



## TABLE OF CONTENTS

INTRODUCTION AND SUMMARY.....	1
I. HIGH SPEED INTERNET ACCESS HAS FLOURISHED IN THE CURRENT UNREGULATED ENVIRONMENT .....	4
A. There Is No Evidence of Any Problem Requiring A Regulatory Solution.....	5
B. “Net Neutrality” Is Difficult To Define and Even Harder To Apply .....	9
1. The Problem of Defining “Net Neutrality”.....	9
2. “Net Neutrality” Regulation Will Trigger Endless and Expensive Litigation.....	14
3. The AT&T/BellSouth Merger Condition Demonstrates The Difficulty of Defining and Enforcing “Net Neutrality” .....	15
C. Regulation Would Discourage Continued Network Innovation and Investment.....	19
II. CABLE OPERATORS MUST HAVE THE FLEXIBILITY TO MANAGE TRAFFIC ON THEIR NETWORKS .....	22
A. A Variety of Factors Affect The Speed and Quality of Downloads.....	23
B. Video Services Are Straining the Capacity of Cable Broadband Networks.....	26
C. Adding Capacity Should Not Be The Only Permissible Strategy For Dealing With Congestion .....	30
D. The Commission Should Not Restrict the Ability of Cable Operators To Manage Their Networks To Best Serve Consumers And Compete Effectively .....	32
CONCLUSION.....	37



than 28.5 million residential high speed data subscribers as of June 2006,<sup>3</sup> and NCTA estimates that this figure now exceeds 30 million. Nearly 99% of those lines are classified as “advanced services lines” by the Commission.<sup>4</sup> The widespread availability of cable high speed access has dramatically enhanced the value of the Internet for consumers, spurring the development of innovative online services that would have been impractical or even impossible to access when dial-up was the norm.

Under the Commission’s current policy, companies that include high speed Internet services among their offerings have had the freedom to experiment with multiple business models, producing more choices and competition in content and providers for consumers, and more innovation than ever before. Consumers today can choose from a broad array of providers using a variety of different technologies, including cable operators, telephone companies, wireless carriers, and satellite providers. They also can obtain service from broadband service providers such as RCN, Wide Open West, Knology, SureWest, and Grande, who offer bundled video, voice, and data offerings, in the same footprint as traditional cable and telephone providers.

In this competitive environment, and with the prospect of still more entry by facilities-based providers, imposing any type of “net neutrality” obligation on Internet access providers is not only unnecessary, it would be counterproductive as well. It would freeze innovation and investment in place. The Commission concluded less than two years ago that a “minimal regulatory environment” for broadband Internet access services would “benefit American

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<sup>3</sup> Federal Communications Commission, *High Speed Services for Internet Access: Status as of June 30, 2006* (Industry Analysis and Technology Division, Wireline Competition Bureau) (rel. Jan. 2007), Table 1.

<sup>4</sup> *Id.*, Table 2.

consumers and promote innovative and efficient communications,”<sup>5</sup> and nothing has changed in the market to alter that conclusion. To the contrary, confirmation that the government would not seek to interfere with developing business models led to an explosion in investment, deployment and competition in the last two years.

“Net neutrality” is the classic “solution in search of a problem.” Its proponents cannot even agree on what it is or why it is needed. Some parties argue that government intervention is needed because broadband providers will block access to Internet content they do not approve of; others are concerned that broadband providers will discriminate against their competitors; and still others argue that the real concern is that broadband providers will establish “fast lanes” for content providers who can pay and relegate everyone else to slower service. The one factor underlying all these arguments is that they are based on pure conjecture, completely untethered from any facts. These arguments ignore the strong incentive that broadband providers have to provide consumers with access to the content they want, as evidenced by NCTA’s statement that its members “have not, and will not, block the ability of high-speed Internet service customers to access any lawful content, application, or services available over the public Internet.”<sup>6</sup>

As we explain in these comments, requirements of the sort proposed by “net neutrality” advocates – whether adopted as formal rules, policy statements, or nonbinding principles – would interfere with a marketplace that is bringing consumers the services they want. NCTA is not alone in its strongly held views on this point. As shown in Attachment A, editorials across the political spectrum (including the Washington Post,<sup>7</sup> Washington Times,<sup>8</sup> and Wall Street

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<sup>5</sup> *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Report and Order, 20 FCC Rcd 14853, ¶ 1 (2005).

<sup>6</sup> *Telecom, Cable Firms Push for Flexibility in ‘Net Neutrality’ Model*, TECHNOLOGY DAILY, Feb. 7, 2006.

<sup>7</sup> *The Internet’s Future*, WASHINGTON POST, Jun. 12, 2006 at A20 (“The weakest aspect of the net neutrality case is that the dangers it alleges are speculative. It seems unlikely that broadband providers will degrade Web

Journal<sup>9</sup>) have expressed the same concerns that we identify in these comments. The bottom line is that there is no need for the Commission to decide that particular business models or particular network management tools should be restricted and no basis on which it could make such findings. Given the tremendous benefits that consumers, and the U.S. economy, have derived from the Commission's hands-off approach to the Internet, and the complete absence of reported problems, regulation is completely unwarranted.

## **I. HIGH SPEED INTERNET ACCESS HAS FLOURISHED IN THE CURRENT UNREGULATED ENVIRONMENT**

Keeping the Internet free of regulation has helped to spur tremendous investment and competition in broadband networks and services. Left free to create new business opportunities and services, broadband providers (including cable operators, DSL, satellite and wireless providers) have invested hundreds of billions of dollars to bring high-speed Internet access

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services that people want and far more likely that they will use non-neutrality to charge for upgrading services that depend on fast and reliable delivery, such as streaming high-definition video or relaying data from heart monitors. If this proves wrong, the government should step in. But it should not burden the Internet with preemptive regulation.”). *See also The Eden Illusion*, WASHINGTON POST, Mar. 13, 2006, at A14. (“The proponents of net neutrality also understate the costs of regulation. If cable or phone companies are not allowed to charge Internet firms for fast delivery, they will be deprived of one source of profits. This will make it harder to raise capital to build the next generation of superfast Internet pipes, capable of delivering high-quality video. Moreover, any definition of net neutrality is likely to be contested in the courts, and legal uncertainty will further deter investment. As a result, net neutrality could end up meaning that all Web services get delivered at a similar but relatively slow rate.”).

<sup>8</sup> *Free-Market Telecom*, THE WASHINGTON TIMES, Jun. 12, 2006, at A18 (“[N]et neutrality is a solution to a non-existent problem.... Internet service providers need Wall Street investors to see broadband as a worthy investment. Charging the heaviest users of those networks extra is the natural market solution. Google and Amazon just want to continue their free ride.... Net neutrality regulation would actually impede growth. To understand how, just imagine the FCC trying to determine a ‘fair price’ and enforcing ‘non-discrimination’ laws. The Internet would become a swamp of contentious litigation.”).

<sup>9</sup> *The Web's Worst Idea*, THE WALL STREET JOURNAL, May 18, 2006, at A14 (“Non-discrimination cases could well be brought against Net neutrality backers like Google – say, for placing a competitor too low in their search results. Google’s recent complaint that Microsoft’s new operating system was anticompetitive is a foretaste of what battles over a ‘neutral’ Net would look like.... If ever there were a solution in search of a problem, ‘Net Neutrality’ is it.... In the decade or so since the commercialization of the Internet began in earnest, the number of users, the speed of their connections and the variety of things they can do on the Net have all rushed forward. Blissfully, but not coincidentally, all this has been accomplished with a light regulatory touch.”).

services to consumers across the nation. With bandwidth usage growing at a rapid pace, continued investment will be needed to keep broadband services robust.

If broadband providers are to continue to make these investments, and if consumers are going to be given the levels of service and innovative new products and features they desire, all at prices they can afford, broadband providers need flexibility to innovate in the business models and pricing plans they employ. Likewise, content providers also need the flexibility to experiment with business models and to partner with broadband providers in doing so. It is far too early for anyone – network providers, content providers, or the Commission – to know which business approaches will succeed in meeting consumer demand in the long run. Any attempt by the Commission to promote or restrict any particular approach runs a substantial risk of being wrong. Such a rash course would resolve by government fiat decisions that are best left to the marketplace. The broadband and content provider marketplace shows no real world problems needing a solution; technological development continues at a breathtaking pace, as do investment and competition. There are no better circumstances than these to let the marketplace alone.

**A. There Is No Evidence of Any Problem Requiring A Regulatory Solution**

Less than two years ago, the Commission determined that a minimum number of non-binding, but relatively clear, policy guidelines rather than regulations were sufficient to “encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet,” ensure that “providers of telecommunications for Internet access or Internet Protocol-enabled (IP-enabled) services are operated in a neutral manner,” and make certain that “broadband networks are widely deployed, open, affordable, and accessible to all

consumers.”<sup>10</sup> There has been no evidence of any problems warranting expansion of those guidelines or converting them into regulatory requirements.

As the Commission acknowledges, it has repeatedly invited “net neutrality” proponents to offer evidence that anticompetitive practices exist in the Internet access marketplace warranting regulatory intervention, yet none has been presented.<sup>11</sup> From the time that cable operators first introduced broadband service, there are those who have raised concerns about discriminatory conduct. After years of being completely wrong in their predictions, it is a wonder that these alarmists enjoy any continuing credibility.

For example, a leading proponent of “net neutrality,” Professor Lawrence Lessig, has been consistently wrong in predicting that cable companies would exercise some negative influence over Internet services. In 2001, Professor Lessig claimed that cable operators were engaging in a “counterrevolution” that was “undermining the potential” of the Internet.<sup>12</sup> In so doing, cable operators were, according to Lessig, “attempting to wall off portions of cyberspace,” thereby destroying the Internet’s potential “to foster democracy and economic growth worldwide.”<sup>13</sup> To Lessig, these developments signaled the end of the “Internet revolution.” Lessig predicted that the “environment of innovation” on the Internet would be altered “to the extent that cable becomes the primary mode of access to the Internet,” because cable companies would vest an increasing degree of intelligence within the network itself, “[r]ather than a network that vests intelligence in the ends.”<sup>14</sup> In 2002, Lessig continued to

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<sup>10</sup> *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Policy Statement, 20 FCC Rcd 14986, ¶ 4 (2005); FCC Press Release, “*FCC Adopts Policy Statement; New Principles Preserve and Promote the Open and Interconnected Nature of Public Internet*” (rel. Aug. 5, 2005).

<sup>11</sup> *Notice* at ¶ 3.

<sup>12</sup> Lawrence Lessig, *The Internet Under Siege*, 127 FOREIGN POLICY 56, 62, 56 (2001).

<sup>13</sup> *Id.* at 56.

<sup>14</sup> *Id.* at 62.

employ this apocalyptic rhetoric, predicting that the First Amendment would be interpreted by the courts to entitle cable companies to “change the logical layer and make it owned as well;” the Sherman Act would then be interpreted to allow cable companies to discriminate freely; and that when this occurred, “[t]he open feature of the Internet will be removed. Enclosed. Chopped up and sold off. With the consequence that innovation here will be different.”<sup>15</sup>

In the years since these predictions were made, they all have proven to be completely wrong. The fact is, cable’s investment in broadband has driven innovation, investment and change, the exact opposite of Lessig’s prediction. As just one example, a video downloading business, such as YouTube, would have been a pipe dream when these predictions were made in 2002. Just five years later, however, YouTube is a multi-billion dollar enterprise, owned by Google, which itself has grown to become one of the largest companies in the world. The staggering growth of these companies could not have occurred without the high-speed broadband services that cable operators and their competitors are providing.

Claims that cable operators will interfere with the ability of consumers to access the content of their choice also have proved to be completely wrong. After more than a decade of offering broadband service, there have been no credible allegations that cable operators are blocking access to content, and the cable industry has committed not to block access to content. As NCTA President Kyle McSlarrow told the Senate Commerce Committee last year: “Let me be clear: NCTA’s members have not, and will not, block the ability of their high-speed Internet service customers to access any lawful content, application, or services available over the public Internet.”<sup>16</sup> Other broadband providers have also acted responsibly. When the single

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<sup>15</sup> Lawrence Lessig, *The Architecture of Innovation*, 51 DUKE L.J. 1783, 1799, 1793 (2002).

<sup>16</sup> *Telecom, Cable Firms Push for Flexibility in ‘Net Neutrality’ Model*, TECHNOLOGY DAILY, Feb. 7, 2006. During the same hearing, the President of the U.S. Telecom Association, Walter McCormick, made a similar

documented case of blocking arose – involving a small rural telephone company, *not* a cable operator – the FCC acted quickly to address the problem.

The vibrant competition in the market for broadband services ensures that distributors work hard to meet consumers’ expectations that they will be able to access content and run the applications of their choice when they choose. As former FTC Chairman Timothy Muris has explained, “[t]his competition [among providers] spurs producers to meet consumer expectations because the market generally imposes strict discipline on sellers who disappoint consumers and thus lose sales to producers who better meet consumer needs. These same competitive pressures also encourage producers to provide truthful information about their offerings.”<sup>17</sup> For these reasons, the absence of evidence of discriminatory behavior by providers is unremarkable: “[W]e would not normally expect to see widespread consumer protection problems in a competitive dynamic as robust as this one, and advocates for a new regulatory regime have not succeeded in generating any appreciable evidence that such problems exist... instead advocating rules that address hypothetical problems.”<sup>18</sup>

Particularly in matters affecting speech, regulation should be designed to rectify existing harms, not hypothetical problems.<sup>19</sup> In the absence of evidence of market failure, government regulation is not warranted. And even if market failure occurred, which it has not, the proposed government solution must be shown to be effective. Given the vagueness of “neutrality,” any

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pledge on behalf of telephone companies, stating “[w]e will not block, impair, or degrade content, applications or services.” *Id.*

<sup>17</sup> Statement of Timothy J. Muris, Foundation Professor, The George Mason School of Law, before the Workshop on Broadband Connectivity Competition Policy, U.S. Federal Trade Commission, Feb. 28, 2007 (*Muris Statement*) at 12; *see id.* at 14-15 (“Competition motivates sellers to provide truthful, useful information about their products and drives them to fulfill promises concerning price, quality, and other terms of sale.... In a competitive market, a consumer deceived by one seller on one purchase can always turn to a different seller the next time.”) (internal citations omitted); *id.* at 16-17 (noting significant competition in broadband access market).

<sup>18</sup> *Id.* at 18.

<sup>19</sup> *See, e.g., Time Warner Entertainment Co., L.P. v. Federal Communications Commission*, 240 F.3d 1126, 1129 (D.C. Cir. 2001) (regulation must address harms that are “real, not merely conjectural”).

proposed regulation is more likely to do more harm than good. As Commissioner McDowell recently stated, “I trust free people acting within free markets to make better decisions for themselves than those of us in government. Free markets and free ideas are the twin cornerstones upon which we have built our free nation. Government should not adversely interfere with the relationships between consumers and entrepreneurs. Rather, government should try to remove barriers to entry and allow competition to flourish.”<sup>20</sup>

In the absence of any evidence of harm and given the robust competition in the broadband services marketplace, the Commission should refrain from adopting new obligations and instead allow the marketplace to continue to grow and change “unfettered by . . . regulation.”<sup>21</sup> Continuation of this existing policy will enable network and applications providers to offer consumers the fullest range of innovative service options.

## **B. “Net Neutrality” Is Difficult To Define and Even Harder To Apply**

### **1. The Problem of Defining “Net Neutrality”**

Assuming that “net neutrality” proponents could overcome the threshold challenge of justifying a need for prophylactic regulation by proving that actual harm in the marketplace exists – which they cannot do – “net neutrality” proposals are so diverse in purpose and intended effect that identifying an adequate definition has been virtually impossible. As Commissioner McDowell noted in his Statement issued with the Notice, “differing names and definitions of the term ‘net neutrality’ abound and continue to change.”<sup>22</sup> Even leading “net neutrality” proponents

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<sup>20</sup> Speech of Commissioner Robert M. McDowell, Credit Suisse Media and Telecom Week Conference (Dec. 5, 2006), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-268839A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-268839A1.pdf).

<sup>21</sup> 47 U.S.C. 230(b)(2); *see also* Pub. Law. No. 104-104, § 706 (directing the FCC to “encourage the deployment . . . of advanced telecommunications capability” by utilizing “regulating methods that *remove* barriers to infrastructure investment”) (emphasis added).

<sup>22</sup> Statement of Commissioner Robert M. McDowell, *Re: Broadband Industry Practices*, Notice of Inquiry, WC Docket No. 07-52 (rel. Apr. 16, 2007).

appear to recognize the analytical challenge posed in reaching a definition of “net neutrality.” For instance, “net neutrality” proponent Tim Wu has stated that the concept of neutrality is “finicky, and depends entirely on what set of subjects you choose to be neutral among.”<sup>23</sup>

About a year ago, Professor David Farber, often described as the “grandfather of the Internet,” discussed the problems involved in defining “net neutrality” at a conference hosted by the AEI-Brookings Joint Center for Regulatory Studies.<sup>24</sup> Among other things, Dr. Farber said that “the definition of network neutrality was very hazy.”<sup>25</sup> He continued: “[O]ne of my problems is that it’s very hard to defend or object to something that I don’t understand what people are talking about. If you read the literature . . . there are at least 500 definitions of what [proponents] think the network neutrality argument is about. It’s almost gotten to be a religious discussion and not a real discussion.”<sup>26</sup> He concluded: “When I think of [network neutrality], what I end up with as a technologist somewhat exposed to policy is I don’t know what I’m talking about, and that scares me. I don’t know what the tradeoffs are between economics, technology, law and I haven’t seen very much work done to think what the answers are before the Congress goes ahead and legislates.”<sup>27</sup>

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<sup>23</sup> Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. TELECOMM. & HIGH TECH. L. 141, 149 (2003).

<sup>24</sup> David Farber, Presentation at AEI-Brookings Joint Center for Regulatory Studies, “Key Issues in Telecommunications Policy” (May 10, 2006), webcast available at <http://www.aei-brookings.org/events/page.php?id=155> (Farber Webcast). Farber is Distinguished a Career Professor of Computer Science and Public Policy in the School of Computer Science at Carnegie Mellon University. He was Chief Technologist at the FCC from 2000-2001 and is known for his pioneering work in distributed computing, including work on early versions of the Internet. See *Technologist Proposes Net Neutrality Solution*, Telephony (May 29, 2006).

<sup>25</sup> Farber Webcast, *supra* note 24.

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

Professor Farber’s conundrum regarding the “definition” of “net neutrality” is not difficult to understand. “Net neutrality” proponents themselves have been all over the map in describing what they mean by that concept and how it would be “enforced.”

- By 2004, Professor Lessig had abandoned some of his earlier rhetoric; he said that he was not concerned with the question of whether the technology that network owners use is proprietary or not, but how these technologies alter the environment for innovation at the edge of the network.<sup>28</sup> As long as network owners respect what Lessig called “internet values,” they would be permitted “to add whatever technology they like to the basic suite of Internet protocols.”<sup>29</sup> Lessig subsequently urged Congress to adopt former Chairman Powell’s “Internet Freedoms,” along with a restriction against “access-tiering” by network service providers.<sup>30</sup> Network service providers would otherwise be free to offer “consumer-tiered” service, such as a minimum bandwidth guarantee. Under this proposal, Lessig also suggested that Congress could add an additional layer of regulation that would “require network providers to provide a ‘basic internet service’ to all broadband customers,” with the basic service package defined by the FCC.<sup>31</sup> More recently, Lessig has suggested that “net neutrality” would not constitute “a massive programme of regulation,” but would instead be “a very thin rule for broadband providers that forbids business models that favour scarcity over abundance.”<sup>32</sup>

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<sup>28</sup> Lawrence Lessig, *Coase’s First Question*, 27 REGULATION 38, 39 (Vol. 3, Fall 2004).

<sup>29</sup> *Id.*

<sup>30</sup> Testimony of Lawrence Lessig on “Network Neutrality” before the Senate Committee on Commerce, Science and Transportation (Feb. 7, 2006).

<sup>31</sup> *Id.*

<sup>32</sup> Lawrence Lessig, *Congress Must Keep Broadband Competition Alive*, FINANCIAL TIMES (LONDON), Oct. 19, 2006, at 17.

- Google has defined network neutrality as “the principle that Internet users should be in control of what content they view and what applications they use on the Internet.”<sup>33</sup> Andrew McLaughlin, Head of Global Public Policy for Google, Inc., recently described a “nondiscriminatory access-tiering” arrangement as “a more pragmatic view” that Google could support,<sup>34</sup> but the company later backed off of McLaughlin’s comments.<sup>35</sup>
- According to the “Save the Internet” coalition, “net neutrality” means “no discrimination,” and “net neutrality” would prevent “internet providers from speeding up or slowing down Web content based on its source, ownership or destination.”<sup>36</sup> The coalition web site implies that a broadband service provider would be permitted to operate nothing more than a dumb pipe, since “the network’s only job is to move data – not choose which data to privilege with higher quality service.”<sup>37</sup>
- Robert Atkinson and Phil Weiser have proposed a three-pronged approach on “net neutrality”, which would (1) require all broadband service providers to post information about their usage policies (*i.e.*, whether content and service providers receive preferential access, and whether any limitations exist on consumer access to content and services of their choice); (2) grant the FCC after-the-fact enforcement powers consistent with

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<sup>33</sup> *A Guide to Net Neutrality for Google Users*, available at <http://www.google.com/help/netneutrality.html>.

<sup>34</sup> Drew Clark, *Is Google Changing its Position on Net Neutrality?* (Mar. 13, 2007), available at <http://gigaom.com/2007/03/13/is-google-changing-its-position-on-net-neutrality/>.

<sup>35</sup> Paul Kapustka, *Google’s MCI Vet to fix ‘Neutrality’ Message* (Mar. 21, 2007), available at <http://gigaom.com/2007/03/21/googles-mci-vet-to-fix-neutrality-message/>

<sup>36</sup> Available at <http://www.savetheinternet.com/=faq>.

<sup>37</sup> *Id.*

antitrust laws; and (3) give broadband providers depreciation and tax incentives to deploy networks if they provide a “best efforts, open Internet data pipe.”<sup>38</sup>

- Under the neutrality provisions of the “Internet Freedom and Preservation Act,” broadband service providers would be required to, *inter alia*, provide consumers with any content, application or service available on the internet on a “reasonable and nondiscriminatory” basis with respect to quality of service, access, speed, and bandwidth.<sup>39</sup>
- Under a neutrality principle offered by Professor Tim Wu, customers would “have the right reasonably to use their Internet connection in ways which are privately beneficial without being publicly detrimental.”<sup>40</sup> Under this proposal, broadband service providers would have the ability to, *inter alia*, impose “neutral” limits on bandwidth usage, ensure the quality of broadband service by eliminating delay or jitter, and prevent security violations of the network.

Other than tying their favored Internet regulation schemes to the rubric of “net neutrality,” these “definitions,” descriptions or proposals for “net neutrality” have little in common and even less to offer regulators as a model for government-imposed “net neutrality” obligations. Net neutrality advocates differ on the solution because they do not agree on exactly what the problem is. For government to wade into this thicket of inconsistent definitions to formulate regulation would be a fool’s errand.

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<sup>38</sup> Robert D. Atkinson & Philip J. Weiser, *A Third Way on Network Neutrality*, The Information Technology & Innovation Foundation (May 30, 2006).

<sup>39</sup> Senate bill 2917, § 12(4)(A) (2006).

<sup>40</sup> Tim Wu, *supra* note 23, at 166.

## 2. “Net Neutrality” Regulation Will Trigger Endless and Expensive Litigation

Professor Farber echoes the thoughts of many who say that because of definitional issues alone, “net neutrality” regulation or even guidelines would be impossible to develop. Even assuming regulations could be written, however, they would still lead to destructive uncertainty as to their actual application. They would also lead to the creation of a new bureaucracy to apply such rules and add layers of additional costs on the backs of competitive broadband providers for dealing with the regulations and bureaucracy.

Incurring such costs might be worthwhile were there real world problems that needed government intervention to remedy. But again, where no one has yet identified such problems; where such regulations would likely increase costs and stifle innovation; and where there is a vigorously competitive marketplace, the costs clearly outweigh the supposed benefits.

The chilling effect that “net neutrality” obligations would impose on the technological and architectural evolution of the Internet is widely recognized by prominent network engineers. Dr. Robert Kahn, who is the co-inventor of the TCP/IP protocol, stated that he is “totally opposed to mandating that nothing interesting can happen inside the [Internet].”<sup>41</sup> Dr. David Farber cautioned (along with several other commentators) that “net neutrality” may prohibit the architecture of the Internet from changing in ways that will provide consumers with a wide range of new and improved services.<sup>42</sup> These services include those requiring high levels of reliability, such as medical monitoring, and better security against viruses, spam, worms, denial-of-service attacks, and zombie computers.<sup>43</sup>

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<sup>41</sup> “An Evening with Robert Kahn” at the Computer History Museum (Jan. 9, 2007), transcript available at [http://vasarely.wiwi.hu-berlin.de/kahn\\_net\\_neutrality\\_transcript.html](http://vasarely.wiwi.hu-berlin.de/kahn_net_neutrality_transcript.html)

<sup>42</sup> Gerald Faulhaber, David Farber, Michael Katz & Christopher Yoo, *Common Sense about Network Neutrality* (June 2, 2006).

<sup>43</sup> *Id.*

Distinguishing between these legitimate practices and practices intended to be covered by any “net neutrality” regime would be extremely difficult, and efforts to do so would face a serious risk of innovation-crushing inaccuracy.<sup>44</sup> Broadband users would suffer the consequences. While “net neutrality” proponents argue that reasonable network management activities would be allowed to continue,<sup>45</sup> the inability of providers to predict which activities will be found reasonable – and which not – will deter them from developing more efficient management technology and techniques.

A broad, indistinct “net neutrality” rule would chill all innovations – technological, contractual, creative – by subjecting all broadband business practices to the regulators’ gaze. In essence, every business decision by broadband providers will have to take into account the uncertainty of government intervention at the behest of any party who does not succeed at the negotiation table. The inevitable result from prescribing such a strait-jacket for broadband service providers and applications providers will be fewer subscribers, reduced innovation, inferior service, and less investment.

### **3. The AT&T/BellSouth Merger Condition Demonstrates The Difficulty of Defining and Enforcing “Net Neutrality”**

Some have argued that the Commission should adopt as a new rule or “principle” the “net neutrality” condition AT&T and BellSouth agreed to in order to obtain FCC approval of their

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<sup>44</sup> Edward W. Felten, Center for Information Technology Policy, Department of Computer Science and Woodrow Wilson School of Public and International Affairs, Princeton University, *Nuts and Bolts of Network Neutrality*, at 5-6 (Jul. 6, 2006), available at <http://itpolicy.princeton.edu/pub/neutralty.pdf>, (noting that any enforcement regime that tries to distinguish legitimate strategies from those with the intentional effect of discrimination “will be costly and will make some errors”). According to Professor Felten, there is “a good policy argument in favor of doing nothing and letting the situation develop further. The present situation, with the network neutrality issue on the table in Washington but no rule yet adopted, is in many ways ideal.” *Id.* at 10.

<sup>45</sup> Both Amazon and Public Knowledge, two strong supporters of “net neutrality,” recently suggested that broadband providers should have the ability to manage their networks and even to provide services that would prioritize traffic, yet both still argue that legislation is needed to ensure nondiscrimination. *See Amazon: Network Operators Could Benefit from Net Neutrality*, TR Daily (June 8, 2007). For broadband providers, trying to distinguish between what is permitted and what is prohibited under this type of regime would be virtually impossible.

merger.<sup>46</sup> Under the “voluntary” “net neutrality” merger condition submitted in that proceeding, AT&T agreed not only to conduct business in a manner that comports with the policy statement for thirty months, but also that it “will maintain a neutral network and neutral routing in its wireline broadband access service” for a period of two years.<sup>47</sup> In so doing, the merged entity committed “not to provide or to sell to Internet content, application, or service providers, including those affiliated with AT&T/BellSouth, any service that privileges, degrades or prioritizes any packet transmitted over AT&T/BellSouth’s wireline broadband Internet access service based on its source, ownership or destination.”<sup>48</sup>

The AT&T/BellSouth merger condition cannot – and should not – be made applicable to other broadband providers. Unlike many of the other conditions that were adopted in connection with this merger, the “net neutrality” condition had nothing to do with actual competitive conditions in the marketplace or the AT&T/BellSouth merger itself. Rather, the merger condition was a “voluntary” submission that was acceptable to the merger proponents because it enabled them to consummate a merger that created the largest telecommunications company in the world. The condition never was intended to be applicable to other parties and the fact that it was acceptable to this one company, under this set of circumstances, provides no policy basis for applying it to all broadband providers.

More importantly, the substance of the condition is problematic. While neutrality proponents like to say that “net neutrality” is a “simple nondiscrimination rule,” the

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<sup>46</sup> See, e.g., Remarks of Gigi B. Sohn, President, Public Knowledge to the Broadband Connectivity Competition Policy Workshop, Federal Trade Commission (Feb. 13, 2007) at 3, available at <http://www.publicknowledge.org/node/829> (“A good place to start for a definition of non-discrimination is in the AT&T/BellSouth merger conditions.”) (Sohn FTC Remarks).

<sup>47</sup> See Letter from Robert W. Quinn, Jr. to Ms. Marlene H. Dortch, WC Docket No. 06-74, at 8 (Dec. 28, 2006). It should be noted that the condition did not apply to AT&T/BellSouth’s enterprise managed IP services or its Internet Protocol television (IPTV) service.

<sup>48</sup> *Id.*

AT&T/BellSouth merger condition belies this claim and likely would forbid activities that would be in the public interest. Like other “net neutrality” proposals, the AT&T/BellSouth condition imparts a broad “nondiscrimination” standard. Such a hard and fast rule would have the perverse consequence of advantaging certain types of applications over others. Applications that are latency- or jitter-sensitive (such as voice, video or interactive gaming) need a higher quality of service to succeed. By prohibiting differentiated service, this merger condition ends up systematically advantaging latency- and jitter-insensitive uses of the Internet over uses that are sensitive to such delay. This “simple nondiscrimination rule” thus prejudices certain types of Internet applications over others – an ironic outcome given proponents’ stated desires.

The purported simplicity of the AT&T condition is also disproved by the complexity of the facts to which it would be applied. A nebulous rule that prohibits the offering of “any service” that either “privileges” or “degrades” or “prioritizes” any packet based on its “source, ownership or destination” promises to spin out a surfeit of issues that would lead to legal disputes. The regulatory process would devolve into a perpetual round of “Mother, May I?” where every network management decision can become the subject of litigation.

Significantly, even “net neutrality” proponents appear to be reading exceptions into the AT&T merger conditions in order to present them as being more palatable. For instance, Professor Tim Wu stated that the AT&T/BellSouth merger condition “does not ban all forms of discrimination” and would allow AT&T to, for instance, “speed all the Internet video traffic on its network,” so long as AT&T does not give one video service provider an advantage over another.<sup>49</sup>

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<sup>49</sup> Tim Wu, *AT&T: The Mechanics of the Deal*, available at [www.savetheinternet.com/=wu](http://www.savetheinternet.com/=wu). Professor Wu presumes that AT&T may, “in time, find the [merger condition] to its liking, as it provides a corporate pre-commitment against ill-advised ‘value-added’ schemes that may prove financially disastrous.” This kind of presumptuous rhetoric is being applied elsewhere. See Art Brodsky, *Why Cable Should Want Net Neutrality*,

While the AT&T/BellSouth condition can certainly be interpreted to prohibit actions that “net neutrality” proponents don’t like, such as so-called “access-tiering” (*e.g.*, the offering of a “prioritized” or “privileged” quality service level to web sites for a fee), there is no express exception in the condition that would permit a “discriminatory” offering on a per-application basis. In the parlance of the AT&T/BellSouth merger condition, the offering of prioritized “video” to all comers might be prohibited because it constitutes the provision of a service that “privileges” a packet based on its “source,” *i.e.*, from a video provider. Moreover, even if a policy of prioritizing all video were deemed to be consistent with the condition, broadband providers would face a separate challenge in determining whether, and how, such prioritization would apply to different types of “video” applications, *e.g.*, Flash video, animated PowerPoint, or video e-mail.<sup>50</sup> The ever-increasing variety of applications on the Internet does not lend itself to the type of line-drawing needed to administer a nondiscrimination requirement.

On the opposite side of the coin, other application service providers may be tempted to argue that a broadband service provider’s offering of prioritized video “degrades” other categories of service (*e.g.*, VoIP packets). “Degradation” claims also may be extended to encompass otherwise benign network management practices when traffic surges beyond the ability of a network to carry it. When this occurs, some packets will be delayed.<sup>51</sup> To complicate matters further, it will not always be clear who should be assigned responsibility for causing the preferential service or “degradation” in a given case. Such results may be explained by the

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MULTICHANNEL NEWS, Apr. 30, 2007 (“Cable doesn’t want to be discriminated against and shouldn’t be able to discriminate, either.”).

<sup>50</sup> Similar classification issues would exist with voice services. That is, if a broadband provider must prioritize all voice services equally, it is not clear whether, and how, such a policy would apply to “voice” applications such as voicemail, voice communications within a gaming application, or voice embedded in a social networking site.

<sup>51</sup> Gerald Faulhaber, David Farber, Michael Katz & Christopher Yoo, *Common Sense about Network Neutrality* (June 2, 2006), available at <http://www.ncta.com/ContentView.aspx?hidenavlink=true&type=pubtp12&contentId=3539>.

Internet backbone that delivered the traffic, by a content provider's use of a caching service, the traffic management practices of the broadband service provider, or the competing demands of users sharing the last mile.<sup>52</sup>

**C. Regulation Would Discourage Continued Network Innovation and Investment**

For a business as dynamic as the provision of high-speed Internet services, there is no need for the government to make judgments about the best business models for an industry. It is clear that how those business models develop will directly affect the level of competitive investment and innovation over the next few decades. No one today can predict which business models will most effectively promote those goals.<sup>53</sup>

As we explain in more detail in the following section, bandwidth usage is growing exponentially. Certain Internet-delivered content – such as gaming sites and streaming video – may require speedier access and less latency to run effectively. Broadband providers have invested heavily to meet consumer demand for bandwidth and, given the popularity of these bandwidth-intensive sites, continued investment will be needed to provide high quality service.

To encourage this investment, cable operators and all others who invest in high-capacity networks must have flexibility to pursue new business models, including the option of recovering some of their network costs through contractual arrangements with the content providers that generate this increased demand for bandwidth. This is similar to an approach that telephone companies have used for decades to manage traffic on the public switched telephone network (PSTN). Specifically, by offering large users the option to move their traffic to dedicated, high-

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<sup>52</sup> See Phil Weiser, *Report from The Center for New West: Putting Net Neutrality in Perspective* (2007).

<sup>53</sup> See *Muris Statement*, *supra* note 17, at 14 (“Ultimately, consumers choose the winners and losers in a competitive marketplace. Regulators should protect the benefits of the competitive process, not determine outcomes.”).

capacity arrangements (*i.e.*, special access), telephone companies are able to control congestion of their switching facilities and offer large users services that are tailored to fit their needs.

If broadband providers were prohibited from considering the option of recovering costs from high-bandwidth content providers, they would be forced to recover 100 percent of the investment needed to deliver that content from individual consumers, many of whom do not use those web sites. While that model has worked for broadband providers in the past, it may be inadequate to deal with coming demands that will be placed on the network. In a market where competition has been very successful in increasing the quantity and quality of broadband service provided to consumers, it is completely irrational to force broadband providers to continue using the same business models that have worked in the past and to deny them the flexibility to adapt to changing circumstances.

As Professor Farber recently noted, blocking premium pricing in the name of neutrality might have the unintended effect of blocking the premium services from which customers would benefit.<sup>54</sup> No one would propose that the U.S. Postal Service be prohibited from offering Express Mail because a “fast lane” mail service is “undemocratic.”<sup>55</sup> Yet “net neutrality” advocates insist on exactly this for Internet services.

Similarly, Professor Muris has noted the significant value to the market in allowing providers to offer services at a variety of speed, mobility and price points so that customers may select the provider and plan that best fits their unique needs at any particular time.<sup>56</sup> While

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<sup>54</sup> David Farber & Michael Katz, *Hold Off On Net Neutrality*, THE WASHINGTON POST, Jan. 19, 2007, at A19; *see also Father of Internet Warns Against Net Neutrality*, THE REGISTER, Jan. 18, 2007 (discussing that Robert Kahn, a leading figure in the development of the Internet, had issued a “strong warning” that net neutrality would inhibit experimentation and innovation, and noting that with the exception of “Google’s man,” “most of the senior engineers responsible for developing the packet switched internetworking of today” oppose net neutrality).

<sup>55</sup> Farber & Katz, *supra* note 54.

<sup>56</sup> *Muris Statement*, *supra* note 17, at 3.

customers today value speed as an important characteristic when purchasing a service, “other attributes may become important over time,” and not every consumer will value the same mix of features.<sup>57</sup>

The benefit of an environment that permits different business models to develop can already be seen. As just one example, Google now offers free Wi-Fi service in Mountain View, California and has proposed a similar offering for San Francisco.<sup>58</sup> Under this business model, upstream content providers are paying fees (for advertising) that enable Google to reduce (to zero) the price of the Internet service that is provided to consumers. Similar experimentation took place when dial-up access was the primary mechanism for accessing the Internet, with some companies offering unlimited access, others charging by the hour, and some companies offering “free” services supported by advertising. The Commission should be encouraging this type of experimentation in the broadband market, not trying to restrict it.

Finally, if the Commission determines to start down a regulatory road, its focus should not be “network neutrality,” but “Internet neutrality.” If regulation is warranted at the transmission layer of the Internet, then it is similarly warranted at all layers. There is no sense prohibiting the physical network layer from discriminating against any particular data if that data is disadvantaged far earlier in its route to the consumer. Indeed, it is well established that, contrary to activity at the network layer, it is common practice for discrimination to occur at the content layer. Akamai speeds up content from favored sources like Google, Amazon, and eBay.<sup>59</sup> Google admitted that it programmed its search capabilities so that *its* favored position on

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<sup>57</sup> *Id.* at 20.

<sup>58</sup> See *EarthLink and Google win San Francisco Wi-Fi bid*, C/NET News.com (April 6, 2006), available at [http://news.com.com/EarthLink+and+Google+win+San+Francisco+Wi-Fi+bid/2100-7351\\_3-6058432.html](http://news.com.com/EarthLink+and+Google+win+San+Francisco+Wi-Fi+bid/2100-7351_3-6058432.html)

<sup>59</sup> See Letter from Joseph W. Waz, Jr., Vice President, External Affairs & Public Policy Counsel, Comcast Corporation to the Honorable Donald S. Clark, Secretary, Federal Trade Commission, Re: Broadband Connectivity Competition Policy Workshop – Comment, Project No. V070000, Appendix 1 at 3 (Feb. 28, 2007)

this very issue – “net neutrality” – shows first if a customer seeks information on the policy debate,<sup>60</sup> and it regularly favors paid search results over other search results.<sup>61</sup> There are many examples of such behavior, none of which would be addressed by regulations limited to the conduct of the network provider.

## **II. CABLE OPERATORS MUST HAVE THE FLEXIBILITY TO MANAGE TRAFFIC ON THEIR NETWORKS**

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In the *Notice*, the Commission asks a series of questions regarding the packet management practices of broadband Internet providers.<sup>62</sup> As we explain below, congestion is a constant source of concern on broadband data networks because it can interfere with the speed and quality of Internet access service. Adding capacity to the network is one tool broadband providers use to mitigate these problems, but in the long run it cannot – and should not – be the only allowable tool. Because some network applications, *e.g.*, peer-to-peer file sharing, can literally absorb all the bandwidth a network can make available, cable operators and other broadband providers must retain the ability to manage traffic on their networks in order to balance the interests of the different types of customers they serve. The cable industry has a strong track record in providing broadband service in a manner that meets the needs of its customers and content providers. Based on that track record, there is no basis for the Commission to restrict the ability of cable operators to manage their networks as needed.

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(Waz FTC Statement), available at <http://www.ftc.gov/os/comments/broadbandwrkshop/527031-00042.pdf>; see also Tim Wu & Christopher S. Yoo, *Keeping the Internet Neutral?: Tim Wu and Christopher Yoo Debate*, 59 FEDERAL COMMUNICATIONS L.J. 575, (Mar. 2007).

<sup>60</sup> Waz FTC Statement at 3.

<sup>61</sup> *Id.*

<sup>62</sup> *Notice* at ¶ 8.

## **A. A Variety of Factors Affect The Speed and Quality of Downloads**

The public Internet is a collection of interconnected networks that use a common language – Internet Protocol (IP) – to facilitate the transmission of data across those networks. Some of these networks serve retail customers, some serve content providers (*i.e.*, web sites), and some operate as backbone networks that exchange and transport traffic among networks that are not directly connected. All of these networks generally operate on a “best efforts” principle, in which each of these interconnected networks makes the best effort it can to get traffic to its destination, but without any guaranteed level of service.<sup>63</sup>

The speed and quality at which data are delivered from web sites to end users (or vice versa) are affected by a variety of factors, three of which are particularly relevant here.

First, decisions made by content providers affect how their services are delivered. Web sites must choose the data rate (speed) and data throughput (bandwidth) that is appropriate for their web site. A web site that serves as a simple advertisement for a small business, for example, obviously requires very different capabilities than a video downloading site with millions of daily users.

Second, the “network of networks” nature of the Internet may also affect the speed and quality of downloads. Because the public Internet operates under the best efforts principle, it is not always an optimal vehicle for delivering applications that require a specified quality of service. If any network that handles traffic is unable to deliver the necessary quality of service, the end user experience may be diminished.

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<sup>63</sup> See Edward Felten, *supra* note 44, at 3 n.2 (“The Internet will do its best to deliver each packet promptly, but it doesn’t make any guarantees. It’s up to the software on the end computers to detect dropped packets and recover.”). As explained below, although quality of service is not guaranteed on the public Internet, certain traffic may be prioritized to ensure that applications work in a manner that is consistent with consumer expectations.

There are a variety of ways in which applications providers often seek to improve the quality and speed at which their services reach their customers. Typically these efforts involve the use of private facilities to bypass portions of the public Internet. For example, as noted, a web site may enter into an arrangement with a content delivery network (CDN), such as Akamai, which uses a private network to send data across the country and store it in servers close to the “edge” of the network, *e.g.*, near a cable operator’s headend.<sup>64</sup> By using a CDN, the content provider is able to reduce the number of networks that handle its traffic, thereby increasing the likelihood that the speed and quality of downloads will be satisfactory.<sup>65</sup> CDNs illustrate one key aspect of how the Internet is not now “neutral.”<sup>66</sup>

The third factor affecting the speed and data quality of downloads is the nature of the individual networks that provide broadband service to end users. In any such network, there will be some portions of the network dedicated to individual subscribers and some portions that are shared among multiple subscribers. Cable systems make extensive use of shared facilities. Headends in cities and towns carry video, voice, and data traffic by fiber optic cables to and from

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<sup>64</sup> See Scott Woolley, *Video Prophet*, *Forbes* (April 23, 2007) (“Eventually they refined a business idea: a service that essentially would be the FedEx of the Internet. People could always trust the public Net to deliver their information cheaply. But others might be willing to pay Akamai a premium to deliver their content faster and more reliably.”), available at [http://www.forbes.com/free\\_forbes/2007/0423/068.html](http://www.forbes.com/free_forbes/2007/0423/068.html).

<sup>65</sup> There are other ways to secure priority access to consumers. For example, SlingMedia recently announced that it is incorporating software from GetConnected into its Slingbox system, which would enable Slingbox users to upgrade their connection speed from their broadband service provider. Slingbox is a device that lets consumers access their television programming wherever they are by turning any Internet-connected computer, PDA or smartphone into a personal television. The Slingbox redirects or “placeshifts” a single, live TV stream from a basic analog cable connection, digital cable box, satellite receiver or a media-enabled PC or DVR. Consumers can choose to retain their service as-is, or purchase the upgraded service at a higher price. GetConnected has agreements with over 500 service providers, avoiding the need for smaller web sites or applications to negotiate directly with the provider. See Greg Tarr, *Slingbox Gets New Abilities*, *TWICE* (Apr. 30, 2007); GCi Press Release, “GCi™ to Enable Premium Digital Content and Services to Sling Media’s Slingbox Customers,” (Apr. 23, 2007).

<sup>66</sup> See Craig McTaggart, *Was the Internet Ever Neutral?*, Prepared for the 34<sup>th</sup> Research Conference on Communication, Information, and Internet Policy, George Mason School of Law, at 14 (Sep. 30, 2006) (“The examples discussed above illustrate that today’s Internet is not neutral as to content, applications, networks, or users. Nor has the Internet ever likely been those things.”).

individual neighborhoods. As in telephone networks and wireless networks, this fiber has tremendous capacity and carries traffic generated by thousands of customers.

In the neighborhoods, the fiber cable hands off to coaxial cable at a node that typically serves 500 or fewer homes. The coaxial cable within the neighborhood is shared among all the homes served by each node (except for the drop to each home, which is dedicated to that home). By adding or splitting nodes, cable operators manage the number of homes served by each node to ensure that there is sufficient capacity in the neighborhood to meet consumers' needs. Although the specific equipment is different, this type of shared use of facilities takes place in wireless networks and telephone company networks as well.<sup>67</sup>

When facilities are not dedicated to individual subscribers, as is the case with virtually all broadband networks, congestion is a concern. A subscriber that sends long streams of content, such as video, may degrade the performance of other users in the neighborhood. As we discuss below, there are a variety of ways in which a cable operator can deal with the issue of congestion. In deciding among these options, cable operators must balance the needs of all of their customers – both those who fully take advantage of the video and data capabilities of today's Internet and those who simply want to browse the Web and send e-mail to friends and family.

Cable operators also have every incentive to consider the needs of content providers in making these decisions. For example, the use of video services such as YouTube may present network management challenges to broadband providers, but such services are very attractive to subscribers. In a recent month, YouTube usage accounted for four percent of *all* traffic on

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<sup>67</sup> In the telephone network, for example, the copper loop leaving the customer's home is dedicated to that customer only up to the point where it connects with a switch or remote terminal. As telephone companies extend the fiber in their networks, these dedicated copper loops make up a smaller portion of the network.

Comcast's high-speed Internet network. But as Comcast Chairman and CEO Brian Roberts explained, "[w]e don't view that as a bad thing. We view that as a great thing . . . ." <sup>68</sup> Cable operators fully recognize that many customers are attracted to the speed and capacity of cable broadband services precisely because they facilitate the use of these new content services. To constrain for no reason a customer's ability to access these content sources would eliminate one of the key selling points of the monthly cable broadband subscription and drive customers to cable operators' competitors. As we explain in the next section, however, the changing nature of Internet content makes balancing the needs of all of our customers an increasingly challenging endeavor.

#### **B. Video Services Are Straining the Capacity of Cable Broadband Networks**

Cable operators began providing high-speed data service to their customers in 1996. The primary on-line activities at that time were e-mail and web browsing. Consequently, at that time, cable networks were designed around the transmission of web pages. The goal was to provide very reliable downloads of relatively small files. When cable operators began to first offer high-speed data networks, they typically provided downstream burst traffic (data entering the customer's home) at speeds of 1.5 Mbps and upstream burst traffic (data being sent from the customer's home) at speeds of 128 Kbps.

Over time, the richness of Internet content has constantly increased. Today's web pages are significantly more complex than they were in 1996. While web pages used to consist primarily of text, most web sites now feature graphics of some kind, and many incorporate video and other bandwidth intensive content.

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<sup>68</sup> See Burke: *VOD 'getting better and better'*, cedmagazine.com (Feb. 6, 2007), available at <http://www.cedmagazine.com/newsletter.aspx?id=140534>.

Cable operators have responded to these developments. In 1996, when cable first offered high-speed Internet service as an alternative to dial up access, the speeds were approximately 1-1.5 Mbps. Today, most cable operators offer broadband speeds topping 5 Mbps and some operators, such as Cablevision, offer speeds up to 50 Mbps.<sup>69</sup> Others, like Comcast, Buckeye, and Cox, offer a “PowerBoost” service that provides speeds as high as 12-16 Mbps on an on-demand, capacity-available basis.<sup>70</sup> Some cable operators are preparing to deploy the next generation “wideband” architecture (DOCSIS 3.0), which is backward-compatible with existing cable high-speed modems, and will deliver speeds of over 100 Mbps.<sup>71</sup>

As Internet content continues to evolve, streaming and downloading of video content will become even more prevalent. In just a few short years, downloading short video clips has grown from a novelty to a standard form of information and entertainment for tens of millions of people, and web sites that offer the streaming or downloading of program-length videos have become increasingly common. The next steps in this evolution – entire networks of online programming and the downloading of video in high-definition format – have already begun. It will take huge amounts of capacity to handle this kind of traffic.

In addition to these video services, cable operators and other broadband providers are seeing expanding use of peer-to-peer (P2P) technologies. P2P applications are essentially automated software programs that allow machines to talk to other machines, with little human intervention. Since it is machines talking to machines, P2P software will automatically tend to use whatever capacity is available on the network, making it difficult for “human applications”

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<sup>69</sup> See *NCTA Section 706 Comments* at 8.

<sup>70</sup> *Id.*

<sup>71</sup> *Comcast's 150 Mbps Modem is Good for U.S. Broadband*, PC WORLD (May 9, 2007), available at <http://blogs.pcworld.com/staffblog/archives/004354.html>; *Comcast's Roberts: 'Wideband' to Trump Telcos*, MULTICHANNEL NEWS (May 8, 2007).

such as email and web browsing to have adequate capacity. The result can be poor performance for these human applications – and an unhappy customer experience.

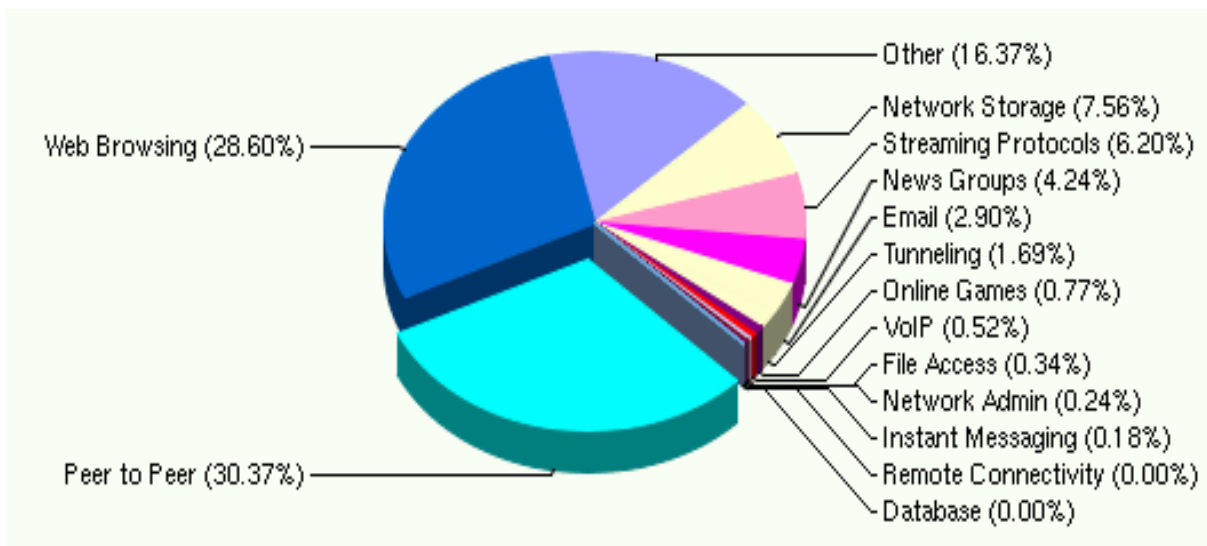
Video services generally, and P2P video in particular, can place tremendous strain on broadband networks. Streaming high-quality video requires as much as 100-200 times the capacity of traditional web browsing. As one Wall Street analyst explained in recent testimony before the Senate Commerce Committee, “downloading a single half-hour TV show on the Web consumes more bandwidth than does receiving 200 e-mails a day for a full year. Downloading a single high-definition movie consumes more bandwidth than does downloading of 35,000 web pages; it’s the equivalent of downloading 2,300 songs over Apple’s iTunes Web site. Today’s networks aren’t scaled for that.”<sup>72</sup>

The effect of P2P applications cannot be understated. P2P applications absorb a rapidly growing portion of downstream and upstream capacity on cable networks, even as that capacity grows. The charts that follow show representative data for a major cable operator. As shown in Figure 1, as much as 30 percent of downstream capacity has been used by P2P applications.

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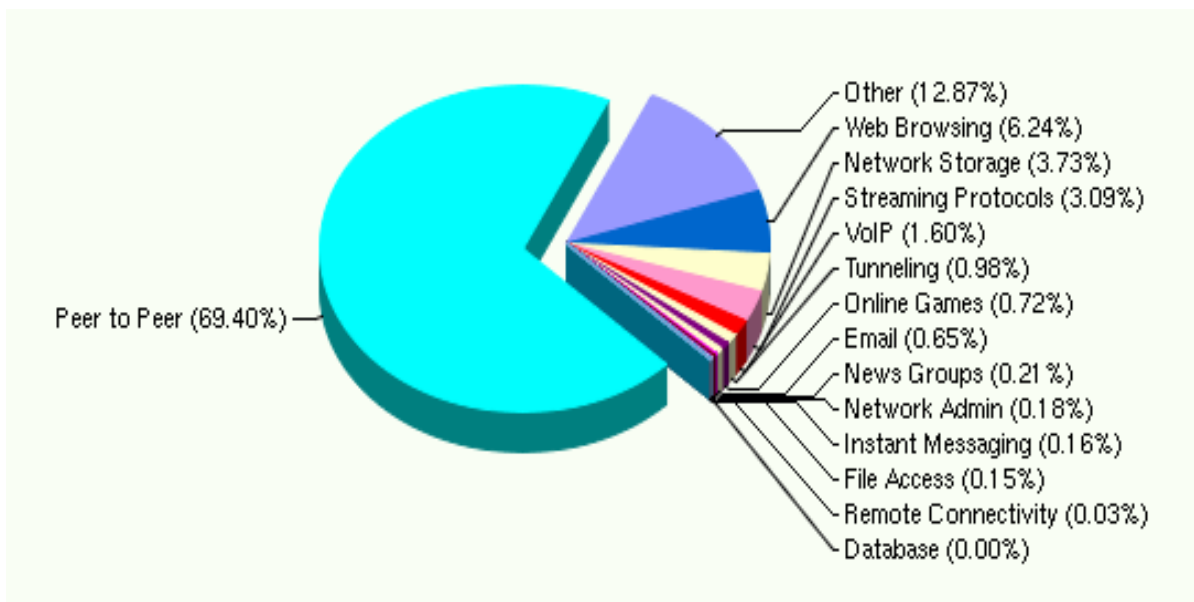
<sup>72</sup> Testimony of Craig E. Moffett, Vice President and Senior Analyst, Sanford C. Bernstein and Co., LLC, to the Subcommittee on Communications (Mar. 14, 2006) at 2, available at <http://commerce.senate.gov/pdf/moffett-031406.pdf> (Moffett Testimony).

**Figure 1 – Downstream Consumption for a Major Cable Operator**



Upstream capacity on cable networks is affected by P2P applications to an even greater degree. As shown in Figure 2, almost 70% percent of upstream traffic can be consumed by P2P applications.

**Figure 2 – Upstream Consumption for a Major Cable Operator**



Cable operators are seeing a dramatic impact as a result of consumers' changing usage patterns and the transmission of more video-rich content. The amount of data sent and received by the average subscriber is increasing steadily over time. At the same time, the number of broadband users also is increasing. As a result, the total amount of traffic carried by cable broadband networks is escalating rapidly.

The growing strain on cable broadband networks from increased use of video services and P2P services shows no signs of abating. Consequently, cable operators and other broadband providers must develop strategies for dealing with these developments in a manner that preserves the quality of the online experience for all consumers and that permits wise and timely investment in expanded capacity.

**C. Adding Capacity Should Not Be The Only Permissible Strategy For Dealing With Congestion**

As the discussion above makes clear, the increasing prevalence of video services, particularly P2P video services, presents a substantial challenge to all broadband Internet providers. There are a variety of approaches cable operators could take to meet this challenge. At one extreme, cable operators could embark on a massive new round of network upgrades, replacing coaxial cable with fiber optic cable, so that all their subscribers could upload and download high-quality video 24 hours a day. Illustrative of this extreme thinking is Consumers Union, which asserts that Congress intended the 1996 Act to facilitate “the deployment of a *communications* technology, where every American could become a broadcaster by simply subscribing to a competitive and affordable advanced service offering.”<sup>73</sup>

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<sup>73</sup> Comments of Consumers Union, Consumers Federation of America and Free Press, GN Docket No. 07-45 (filed May 16, 2006) at 16.

Whatever the rhetorical appeal of every consumer being able to broadcast high-quality video, upgrading the network to make that possible is not even remotely realistic today. Financing such investments would be extremely challenging.<sup>74</sup> Given the substantial costs of adding capacity to networks, and the equally substantial consumer price increases that would be necessary to fund capital expenditures of this type, this is an untenable strategy for cable operators trying to compete in an intensely competitive environment.

At the other extreme, broadband providers could, in theory, meet the challenge of P2P video and other new video services by barring their use. The Department of Defense now blocks web sites such as Facebook and YouTube in order to prevent degradation of the traffic on its networks.<sup>75</sup> Similarly, Ohio University recently announced that it would no longer permit P2P file sharing applications on its network.<sup>76</sup>

Although we can appreciate the rationale offered by the Department of Defense and Ohio University for taking the steps they did, cable operators will not go down the path of blocking access to video or P2P services. Blocking such services would be a recipe for stagnation of the Internet and massive dissatisfaction among consumers, which would lead to loss of customers to our competitors. As noted above, NCTA has stated that its members will not block access to any lawful content, application, or service available on the public Internet.<sup>77</sup>

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<sup>74</sup> See Moffett Testimony, *supra* note 72 (“Despite this strong demand for networks, however, Wall Street harbors grave doubts about the ability to earn a return on network investments.”). NTIA Administrator John Kneuer recently made a similar point, noting that this “is not a risk-free investment” and network operators will have to make a business case to convince investors to fund network investment. See *Kneuer Rejects Government Role in Investment Decisions*, TR Daily (June 8, 2007).

<sup>75</sup> See, e.g., Leo Shane III & T.D. Flack, *DOD Blocking YouTube*, Others, STARS & STRIPES, May 13, 2007, available at <http://stripes.com/article.asp?section=104&article=53421&archive=true>.

<sup>76</sup> See Ohio University Announces Changes in File-Sharing Policies, Apr. 25, 2007, available at <http://www.ohio.edu/students/filesharing.cfm>.

<sup>77</sup> *Telecom, Cable Firms Push for Flexibility in ‘Net Neutrality’ Model*, *supra* note 6.

Such extreme measures are not the way to meet the challenges of the evolving Internet. Cable operators and other broadband providers will continue to have the option of adding capacity by, for example, deploying more fiber, but that cannot be their only tool for dealing with the rapidly increasing flow of Internet content. First, as noted above, adding capacity is expensive. As with any capital expenditure, any investment in new broadband facilities must be justified by the anticipated revenue those facilities will generate. This market-oriented approach to investment, which is typical of competitive markets, has guided the cable industry for decades. There can be no doubt that such an approach results in more efficient investments than the traditional system of guaranteed returns and government subsidies that has characterized the telephone business. But it requires regulators to maintain a hands-off approach in favor of the market, even when they might wish for investment to happen at a quicker pace.

Second, simply adding capacity, without taking additional steps to manage traffic on the network, may not be adequate to deal with the increasing role of P2P video applications. As discussed above, one of the key features of P2P applications is that they seek out and use any available network capacity. Consequently, if a cable operator were to upgrade the capacity of its network, the benefit of that upgrade would flow disproportionately to the tiny minority of customers that actually use P2P applications, much of it consisting of illicit transfers of copyrighted works. The “machines talking to machines” will use all available capacity. Therefore, adding capacity alone will not solve this problem.

**D. The Commission Should Not Restrict the Ability of Cable Operators To Manage Their Networks To Best Serve Consumers And Compete Effectively**

As noted, cable operators need more cost-effective tools than capacity upgrades to deal with the evolving nature of Internet content in a manner than meets the needs of consumers and

content providers. Some of the tools that will be helpful to network providers already are in use today.

With respect to retail customers, many broadband providers offer varying tiers of service. Tiered service is a mechanism for charging a higher price to those customers that are likely to place greater demand on shared network resources. This type of pricing strategy often makes sense given the fact that only about two percent of subscribers use nearly 32 percent of available bandwidth.

Another tool is to include “acceptable use provisions” in agreements with subscribers. Such provisions give cable operators the ability to limit abusive uses of the service that might threaten to degrade the quality of service received by other users. And, in fact, most ISPs have such acceptable use provisions in place today.

The benefit of both of these tools – tiered services and acceptable use provisions – is that they help the broadband provider anticipate the quantity of traffic expected on the network, and they allow some degree of cost recovery based on causation. More refined variations of these tools might be helpful in managing the network in the future, particularly with the continued growth of P2P video traffic. For example, a cable operator might consider charging lower rates to customers who agree not to engage in P2P file sharing during peak hours. Innovation and changes are taking place so rapidly on the Internet that techniques used today to deal with congestion may not be useful to the next new web application. The point is, cable operators need the flexibility to experiment to find the proper balance as the Internet evolves at the customer and application provider level.

Cable operators and other broadband providers generally have not used these types of management tools in their dealings with content providers. But there is no reason why they

should be prevented from doing so if they make economic sense in a competitive marketplace. As noted above, the “best efforts” principle upon which the public Internet is based, combined with the shared nature of cable broadband networks, means that the introduction of innovative high-bandwidth services might cause interference with the online experience that existing customers have come to expect. Contractual arrangements between cable operators and content providers offer a means by which cable operators can try to minimize such harmful effects for the benefit of all consumers and content providers.

For example, downloading of HD programming could lead to substantial congestion on today’s broadband networks.<sup>78</sup> Not only would this congestion degrade the service of retail customers, but it also makes it difficult for content providers to incorporate HD video into their services. Contractual arrangements between content providers and broadband network providers potentially could address the congestion issues in a manner that suits the needs of all parties.

There is ample precedent for such contractual arrangements in the special access services offered by telephone companies. As explained above, by offering services that enable large users to move their traffic onto dedicated, high-capacity facilities, telephone companies reduce the need to invest in new switches. These services help telephone companies better meet the needs of both high-volume and low-volume customers – the former by offering services designed to fit their needs and the latter by more efficiently using scarce network resources.

The proposals suggested by “net neutrality” advocates would limit, in some cases significantly, the tools available to cable operators in managing their networks. At the extreme, some proposals would require network providers to treat all traffic identically – on the theory

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<sup>78</sup> See The Mark Cuban Weblog, available at <http://www.blogmaverick.com/2006/07/14/broadband-video-is-overrated-too/> (“clogged pipes in that last mile are going to clog further as more content is delivered at higher bit rates. Which in turn mean that fewer broadband bits can be delivered at busy times to last mile users. Net Neutrality will pretty much guarantee that this is a problem forever and ever.”). Mark Cuban is the founder of HDNet, a national television network that delivers all of its programming in HD format.

that “a bit is a bit is a bit.”<sup>79</sup> While such a formulation is appealing in describing digital communications, it does not describe the Internet – at *any* layer – and insisting on it would be harmful to consumers. As just one example, cable operators currently use tools to control e-mail spam, filter computer viruses, and limit “zombies” from taking over a customer’s computer and using it to resend large amounts of data over the Internet.<sup>80</sup> These functions depend on the cable operator identifying the offending traffic and taking steps to stop it. Even many “net neutrality” advocates recognized that “discrimination” of this sort is in the public interest and that banning it would be harmful to consumers.<sup>81</sup>

Other “net neutrality” proposals are less extreme but also would be problematic for consumers. For example, some parties have advocated a regime in which broadband networks would be permitted to offer differentiated services to content providers, but only if those services were made available to similarly situated providers on a nondiscriminatory basis.<sup>82</sup> Such an approach may have some superficial appeal, and may be the rule more than the exception as application provider plans develop. But determining whether two providers were similarly situated would be even harder than it is in the common carrier world, where specialized

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<sup>79</sup> See Save the Internet Coalition, available at <http://www.savetheinternet.com/>.

<sup>80</sup> See, e.g., *Charter Rolls Out Enhanced High-Speed Internet Service*, Business Wire, Sep. 21, 2006 (“To stay ahead of an ever-changing industry and to protect our customers against a host of new Internet threats, Charter has partnered with F-Secure, an award-winning Internet security provider, to offer our upgraded High-Speed Security Suite version 6.15,” [said Himesh Bhise, vice president of Charter’s High-Speed Internet.]); see also Karen Brown, *Voice of Security: Tight Makes Right*, MULTICHANNEL NEWS, Apr. 3, 2006 (“Insight [Communications Co.] has put in place advanced firewalls and network monitoring systems at its network operations center. The purpose: to deter and fend off hacker intrusions, be they denial-of-service attacks aiming to overwhelm softswitches, or even unauthorized users trying to piggyback on the voice service without paying.”).

<sup>81</sup> See Sohn FTC Remarks, *supra* note 46, at 3 (“[W]e do not oppose broadband providers ... engaging in legitimate network management to ensure the proper operation of the network.”); see also Tim Wu, *supra* note 23, at 166.

<sup>82</sup> See Sohn FTC Remarks, *supra* note 46, at 2-3 (“This is about whether the last-mile provider will deny [content and service providers] the opportunity for better service so as to advantage their proprietary services.”).

arrangements for specific retail clients have been used for decades.<sup>83</sup> To apply an even stricter standard to competitive broadband providers than applies to traditional monopoly telephone services, in the absence of market evidence that there is a problem, makes little sense.

Moreover, the competitive market generally acts to quell unreasonably discriminatory network management practices. That is, to the extent that a particular service provider engages in such practices, other broadband service providers can publicize that fact and encourage consumers to switch providers. In this way, the market will discipline companies that fail to respond to consumers' needs. In addition, broadband consumers themselves serve as an important check on such behavior, and freely use the Internet as a tool to publicize problematic industry practices through relevant blogs or listserves.

In short, in the absence of any demonstrated market failure and public harm, there is nothing that justifies the costs and risks associated with any type of Commission-imposed nondiscrimination requirement. Given the constantly evolving nature of Internet content and network technology, attempts by the Commission to adopt rules based on a snapshot of the current marketplace almost certainly will have unintended consequences that are harmful to broadband networks, content providers and consumers. Indeed, even adoption of a nondiscrimination principle, rather than an enforceable rule, could have the effect of discouraging companies from experimenting with new approaches to the provision of broadband services.

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<sup>83</sup> See e.g., *AT&T Communications Revisions to Tariff FCC No. 12*, CC Docket No. 87-568, Memorandum Opinion and Order on Remand, 6 FCC Rcd 7039, 7040 (1991) (approving AT&T's Tariff 12, which consists of a series of options, each constituting a customized package of telecommunications services.'').

## CONCLUSION

The Commission's hands-off approach to Internet regulation has created an environment that fosters investment in network facilities and innovative technologies and services. The result of the Commission's strategy over the past decade has been increased deployment of broadband networks, increased speed and quality of services, and increased levels of competition. Given these successes, there is no reason for the Commission to change course now. Regulation of the provision of broadband services and the management of broadband networks, no matter how well-intentioned, almost certainly would reduce competitive investment and constrain growth in networks and the services that depend on them.

Respectfully submitted,

**/s/ Daniel L. Brenner**

Daniel L. Brenner  
Neal M. Goldberg  
Steven F. Morris  
National Cable & Telecommunications  
Association  
25 Massachusetts Avenue, NW – Suite 100  
Washington, DC 20001  
(202) 222-2445

Howard J. Symons  
Tara M. Corvo  
Mintz, Levin, Cohn, Ferris, Glovsky &  
Popeo, P.C.  
701 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004  
(202) 434-7300

Counsel for the National Cable &  
Telecommunications Association

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**ATTACHMENT A**  
**U.S. Newspaper Editorials Opposed to “net neutrality”**  
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Editorial, *Chicago Sun Times*, “Don't connect government to 'network neutrality' fight,” 09/6/06,  
[http://findarticles.com/p/articles/mi\\_qn4155/is\\_20060906/ai\\_n16705999](http://findarticles.com/p/articles/mi_qn4155/is_20060906/ai_n16705999)

Editorial, *Denver Post*, “High stakes battle over net neutrality,” 08/4/06,  
[http://www.denverpost.com/opinion/ci\\_4133256](http://www.denverpost.com/opinion/ci_4133256).

Editorial, *Orlando Sentinel (FL)*, “Protect the Web,” 7/24/06,  
<http://pqasb.pqarchiver.com/orlandosentinel/access/1082111451.html?dids=1082111451:108211451&FMT=ABS&FMTS=ABS:FT&date=Jul+24%2C+2006&author=Sage&pub=Orlando+Sentinel&edition=&startpage=A.10&desc=Protect+the+Web+>.

Editorial, *Milwaukee Journal-Sentinel (WI)*, “A light touch for the Internet,” 7/24/06,  
[http://findarticles.com/p/articles/mi\\_qn4196/is\\_20060723/ai\\_n16643388](http://findarticles.com/p/articles/mi_qn4196/is_20060723/ai_n16643388)

Editorial, *Omaha World Herald (NE)*, “Paying for new pipes,” 07/14/06,  
<http://www.dailyamerican.com/articles/2006/07/14/opinion/editorial01.txt>.

Editorial, *Arizona Republic*, “‘Net Neutrality’ Would Stifle Innovation,” 6/26/06,  
<http://www.azcentral.com/arizonarepublic/opinions/articles/0626mon1-26.html>

Editorial, *Chicago Tribune*, “Hands off the Internet,” 06/26/06,  
<http://pqasb.pqarchiver.com/chicagotribune/access/1066270681.html?dids=1066270681:1066270681&FMT=ABS&FMTS=ABS:FT&type=current&date=Jun+26%2C+2006&author=&pub=Chicago+Tribune&edition=&startpage=20&desc=Hands+off+the+Internet>.

Editorial, *Washington Times*, “Free-market telecom,” 06/12/06,  
<http://www.washingtontimes.com/op-ed/20060611-094356-1641r.htm>.

Editorial, *Washington Post*, “The Internet's Future,” 06/12/06,  
<http://www.washingtonpost.com/wp-dyn/content/article/2006/06/11/AR2006061100707.html>.

Editorial, *San Antonio Express-News (TX)*, “With Net neutrality, proceed with caution,” 06/12/06,  
[http://www.mysanantonio.com/opinion/editorials/stories/MYSA061206.01O.net\\_neutrality1ed0612.221e895.html](http://www.mysanantonio.com/opinion/editorials/stories/MYSA061206.01O.net_neutrality1ed0612.221e895.html).

Editorial, *Investor's Business Daily*, “Say No To Neutrality,” 05/23/06,  
<http://www.investors.com/editorial/editorialcontent.asp?secid=1501&status=article&id=155701&secure=1224>

Editorial, *Asheville Citizen-Times (NC)*, “Congress should tread lightly around issue of net neutrality,” 05/23/06.

Editorial, *Wall Street Journal*, “The Web's Worst New Idea,” 5/18/06, <http://online.wsj.com/article/SB114791513048756153.html>.

Editorial, *The Oregonian*, “Not so fast on network neutrality,” 5/15/06, <http://www.benton.org/index.php?q=node/2338>.

Editorial, *Washington Post*, “The Eden Illusion,” 3/13/06, [http://www.washingtonpost.com/wp-dyn/content/article/2006/03/12/AR2006031200808\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2006/03/12/AR2006031200808_pf.html)

Editorial, *Rocky Mountain News (CO)*, “Misplaced fears of a telecom merger,” 3/8/06, <http://www.highbeam.com/doc/1P1-119481189.html>.