not require the FCC to determine whether or not the goal of deployment to all Americans has been met. Had Congress intended the Commission answer that question, the statute would have been drafted to request the agency to "determine whether advanced telecommunications capability has been deployed to all Americans." It did not. The statute says "is being deployed," which implies a continuing Notwithstanding, under activity. Commission's reasoning, if broadband is not universally available at the time it conducts its inquiry, then it may impose regulation upon advanced services under Section 706.

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At bottom, the Commission misunderstands (or deliberately chooses to ignore) the fact that an assessment of the *pace* of deployment and an assessment of the *level* of deployment are two very different things. Section 706 relates to the pace of deployment, and this fact was not lost on earlier administrations. In prior *Section 706 Reports*, the analysis is consistently directed at the *pace* of deployment. In the *Fifth Section 706 Report*, for example, the agency recognized that "[t]he end goal is to ensure the ubiquitous and affordable availability of broadband for all Americans." ⁴⁵ But, the Commission concluded deployment was reasonable and timely because:

The data reflect the industry's extensive investment in broadband deployment, including at higher speeds, as evidenced by increased subscribership for those higher-speed services. The record also reflects that providers are continuing to make significant investments in broadband facilities going forward.⁴⁶

As such, the earlier Section 706 Reports understood that the question "is broadband being deployed" is not that same as the question "has broadband been completely deployed." Commissioner Meredith Baker summed it up nicely in her statement on the Report:

The goal encapsulated by Section 706 is universal broadband availability. Nowhere in Section 706 does it require that goal to be reached definitively in 2010. Rather, the question is whether network providers continue to make

demonstrable progress towards that goal. All evidence suggests that answer be made in the affirmative.⁴⁷

Normally, when we think of rational behavior, we envision a comparison of costs and benefits, with proper action being taken when the benefits exceed the cost. In the context of Section 706, where the Commission is directed "determine whether advanced to telecommunications capability is being deployed to all Americans in a reasonable and timely fashion,"48 Congress instructs the agency to provide an assessment of whether the current level of deployment, measured at "regular" intervals, is reasonable and timely under existing conditions. The Section 706 Reports are a continuing series of assessments, not a one-shot review. Like all technology, broadband service is being diffused throughout the country over time.49 Congress appears to have understood the nature of the diffusion process—if benefits and costs vary over time, then what may be unreasonable activity at time t may be reasonable activity at time t'.

The present Commission does not appear to, or (perhaps more accurately) chooses not to, grasp the distinction between the goal and the pace of progress. As such, it has failed to answer the question posed to it by Congress, but has in doing so provided the factual predicate for an aggressively regulatory agenda.

Conclusion

In full, the agency's argument is that deployment is not reasonable or timely because it was not ubiquitous at the time it conducted its Section 706 inquiry. Yet, the agency's *National Broadband Plan* estimates that deploying broadband to the highest cost areas has a price tag of over \$50,000 per housing unit (on average, with some households costing far more). No plausible cost-benefit analysis would justify such expenditure for terrestrial broadband service to the average household (only some of which use broadband). Given current

technology, satellite broadband is the only economically sensible approach to providing service for thousands of U.S. households in the highest cost areas. If satellite is excluded from the definition of "broadband," then ubiquitous deployment is not reasonable. If satellite is included, then deployment is (for all practical purposes) ubiquitous. To conclude that deployment is unreasonable and untimely the agency had to do two things: (1) exclude satellite broadband; and (2) ignore its own estimates of deployment costs which force the conclusion that ubiquitous deployment is not reasonable. The agency did both.

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While some praised Chairman Genachowski for his "courage" and for taking an "objective look at the law and data," 50 the agency's blatant logical inconsistencies and ignorance of contemporaneous FCC research leads us to conclude that the more plausible Commission's interpretation is that the "unreasonable and untimely" determination was intended to serve as a factual predicate for much of the agency's expanded regulatory agenda. As the Sixth Report concludes, "[i]f the Commission finds that broadband is not being deployed in a reasonable and timely manner, it must take immediate action to accelerate deployment. ... We have already begun."51 Indeed, it has.

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In light of these points, we conclude that the legal and factual predicates for much of the agency's aggressive regulatory agenda under Chairman Julius Genachowski stand on shaky ground. The next *Section 706 Report* is due out soon. We expect the agency to echo its last finding—after all, its aggressive regulatory agenda hangs on it.

NOTES:

- * Dr. George Ford is Chief Economist, and Lawrence J. Spiwak is the President, of the Phoenix Center for Advanced Legal and Economic Public Policy Studies. The views expressed in this Perspective are the authors' alone and do not represent the views of the Phoenix Center or its staff.
- ¹ 47 U.S.C. § 1302.
- As we noted in Phoenix Center Perspective No. 11-01: Federalist Implications of the FCC's Open Internet Order (February 8, 2011) (available at: http://phoenix-center.org/perspectives/Perspective11-01Final.pdf), the Commission's use of Section 706 also raises significant issues of federalism and pre-emption. However, discussion of these issues is beyond the scope of this Perspective.
- In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, Sixth Report, FCC 10-129, 25 FCC Rcd 9556 (rel. July 20, 2010) (hereinafter "Sixth Report" and available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-129A1.pdf). All the Section 706 reports are available at http://www.fcc.gov/broadband/706.html.
- ⁴ *Id.* at 2 ("we conclude that broadband deployment to all Americans is not reasonable and timely. This conclusion departs from previous broadband deployment reports, which held that even though certain groups of Americans were not receiving timely access to broadband, broadband deployment "overall" was reasonable and timely").
- 5 Id. at ¶ 28.
- 6 Id. at ¶ 28 (emphasis added). According to the *National Broadband Plan*, the unserved equal about seven million housing units, or about 6% of the U.S. total. ("Given the ever-growing importance of broadband to our society, we are unable to conclude that broadband is being reasonably and timely deployed to all Americans in this situation.")
- ⁷ *Id.* at ¶ 2; ¶ 28. In the *National Broadband Plan*, the FCC determined that "[a]ll Americans should have access to broadband service with sufficient capabilities." *National Broadband Plan: Connecting America*, Federal Communications Commission (March 2010) (available at: http://www.broadband.gov/download-plan) at XIII (hereinafter "*National Broadband Plan*").
- ⁸ See In re Preserving the Open Internet, Broadband Industry Practices, FCC 10-201, REPORT AND ORDER, 25 FCC Rcd 17905 (rel. Dec. 23, 2010).
- ⁹ In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services, FCC 11-52, 26 FCC Rcd 5411, Second Report and Order (rel. April 7, 2011).
- National Broadband Plan, supra n. 7, at 150.
- We note that the current Commission used a similar tactic to effectively preclude forbearance under Section 10 for unbundled network elements. *See* G.S. Ford and L.J. Spiwak, PHOENIX CENTER PERSPECTIVE No. 10-08: *The Impossible Dream: Forbearance After the Phoenix Order* (December 16, 2010) (available at: http://www.phoenix-center.org/perspectives/Perspective10-08Final.pdf).
- 12 Sixth Report, supra n. 3 at ¶ 28.
- ¹³ *Id*.
- Webster's New World Legal Dictionary (2010).
- National Broadband Plan, supra n. 7 at 20; Sixth Report, supra n. 3 at n. 81.
- ¹⁶ Sixth Report, supra n. 3 ¶ 28.
- National Broadband Plan, supra n. 7 at 136; see also Sixth Report, supra n. 3 at ¶¶ 23-25.
- And in his statement for the latest *Inquiry* concerning the *Sixth Report*, Chairman Genachowski observed, "market forces alone are unlikely to close [the availability] gap in the near future" (available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-148A2.pdf).

NOTES CONTINUED:

- ¹⁹ The Broadband Availability Gap, OBI TECHNICAL PAPER No. 1, Federal Communications Commission (March 2010): (available at: http://download.broadband.gov/plan/the-broadband-availability-gap-obi-technical-paper-no-1.pdf and hereinafter "Gap Report").
- Though the U.S. government has apparently squandered a great deal of money on broadband deployment efforts arising out of the ARRA. *See, e.g.,* A. Feinberg, *Republicans Question \$126 Million Stimulus Grant For W.Va. Broadband,* The Hill (May 16, 2012) (available at: http://thehill.com/blogs/hillicon-valley/technology/227771-gop-questions-126m-stimulus-grant-to-west-virginia-libraries); J. McElhatton, *Online Soap Opera Cleans Up With Stimulus Broadband Cash; Nearly \$1M In Federal Funds For "Diary Of A Single Mom"*, The Washington Times (December 1, 2011) (available at: http://www.washingtontimes.com/news/2011/dec/1/online-soap-opera-cleans-up-with-stimulus-broadban/?page=all).
- ²¹ In re Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing an Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up Universal Service Reform Mobility Fund, FCC 11-161, 26 FCC Rcd 17663, REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING (rel. November 18, 2011).
- National Broadband Plan, supra n. 7 at XIII.
- ²³ Gap Report, supra n. 19.
- ²⁴ <u>www.census.gov</u> (129,065,264 "housing units").
- http://www.ntia.doc.gov/press-releases/2011/commerce%C3%A2%E2%82%AC%E2%84%A2s-ntia-unveils-national-broadband-map-and-new-broadband-adoption-survey.
- ²⁶ *Gap Report, supra* n. 19 at 5, 13.
- ²⁷ *Id.* at 5.
- ²⁸ *Id.* at 33-4.
- ²⁹ *Id.* at 3.
- ³⁰ *Id.* at 5. If the service level is assumed to be 100 Mbps delivered by fiber-to-the-premises ("FTTP"), then the investment gap increases to \$321.8 billion dollars, where the availability gap is defined to be nearly all U.S. homes. *Id.* at 45 (unserved households equaling 130 million).
- 31 *Id.* at Ex. 1-A. An example helps illustrate the difference. Say that the present value total cost of serving a home (capex and operational) is \$10,000. Service provision renders a lifetime present value flow of about \$6,500. In this case, the investment gap would be \$3,500 [= \$6,500 \$10,000], but the total cost of service is \$10,000. For ubiquitous FTTP, the total cost is about \$670 billion. In Phoenix Center Policy Paper No. 12, we estimated the cost of such a network to be about \$600 billion. T. R. Beard, G. S. Ford and L. J. Spiwak, *Why ADCO, Why Now? An Economic Exploration into the Future Industry Structure for the "Last Mile" in Local Telecommunications Markets*, Phoenix Center Policy Paper No. 12 (November 2001), reprinted in 54 Fed. Com. L. J. 421 (May 2002).
- M. Dutz, J. Orszag, and R. Willig, *The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households*, CompassLexecon (2009).
- ³³ *Id.* at Table 3 (revenue figures) and at pp. 20, 23-4 (surplus calculations show a high of about \$32 billion on revenues of about \$30 billion). *See also Gap Report, supra* n. 19 at 49 (referencing the Dutz *et al.* 2009 paper); *and also see* S. Greenstein and R. McDevitt, *The Broadband Bonus: Estimating Broadband Internet's Economic Value*, 35 TELECOMMUNICATIONS POLICY 617-632 (2010) (estimating a ratio of consumer surplus to revenue of about 1.4).
- The "presently paying" is an important qualifier, since this ratio approach is not generally valid for all prices and revenues. But, Dutz *et al.* (2009) and *Gap Report* (2010) have prices that are reasonably comparable. If we discount the surplus at a lower 5% rate over the 20-year horizon, then the consumer surplus rises by about 50%. *See* G.S. Ford and T.M. Koutsky, "In Delay There Is No Plenty": The Consumer Welfare Cost of Franchise Reform Delay, PHOENIX CENTER POLICY BULLETIN No. 13 (January 2006) at n. 21 (available at: http://www.phoenix-center.org/PolicyBulletin/PCPB13Final.pdf).

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- ³⁵ Greenstein and McDevitt (2010), *supra* n. 33.
- 36 In the National Broadband Plan, supra n. 7 at XIII, this fund is called the "Connect America Fund."
- National Broadband Plan, id. at 150.
- 38 B. Levin, Universal Broadband: Targeting Investments to Deliver Broadband Services to All Americans, The Aspen Institute (2010) (available at:

http://www.knightfoundation.org/media/uploads/publication_pdfs/Universal_Broadband_Blair_Levin.pdf)

("Ultimately, it will be too expensive to provide service to the last .2 percent of homes, so those homes should be served by satellite broadband").

- ³⁹ National Broadband Plan, supra n. 7 at 37.
- ⁴⁰ *Id.* at 15 ("Finally, broadband networks can take multiple forms: wired or wireless, fixed or mobile, terrestrial or satellite").
- 41 Sixth Report, supra n. 3 at ¶5; Gap Report, supra n. 19 at 3; National Broadband Plan, supra n. 7 at 24, n. 33 ("the analysis excludes satellite broadband because satellite capacity is limited").
- National Broadband Plan, supra n. 7 at 38.
- 43 Sixth Report, supra n. 3 at ¶ 29.
- 44 47 U.S.C. §706(b).
- In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, FIFTH REPORT, FCC 08-88, 23 FCC Rcd 9615 (rel. June 12, 2008) at ¶ 76 (hereinafter "Fifth Report" and available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-88A1.pdf).
- 46 Id. at ¶ 59 (available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-88A1.pdf).
- ⁴⁷ Statement of Commissioner Meredith Baker, Sixth Report, supra n. 3.
- ⁴⁸ Section 706(b), *supra* n. 1.
- ⁴⁹ As shown in Policy Bulletin No. 24, broadband adoption follows this process. G. S. Ford and L. J. Spiwak, *Evaluating Broadband Stimulus and the National Broadband Plan: Establishing Expectations for Broadband Rankings*, Phoenix Center Policy Bulletin No. 24 (March 2010) (available at: http://www.phoenix-center.org/PolicyBulletin/PCPB24Final.pdf).
- http://www.freepress.net/press-release/2010/7/20/fcc-report-finds-broadband-deployment-lacking. Others were less impressed. *See, e.g,* the Dissenting Statements of Commissioners Robert McDowell and Meredith Baker.
- ⁵¹ See supra n. 43.