

# JUSTIFYING THE ENDS: SECTION 706 AND THE REGULATION OF BROADBAND

By George S. Ford, PhD and Lawrence J. Spiwak, Esq.

## INTRODUCTION

Since the mid-1990s, the complex question of how, if at all, the Federal Communications Commission (FCC) should regulate the Internet has been subject of fierce debate. Starting in the Clinton Administration, the FCC made a very deliberate set of decisions to classify broadband as a Title I “information” service rather than as a traditional “common carrier” service under Title II. In so doing, the agency allowed the then-nascent

Internet to grow without subjecting these services to a wide variety of legacy regulations, including, but not limited to, regulation by fifty different state public utility commissions, having to pay access charges and universal service fees, and subjecting broadband service providers to onerous common carrier reporting requirements. With the push for “net neutrality” regulation at the beginning of the Obama Administration, the agency was faced with a major legal conundrum: Given the D.C. Circuit’s dismissal of the Bush Administration’s attempt to split the proverbial Title I/Title II baby with an ill-defined “policy statement” in *Comcast v. FCC*, if the FCC wanted to assert formal jurisdiction over the Internet, the FCC would either have to (a) reverse itself and reclassify broadband as a Title II service; or (b) try to find an alternative legal theory that would be less invasive than full reclassification yet still be able to survive legal scrutiny.<sup>1</sup>

The FCC’s response was to take the latter tack with a rather clever argument. The agency’s legal strategy 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,

**George S. Ford** is the Chief Economist and co-founder of the Phoenix Center for Advanced Legal & Economic Public Policy Studies in Washington, D.C. (U.S.A.). Dr. Ford has a Ph.D. in Economics (Auburn University 1994) and has served as a professional economist at the Federal Communications Commission and in the private sector. Dr. Ford has testified as an expert before many state regulatory commissions, courts, and the U.S. Congress.

**Lawrence J. Spiwak** is the President and co-founder of the Phoenix Center for Advanced Legal & Economic Public Policy Studies in Washington, D.C. (U.S.A.). Mr. Spiwak received his B.A. from the George Washington University in 1986 (Special Honors, Middle Eastern Studies) and his J.D. from the Benjamin N. Cardozo School of Law in 1989. Mr. Spiwak is a member in good standing of the bars of New York, Massachusetts, the District of Columbia, and the U.S. Court of Appeals for the D.C. Circuit. In 2012, Mr. Spiwak was selected by his peers to receive the Federal Communications Bar Association’s Distinguished Service Award for his efforts to bring greater analytical rigor to the Federal Communications Law Journal.

or other regulating methods that remove barriers to infrastructure investment.” As part of its mandate, Section 706(b) requires the Commission to conduct a regular inquiry into “whether advanced telecommunications 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 and by promoting competition in the telecommunications markets.”<sup>2</sup> If the Commission finds that deployment is not “reasonable and timely” when it conducts its Section 706 inquiry, then the agency reasons it has the legal authority to impose broad-reaching regulation over advanced services.<sup>3</sup>

The first five FCC *Section 706 Reports* contained no plan to regulate the Internet and thus concluded that deployment, though not ubiquitous, was nonetheless “reasonable and timely.”<sup>4</sup> Following the release of the *National Broadband Plan*,<sup>5</sup> which contained many proposals to increase the influence of regulation over the Internet, and the Obama Administration’s interest in Network Neutrality regulation, the *Sixth Report* reversed this pattern and concluded that broadband deployment was not “reasonable and timely.”<sup>6</sup> The Commission’s determination hung on the standard of universal broadband availability,<sup>7</sup> and since “we have not achieved this goal today,”<sup>8</sup> the agency declared that deployment is not “reasonable and timely.”<sup>9</sup> Following its interpretation of Section 706, the agency used this finding to justify the regulation of broadband services in its *Open Internet Rules*.<sup>10</sup> Significantly, the agency has also used this legal theory to motivate implementation of the *National Broadband Plan*<sup>11</sup> and to extend its legal authority to regulate commercial data roaming agreements.<sup>12</sup>

Given the breadth and scope of the Commission’s willingness to use its new-found legal authority in Section 706, the purpose of this paper 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. In fact, the *National Broadband Plan* explicitly recognized that the cost of ubiquitous coverage of terrestrial broadband could not be justified, and recommended the use of “satellite broadband” as an alternative since it is ubiquitously available.<sup>13</sup> 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 of 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 706.<sup>14</sup> In so doing, the legal and factual predicates for much of 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.”<sup>15</sup> Since universal availability was not achieved at the time of the *Sixth 706 Report*, the agency concluded deployment was not “reasonable and timely.”<sup>16</sup>

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.”<sup>17</sup> 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. The question to ask is whether the reasonably prudent business person could justify a business case of universal availability as envisioned by the FCC.

Today, recent estimates suggest broadband is available to an impressive 95% of the households in the United States.<sup>18</sup> As the Commission explicitly observes, most of this deployment has been accomplished with private sector investment. Yet, as the Commission 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 un-served minority of Americans will be able to obtain the benefits of broadband anytime

in the near future.”<sup>19</sup> 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.”<sup>20</sup> 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.<sup>21</sup> In the agency’s own words, ubiquitous available is not a reasonable expectation absent government subsidy (i.e., funding the “gap”).<sup>22</sup> 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, 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.”<sup>23</sup> In fact, the Commission recently took bold steps to attempt *shrink* the Universal Service Fund burden.<sup>24</sup> 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 cost-benefit 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.”<sup>25</sup> Following up on the *National Broadband Plan*, the 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.<sup>26</sup> Using statistical methods and available data, the *Gap Report* estimates that approximately 7 million U.S. households do not have access to broadband service. In 2009, there were about 129 million homes in the U.S., so the unavailability rate was about 5.4% of households.<sup>27</sup> This estimate was subsequently supported by the *National Broadband Map*.<sup>28</sup>

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.<sup>29</sup> 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.<sup>30</sup> The discount rate is assumed to be 11.25% and the planning horizon is 20 years.<sup>31</sup> Broadband service is assumed to be a 4 Mbps download and 1 Mbps upload service.<sup>32</sup> 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.<sup>33</sup> 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.<sup>34</sup>

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. However, averages can be deceiving, 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). 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.

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, when it may or may not subscribe to the service, is obviously unreasonable. Nevertheless, we will do the math on the benefits to confirm the intuition.

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.<sup>35</sup> In that study, which is cited in the *Gap Report*, total surplus (that is, expenditures plus consumers’ surplus) is, on average, about twice revenues.<sup>36</sup> 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.<sup>37</sup> 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 the 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 social benefits. Even assuming externalities many times private gains (which is preposterous) the cost-benefit test fails.<sup>38</sup> 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.

## A SOLUTION, REJECTED

Both the *National Broadband Plan* and the *Gap Report* conclude satellite broadband may be the technology of choice for rural 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.<sup>39</sup> 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.”<sup>40</sup> 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.<sup>41</sup>

Using satellite for very high-cost areas seems to be a reasonable if not a 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.”<sup>42</sup> 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,”<sup>43</sup>

the service level thresholds of 4 Mbps download and 1 Mbps upload service excluded the service from consideration at the time.<sup>44</sup> 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.<sup>45</sup>

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.... We have already begun.”<sup>46</sup> 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 the Commission to “determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.”<sup>47</sup> 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 activity. Notwithstanding, under the 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.

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.”<sup>48</sup> 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.<sup>49</sup>

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 Dissenting 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.<sup>50</sup>

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 to “determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion,”<sup>51</sup> 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.<sup>52</sup> 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  $t'$ . In contrast, 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, not only has the agency 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.

While some praised Chairman Julius Genachowski for his “courage” and for taking an “objective look at the law and data,”<sup>53</sup> the agency’s blatant logical

inconsistencies and ignorance of contemporaneous FCC research leads us to conclude that the more plausible interpretation is that the Commission’s “unreasonable and untimely” determination was intended to serve as a factual predicate for much of the agency’s expanded regulatory agenda. Judging by the pervasive and continued use of this theory to justify much of the current FCC’s aggressive regulatory agenda, indeed it has.<sup>54</sup> Given the massive legal and factual gymnastics the agency undertook to justify its actions, however, perhaps it is time for Congress to step in and clear up this mess once and for all.

## NOTES

1. For a complete discussion of these cases and the political fight over potential reclassification, see G.S. Ford, L.J. Spiwak ad M. Stern, *The Broadband Credibility Gap*, 19 COMM.LAW CONSPICUOUS 75 (2010).
2. 47 U.S.C. § 1302(emphasis added).
3. 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 paper. G.S. Ford and L.J. Spiwak, *Federalist Implications of the FCC’s Open Internet Order*, Phoenix Center Perspective No.11-01 (February 8, 2011) (available at: <http://phoenix-center.org/perspectives/Perspective11-01Final.pdf>).
4. *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](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>.
5. *Connecting America: The National Broadband Plan*, Federal Communications Commission (March 2010) (available at: <http://www.broadband.gov/download-plan>) (hereinafter “*National Broadband Plan*”).
6. *Sixth Report*, *supra* n. 4 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”) (emphasis in original).
7. *Id.* at ¶ 28.
8. *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.”)
9. *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.” *Supra* n. 5 at XIII.
10. See *In re Preserving the Open Internet, Broadband Industry Practices*, FCC 10-201, Report And Order, 25 FCC Rcd 17905 (rel. Dec. 23, 2010).
11. See, e.g., *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 Inter-carrier Compensation Regime; Federal-State Joint*

- Board on Universal Service; Lifeline and Link-Up Universal Service—Mobility Fund*, FCC 11-161, 26 FCC Rcd 17663, Report and Order and Further Notice of Proposed Rulemaking (rel. November 18, 2011) at ¶¶ 66-73.
12. *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) at para 64, *Aff'd Celco Partnership v. FCC*, \_\_\_f.3d\_\_\_ (D.C. Cir. December 4, 2012).
  13. *National Broadband Plan*, *supra* n. 5 at 150.
  14. 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>).
  15. *Sixth Report*, *supra* n. 4 at ¶ 28.
  16. *Id.*
  17. Webster's New World Legal Dictionary (2010).
  18. *National Broadband Plan*, *supra* n. 5 at 20; *Sixth Report*, *supra* n. 4 at n. 81.
  19. *Sixth Report*, *supra* n. 4 ¶ 28.
  20. *National Broadband Plan*, *supra* n. 5 at 136; see also *Sixth Report*, *supra* n. 4 at ¶¶ 23-25.
  21. 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." Statement of Chairman Julius Genachowski, *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*, FCC 10-148, Seventh Broadband Deployment Notice of Inquiry, 25 FCC Rcd. 11355 (rel. August 6, 2010) (available at: [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-10-148A2.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-148A2.pdf)).
  22. *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").
  23. 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/hillconvalley/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-broadband/?page=all>).
  24. See *supra* n. 11.
  25. *National Broadband Plan*, *supra* n. 5 at XIII.
  26. *Gap Report*, *supra* n. 22.
  27. [www.census.gov](http://www.census.gov) (129,065,264 "housing units").
  28. <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>.
  29. *Gap Report*, *supra* n. 22 at 5, 13.
  30. *Id.* at 5.
  31. *Id.* at 33-4.
  32. *Id.* at 3.
  33. *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).
  34. *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 previous research, 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).
  35. M. Dutz, J. Orszag, and R. Willig, *The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households*, CompassLexecon (2009).
  36. *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. 22 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).
  37. The "presently paying" is an important qualifier, since this ratio approach is not generally valid for all prices and revenues. But, Dutz et al., *supra* n. 35 and *Gap Report*, *supra* n. 22, 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>).
  38. Greenstein and McDevitt (2010), *supra* n. 36.
  39. In the *National Broadband Plan*, *supra* n. 5 at XIII, this fund is called the "Connect America Fund."
  40. *National Broadband Plan*, *id.* at 150.
  41. 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](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").
  42. *National Broadband Plan*, *supra* n. 5 at 37.
  43. *Id.* at 15 ("Finally, broadband networks can take multiple forms: wired or wireless, fixed or mobile, terrestrial or satellite").
  44. *Sixth Report*, *supra* n. 4 at ¶5; *Gap Report*, *supra* n. 22 at 3; *National Broadband Plan*, *supra* n. 5 at 24, n. 33 ("the analysis excludes satellite broadband because satellite capacity is limited").
  45. *National Broadband Plan*, *supra* n. 5 at 38.
  46. *Sixth Report*, *supra* n. 4 at ¶ 29.
  47. 47 U.S.C. §706(b).
  48. *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](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-88A1.pdf)).

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49. *Id.* at ¶ 59 (available at: [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-08-88A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-88A1.pdf)).
50. Dissenting Statement of Commissioner Meredith Baker, *Sixth Report*, *supra* n. 4.
51. Section 706(b), *supra* n. 2.
52. As shown in our previous research, 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>).
53. <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 to the *Sixth Report*, *supra* n. 4.
54. Indeed, we note that in the FCC's most recent *Section 706 Report*, released on August 21, 2012, the Commission again finds that broadband is not yet being deployed "to all Americans" in a reasonable and timely fashion. *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*, FCC 12-90, Eighth Broadband Progress Report, 27 FCC Rcd 1, 342 (rel. August 21, 2012).

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