



## Principles for an Open Broadband Future A Public Knowledge White Paper

---

### EXECUTIVE SUMMARY

The deployment of broadband telecommunications services could have as great an impact on society as the appearance of the printing press in the 15<sup>th</sup> century and television and radio in the 20<sup>th</sup>. Broadband technologies have the potential to bring about unprecedented benefits to consumers and to our national economy. If the U.S. adopts the right policy framework, emphasizing competition and limited regulation, the growth of broadband technologies will significantly strengthen our democracy and every individual's economic empowerment.

Unfortunately, broadband services are at risk of being controlled by gatekeepers who have the ability to skew the marketplace against the interests of consumers. As a result of recent mergers in the telecommunications and cable industries, broadband provision is increasingly dominated by a duopoly that is under no obligation to ensure that their networks are open and accessible to all users and applications. Moreover, outdated government spectrum policies have placed artificial limits on broadband deployment. In large part because of these developments, the U.S. ranks only 16th in the world in broadband adoption.

These problems arise because broadband technologies are operating in a policy vacuum. Today, there is no plan to ensure that broadband will be affordable; there are no enforcement measures to ensure that broadband networks are open and transparent; there is no plan to maximize the provision of unlicensed wireless broadband services and there is no guarantee that municipalities have the right to deploy broadband services for their consumers. This policy vacuum creates uncertainty, chills innovation, and depresses both the demand and supply of broadband services.

The U.S. needs to enact a clear set of principles for broadband services to ensure that these networks are widely deployed, open, affordable and accessible to all consumers. Without such principles, there is great danger that any future legislation on these issues will become a grab bag of special interest provisions. Therefore, the following principles should be the starting point for any telecommunications legislation in the 109<sup>th</sup> Congress.

Broadband networks must be:

- 1) open to competition from any entity, including municipalities;
- 2) open to the attachment of any equipment the user chooses, as long as it does not harm the technical operation of the broadband network;
- 3) open and accessible to consumers, application developers, and information service providers and to other networks, without restrictions or degradation, except for law enforcement or for network management purposes;
- 4) open, available and affordable to all consumers, regardless of income, race, geographic location, or disability; and
- 5) open to the maximally efficient number of licensed and unlicensed wireless providers.

## Introduction

The deployment of broadband telecommunications services<sup>1</sup> could have as great an impact on society as the appearance of the printing press in the 15<sup>th</sup> century and television and radio in the 20<sup>th</sup>. Broadband technologies are bringing about a paradigm shift in how we live our lives. Distance learning, telemedicine, web conferencing, unlimited and uncensored information, feature-rich communications and high-resolution entertainment can all be delivered to consumers over broadband connections at a fraction of the cost and at an order of magnitude faster speed than today.

If the U.S. adopts the right policy framework, emphasizing competition and limited regulation, the growth of broadband technologies can significantly increase and enhance the sharing of knowledge, strengthen our democracy and enhance every individual's economic empowerment. Our goal should be to ensure that all consumers have access to widespread and *competitive* broadband services at *affordable* prices, using a *variety of technologies*, to permit *any commercial or governmental entity* to develop new and customer-driven *applications and information services*, and to allow consumers to enjoy their first amendment rights to *have access to and disseminate their own unlimited and uncensored information*.

Unfortunately, these objectives are in grave danger. Some recent developments show the country moving in the opposite direction:

- Low-income, rural and minority consumers have less access to broadband services than higher-income, urban and white, consumers.<sup>2</sup>
- In most markets, just two providers - the cable company and the telephone company – dominate the provision of broadband services.<sup>3</sup>

---

<sup>1</sup> This paper uses the term broadband services generally to mean the high-speed transmission of information over telecommunications networks to the public. Thus the term does not include the actual information being transmitted (information services) or private, proprietary networks (intra-corporate networks, for instance). While there is disagreement over what transmission speed defines broadband services, these Principles for an Open Broadband Future are not dependent on any specific speed or technology. Furthermore, many of these principles can equally be applied to narrowband services. Nonetheless, this paper focuses on broadband services because of the enormous impact these services can have on our future.

<sup>2</sup> See, "A Nation Online: Entering the Broadband Age, September, 2004, U.S. Department of Commerce, Economics and Statistics Administration and the National Telecommunications and Information Administration (NTIA), available at <http://www.ntia.doc.gov/reports/anol/index.html>.

<sup>3</sup> According to one estimate, the cable and telephone companies serve 98% of all broadband consumers in the U.S. See, "Connection the Public: The Truth About Municipal Broadband.", by Harold Feld and Gregory Rose, Media Access Project; Mark Cooper, Consumer Federation of America; and Ben Scott, Free Press, April 2005. p. 3.

- The U.S. ranks 16<sup>th</sup> worldwide in broadband adoption per 100 inhabitants<sup>4</sup>, in large part because the prices for broadband services are unaffordably high.<sup>5</sup>
- Unlicensed wireless broadband providers are relegated to a much smaller portion of the electromagnetic spectrum than technology allows.<sup>6</sup>
- Some companies are retaining the authority to build proprietary broadband networks and may restrict or degrade consumers' access to certain Internet sites or certain applications.<sup>7</sup>
- The FCC has allowed telephone companies to force consumers to buy landline telephone service even when they wish to purchase only broadband service.<sup>8</sup>
- Fifteen states bar or limit municipalities' ability to build broadband networks.<sup>9</sup>

These trends demonstrate that the country's current communications policies are simply inadequate; they provide no assurance that consumers will reap all the benefits of these broadband technologies. Instead, broadband technologies are operating in a policy vacuum. Today, there is no plan to ensure that broadband will be affordable; there are no enforceable rules to ensure that all public broadband networks are open and transparent; there is no plan to maximize the provision of unlicensed wireless broadband services, and there is no guarantee that municipalities have the right to deploy broadband services for their consumers. This

---

<sup>4</sup> The countries the U.S. trails in broadband subscribership are S. Korea, Hong Kong (China), the Netherlands, Denmark, Canada, Switzerland, Taiwan, Belgium, Iceland, Sweden, Norway, Israel, Japan, Finland, and Singapore. This list ranks the top 20 economies by broadband penetration rate. The chart is dated "2004 (provisional)" and is available at [http://www.itu.int/ITU-D/ict/statistics/at\\_glance/top20\\_broad\\_2004.html](http://www.itu.int/ITU-D/ict/statistics/at_glance/top20_broad_2004.html). The U.S. ranking is down from 13<sup>th</sup> last year, as reported in *The Portable Internet*, September 2004, at <http://www.itu.int/osg/spu/publications/portableinternet/index.html>. This report does not, as is often mistakenly reported, rank countries based on broadband *deployment*; rather, it ranks countries based on the percentage of their consumers that are broadband *subscribers*. It should also be noted that several of these countries subsidize their broadband services to encourage deployment and subscribership.

<sup>5</sup> According to NTIA, "Too Expensive" was the second leading reason why consumers do not subscribe to broadband, after "Don't Need/Not Interested". See, *A Nation Online: Entering the Broadband Age*, a Joint Report of the National Telecommunications and Information Administration (NTIA) and the Economic and Statistics Administration, U.S. Department of Commerce, September, 2004, p. 19.

<sup>6</sup> Report of the FCC's Spectrum Policy Task Force, ET No. 02-135, November 2002, p. 10, available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-228542A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228542A1.pdf).

<sup>7</sup> Jonathan Krim, "FCC Probes Blocking of Internet Phone Calls," *Washington Post*, February 17, 2005.

<sup>8</sup> *BellSouth Telecommunications Inc. Request for Declaratory Ruling*, WC Docket No. 03-251 (March 25, 2005) found at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-05-78A1.doc](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-78A1.doc)

<sup>9</sup> "Why your broadband sucks," *Wired*, March 2005, Lawrence Lessig, available at <http://www.freepress.net/news/6879>.

policy vacuum creates uncertainty, chills innovation, and depresses both the demand and supply of broadband services and technologies.<sup>10</sup>

As Congress re-examines the nation's telecommunications laws, it must do so guided by key principles that will ensure that broadband services are deployed to serve the interests of consumers and the economic interests of the country. Without such principles, there is great danger that any proposed legislation will become a grab bag of special interest benefits, with each corporate interest trying to strengthen its position in the marketplace. Broadband networks must not become closed and under the control of gatekeepers seeking to promote narrow political or corporate agendas. While the legislative process certainly allows companies to advocate for their own interests, it is vitally important that Congress focus first and foremost on the consumer's interest in broadband networks of the future.

In short, American consumers need a new set of *Principles for an Open Broadband Future* that will ensure that broadband networks are deployed to maximize consumer welfare. These principles need to address each aspect of the broadband universe – the physical construction of broadband pipes (wireless or wireline), the access to those pipes by consumers, equipment manufacturers, applications developers and content providers, and the use of those pipes to transmit, share and publish information. These principles must walk a fine line: they must be clear and enforceable, so as to stimulate broadband deployment and guarantee consumer access; at the same time they must operate with as light a regulatory touch as possible to avoid burdening network owners with such excessive rules that they lose their incentives to construct these new networks. Setting forth a clear set of principles to guide the development of broadband policy will provide additional certainty to investors, network planners, equipment and application developers, content providers and consumers, so that the broadband future becomes a reality soon.

The overriding goal of these principles can be summarized in one word: *openness*. If made open and accessible to all Americans, broadband services and applications can ignite new opportunities for innovation, creativity, and economic value for all Americans. Furthermore, safeguarding access to the free flow of information over broadband networks can strengthen our democracy and freedom of expression. *Congress' most important objective should be to ensure that consumers' rights to access and use broadband networks are preserved and enhanced, to allow the unfettered sharing of knowledge.*

This white paper sets out the rationale for the Principles for an Open Broadband Future. Adoption of these principles will promote the deployment of broadband technologies and

---

<sup>10</sup> "Those countries that have done well [in promoting broadband subscribership], have done well because of active government policies for the development of broadband," added Lara Srivastava, telecom policy analyst for the Geneva-based ITU, which is part of the United Nations. "In the U.S., they don't have active policies like Korea or Singapore, or Japan." Quoted in Technology Daily, "U.S. Drops Further Behind in Broadband Race," by Drew Clark, April 26, 2005, available at <http://www.njtelecomupdate.com/lenya/telco/live/tb-QGBX1114459808856.html>

ensure that they remain open and accessible by the public. These principles should form the foundation of any new effort to re-write the Communications Act in the 109<sup>th</sup> Congress.

## 1. Open Competition Among Broadband Providers

*Principles:*

- a. *Every consumer should be able to choose among multiple, competing broadband networks, services, applications and content providers, including municipalities.*
- b. *Government policies should be technology-neutral and should forbear from regulating broadband networks except where necessary to promote competition.*

Every consumer should be able to choose among multiple, competing broadband networks, services, applications and content providers. Eliminating barriers to competitive entry in each of these markets has many benefits. Open competition will provide network builders the maximum incentive to provide consumers the best quality, service, and price that it is possible to deliver. Competition has been shown time and again to promote innovation and the development of new technologies. As firms seek to win market share, they will develop the most efficient technology possible. This incentive to innovate benefits the entire American economy by spawning a healthy high-tech community of research and entrepreneurship. Finally, competition promotes the first amendment value of information diversity. Consumers benefit from an active “marketplace of ideas,” in which the general public is permitted to hear and voice their political, religious, and economic views. Promoting an open competitive market for all aspects of broadband is thus one of the highest values government policy can promote.

To reach this goal, government must carefully assess its role. Where a vibrant competitive market for broadband already exists, government should forbear from regulating as much as possible. Excessive government regulation on broadband providers and suppliers can burden companies and stifle innovation and investment. Government should instead ensure that the market operates in a way that maximizes the flow of information and encourages competition.

At limited times, however, affirmative government policies may be required to open markets to competitive entry. Specific government action may be especially necessary when the government itself erected barriers to entry by prohibiting competition, or where a firm holds market power or bottleneck control over an essential communications commodity. For instance, transmission services provide the equivalent of “raw material,” without which no information services, applications or uses can be developed or deployed. Government must ensure that the transmission path is open to competing service providers, application developers, content providers and consumers in order to promote an open market in which investment and innovation are stimulated. Otherwise, the uses of the network will be skewed in the interests of those who own the network.

In short, government policy must be limited, targeted, and effective. Government policy should be smart, not smothering.

Congress should also explore new ways to stimulate competition to the duopoly currently held by the cable and telecom companies.<sup>11</sup> This is especially important in the wake of the announced mergers of large long distance companies with the two largest Bell companies (*i.e.*, AT&T/SBC and MCI/Verizon). One approach Congress should strongly consider is to guarantee the right of municipalities to provide their own broadband services. Competition from governmental entities could encourage private sector entities to increase deployment, innovate and drive broadband prices down. Indeed, municipal broadband networks provide a business opportunity for small businesses and entrepreneurs. Municipalities that build their own local broadband networks stimulate economic growth by creating jobs, purchasing equipment and services from local businesses, and attracting companies to locate offices in that city.<sup>12</sup>

Unfortunately, at least 15 states have adopted laws banning or limiting these municipal networks. These laws are often anticompetitive and contrary to the public interest.<sup>13</sup> While the citizens of certain municipalities may decide that taxpayer dollars should not be spent on broadband services, that is a decision that should not be taken away from them by surreptitious legislation that places flat bans on municipal broadband service. Therefore, Congress should preempt these state laws and permit municipalities to serve the needs of their local communities.

Another approach to promoting competition that Congress should consider is codifying a national franchise for new entrants into broadband video services, particularly where those new entrants are authorized to deploy and already deploy a network. Those seeking to compete in the provision of broadband video will be severely delayed if they must seek franchises from 10,000+ local authorities throughout the country. The provision of a national franchise need not deprive localities of any income – the franchise can be conditioned on

---

<sup>11</sup> According to one estimate, the cable and telephone companies serve 98% of all broadband consumers in the U.S. See, “Connecting the Public: The Truth About Municipal Broadband,” by Harold Feld and Gregory Rose, Media Access Project; Mark Cooper, Consumer Federation of America; and Ben Scott, Free Press, April 2005. p. 4.

<sup>12</sup> *Id.*, pp. 9-10.

<sup>13</sup> For instance, the recently adopted Pennsylvania law restricting the right of municipalities to set up their own wireless services should be preempted because it limits consumer choice and reflects an anticompetitive effort by incumbent licensees to dominate the market. See, “Fast Internet Service for the People: Telecoms Fight Plans for Public Networks,” Washington Post, Dec. 2, 2004, by Jonathan Krim, p. A1, at <http://www.washingtonpost.com/ac2/wp-dyn/A26409-2004Dec1?> Fourteen other states have adopted similar laws, and another 11 states are considering doing the same. See, “Why Our Broadband Policy’s Still a Mess,” CNET, February 28, 2005, by Jim Hu, available at <http://www.freepress.net/news/6941>.

receipt of the same fee on revenues that cable providers now pay. This fee can be passed down to the localities where competitors seek to provide services. At the same time, Congress should be cognizant of the important role of local authorities in the provision of multi-channel video services, including, but not limited to, ensuring universal access, promoting competition and community media, and protecting public safety.

Until broadband competition matures, policy-makers should also take action to prevent the dominant firms from extending their market power into competitive markets. BellSouth, for instance, is requiring consumers to purchase basic telephone service before the consumer can purchase DSL. The FCC recently upheld this practice. Similarly, some cable companies require consumers to purchase basic cable service to receive their cable modem offerings. These practices make it more difficult, if not impossible, for consumers to purchase stand-alone broadband services.

Furthermore, markets work best if policies are technology-neutral and do not favor one provider over another. To the extent practicable, government policy should seek to promote all technologies and should not artificially favor one technology over another. For instance, any requirement of openness (discussed below) should be applied equally to all broadband networks, regardless of their history or technology.

## **2. Open to All Attached Equipment**

*Principle:*

- c. Consumers must have the right to attach to the broadband network any equipment that does not harm the operation of the network.*

Consumers must have the opportunity to attach their own personal equipment and devices to broadband networks, as long as the equipment does not harm those networks. Digital media devices can empower consumers to control their broadband experience. MP3 players, like the iPod, let consumers be their own radio programmers. Personal video recorders (PVRs), like TiVo, let consumers become network-programming executives. Personal computers let consumers be their own record and movie producers, and give artists and scholars the freedom to distribute their works without gatekeepers. With the right tools, consumers, not media executives, can decide what programs to watch, what music to listen to, and what information to read and disseminate.

Open attachment is particularly important for business customers because it protects their ability to obtain the most innovative equipment at the most competitive prices. If broadband service providers are free to dictate which equipment can be connected to their networks or require customers to use only equipment purchased from the broadband provider, the equipment market will be less competitive, less innovative, and less responsive to the needs of customers.

It is not yet clear whether consumers will enjoy this freedom to use their own equipment in the future. Indeed, since 2000, at least eight states have enacted laws that would permit broadband providers to restrict the types of equipment that consumers could attach to a broadband line.<sup>14</sup>

Furthermore, there is tremendous uncertainty over the rules that apply to broadband networks. The FCC has for many years operated a registration process that allows manufacturers of telephones, fax machines, cordless phones, etc. to obtain FCC certification that the equipment does not harm the telephone network.<sup>15</sup> Similarly, the Telecommunications Act of 1996 required the FCC to adopt rules to promote competition for cable set-top boxes.<sup>16</sup> Both these provisions helped to create a still-burgeoning industry of equipment manufacturers that has greatly enhanced the consumer's ability to receive and generate communications. These provisions also stimulated a vibrant computer and electronics industry.

Despite these successes in the narrowband telephone and cable world, the FCC is now considering changes to its policies that could allow broadband transmission providers to control the attachment of equipment to their networks.<sup>17</sup> If the FCC does, in fact, change this rule, broadband companies could design their broadband networks in proprietary ways to favor the network owners' equipment and prevent access by the equipment sold by non-partner companies.

The consumer's right to attach his/her own equipment to broadband networks needs to be codified before any network owner develops a vested interest in one type of equipment. When AT&T owned almost the entire telephone network, it insisted that no one else be allowed to attach non-AT&T equipment to the network, and it fought consumers' efforts to attach their own equipment to the network in the courts over three decades. Broadband consumers and equipment manufacturers simply cannot afford the possibility of such delay and uncertainty.

---

<sup>14</sup> See, <http://www.freedom-to-tinker.com/superdmca.html>.

<sup>15</sup> 47 U.S.C. Part 68. This regulation flows from the policy that allows private uses that are beneficial as long as they are not publicly detrimental.

<sup>16</sup> See Section 629 of the Communications Act, as added by Section 304 of the Telecommunications Act of 1996.

<sup>17</sup> The FCC has not yet decided whether broadband networks are "telecommunications services," to which its Part 68 registration requirements apply, or "information services," to which Part 68 does not apply.

### 3. Open Network For All Applications and Content

*Principles:*

- d. *Consumers and applications providers must have the opportunity to use broadband networks without restriction or degradation in quality, except when authorized by a court for law enforcement purposes or where necessary to protect against technical interference and guarantee signal quality.*
- e. *Consumers have a right to access information and ideas from a diversity of sources, and have the right to disseminate their own ideas to the public in any manner they desire.*
- f. *Every broadband network should be able to interconnect with every other broadband network.*

One of the transformational aspects of IP-based technologies over broadband networks is that they make obsolete the notion of the “Intelligent Network.” In such a network, intelligence was tightly woven into a circuit-based network that was centrally controlled by the telephone companies. In contrast, broadband networks provide extremely high-speed, but dumb, transmission capability. IP technologies provide the basic connectivity that permits multiple applications to be layered on top of this capability. This structure greatly increases creative software development and consumer control, at substantially lower cost.<sup>18</sup>

Software developers are incredibly inventive, bringing unprecedented new services to consumers. But their future inventiveness depends upon the enforcement of one central principle – that the Internet remains equally open and accessible both to developers and to users of these applications, without obstruction or degradation by network service providers. Broadband adoption will be slowed and the Internet gated unless Congress preserves this principle. Consumers must have unfettered ability to reach and use legal content and services, to communicate and interact with each other, and to reach desired Internet destinations without impediments imposed by transmission network providers.

One of the most popular examples of broadband applications is Voice over Internet Protocol (VoIP). VoIP offers voice telephone consumers unprecedented flexibility, unheard of in traditional telephone services. Just like many other applications provided over the Internet, it does not matter where the provider is located – a server providing a VoIP application could be down the street, or in the next state, or in Britain, Ukraine or India. Skype, which provides free VoIP software and has been downloaded over 15 million times by users around the world, originated in Estonia.

---

<sup>18</sup> See, The Rise of the Stupid Network, by David Isenberg, **Computer Telephony**, August 1997, pp. 16-26.

But VoIP is just one of many exciting applications of broadband technologies. Broadband networks will permit remote diagnostics of patients' health, low-cost videoconferencing so that family members separated by distance can see their loved ones, sophisticated commercial transactions, and access to high-definition entertainment programming (such as IPTV). Equally as exciting are the possibilities for "consumer-driven" media. We already know about the power of interactive weblogs to influence the public debate. In addition, services like Google Video promote and sell digital video files of any length and size. And the newly launched Internet TV allows anybody to send full screen video over the Internet to thousands of people at virtually no cost, using BitTorrent technology.

Codifying the open network principle will stimulate continued investment in these and other as-yet undeveloped applications by eliminating the possibility of future restrictions on network uses. Thus, software developers will be able to raise funds now to bring new applications to market with confidence that the network will be accessible to their applications in the future. Furthermore, an open and accessible network permits fair competition among applications (the always appealing "level playing field"). Competing applications programs will survive or fail based on their merits, rather than on bias by the network owner or operator. Finally, the open network principle can bring us closer than ever to the First Amendment ideal – a marketplace of ideas where everyone can speak over the means of mass communications. The ability for consumers to hear more voices and to disseminate their own thoughts, contributes to a more robust, self-empowered democracy, and diminishes the need for government regulation of media ownership.

Similarly, every broadband network should be able to interconnect to every other broadband network. It is axiomatic that our system of communications and our society function better when each individual can connect to every other individual. The Internet is often called a "network of networks," and its robustness can only be assured if networks can connect and work with each other.

The principle of openness should apply to all *public* networks, regardless of history, size, geography or technology. This is not an issue of market power, where, since some operators have greater leverage than others, regulations should vary based on the monopoly characteristics of the enterprise. Instead, there should be parity in the way that this principle is applied to network operators – all broadband networks that make service available to the public should be guided by this openness regime.<sup>19</sup>

If network owners are allowed to discriminate in any manner against certain traffic, applications or networks, the customer's experience of the Internet could be severely curtailed. For example, a broadband network provider might block consumers from using their broadband connection to access a virtual private network (VPN) allowing them to work

---

<sup>19</sup> This principle is not intended to apply to private, intra-corporate networks that are designed to meet the needs of a closed community.

from home. A broadband network provider might only allow users to purchase products online using its affiliated credit card. A network owner might contract with a web site portal to give that portal preferential access or intentionally give slower speed connections to web sites owned by its competitors. Or it could make the user experience of competitor websites more unpleasant by embedding extra pop-up ads or other distractions in those websites.

These concerns are not purely hypothetical. Several cable companies bar their residential consumers from accessing virtual private networks (VPNs), possibly in order to encourage those consumers to purchase a more expensive commercial offering. One survey found that cable and DSL operators tend to favor older uses of broadband networks (e-mail and web-surfing) over newer applications (such as interactive games and peer-to-peer networking).<sup>20</sup> The FCC fined a telephone company \$15,000 for blocking a VoIP provider,<sup>21</sup> and Vonage has raised a similar complaint against a wireless provider and a cable system operator.<sup>22</sup>

Perhaps the biggest threat to the openness of the network may come with the arrival of video (television) over the Internet, known as IPTV. Will cable systems permit unlimited access to IP traffic over their networks if IPTV begins to siphon off their cable revenues? There is no doubt that cable companies will have strong incentives to block or degrade video over IP running over their cable networks. If they do so, the principle of openness will be breached, giving “cover” to any other network owner to restrict content and potentially opening the floodgates to widespread Internet restrictions.

Some have maintained that network operators must have the ability to restrict access to the network for legitimate law enforcement purposes, or for network management. While these examples may be valid, this authority can be easily abused and should not be broadly permitted.<sup>23</sup>

The beauty of the Internet is that it allows each user to go anywhere he or she wants and allows software programmers to develop any application, confident that the network will remain available. We have become so accustomed to this freedom that we take it for granted.

---

<sup>20</sup> See, “Network Neutrality and Broadband Discrimination,” 2 *J. on Telecomm. & High Tech L.* 141 (2003) by University of Virginia Law Professor Tim Wu, available at [www.law.virginia.edu/lawweb/Faculty.nsf/FHPbl/6697](http://www.law.virginia.edu/lawweb/Faculty.nsf/FHPbl/6697).

<sup>21</sup> See, In the Matter of Madison River Communications, LLC and affiliated companies. File No. EB-05-IH-0110, DA 05-543, March 3, 2005.

<sup>22</sup> Comments of Jeffrey Citron at “Blocking VoIP Calls: Foreboding Harbinger or Benign Fluke?,” Advisory Committee to the Congressional Internet Caucus, April 19, 2005.

<sup>23</sup> See, Wu, Tim, “Network Neutrality, Broadband Discrimination,” 2 *Journal of Telecommunications & High Technology Law*, Vol. 2 <http://ssrn.com/abstract=388863>.

Any network operator, however, could circumvent the openness of the network, at any time, without penalty. This open network principle has not yet been codified, but should be.

#### 4. Open Spectrum for Commercial and Non-Commercial Use

*Principles:*

- g. To the maximum extent possible, spectrum should be allocated to allow greater sharing by private commercial and non-commercial uses.*
- h. To the maximum extent possible, spectrum licensees should be given flexible use of their spectrum to offer new services in response to consumer demand.*
- i. Unlicensed services should have the benefit of a presumption that they be authorized in any spectrum band as long as they do not cause interference with existing licensees.*

For nearly 80 years, regulation of spectrum – the public airwaves - has been based upon a principle of physical scarcity. For example, broadcasters were given the exclusive right to use scarce spectrum in exchange for both special privileges (such as “must carry” on cable systems) and duties (for example, serving as “public trustees” for those who could not access the airwaves). While such regulation was originally intended to protect the public, in practice, it has served largely to protect incumbents from competition, which in turn has limited consumer choice and resulted in diminished public service.

Fortunately, new digital technologies make physical scarcity a thing of the past. Tremendous advances in wireless technologies now permit unprecedented degrees of spectrum sharing and more flexible use without causing interference to existing users. Spectrum that was formerly the exclusive province of microwave ovens and industrial equipment now plays host to unlicensed wireless broadband networks that provide not only last-mile connectivity, but also last-30-50-mile connectivity. New spread spectrum technologies and “smart radio” antennas permit unprecedented degrees of sharing without causing interference. Smart radios can facilitate secondary markets – that is, licensed users could lease their spectrum to third parties using smart radio technologies. And, because of their frequency agility, smart radios could also act as a bridge between two different radio services – effectively translating the signals from one service to the frequency and format of another.<sup>24</sup>

Unfortunately, thanks to the old regulatory regime, spectrum scarcity still exists, but it is not the result of physics. The problem is allocational scarcity – the FCC’s traditional mode of spectrum allocation and assignment keeps too much spectrum in too few hands on an

---

<sup>24</sup> See generally, Kevin Werbach, Radio Revolution, The Coming Age of Unlicensed Wireless, available at <http://www.newamerica.net/index.cfm?pg=article&DocID=1427>.

exclusive basis. This spectrum policy not only completely ignores the promise of new technologies, it sacrifices significant public revenues and inhibits the rapid and affordable deployment of wireless broadband access. In short, the consumer and innovative technology companies are being short-changed.<sup>25</sup>

Traditionally, the FCC has awarded licenses to use a fixed portion of the spectrum to certain classes of entities for specific pre-determined purposes. This “command and control” method of spectrum allocation creates enormous inefficiencies. According to an FCC staff paper, only 7% of the most valuable spectrum between 300 MHz and 3000 MHz is available for allocation to new or shared uses; the remainder of this valuable spectrum is already allocated. Yet, it appears that this apparent “spectrum scarcity” is artificial. As the FCC itself noted in its 2002 Spectrum Policy Task Force Report, much of this exclusively allocated spectrum is underutilized.<sup>26</sup>

The problem of underused spectrum identified by the FCC’s Task Force can be addressed by moving away from exclusive allocations and towards greater spectrum sharing. Importantly, more spectrum must be made available for unlicensed uses such as WiFi<sup>27</sup> and WiMax.<sup>28</sup> Promoting wireless broadband networking with unlicensed consumer devices will empower consumers to make their own choices, reduce their costs, and give them another channel for self-expression. Further, service providers should have the flexibility to optimize their own networks based on factors like geography, types of applications, and the number of subscribers, instead of non-market based regulations. Service providers are already beginning to mix and match technologies – major cellular carriers are integrating their networks with WiFi hotspots and some broadband over power line providers are using WiFi to get from the power lines at the curb to inside the home. The FCC needs to play a more active role in encouraging these innovative uses of the spectrum.

What is true for commercial uses is also true for government-held spectrum. Government users are often granted exclusive use of certain frequency bands and have little incentive to develop spectral efficient technologies. Our spectrum policy should encourage even

---

<sup>25</sup> The first step to repairing this broken policy and to ensure greater and higher quality broadband deployment is for Congress to end the digital television transition by mandating that broadcasters return their 6Mhz of “analog” spectrum no later than December 31, 2008.

<sup>26</sup> Report of the FCC’s Spectrum Policy Task Force, ET No. 02-135, November 2002, p. 10, available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-228542A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228542A1.pdf).

<sup>27</sup> WiFi (shorthand for “wireless fidelity”) is a family of spread spectrum wireless local area networking (LAN) standards designed to allow users to send and receive data at 1 to 54 Mbps within a few hundred feet of another WiFi device or access point. See Werbach at 22.

<sup>28</sup> WiMax is an industry alliance between Intel, Proxim, Jujitsu, Alvarion, Aperto, and Nokia formed to promote and ensure the interoperability of wireless Metropolitan Area Networks (MANs). See Werbach at 28.

governmental license holders to use spectrum in the most innovative manner possible. In other words, government users should not be permitted to warehouse or stockpile spectrum for future uses. The government should be required to demonstrate its efficiency in order to retain its spectrum. Similarly, state and local governments should not be permitted to exclude commercial uses of the spectrum allocated to them if spectral interference issues can be resolved.

## 5. Open to All Users at Affordable Prices

*Principle:*

- j. All consumers, regardless of income, race, geographic location or disability, should have access to affordable broadband connectivity by the end of the year 2007.*

*All consumers should have access to broadband networks at affordable prices. Broadband technologies provide more than a faster way to surf the Internet. Broadband technologies have the potential to change our lives. Access to broadband can significantly improve our education, health care, and commerce as well as our social interactions. Broadband services can reduce costs and improve the quality of life. In short, virtually every aspect of our lives can be significantly enhanced with access to high-speed networking capability, and all American consumers should have the right to these benefits.*

Current policy ensures that every consumer has access to affordable telephone service; but this policy does *not* currently apply to broadband services. As a result, on a nationwide basis, 93% of American homes have access to broadband services, but less than 25% of homes actually subscribe. According to NTIA, the lack of a broadband policy is having a discriminatory impact on rural, minority and low-income consumers:<sup>29</sup>

- Only 24.7 rural households that have Internet access purchase broadband connections, compared to 40.4% of urban households. Furthermore, 22.1% of rural households that have dial-up service say that broadband services is “Not Available,” compared to 4.7% of urban households who respond that broadband is “Not Available.”
- The following percentages of consumers lived in a home with a broadband Internet connection: White (25.7), Black (14.2), Pacific Islander (34.2), Hispanic (12.6).

---

<sup>29</sup> See, “A Nation Online: Entering the Broadband Age, September, 2004, U.S. Department of Commerce, Economics and Statistics Administration and the National Telecommunications and Information Administration (NTIA), available at <http://www.ntia.doc.gov/reports/anol/index.html>.

- Less than 20% of households with less than \$50,000 in annual income have broadband access, while over 40% of households with income over \$75,000 have broadband access.

These numbers present two issues: 1) how to increase deployment to ensure that broadband services are available to the remaining American homes not currently passed by broadband services, and 2) how to increase the value (increasing content and lowering the price) of broadband service so that it is more affordable for consumers.

There are a variety of mechanisms available to encourage deployment in areas of unmet need. Low interest loan programs, tax credits, and construction by state and local governments have been used and/or considered to promote deployment. More spectrum can be allocated to wireless technologies to satisfy the need, depending upon the local terrain and other geographic factors.

Similarly, Congress has several alternatives available to help increase the value of broadband services. Preserving the openness of broadband networks (discussed above in #3) can help increase the investment devoted to quality content.

But the principal deterrent to broadband subscribership appears to be the high price. According to the NTIA Report, “Too Expensive” was the second leading reason why consumers do not subscribe to broadband, after “Don’t Need/Not Interested.” Broadband service must be priced at affordable levels to allow ALL consumers to benefit from these technologies. The best way to lower prices is to promote competition. Studies of cable, telephone, and wireless markets all show that prices are lower in areas where three or more companies compete head-to-head.<sup>30</sup>

If competition for broadband services fails to grow, then policy-makers may need to consider other measures, such as subsidies or tax credits. In the alternative, broadband prices could be reduced to below-cost levels by regulation (with the provider receiving the subsidy for each low-income subscriber to make up the shortfall).<sup>31</sup> No matter what approach is adopted, however, any mechanism should only be adopted after it is clear that competition will not work, and any monetary transfer should be directly targeted to lower income consumers (rather than companies) to make sure that the program does not become excessively large and inefficient.

---

<sup>30</sup> *E.g.*, <http://www.gao.gov/htext/d04241.html> (On the basis of 12 markets we examined, it appears that broadband service providers' (BSPs') entry into a market benefited consumers in the form of lower prices for subscription television, high-speed Internet access, and local telephone services.)

<sup>31</sup> The FCC currently operates successfully the Lifeline and Link-Up programs to ensure that basic telephone service is affordable. These programs could be expanded to include access to broadband, or may serve as models for future broadband programs.

Whatever the exact mechanism that is chosen, the critical first step is for Congress to enact a policy to make affordable broadband services available to all Americans by the end of 2007. President Bush has already announced this goal,<sup>32</sup> and it is now up to legislators and regulators at all levels to meet it. Doing so will have several benefits: it will stimulate spending on broadband equipment, thereby helping to revive the high-tech manufacturing sector of the economy; it will encourage applications developers to devote their energies to software and other applications to serve the burgeoning consumer demand; and it will increase the country's international competitiveness. Perhaps most important, however, it will bring enormous benefits to American consumers. Affordable broadband services will allow each member of the country to participate in the American economy and society as never before.

## Conclusion

The broadband revolution is underway, but its future is uncertain. Will it be skewed by vested interests or will it be made open and accessible to the public? With many industry participants seeking to exercise their rights to influence the upcoming legislative debate on broadband, the voice of consumers risks becoming lost in the shuffle.

That is the purpose of this document. This paper is intended to set forth the key principles to ensure that consumers benefit from the construction of broadband networks. These principles should serve as the foundation for any revision of law or policy affecting broadband networks. By favoring openness, marketplace competition and limited regulation, our economy and our society will reap the maximum benefits of these exciting technologies.

---

<sup>32</sup> See, A New Generation of American Innovation, April 2004, at [http://www.whitehouse.gov/infocus/technology/economic\\_policy200404/innovation.pdf](http://www.whitehouse.gov/infocus/technology/economic_policy200404/innovation.pdf).