# Telecommunication Services in the Broadband Age: How to Ensure Affordability for Low-Income Consumers?

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## Abstract

One of the practical challenges faced by regulators when pursuing low-income assistance for high-speed Internet service is to know what constitutes affordability and how to measure an affordable rate. Although affordability is the greatest barrier faced by low-income consumers to subscribing to broadband internet, there is currently no statutory or regulatory definition of affordability for telecommunication services. By looking into initiatives adopted by state and federal regulators, as well as the private sector, this paper aims to help regulators define what affordability means for telecommunications services, especially for broadband internet.

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**Summary**

## 1. Introduction

The Telecommunications Act of 1996 ("Telecom Act") has expanded the scope of universal service to ensure that both telecommunications and advanced services considered essential to citizenship are provided at "affordable" and "reasonably comparable" rates.[2] To carry this goal, state and federal commissioners have implemented implicit[3] and later on explicit[4] subsidies that made it possible to offer residential consumers low local telephone rates throughout the country.

However, amid the reality of the 21st century, with broadband connection supplanting traditional telecommunication voice and data services as the primary way that people communicate, should regulators change course and include high-speed internet as a basic telecommunication service? Would this new definition imply that broadband must be brought to low-income consumers at below cost rates?

Affordability is, in fact, the most often-cited reason for low subscription to high-speed internet service by low-income Americans. Although "affordable rates" have been an explicit national objective since 1996, it is still not clear what actions regulators might take in order to enhance broadband adoption among millions of consumers that cannot afford broadband at home.

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[2] See Title 47 U.S.C. § 254(b)(1): "quality services should be available at just, reasonable, and affordable rates,"; and Title 47 U.S.C. § 254(b)(3): "Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services … at rates that are reasonably comparable to rates charged for similar services in urban areas."

[3] See *Texas Office of Pub. Util. Counsel v. FCC*, 183 F.3d 393, 406 (5th Cir. 1999) ("TOPUC") ("Implicit subsidies (…) involve the manipulation of rates for some customers to subsidize more affordable rates for others."). Under this system, regulators might, for example, "require the carrier to charge 'above-cost' rates to low-cost, profitable urban customers to offer the 'below-cost' rates to expensive, unprofitable rural customers."

[4] In the 1996 amendments to the Communications Act, Congress therefore specified that any federal universal service mechanisms should be "explicit", "sufficient to achieve the purposes" of section 254. 47 U.S.C. §254(e). Following Congress' mandate, FCC established a federal universal service fund through the Federal-State Joint Board on Universal Service, 12 FCC Rcd 8776 (1997).

This research paper addresses a practical and fundamental issue for low-income assistance with respect to broadband internet service: what constitutes "affordability" for (broadband?) telecommunication services and how can we measure affordability.

This work acknowledges that regulators also face other challenges when trying to enhance broadband adoption among the low-income consumers. For example, the legal authority of the Federal Communication Commission ("FCC") is highly contested and it is currently subject to challenge on jurisdictional grounds. Also, there is also a debated issue of what modifications should be made to the Universal Service Fund so that it could include broadband support for low-income consumers. However, these issues are not within the central scope of this work.

The remainder of this research paper is organized as follows. Section 2 introduces the debate by discussing why regulators might choose to subsidize broadband internet. Section 3 examines possible definitions and measurements for affordability. Section 4 provides examples of federal and state experience in seeking to apply affordability for telecommunication services. Section 5 analyses the efforts to measure affordability in the housing sector. Section 6 concludes the paper by contrasting the affordability definitions and measurements found. The Appendix in Section 7 contains data tables comparing the definition and different measures applied to affordability.

## 2. Should broadband internet be affordable?

There are three initial factors that must be appraised in order to determine whether regulators should guarantee low-income assistance for broadband internet. First, regulators must ask whether high-speed internet can be considered an essential service. Second, regulators must evaluate whether cost is a real barrier for broadband adoption. Third, the regulator's role in this debate should be defined and analyzed.

### 2.1. Is broadband an essential service?

As the American universal service system is designed to ensure that everyone has "affordable" access to whatever communication services are deemed essential, the first question a policymaker should ask is whether broadband internet can be deemed essential or not.

With respect to the essentiality of broadband in our daily economic and social life, statements by Congress, the White House, and Federal Agencies endorsing this position abound.

For example, Congress directed the Federal Communications Commission ("FCC") in early 2009 to develop a National Broadband Plan ("NBP")[5] arguing that maximizing the use of broadband would advance a wide range of public interests, such as "*consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, employee training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes*."[6]

The economic importance of the Internet was reinforced by a Presidential memorandum on June 28, 2010.[7] Explaining the American productivity growth that started in the 1990s, it acknowledges that '*the Internet, as vital infrastructure, has become central to the daily economic life of almost every American by creating unprecedented opportunities for small businesses and individual entrepreneurs*."

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[5] Available at http://www.broadband.gov/download-plan/

[6] As stated in the Introduction of the National Broadband Plan (http://www.broadband.gov/plan/1-introduction/ ). See also Title 47 USC § 1301: "Continued progress in the deployment and adoption of broadband technology is vital to ensuring that our Nation remains competitive and continues to create business and job growth."

[7] Although this memorandum aims at wireless internet, its considerations are transferable to wireline internet. Available at http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution.

Aligned with Congress's view, former FCC Chairwoman Mignon Clyburn recognized the essentiality of broadband access to the Internet not only from an economic perspective, but also from a social one: "*broadband is no longer a luxury but is essential in today's society to finding a job, getting an education, receiving quality health care, and staying connected with family and community*."[8]

From those justifications, we can conclude that citizens require broadband internet access in order to participate in important aspects of society and government. It is through the internet that many critical government services can be obtained, and that information may be quickly and effectively exchanged among people, either for professional, educational, or social purposes.

### 2.2. Is cost a problem?

As part of the FCC's work in the context of the NBP, the Commission released the National Broadband Plan Consumer Survey ("Consumer Survey")[9], a national random digit-dial survey of adults in October and November 2009 to assess America's attitudes toward broadband, which found that affordability and lack of digital skills are the main reasons why nearly one third of the country is not connected to high-speed Internet at home. That number compares poorly to Singapore and Korea where the adoption rates top 90%.

The Consumer Survey identified the cost of connectivity as the biggest factor holding back broadband adoption: on average, 36% of broadband non-adopters, or 28 million adults, said they do not have home broadband because the monthly access fee, installation fee, or the cost of a computer is too high. Secondly, digital literacy issues,

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[8] Available at http://www.fcc.gov/document/connect-america-fund-expands-broadband-600k-homes-businesses

[9] *Broadband Adoption and Use in America*, OBI Working Paper Series No. 1, John B. Horrigan. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf

such as lack of online skills or fear of the risks incurred by going on the web represent 22%, followed by 19% of non-adopters who said the internet is not relevant.[10]

Among the poorest consumers, affordability is the most significant factor: it represents 47% of broadband non-adopters with annual income under $20,000, and 38% of broadband non-adopters with annual income varying from $30,000 to $40,000.[11] Those are alarming numbers, especially while 93% of households with incomes greater than $75,000 have broadband at home.[12]

Lack of affordability, rather than availability of service, was also the main reason for non-adoption of home broadband internet according to the latest census data provided by the 2010 study prepared jointly by the Commerce Department's Economics and Statistics Administration ("ESA") and National Telecommunications and Information Administration ("NTIA").[13]

Finally, according to the Consumer Survey, on average, Americans pay nearly $41 per month for broadband service and non-adopters concerned with cost would be willing to pay, on average, $25 per month for broadband.

Thus, affordability is especially important for broadband as "*studies consistently show that costs are the greatest barrier to broadband adoption, and costs issues are especially acute for low-income consumers".*[14]

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[10] FCC's Press Release available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296443A1.pdf

[11] National Broadband Plan Consumer Survey, Exhibit 28.

[12] *See* John B. Horrigan, PhD, *Broadband Adoption and Use in America* 13, Exhibit 1 (Fed. Comm. Comm'n, OBI Working Paper Series, Working Paper No. 1, 2010) (*Broadband Adoption and Use in America*), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf.

[13] U.S. Department of Commerce, Economics & Statistics Administration & National Telecommunications and Information Administration, *Exploring the Digital Nation: Home broadband internet adoption in the United States*8, available at http://www.ntia.doc.gov/files/ntia/publications/esa_ntia_us_broadband_adoption_report_11082010_1.pdf

[14] According to the speech of, at the time, FCC's Commissioner Mignon Clyburn, during a round table to discuss low-income assistance on June 23, 2010 which she explained the importance of lowering the cost of broadband for low-income consumers, as recommended in the NBP. Available at http://www.fcc.gov/events/roundtable-discussion-explore-broadband-pilot-programs

### 2.3. What is the regulator's role?

Despite the essentiality of broadband internet in our modern society and the cost barrier for broadband penetration, the regulators' role with respect to low-income assistance is not free from objections. One the one hand, opponents often argue that making regulators responsible for affordability matters would be illogical, since regulators should operate only under the just and reasonable standard.[15]

From this perspective, regulators should be only concerned with setting reasonable rates for consumers and reasonable return on investment diligently incurred by the public utility, as well as establishing standards of service. Affordability, as a wealth distribution issue, should be Congress' concern, and the regulator should not be called to set rates below cost.[16]

Furthermore, opponents of subjecting broadband to any type of regulation (*i.e.*, broadband providers) claim that FCC lacks legal authority over the internet.[17] Under this view, as the Telecom Act doesn't explicitly describe broadband internet, and the FCC currently classifies providers under information services subject to Title I jurisdiction, and not as common carriers under Title II, the Commission cannot take any action in the broadband area, especially requiring universal and affordable service.

On the other hand, the evolving notion of public interest and, thus, the evolving definition of basic service,[18] might justify an expanded regulator's role. In this sense, low-income consumer assistance could be included within the regulator's goals, and

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[15] See *Preside or Lead*, Scott Hempling, p. 133: "*A regulator's job is to regulate – to establish performance standards, then align compensation with compliance. In this equation, affordability is not a variable*."

[16] Id., p. 112: "(…) *while affordable service is a societal goal, regulation's role is to price properly, then press legislators to help the poor. Consumer protection, an oft-cited purpose of regulation, is protection from abuse by monopolies, not from costs caused by the consumer. Consumers must carry their own weight*."

[17] FCC's authority over the internet is very controversial and many states and internet service providers dispute the federal Universal Service Fund can be used to support only telecommunications services, which don't include broadband service as an information service. Currently the Tenth Circuit is reviewing the USF-ICC Reform Order, and it might decide about Commission's authority to fund broadband Internet access.

[18] *Serving the "Public Interest" – Traditional vs Expansive Utility Regulation*, Eric Filipink, 2009. p. 03.

economic development, job creation, civic participation, among others, could be deemed as legitimate policy criteria.[19]

From the FCC's point of view, it not only should direct the line-item fees on consumer bills to help carriers provide an affordable broadband service, but it also has sufficient legal authority to do it under sections 254 and 706 of the Telecom Act.[20]

Despite the debate over what should be the extension of regulator's role, or even whether FCC has authority over internet, the Commission has taken real action in the broadband area. This is a very recent change of course though. As emphasized by Nuechterlein and Weiser (2013, p. 307), "*it was not until several years into the twenty first century (...) that the FCC began seriously considering new broadband subsidies*", and "*it was not until 2011 that the FCC made clear that it would make broadband subsidies the central focus of its universal service program*".

Thus, if the goal is to have a society in which everybody has the same opportunities, broadband internet, as an essential technology to consumers, should be made affordable, on the principle that "quality services should be available at just, reasonable, and affordable rates."[21]

## 3. What does affordability mean?

In the English everyday language, affordable means 'within a person's financial capacity'; but in the economics literature the concept is almost absent (Milne, 2006). For telecommunications, it can be defined in a relative way: the cost of service should not exceed a certain percentage of a family income (ITU, 1998). It could mean below or

[19] For more details on the debate over the expanded roles, goals, and decision-making criteria, see *Serving the "Public Interest" – Traditional vs Expansive Utility Regulation,*Eric Filipink, 2009.

[20] "Consistent with that decision, we conclude that sections 254 and 706 authorize us to fund bundled voice and broadband services as well as standalone broadband services as part of a discrete, time-limited Pilot Program structured to determine how best to bring advanced services to low-income consumers." *Lifeline Reform Order*, para. 328.

[21] See Title 47 U.S.C. § 254(b)(1).

above cost of supplying a certain service. Affordability could mirror the willingness to pay for utility services, or it could be based on a "burden-threshold" of the household's total income (Kessides et al., 2009).

Moreover, affordability is influenced by the overall income level and by the overall telecom price levels. Marketing factors, such as service packaging, as well as user factors, such as value perceptions and cost-saving behavior, also affect the perception of affordability (Milne, 2006).

Although "affordability" might have a major effect on the success of a public policy, as seen in item 2.2 above, it appears that the term has been greatly underused historically in utility ratemaking and policymaking in the United States. Thus, more important than rigorously defining it, this paper will take a more practical approach and assess how regulators are dealing with the issue.

Are regulators linking affordability with availability (meaning that service can be obtained at a reasonable cost in a geographical area)? Are they assessing affordability by a service's penetration statistics? Are regulators directly asking consumer to know what prices they can afford?

## 4. How to define and measure affordability for communications service?

Even if there was a consensus regarding the role and the authority of regulators to ensure affordable broadband internet, and a consensus regarding affordability definition, regulators would still face the elemental problem of measure an affordable rate. Statutes fall short of providing sufficient guidance for commissioners. What constitutes affordability, and how to implement it are all open questions that regulators must address.

To accomplish this goal, this paper will examine the experience from the FCC, state regulators and private-sector initiatives with respect to affordability for telecommunications, namely: (i) the 2010 USF litigation in Court, which presents the interaction between "affordability" and other universal service principles; (ii) FCC's initiatives, which bring a practical approach towards affordability, such as: (a) *2010 National Broadband Plan*; (b) *2011 USF/ICC Transformation Order*; and (c) *2011 Lifeline and Link Up NPRM* and *2012 Lifeline Reform Order*; (iii) private sector experience in *2012 Connect2Compete*; and (iv) the state regulator experience in the 2013 California's Proposed Decision to reform Lifeline.

### 4.1. USF Litigation in Court

#### 4.1.1. *Vermont Public Service Bd. v. FCC* (2011); and *Qwest v. FCC* (2005)

In both Vermont v. FCC[22], and Qwest v. FCC[23], FCC is required by the Courts to explain its interpretation of the undefined terms "reasonably comparable" rates and "sufficient" universal service support, and demonstrate that the high-cost support mechanism preserves and advances universal service in rural areas.

The high-cost support, which supports the provision of services in rural areas, represents the most expensive component of the Universal Service Program: in 2009, total expenditures totaled $4.3 billion of the $7.26 billion. Besides the high-cost, the Universal Service Program has other three separate funds: (i) low-income support for basic telephone services; (ii) rural health care support for health providers in rural areas; and (iii) schools and libraries support for phone and internet services.

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[22] *Vermont Public Service Board v. FCC* (DC Circuit, 2011). D.C. Circuit Court reviewed FCC's high-cost universal service support program for non-rural carriers.

[23] *Qwest Commc'ns Int'l, Inc. v. FCC*, 398 F.3d 1222 (10th Cir. 2005) ("Qwest II")

In order to justify the level of federal high-cost support and defend the sufficiency of the high-cost fund, the FCC weighed the principle of "affordability".

According to the FCC, the principles that guide the universal service policies are in section 254(b) and include: (i) that there should be "specific, predictable, and sufficient" federal and state universal service mechanisms;[24] (ii) that quality services should be available at just, reasonable, and affordable rates;[25] and (iii) that consumers in all regions of the nation should have access to telecommunications and information services that are "reasonably comparable" in rates and quality to those provided in urban areas.[26]

In the context of USF litigation in Court, FCC acknowledges that "sufficiency" and "affordability" are conflicting universal service principles that must be balanced. As explained in Qwest: "*if the universal service fund grows too large, it will jeopardize other statutory mandates, such as ensuring affordable rates in all parts of the country, and ensuring that contributions from carriers are fair and equitable*."[27]

Thus, the FCC declined to increase subsidies to telecommunications providers in rural states, as asked by states such as Vermont and Maine. Increasing the size of the fund would only add to the already heavy universal service contribution burden placed on consumers.[28] Furthermore, to prove that the high-cost support mechanism has in fact produced "reasonably comparable" rates, FCC relied in data showing that services have advanced in rural areas.

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[24] 47 U.S.C. §254(b)(5).

[25] 47 U.S.C. §254(b)(1).

[26] 47 U.S.C. §254(b)(3).

[27] Qwest II Remand Order, 25 FCC Rcd at 4087, para. 28.

[28] Brief for Respondents: "*the FCC found that lowering the cost benchmark would have been contrary to the interests of consumers in net contributor states because it would have required them to contribute more than is necessary to ensure that rates are affordable and reasonably comparable in states like Maine and Vermont*."

The Court in Vermont v. FCC ruled that FCC's decision to leave the high-cost support mechanism unchanged was neither arbitrary nor capricious, even because the high-cost fund would be soon overhauled to give space for broadband support.[29]

## 4.2. FCC Orders and Reports

### 4.2.1. National Broadband Plan

On March 17, 2010 the FCC delivered to Congress the 376-page National Broadband Plan ("NBP"),[30] and for the first time recognized that although increasing numbers of Americans have broadband at home, urban and rural low-income households disproportionately do not.

The NBP identified a number of major barriers for broadband adoption. As discussed in section 2.2 above, the main obstacle to adoption is cost. This is particularly true for low-income Americans, who tend to be older, poorer, less educated, a member of a minority group or have a disability. Many non-adopters also lack digital literacy, which is basic knowledge on how to use a computer and navigate a webpage, or just do not think that broadband is relevant to them.[31]

The importance of broadband internet was stated by the FCC in the following words: '*everyone in the United States today should have access to broadband services supporting a basic set of applications that include sending and receiving e-mail, downloading Web pages, photos and video, and using simple video conferencing.*"[32]

Therefore, the NBP recommended shifting the subsidized Lifeline program from basic voice service towards its goal of affordable access to robust broadband service

[29] There is currently a complaint from the states in appeal against the FCC's USF Reform Order in the 10th Circuit.

[30] The National Broadband Plan is available at http://download.broadband.gov/plan/national-broadband-plan-pdf.

[31] NBP, p. 168.

[32] NBP, p. 135.

with actual download speeds of at least 4 Mbps and actual upload speeds of at least 1 Mbps to 100 million U.S. households by 2020.[33]

With respect to low-income consumers that live in the suburbs, the NBP also recommend introducing competition as a way to help lower the prices and increase speedy of broadband internet. Note that about 78% of U.S. homes have access to only two wireline broadband service providers.[34]

Furthermore, as ensuring low-income Americans affordable broadband service was a key goal of the NBP, [35] the Plan also recommended the adoption of pilot programs to produce actionable information about how best to design broadband support mechanisms. Those programs began in 2012 with the Lifeline Reform Order, as we see in 3.2.3(ii) below.

#### 4.2.2. USF/ICC Transformation Order (2011) and USF/ICC Transformation Order and FNPRM (2012)

The USF/ICC Transformation Order and FNPRM ("CAF Order"), released by FCC on November 18, 2011, modernized the intercarrier compensation ("ICC") system, adopted new rules to ensure "robust and affordable" voice and broadband services, and made clear that the Commission would start to make broadband subsidies the central focus of its universal service program.

The CAF Order started the transition from the telephony-oriented high cost fund – a Universal Service Fund ("USF") program designed to keep telephone rates for

[33] Note that that the speeds proposed in the NBP are the minimum requirements to allow basic data communications, and are very low compared to other countries. NBP also aims at providing more choices for wireless broadband (free up 500 MHz of capacity for broadband services by 2020, up from a mere 50 MHz open for broadband today).

[34] "How the FCC's new national broadband plan is expected to affect consumers", *The Washington Post*, March 17, 2010. Note that this is just a recommendation from the NBP, and the FCC hasn't done anything in concrete to increase competition. Also, with Verizon moving toward wireless only, even fewer than 78% of homes will have more than one wireline provider.

[35] National Broadband Plan at XIII, Chapter IX (Adoption and Utilization).

customers affordable in the rural areas –into the broadband-oriented Connect America Fund ("CAF"), which will ultimately replace all existing high-cost support mechanisms and focus on deployment, adoption, and use of both fixed and mobile broadband.

In the CAF Order, FCC recognizes that "*all Americans should have access to broadband that is capable of enabling the kinds of key applications that drive our efforts to achieve universal broadband, including education (e.g., distance/online learning), health care (e.g., remote health monitoring) and person-to-person communications (e.g., VoIP or online video chat with loved ones serving overseas).*"[36]

More specifically, CAF Order addresses three barriers related to broadband availability: (i) deployment of broadband service; (ii) sufficient robustness (e.g., bandwidth) to meet the needs of consumers; and (iii) reasonable comparability of broadband service.[37] Affordability, which is another barrier of broadband availability, is addressed in the Lifeline Reform Order discussed in the item 3.2.3 below.

It is important to highlight that although the CAF Order addresses availability and not affordability issues, the FCC has recognized that ensuring broadband service is affordable is a component of ensuring it is available. According to the FCC: "*For broadband to be 'available' to a consumer, a broadband network must be deployed to the consumer, the service must be of sufficient robustness to meet the needs of consumers, and the broadband service offered over the network must be affordable.*"[38]

With respect to the network deployment, which is a more acute need in rural areas, the FCC plans to use the National Broadband Map, a tool maintained by the

[36] *CAF Order*, Section VI "Public Interest Obligations", para. 87.

[37] *CAF Order*, Section IV "Goals", para. 48.

[38] *Lifeline Reform Order*, Section III, "Performance Gols and Measures", para. 28; and Section XIII, "Further Notice of Proposed Rulemaking", para. 416.

NTIA to collect data on broadband infrastructure by mapping broadband availability across the United States.[39]

Regarding robustness, FCC adopted a speed benchmark for fixed broadband provided by CAF recipients. For each $775 in federal support, ILECs must deploy new broadband service with actual speeds of 4 Mbps downstream and 1 Mbps upstream to one new unserved location. FCC will require recipients to demonstrate that by the end of the third year they have offered broadband "*to at least 85 percent of their high-cost locations*."[40]

Finally, FCC declined to adopt outcome measures for the performance goal related to ensure reasonably comparable rates for broadband and voice service. However, FCC had proposed on the NPRM that the ratio of the rural price to rural household disposable income should be similar to the ratio in urban areas."[41]

### 4.2.3. Lifeline and Link Up NPRM (2011) and Lifeline Reform Order (2012)

Since 1985 the Lifeline program has provided a discount on phone service for qualifying low-income consumers – households which income is at or below 135% of the federal Poverty Guidelines, or that participate in a qualifying income-based public-assistance program. Currently, Lifeline provides a household with an average $9.25 discount per month either on wireline or wireless telephone charges. In addition, some states provide additional subsidies from their State Lifeline funds.

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[39]The National Broadband Map is available at http://www.broadbandmap.gov/about. It is interesting to note that the first CAF disbursements were distributed earlier this year and the largest carriers – AT&T and Verizon – refused to take any money from the federal support because they do not want to meet the Federal requirements.

[40] *CAF Order*, Section VII "Establishing the Connect America Fund", para. 160.

[41] *USF/ICC Transformation NPRM*, 26 FCC Rcd, para. 486.

In 2011 and 2012, the Lifeline/Link Up program has undergone extensive reforms through *Lifeline and Link Up Notice of Proposed Rulemaking* ("Lifeline NPRM"), released March 4, 2011, and *Lifeline and Link Up Reform and Modernization* Order ("Lifeline Reform Order"), released February 6, 2012.

The Reforms are essentially based on recommendations from the NBP, and consist of a number of measures to eliminate waste, fraud and abuse – which are estimated to save the Universal Service Fund up to $2 billion yearly until 2015 –, as well as actions towards the modernization of the low-income program, mainly to include broadband assistance.

Regarding the reforms related to the voice service assistance, the Reforms directly discuss the complexity of defining affordability. In the Lifeline NPRM, the FCC sought comment on whether Lifeline's reimbursement framework (based in the four-tier system) for determining federal support should change.[42] In response to this questioning, the Lifeline Reform replaced the Lifeline program's burdensome administrative reimbursement structure with a uniform flat-rate.

In making this change, the FCC made an important statement about affordability. The Commission acknowledged that subscriber line charge ("SLC") is no longer an appropriate metric[43] and argued that "*the prices consumers face in the marketplace are what determine affordability and adoption decisions, not the network costs of the incumbent LEC (the original basis for the SLC*)."[44]

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[42] The reimbursement framework is current based on a complex four-tier system. Tier One support is received by all ETCs for each qualifying consumers and equals the incumbent subscriber line charge, capped at $6.50. Tier Two support provides an additional $1.75 per month in federal support. Tier Three support provides an amount equal to one-half the amount of any state-mandated Lifeline support, capped at $1.75.Tier Four support provides up to an extra $25 per month to subscribers living on Tribal lands. For more details see *Lifeline Reform Order*, Section V "Support amounts for voice services", paras 51-59.

[43] According to the FCC, "notably, most non-ILEC ETCs do not assess SLCs on their subscribers, and their rates are not regulated by the Commission and/or the states." *Lifeline and Link Up NPRM*, Sec. IX, para. 247.

[44] *Lifeline Reform Order*, Section V "Support amounts for voice services", para 55.

Therefore, the FCC decided to adopt a flat rate of $ 9.25 per line per month. This amount was determined by combining the average of support offered by each layer of the four-tier system, but was not calculated based on affordability findings, since the FCC recognized that it did not "*have a basis in the record (...) to determine at this time the appropriate total level of Lifeline support that should be provided to each low-income consumers (...)*".[45]

With respect to the modernization of the program, the Lifeline Reform represents the first concrete step towards affordability of broadband services to low-income consumers. Although, the FCC did not take the opportunity to immediately expand the Lifeline program to cover broadband services, it began to move it in that direction. The Commission (i) defined broadband and voice service availability as performance goals; and (ii) adopted broadband pilot programs to develop data on the necessary amount of subsidies for broadband and the length of time support might need to be provided.

**(i) Availability/Affordability Measurement: Subscription Rates**

With respect to the first action taken, the Lifeline Order sheds some light on the concepts surrounding affordability. In the NPRM, FCC acknowledged that had not yet established a "performance measure" to evaluate the progress of the low-income programs, recognized that broadband was not yet a Lifeline performance goal, and proposed "availability" and "affordability" as separate goals.[46]

However, in the Reform Order, the FCC adopted "availability" of voice and broadband service for low-income Americans as the "performance goals" for Lifeline, to which will be applied the "associated measurements".[47] Thus, by choosing the least

[45] Id. para 58.

[46] *Lifeline and Link Up NPRM,* Sec. III "Establishing Program Goals and Measuring Performance", paras 43-45.

[47] *Lifeline Reform Order*, Sec. III "Performance Goals and Measures", para 24-33.

burdensome means to monitor the program's progress, affordability will not be measure separately, but along with availability.

Under the Order, broadband will be considered available to a low-income consumer if (i) the broadband network has been deployed; (ii) the service offered provides a sufficient level of robustness (e.g., bandwidth); and (iii) is *affordable* for the low-income consumers. The same concepts apply to voice service, as applicable. In other words, from the FCC's perspective, "affordability", together with robustness, is a component of a service that is in fact available.

In order to measure whether broadband and voice service are available or not, FCC adopted the "subscription rates" of low-income consumers as its proxy. Therefore, availability will be measured by the extent to which low-income consumers are subscribing, and not by the strict physical deployment. Specifically, FCC will compare the penetration levels for low-income households with the "next-highest income" bracket.[48] The narrower the difference, the bigger the FCC will assume the progress towards availability.

One of the main supports for this initiative comes from the Census Bureau, which already collects information on income level, and has started to develop questions regarding broadband adoption for possible inclusion in the American Community Survey in 2013, so that the FCC and the NTIA can use these statistics to increase access to broadband, particularly to low-income consumers.[49]

[48] Those concepts were left to be defined by the Wireline Competition Bureau, and might be defined as 0 to 135 percent of the Federal Poverty Guidelines for 'low-income' household and 135 to 175 percent of the Federal Poverty Guidelines for 'next-highest income', as suggested in the Order.

[49] For more details see the American Community Survey, available at http://www.census.gov/#.

### (ii) Broadband Pilot Programs: how to increase broadband adoption?

Regarding the second action described above, the FCC has started to modernize Lifeline to address affordability of broadband service by using a "discrete" fraction of the savings foreseen – no more than $25 million – to adopt the low-income Lifeline Broadband Pilot Program ("Pilot Program").[50] The Pilot Program is designed to explore how Lifeline can best be used to increase broadband adoption among Lifeline-eligible consumers.

On April 30, 2012, FCC launched a competition to identify the projects, proposed by broadband providers that are also eligible telecommunications carriers ("ETCs") that would best qualify for the Pilot Program.[51] By the Order released on December 19, 2012, the Wireline Competition Bureau ("Bureau") authorized approximately $13.8 million to support the 14 pilot projects selected covering 21 states and Puerto Rico.[52] Each project has different service terms with respect to subsidy amount, end-user charges, access to digital literacy training, equipment type, speed ranges and data usage limits, and will offer up to 12 months of subsidized broadband service for eligible subscribers.

The pilot projects were required to use the federal criteria for low-income consumer eligibility and are available only to households that do not currently subscribe to broadband service. Thus, the Pilot Program will be able to measure the extent to which discounts on the cost of broadband services may induce its adoption by low-income consumers. Enrollment of eligible subscribers ended November 1, 2013.

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[50] *Lifeline Reform Order*, Section IX "Modernizing the Program", paras 310-354.

[51] FCC launches competition to identify the best ways to increase broadband adoption among low-income Americans, available at https://www.fcc.gov/document/fcc-launches-broadband-adoption-lifeline-pilot-program-competition

[52] The Broadband Adoption Lifeline Pilot Program Map is available at http://transition.fcc.gov/wcb/images/Broadband-Adoption-Lifeline-Pilot-Program-Map.pdf

Furthermore, although the Lifeline NPRM recognized that the expense of consumer equipment necessary to access the Internet (*i.e.*, computers, smart phones, air cards, and modems) has been shown to be a major barrier to broadband adoption for low-income households,[53] the Pilot Program will not subsidize equipment purchases, only services. Moreover, as the NBP and subsequent research have identified, the lack of digital literacy[54] among low-income Americans remains a major barrier to broadband adoption; thus, the pilot projects were encouraged to experiment with different approaches to overcoming digital literacy barriers to broadband adoption.

According to the Bureau, the selected projects include (i) 5 wireless broadband projects; (ii) 7 wireline broadband projects; and (ii) 2 projects that will offer both wireline and wireless broadband technologies. Out of the 14 selected pilot projects, 7 will provide discounted broadband service in rural areas, and 7 will provide discounted broadband service in urban and suburban areas. Depending on the number of subscribers that enroll in the ETCs' broadband service plans, the 14 selected projects could serve a maximum of approximately 74,000 low-income consumers who do not currently subscribe to broadband.

Projects will test a range of monthly end-user charges, such as $40, $35, or $20, with some projects testing lower charges and others testing higher charges. For example, the pilot that will take place in New York is called XChange and will offer digital literacy to seniors and test a range of subsidy amounts of $10, $15 and $20, by randomizing three different broadband plans priced at $4.99, $9.99 and $19.99 based on

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[53] *Lifeline and Link Up Reform and Modernization NPRM*, 26 FCC Rcd 2770 (2011), para 268.

[54] The NBP defined digital literacy as the skills needed to "*us[e] [information and communications technology] to find, evaluate, create and communicate information*". See *National Broadband Plan* at 174-77.

buildings and neighborhoods in Central Brooklyn. The project will employ wireline and fixed-wireless plan and the Lifeline support will not exceed $1,897,320.[55]

The FCC plans to use experience from other broadband adoption program such as the Broadband Technology Opportunities Program ("BTOP"), the Broadband Initiatives Program ("BIP"), and Connect2Compete" program – specifically the type of data collected and tools used, evaluation metrics/criteria, use of control groups – to evaluate the pilots and better understand the factors driving broadband adoption among low-income consumers. Thus, information regarding affordability and the robustness of broadband available to low-income consumers will be collected as part of the Pilot Program.

#### 4.2.4. Connect2Compete

Connect2Compete started in 2011 as an FCC's-supported program and became a national private and nonprofit sector partnership in 2012.[56] The program focuses on tackling the main obstacles to broadband adoption, namely cost and digital literacy. For example, on digital literacy, libraries across the country (along with companies like Best Buy) have committed to offering free digital skills training as part of Connect2Compete.

With respect to cost, through partnerships with large cable companies such as Freedom Pop, Comcast, Cox Communications, Mediacom, Brighthouse, and Wilco – Connect2Compete offers families with school-aged children receiving free school lunches two years of broadband cable internet for $9.95 per month with minimum download speeds of 1 Mbps, as well as refurbished computers for $150 and laptops for

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[55] A list of selected participants with a brief description of their projects is available at http://www.usac.org/li/about/broadband-pilot/participants.aspx.

[56] Available at http://connect2compete.org/; *see also* FCC & "Connect to Compete" Tackle Broadband Adoption Challenge Through Expanded Digital Literacy Training, Fact Sheet (Oct. 12, 2011) (Connect to Compete Digital Literacy Fact Sheet), available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1012/DOC-310346A1.pdf

$199. On average, Connect2Compete offers a 70% discount off monthly broadband services charges. [57]

Connect2Compete is intended to complement the BTOP and the BIP which together have committed more than $7 billion to fund numerous broadband initiatives, many of which have already increased broadband adoption.

For example, the Internet Essentials, Comcast's initiative integrated to Connect2Compete, is aimed at families that have one or more children who qualify for free school lunches, and is advertised as providing $9.95 per month broadband services, at speeds of up to 1.5 Mbps down and 384 Kbps up, and the opportunity to purchase a $150 netbook computer.

#### 4.2.5. States low-income support programs: California's new Order

Within the framework established by the 1996 Act and the Universal Service First Report and Order, 40 states have their own Lifeline programs and set their own requirements for customer eligibility, certification, verification, and support levels when implementing the Lifeline program. The default states (those without their own programs) follow the FCC's criteria.

Useful guidance on affordability is found in the context of the Proposed Decision recently issued by the California Public Utilities Commission ("CPUC") on October 31, 2013 to modernize and expand the California Lifeline Program. If approved, the Proposed Decision will extend the price cap on Lifeline wireline service and include wireless services among the offerings supported by the California Lifeline fund, among other measures.

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[57] Press Release, FCC "Connect to Compete" Tackle Barriers to Broadband Adoption (Nov. 9, 2011), available at http://www.fcc.gov/document/fcc-and-connect-compete-broadband-fact-sheet (detailing private/non-profit partnership providing qualifying families with $9.95 monthly broadband service and reduced price equipment).

In 2008 the CPUC was directed by the state Legislature to complete a telephone service affordability survey of customers and noncustomers who reside in areas funded by the California High Cost Fund-B ("CHCF-B"), and a statewide affordability survey ("2010 Affordability Survey"), to gather information on which to base its future telephone regulation policies.[58]

According to the statewide survey, 72% of all Lifeline subscribers say their bill is affordable and 28% say it is not affordable. When asked to report the increased threshold price that customers might tolerate while still retaining landline service, Lifeline customers report tolerable increases of around $10 to $15 dollars.

As stated in the CHCF-B survey, households earning $39,800 or less appear to be the ones where concern about being able to pay the phone bill is more common, and the average maximum customers report being willing to pay before discontinuing their basic phone service is $28.66. As customers pay, on average, a basic phone service rate of $17.41, they would tolerate a 63% increase before discontinuing their phone service.

The table below summarizes the risk for doing without phone service should bills increase beyond the affordability threshold of each level of household income:

| **Mean Tolerable Change in Statewide Median Monthly Bill by Household Income** | | | | | | |
|---|---|---|---|---|---|---|
| | $24,000 or less | $24,001-$34,000 | $34,001-$39,800 | $39,801-$50,000 | $50,001-$75,000 | Over $75,000 |
| Tolerable % Change | 37% | 24% | 21% | 24% | 20% | 28% |
| Median Bill | $30 | $50 | $53.80 | $56.10 | $75.00 | $75.00 |
| Tolerable Increase Amount | $11.10 | $12.00 | $11.30 | $13.46 | $15 | $21 |

Source: Statewide Survey, 2010.[59]

[58] 2010 CHCF-B and Statewide Affordability Surveys are available at http://www.cpuc.ca.gov/PUC/Telco/generalInfo/2010AffordabilitySurveys.htm.

[59] Also available at the "Affordability of Basic Telephone Service", Staff Report to the California Legislature (2010), available at http://www.cpuc.ca.gov/NR/rdonlyres/383BBEA3-45F8-42E4-8582-70413539AC45/0/2010_Affordability_Report_Final_Sep_29_2010.pdf.

The 2010 Affordability Survey concluded that the California Lifeline performs an important function in ensuring affordability of telephone service for low-income consumers.

## 5. Efforts to measure affordability in other sectors: the Federal Public Housing Assistance

Although the focus of this paper is on the definition of affordability for telecommunication service, this paper will briefly explore the experience in the housing sector for its potential transferability.

The U.S. Department of Housing and Urban Development ("HUD") established the Public Housing Program to provide rental housing for low-income families, elderly, and persons with disabilities.[60] The total payment for a rent is basically based on the family's anticipated gross annual income, and its calculated from the highest of the following: (i) 30% of the monthly adjusted income (after deductions allowed by the regulations); (ii) 10% of monthly income; (iii) welfare rent, if applicable; or; (iv) a $25 minimum rent or higher amount (up to $50) set by an HA.

HUD's housing program relies on the Housing Affordability Data System ("HADS"),[61] a set of housing-unit level datasets that measures the affordability of housing units and the housing cost burdens of households, relative to area median incomes, poverty level incomes, and Fair Market Rents. The purpose of these datasets is to provide housing analysts with consistent measures of affordability and burdens over a long period.

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[60] Available at http://portal.hud.gov/hudportal/HUD?src=/topics/rental_assistance/phprog.

[61] *Housing Affordability Data System*, by David A. Vandenbroucke, HUD, January 28, 2011. For more details on the mechanisms to measure and review affordability see http://www.huduser.org/portal/datasets/hads/HADS_doc.pdf.

The three commonly used affordability measures express cost of a housing unit relative to (i) the cost of safe, sound and adequate housing, (ii) what a family earning the median income could be expected to pay for housing, or (iii) what a family with income at the poverty level could be expected to pay for housing.

Specifically, HADS provide three standards for assessing the affordability of housing units: (i) fair market rent ("FMR"); (ii) area median income ("AMI"); and (iii) poverty-level income. For FMR, the monthly cost of each unit is expressed as a percentage of FMR. For the other two, units are deemed affordable at a certain percentage of the income measure, assuming that 30% of income is spent on housing.

According to HADS, these three standards were chosen because each is commonly used in affordability discussions. Housing cost relative to AMI is perhaps the most common affordability standard. The FMR is the payment standard for housing assistance programs and is often used as a proxy for the cost of an "affordable" unit in housing literature. Poverty income is a widely recognized threshold, and is often used in the general press.

## 6. Conclusion

The Universal Service Fund has historically focused on ensuring reasonably comparable rates between rural and urban areas, supporting affordable voice and broadband services for schools and libraries, and providing low-income assistance for telephone services.

Subsidizing broadband services for low-income consumers is a recent role for the FCC and state regulators, which is reflected in the U.S. early stage in increasing broadband adoption among millions of citizens that lack broadband internet at home.

Together with “deployment”, and “sufficient robustness”, the FCC defines “affordability” as a component of broadband availability. To be available, broadband networks have to be deployed, offer sufficient bandwidth, and be affordable for the consumer. Digital literacy is another barrier for broadband adoption and is addressed by regulators and private sector’s initiatives.

According to the FCC, affordability is assessed by prices that consumers face in the marketplace, as opposed to the network costs of the incumbents. Introducing competition, therefore, might be a way to help lower the prices and increase speedy of broadband internet, although further studies in this area are required.

From the telecom experience there are at least three approaches adopted by regulators to assess affordability: (i) inference from telephone and broadband subscription/penetration rates, as provided by the Lifeline Reform Order; (ii) natural experiment, by testing different levels of discount on services and equipment, as in the Broadband Pilot Program and Connect2Compete; and (iii) field researches on use of communications and willingness to pay, as adopted in the California’s 2010 Affordability Survey.

Transferring the housing experience to telecom, regulators could also measure affordability by collecting data on household expenditure on telecommunication and combine it with the median family income for the area/region. Thus, regulators could calculate an affordable rate through a measurement of a percentage of income devoted to telecom.

Finally, the results from the ongoing 14 Pilot Programs are likely to provide guidance for regulators with respect to what constitutes an affordable telecom service, and how regulators can best lead towards increasing broadband adoption among low-income consumers.

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*Qwest Communications Int’l, Inc. v. FCC*, 398 F.3d 1222 (10th Cir. 2005).

## 8. Appendix

The Data Tables bellow: (i) gather the key principles related to affordability; (ii) compare and contrast definitions of affordability; and (iii) compare measures adopted by regulators to ensure that service is affordable.

| Section 254(b) – Universal Service Principles | |
|---|---|
| **Affordability and key principles** | **Source** |
| "quality services should be available at just, reasonable, and affordable rates," | 47 U.S.C. § 254(b)(1) |
| "Consumers in all regions of the Nation (…) should have access to telecommunications and information services (…) at rates that are reasonably comparable to rates charged for similar services in urban areas." | 47 U.S.C. § 254(b)(3) |
| there should be "specific, predictable, and sufficient" federal and state universal service mechanisms. | 47 U.S.C. §254(b)(5) |
| the FCC found that its new definition of sufficient "is tied explicitly to all of the principles in section 254(b). It also expressly incorporates the principle of affordability by ensuring that universal service is sufficient without growing the universal service fund so large as to render unaffordable the rates for telecommunications services." (p. 25) | Vermont PSB v. FCC, 661 F.3d 54, 58 (D.C. Cir. 2011)<br><br>On Petition For Review Of An Order Of The Federal Communications Commission |
| "the FCC also was recognizing the interplay between the principle of affordability (…) and the principle of reasonable comparability (…), which the Tenth Circuit itself recognized." (p. 42) | |
| "FCC explained that 'the fact that telephone subscribership penetration rates have increased (…) demonstrates that rates are not too high [i.e., unaffordable] under the Commission's universal service program; indeed, the essential telecommunications services encompassed by universal service have become more available than ever before." (p. 43) | |
| "Rates cannot be divorced from a consideration of universal service," "nor can the variance between rates paid in rural and urban areas. If rates are too high [i.e., unaffordable], the essential telecommunications services encompassed by universal service may indeed prove unavailable." (398 F.3d at 1236) | Qwest Communications Int'l, Inc. v. FCC, 398 F.3d 1222 (10th Cir. 2005) Qwest II |
| This Court and other courts have held that the FCC "enjoys broad discretion" when "balancing" the sometimes conflicting universal service principles in section 254(b) of the Act - particularly when it must balance the principles of sufficiency (section 254(b)(5)) and affordability (section 254(b)(1)) | Rural Cellular Ass'n, 588 F.3d at 1103 |
| concept of "sufficiency" can reasonably encompass "not just affordability for those benefitted, but fairness for those burdened." | Rural Cellular Ass'n, 588 F.3d at 1102 |

| Telecom Experience | |
|---|---|
| **Affordability Definition** | **Source** |
| "One way of defining affordability is relative: the cost of telephone ownership should not exceed a certain percentage of family income. Available data suggest that the threshold level is between one and two per cent of family income for those with telephone service [for high income countries]" | ITU 98 Report Universal Access http://www.itu.int/ITU-D/ict/publications/wtdr_98/WTDR98_e_chap2.pdf |
| "The most critical demand-side factor is affordability. The USF administrator should collect data on individual or household expenditures on telecommunications and other services. Combined with income data (preferably by region and sub-region), this information will give the administrator a good idea of the current and expected affordability of telecommunication services in each region." | ITU 2003 Report Universal Access |
| "We propose to define a telecommunications service package as affordable if:<br>• The package allows a household in the lowest income docile to make socially necessary [30 and 60 paid minutes per month as possible average socially necessary minimum levels of use of voice telephony in our definition of affordability] use through sustainable expenditure i.e. expenditure which is without detriment to other essential spending [We assume that it is sustainable for a household in the lowest decide to spend 4% of household income on telecommunications]<br>• The package helps such a household readily control its expenditure on telecommunications." | Lewin, 2010 http://www.vodafone.com/content/dam/vodafone/about/public_policy/affordability_plum.pdf |
| "For broadband to be 'available' to a consumer, a broadband network must be deployed to the consumer, the service must be of sufficient robustness to meet the needs of consumers, and the broadband service offered over the network must be affordable." | Lifeline Reform Order, Section XIII, "Further Notice of Proposed Rulemaking", para. 416 http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-11A1.pdf |
| "the prices consumers face in the marketplace are what determine affordability and adoption decisions, not the network costs of the incumbent LEC (the original basis for the SLC)." | Lifeline Reform Order, Section V "Support amounts for voice services", para 55. http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-11A1.pdf |

| Affordability Measures | Source |
|---|---|
| **Subscription Rates**: "as an outcome measure of the availability of broadband service to low-income consumers, we adopt the broadband penetration rate of low-income consumers, i.e. the extent to which low-income consumers are subscribing to broadband. Progress towards our goal of ensuring the availability of broadband service to low-income consumers will be indicated by a narrowing of the difference between this outcome measure and the broadband service penetration levels of non-low-income consumers in the ´next highest income´ bracket." | Lifeline Reform Order, Sec. III "Performance Goals and Measures", para 35 http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-11A1.pdf |
| **Penetration Rates**: "all those countries with household penetration over 80%, a basic service basket costs no more than 2.5% of household expenditures. Conversely, basket costs above 5% of household consumption were associated with penetrations of below 20%." | ITU 98 Report Universal Access http://www.itu.int/ITU-D/ict/publications/wtdr_98/WTDR98_e_chap2.pdf |
| **Natural Experiment**: Each project has different service terms with respect to subsidy amount, end-user charges (such as $40, $35, or $20, with some projects testing lower charges and others testing higher charges), access to digital literacy training, equipment type, speed ranges and data usage limits to measure the extent to which discounts on the cost of broadband services may induce its adoption by low-income consumers**.** | 14 Broadband Pilot Programs http://www.fcc.gov/encyclopedia/low-income-broadband-pilot-program |
| **Field Researches**: Consumer surveys computed the average tolerable change in statewide median monthly bill by household income (*i.e*., $11.10 is the tolerable increase amount for household income of $24,000 or less) | 2010 Affordability Survey http://www.cpuc.ca.gov/NR/rdonlyres/383BBEA3-45F8-42E4-8582-70413539AC45/0/2010_Affordability_Report_Final_Sep_29_2010.pdf |
| **Percentage of income devoted to telecom**: Transferring HUD's housing experience to telecom, regulators could also measure affordability by collecting data on household expenditure on telecom services and combine it with the median family income for the area/region. Regulators could calculate an affordable rate through a measurement of a percentage of income devoted to telecom. | Housing Affordability Data System http://www.huduser.org/portal/datasets/hads/HADS_doc.pdf |