*Unwarranted Fears Mask the Benefits of Network Diversity: An Argument against Mandating Network Neutrality*

Elvis Stumbergs

## ABSTRACT

The rapid development of the Internet has necessitated an update to Federal telecommunications laws. Recent Congressional efforts to enact such an update, however, have spawned a fiery debate over a somewhat nebulous concept: network neutrality. The debate concerns the way that Internet access providers handle the data traffic being sent over their networks. These providers would like the option to offer some of their customers, web site hosting companies and similar entities, additional services that would essentially result in these customers' content loading faster, more reliably, or more securely than others not receiving such priority treatment. Yet, this proposed "diversity" of content treatment has worried many who fear that the egalitarian nature of the Internet, under which substantial innovation has occurred, would be disturbed by the imposition of inherent traffic preferences. These individuals propose including a provision in new telecommunications legislation that would mandate a "neutral" Internet where preferences for data are prohibited from being implemented. In this Comment, Elvis Stumbergs sheds some light on details behind the network neutrality debate. Often glossed-over details of Internet architecture are described to illustrate the consequences of a diverse and neutral Internet, and the various arguments for and against network neutrality are summarized. Stumbergs then devotes the Comment primarily to examining present and potential competition in the provision of Internet access, along with regulatory, antitrust, and legislative options available to ensure the preservation of a vigorous Internet access marketplace. Stumbergs concludes that network neutrality proponents' fears are largely unwarranted. Moreover, imposing network neutrality legislation could ironically hinder the innovation that network neutrality advocates seemingly seek to protect.

# UNWARRANTED FEARS MASK THE BENEFITS OF NETWORK DIVERSITY: AN ARGUMENT AGAINST MANDATING NETWORK NEUTRALITY

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## INTRODUCTION

The rapid development of the Internet has necessitated an update to Federal telecommunications laws, yet recent Congressional efforts to enact such an update have spawned a fiery debate over a somewhat nebulous concept: network neutrality.[1] Network neutrality proponents seek to rally public support for their cause with claims like "Internet freedom is under attack"[2] and that Congress must pass legislation to stop "cable and telco giants" from shutting "down the free flow of information."[3] Arguments for the other side include assertions that such legislation would throw "the brakes on the development of the Internet" and potentially derail "much-needed investment and innovation."[4] Not surprisingly, the inflammatory political rhetoric surrounding this issue often glosses over the details of what network neutrality is and the reasoning behind each side's position. This Comment attempts to provide some of the details of the debate, along with a closer look at Internet technology, competition in the provision of broadband Internet access, and what effects a network neutrality mandate

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[1] *House Judiciary Passes Internet access measure*, WASH. POST, May 25, 2006 (discussing conflicting bills passed by the House Judiciary Committee and House Energy and Commerce committee over the issue of network neutrality).

[2] Subject of Moveon.org email from Eli Pariser (May 1, 2006), on file with author.

[3] Save the Internet: The Threat is Real, *at* http://www.savetheinternet.com/=threat (last visited May 28, 2006).

[4] Mike McCurry and Chris Wolf, *Welcome to the Official Blog for HandsOff.org*, HANDSOFFTHEINTERNET.ORG BLOG, *at* http://handsoff.org/announcements/net-neutrality-network-neutrality-tiered-service-hands-off-the-internet/ (May 22, 2006).

could potentially have. Evidence suggests that while network neutrality proponent's call for Internet egalitarianism may have emotional appeal, their fears about an Internet doomsday without neutrality legislation prove to be mostly unwarranted. Moreover, should neutrality legislation be enacted, it would ironically hinder rather than help the Internet innovation that its proponents claim to be supporting.

Part I of this Comment provides a technical overview of Internet architecture and defines what exactly is meant by "network neutrality" and its antithesis, "preferred access" or "network diversity." The Internet operates as a "packet-switched" network that transmits information by first splitting it into small lumps called "packets," which are then stamped with the equivalent of a digital delivery address, and then sent them off into cyberspace with little more than trust and hope in the rest of the network to carry them to their destination. Routers, intermediary network computers that direct the flow of data traffic, use their "best efforts" to make sure the information is delivered – but they do not offer any guarantees. Near everyone who has ever used the Internet has undoubtedly encountered a web site which they could not easily connect to or an email that possibly took longer to be received than they expected. While most users may not have given clicking 'reload' on one's browser or waiting a minute longer

for a message much thought, they perhaps have been slightly more than annoyed when their favorite video stream has had to pause to "buffer" or an Internet phone call (VoIP) has sounded somewhat distorted. These few examples reveal some of shortcomings of "best efforts" Internet delivery and are at the heart of what Internet access providers, collectively-termed Broadband Services Providers (BSPs), seek to remedy through their proposed offering of preferred access. Preferred access would essentially allow BSPs to flag certain content, such as video or VoIP, with a priority attribute which would result in that content being less prone to getting slowed down by network congestion. The result would be the ability for BSPs to offer their clients, primarily web sites – also termed content providers – an enhanced level of service which could guarantee delivery of their content for an extra fee. So, what's the problem?

Part II describes the origins of the concept of "network neutrality" and explains why the theory's current proponents view preferred access – also known as "network diversity" – as bestowing catastrophic results for the Internet. It is feared that BSPs will abuse their power in granting preference for certain content and end up in a position to act as Internet gatekeepers. The Internet's democratic ideal of equal access for all could disappear when BSPs are lured by the prospect of large fees paid to them by mega-

corporations to make their web sites load at ultra-fast rates, all at the expense of smaller sites which would be left to perish in the Internet "slow lane." A non-neutral Internet could potentially go the way of other mass media such as TV and radio, where large corporations arguably dominate and minority voices often struggle to be heard. Fortunately, such an outcome is unlikely under a network diversity scheme. Additionally, network diversity holds increased incentives for network infrastructure investment and development. Why this optimism?

Part III-A elaborates on the theories proposed by scholars like Christopher Yoo and Adam Thierer and argues that fears of BSP abuse are unwarranted because, largely, competitive pressures from potential new and existing BSPs will provide a disincentive for incumbent BSPs to take actions not preferred by consumers. Consumers, having thus far grown accustomed to not having their access to their selected web sites impeded will not tolerate actions by their BSP which might degrade their service. Many consumers can pick which BSP will provide their service – usually DSL or cable-modem – and if one service does not suit their needs, they can switch to another. For those consumers who do not presently have a choice, new and existing wireless and powerline BSPs will enter the market to satisfy the demand for alternate BSPs by these consumers. In fact, evidence

of alternate BSPs entering the market already exists and consumers are being offered ever increasing options for who will provide their Internet service.

A caveat to alternate BSPs effectively competing, by offering different service than incumbents, stems from the fact that a few of the last-mile incumbents also own or operate large portions of the Internet backbone network. It may potentially be the case that alternate last-mile BSPs are unable to easily change the preferences of Internet traffic that they receive from backbone networks and therefore may not be able to offer service to consumers that's meaningfully different from that provided to them by the incumbents. However, since incumbent BSPs have not announced whether they would implement data preferences on their backbone network, incumbent BSP dominance in the backbone network is not definitively established, and new entrants could exist in the backbone market as well, it would be premature to rule out competitive pressures from being effective merely because of this issue.

Moreover, additional fail-safe protections in the form of regulatory, legal, and legislative action exist to make network neutrality proponent's fears further unwarranted. The FCC retains authority to engage in *ad hoc* adjudication against BSPs that engage in anti-competitive practices and they have already proven their effectiveness in dealing with BSPs engaged in

blocking activity. Antitrust law also exists which could address collusion between BSPs in limiting consumer choice. Finally, should all these protections not succeed in creating a vibrant marketplace for Internet access, Congress could still enact legislation to remedy any problems that could appear at some later point. The main argument of this Comment is that this point has not yet been reached.

Part III-B illustrates the innovative harms from network neutrality legislation that should rightfully be feared. Allowing BSPs the opportunity to offer a preferred access service enhancement for their content provider clients could make possible a number of new Internet applications, while network neutrality legislation would foreclose such opportunities. Quality-of Service guarantees could create new businesses which specialize in delivering sensitive data without delay (akin to a FedEx for the Internet) and offering increased speed for a fee could create new services for consumers. Consumers could have the option of paying a slightly higher fee to have one specific download be faster and public safety could even be improved by allowing emergency communications to take place over the Internet without fear of network congestion. Some may argue that the existing trend in general increases in premises and network bandwidth could lessen congestion and provide more data delivery reliability even with network neutrality. However, unlike a preferred access scheme, a network

neutrality mandate would nevertheless necessitate that data delivery still take place on a "best efforts" basis and without any guarantees of success. Moreover, consumers should have the choice to target which services they need expanded bandwidth for and not be forced into contracting for larger overall bandwidth from their BSP just in hopes that the few applications that they need increased reliability for will function without difficulty. The future network bottleneck will likely exist not at households' and business' premises, but rather on Internet networks. Therefore, merely expanding premises bandwidth would be insufficient to offer the type of service-level guarantee that a preferred access scheme would provide.

In sum, as explained below, currently enacting network neutrality legislation would be based on unwarranted fears and mask benefits that could abound from a scheme of network diversity.

## I. TECHNICAL BACKGROUND

### *A. Congestion-Prone Internet Architecture*

A sketch of basic Internet architecture is helpful in understanding how a preferred access scheme could be implemented and why it would exist.

The Internet is a network of networks. Individual operators of Internet

networks have jointly decided to use a common language – the Internet Protocol (IP) service – to enable data on one network to be transmitted to another network.[5] Because of the large number of networks in existence that have adopted IP, the Internet provides a "single global network service"[6] that allows data in one part of the world to reach its destination in another part by merely traversing any number of networks until it reaches its target.

A key feature of the Internet is that all data originating from a user or content provider is carved into discrete lumps called "packets," which are then sent across the networks and reassembled at their destination.[7] The packet's organization into two discrete parts consisting of the "header" and "payload"[8] makes this slice-and-reassemble approach possible. The header includes information about the sender of the packet, its destination, and how the data in the payload portion is to be reassembled once it reaches its destination. Although the header typically contains additional information aside from that mentioned, it is nevertheless minimal.[9] This minimalist approach offers the Internet flexibility and efficiency because network "routers" only have to process small, standardized pieces of information in

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[5] GRAHAM KNIGHT, INTERNET ARCHITECTURE 244 (Hossein Bidgoli ed., The Internet Encyclopedia, John Wiley & Sons 2004)

[6] *Id.*

[7] *Id.*

[8] *Id.* at 247.

[9] *Id.* at 247, 249. Typically the entire header is only 40 bytes. IP headers and TCP

the header to enable them to pass on packets to users or other networks.[10]

However, the simplicity of Internet architecture that increases speed and interoperability also results in sacrifices in the reliability of packets reaching their destination. The basic IP service just sends off packets with a destination address and hopes that other networks will use their "best efforts" to deliver the packet to its end-point.[11] When scholars refer to the Internet operating on a "best efforts" basis, it refers to this method of transmission.[12] The IP service offers no guarantees of success. A packet may become "lost" on the way to its destination, it may be arbitrarily delayed, or arrive in an order different from that in which it was sent.[13] The use of the Transmission Control Protocol (TCP) in conjunction with IP (commonly referred to as TCP/IP) mitigates a few of these reliability issues, by adding sequence and acknowledgement features to the transmission scheme, but delivery of packets still remains far from guaranteed.[14]

The major barrier to guaranteed packet delivery is "congestion" – a

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headers are each typically 20 bytes long and the payload may be any length subject to network limits.

[10] A router is a network device that forwards packets from one network to another. Based on internal routing tables, routers read each incoming packet and decide how to forward it. To which interface on the router outgoing packets are sent may be determined by any combination of source and destination address as well as current traffic conditions (load, line costs, bad lines, etc.). Router definition, *at* http://www.answers.com/topic/router (last visited on May 28, 2006).

[11] KNIGHT, *supra* note 2, at 247.

[12] Christopher S. Yoo, *Beyond Network Neutrality*, 19 HARV. J. L. & TECH. 1, 21 (2005).

[13] KNIGHT, *supra* note 2, at 247.

[14] TCP is the "Transmission Control Protocol." It allows receivers the ability to check that they have received all of the packets and request re-transmittal in case any become

situation that occurs when too much traffic attempts to pass through a particular location on the Internet where the routers are not able to forward all of the incoming packets to another network.[15] A router will hold packets that have not yet been sent in a queue, but only up to a certain point because of memory constraints. When the router becomes congested, packets will either be delayed in reaching their destination or actually become "lost." If network resources permit transmission of the packet while it is still in the router queue, then it will be sent to its destination, albeit at a delay. However, when the router memory is exhausted, the router discards queued packets and they are then "lost." In such a situation of "lost" packets, the receiver of data must rely on the sender to detect that some of its packets have not arrived and re-send them. This loss of packets could result in much more substantial delays or even failures in transmission. While TCP can help alleviate some of these congestion problems, certain Internet applications, especially those favoring real-time communication, use protocols other than TCP and therefore Internet resource management remains a live issue.[16]

It is, in fact, these real-time applications, which often have the least protection against congestion, that are most sensitive to lost or delayed

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missing. KNIGHT, *supra* note 2, at 249.

[15] *Id.*

[16] Some applications use UDP (User Datagram Protocol), a protocol popular with "real-time applications" that "lacks TCP's reliability and congestion control mechanisms,

packets.[17] A user may not mind if a web site containing text and images loads a few seconds slower, an email arrives a minute or two later, or even if she has to press 'reload' on her browser because the site did not load the first time. All of this content is "latency-insensitive" and the current "best efforts" Internet architecture inherently favors this type because slight delays in the transmission of latency-insensitive content are not overly bothersome to users.[18] Conversely, Internet telephone service (VoIP) and streaming media, for example, are "latency-sensitive" applications that rely on a constant flow of data and any disruption of this stream results in a noticeable degradation of service. A VoIP user may experience distorted sound quality or a lost connection when the network is not able to send or receive all of the required packets necessary to maintain the voice conversation; a user watching high quality Internet TV could have her video frequently interrupted by re-buffering pauses if packets do not arrive fast enough to provide all the necessary image data. These are but a few of the existing Internet applications that could benefit from having more of a guarantee in the delivery of packets. As discussed *infra* in Part IV.B, there exist other Internet applications, yet to be offered, which could also take advantage of certain preferred access features.

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leaving such issues to the applications themselves." *Id.* at 250.

[17] *Id.* at 260.

[18] *Id.*; Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. TELECOMM. & HIGH TECH. L. 141, 148 (2003) (the current Internet "implicitly disfavors applications" that

### *B. Packet Prioritization Solution to Congestion*

Various protocols have been designed to remedy congestion problems.[19] Common to these approaches is their attachment of extra information to a packet's header that indicate what priority the information in the payload should have in reaching its destination.[20] One approach separates traffic into "classes" where a basic class is treated on a best efforts basis, while a time-sensitive high priority traffic class receives expedited transmission. Methods for accomplishing priority transmission include reserving router capacity for the duration of the packet's path and instructing routers to send packets with a higher priority level before those with a lower level.[21] Collectively, efforts at ensuring a packet's delivery are described as ensuring a "Quality of Service" (QoS).[22]

The debate about Net neutrality centers on Broadband Service Providers' (BSPs) ability to offer their content providers a QoS guarantee similar to that described above.[23] BSPs would like the ability to offer their

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care about how fast data arrives).

[19] *See* discussion of INTSERV and DIFFSERV. KNIGHT, *supra* note 2, at 260-61.

[20] *Id.*

[21] *Id.* at 261.

[22] *See* QoS Definition – Computer Networking, ABOUT.COM, *at* http://compnetworking.about.com/od/networkdesign/l/bldef_qos.htm (last visited May 28, 2006).

[23] While there have been numerous news reports about the prospect of BSPs

server-side customers (i.e. web site operators) an enhancement to their network service whereby a web site could pay some additional fee in exchange for the BSP branding that specific web site's content with a priority tag resulting in that traffic receiving expedited treatment by that BSP's routers and, consequently, faster delivery to its destination.[24] Such a feature would likely receive the greatest demand from providers of latency-sensitive Internet content, such as streaming video and gaming.[25]

As a note, a potential complication could exist with regard to BSPs negotiating with their neighboring networks to continue the priority treatment of data originating on their network. For a priority access scheme to be effective, BSPs would have to negotiate service level agreements (SLAs) with neighboring networks to ensure that whatever traffic one BSP has branded as high priority continues to be treated this way on other networks.[26] Large BSPs, like AT&T, with local loop access to end users

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prioritizing packet delivery, there have been no technical details released how BSPs actually intend to accomplish this. Most of the technical details about how QoS would be accomplished are inconsequential insofar as my argument is concerned, except the issue of at which network level (last-mile, backbone) the traffic preference would be implemented. *See* discussion *infra* Part II.A.1.c.

[24] Dionne Searcey and Amy Schatz, *Phone Companies Set Off A Battle Over Internet Fees*, WALL ST. J., Jan. 6, 2006, at A1; Ken Belson, *Consumers May Pay Once For Internet Access And Again for Using It* , N.Y. TIMES, Mar. 6, 2006, at C1.

[25] Belson, *supra* note 24 ("a mom-and-pop online retailer might consider [preferred access] unnecessary, but a company selling, say videos online could see it as crucial"). Any website seriously considering streaming high quality video programming over the Internet would need to ensure that its, likely paying, subscribers can watch the programming without pauses for re-"buffering" content that are caused by network congestion. Similarly, competitive online gaming relies on real-time interaction between players and delays in relaying data substantially hamper the gaming experience.

[26] KNIGHT, *supra* note 2, at 261. As mentioned *supra*, the Internet is a network of

may be able to route traffic just on their networks and avoid having to make SLAs with other networks. However, negotiating the treatment of priority packets (including fee allocation among BSPs) for smaller networks, and even for larger networks in their international communications, could prove to be a more complex task in terms of settlement of access fees. This issue relates to BSP ownership of backbone networks, which is further discussed in Part IV.A.1.c.

## II. NETWORK NEUTRALITY DEBATE

The term "Network Neutrality" has come to be used ever more frequently, but what it refers to remains a fairly broad set of concepts and its precise meaning often hinges on the context it is used in. "Network neutrality" was coined roughly around 2002 by scholars like Professors Lawrence Lessig and Tim Wu, who sought to have the term capture the idea of an "open access" Internet.[27] Such an Internet would offer users nearly unlimited choice in the services that they use and how they use them.[28] This broad sense of neutrality has been applied to numerous aspects

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networks.

[27] *The Government's Role in Promoting the Future of Telecommunications Industry and Broadband Deployment: Before the Communications Subcommittee of the Senate Committee on Commerce, Science, and Transportation*, 107th Cong. 2-4 (2002) (testimony of Lawrence Lessig, Professor Law, Stanford Law School), *available at* http://commerce.senate.gov/pdf/lessig.pdf; Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. TELECOMM. & HIGH TECH. L. 141, 141 (2003).

[28] Users would only be required to not cause damage to the network under "network

of the Internet, such as critiquing BSP prohibitions on home users running servers, networking multiple computers, establishing WiFi networks, utilizing VPNs for telecommuting and so forth.[29]

The present network neutrality debate, though, has a narrower focus. Current media and legislative reference to the concept of network neutrality predominantly concerns the ideal of all websites receiving "equal" treatment by prohibiting BSPs from granting any one website faster or more reliable delivery of its content relative to other websites.[30] Essentially, network neutrality proponents seek to maintain the current state of the "best efforts" delivery Internet and legally prohibit BSPs from entering into deals with web site operators to guarantee them a congestion-mitigating QoS

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neutrality." Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. TELECOMM. & HIGH TECH. L. 141, 152-163 (2003). The FCC has also adopted a policy statement through which it has indicated that it would seek to preserve user freedom in accessing the content of their choice. Policy Statement, *In the Matters of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, *CC Docket 02-33, et al.* (Adopted August 5, 2005, released September 23, 2005), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf. Notably, the FCC's policy statement does not prohibit BSPs from granting preferred access, but rather states that the FCC will seek to foster consumer choice and competition.

[29] Wu, *supra* note 28.

[30] Congress would essentially be imposing a de jure technical standard that would prohibit the inclusion of additional information in packet headers to guarantee expedited delivery. The proposed "Network Neutrality Act of 2006" requires that BSPs which ''prioritize[] or offer[] enhanced quality of service to data of a particular type, to prioritize or offer enhanced quality of service to all data of that type (regardless of the origin of such data) without imposing a surcharge or other consideration for such prioritization or enhanced quality of service." (emphasis added) Proposed amendment by Reps. Markey, along with Boucher, Inslee and Ensley to H.R.5252 Communications Opportunity, Promotion, and Enhancement (COPE) Act of 2006. See also James Surowiecki, *Net Losses*, THE NEW YORKER, The Financial Page (March 20, 2006) ("The Internet has become a remarkable fount of economic and social innovation largely because it's been an archetypal level playing field…");

guarantee.[31]

The network neutrality position contrasts with that of "network diversity," a term coined by Professor Christopher Yoo.[32] While network neutrality seeks to impose affirmative obligations on BSPs through regulation, network diversity views "regulatory forbearance" as the optimal position to take regarding broadband provision.[33] The theory adopts a position of *first do no harm*. The proper inquiry, according to Yoo, is not about the possible benefits that network neutrality could provide, but rather about harm to innovation and competition that could result if network neutrality is imposed.[34] In responding to this question, Yoo acknowledges the allure of network neutrality's egalitarian principles but concludes that the competitive harms inherent in mandated network neutrality outweigh even qualified benefits of network diversity.[35]

Network neutrality proponents fear anti-competitive side effects that

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[31] See *supra* Part I.b for more detail about QoS guarantees. Also, a QoS guarantee is different from a BSP offering end-users tiers of bandwidth. BSPs currently offer users the opportunity to choose which level of maximum upload and download speed they would want (e.g, 3 Mbps download / 768 kbps upload) between their premises and the BSPs central office. *Verizon Online DSL Internet Service Speeds*, VERIZONONLINE.COM, *at*: http://www22.verizon.com/ForHomeDSL/channels/dsl/popups/verizononlinedslservicespeeds.asp (last accessed May 29, 2006). Actual transfer speeds, though, vary significantly based on the proximity of the network that the user is communicating with, in relation to their own, and the level of congestion en route to this network. Preferred access would act as a means of "clearing a path" for data sent between a user and a remote network in an attempt to have a user maximize the utilization of bandwidth that she has available.

[32] Christopher S. Yoo, *Would Mandating Broadband Network Neutrality Help or Hurt Competition? A Comment on the End-to-End Debate*, 3 J. TELECOMM. & HIGH TECH. L. 23, 29 (2004).

[33] Yoo, *supra* note 12, at 8.

[34] *Id.* at 6.

could result if BSPs are allowed to offer preferred access tiers. A number of concerns are voiced: 1) content innovation could be hindered when smaller websites are unable to pay preferred access fees and thus lose visitors to "faster" sites who can pay the fees; 2) BSP subsidiaries could provide content themselves and thereby have an unfair advantage over competitors in that market when they grant themselves preferred access, potentially at a discount; 3) consumers could end up paying twice for the internet service – once for their broadband service, and another time when web sites pass on their preferred access fees, and, most of all; 4) that BSPs could act as Internet gatekeepers that effectively block content and pick the winners and losers on the Internet instead of leaving those decisions to the marketplace. To alleviate these fears, a neutral network is proposed – an Internet that would be analogous to the national highway system or electrical grid where all users are treated equally and every manufacturer can rest assured that their products (be it cars, appliances, or Internet applications) will function "equally"[36] well in the hands of consumers.[37]

Network neutrality opponents (or network diversity proponents,

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[35] *Id.* at 77.

[36] As indicated in Sections II and IV, because applications have different latency requirements, a scheme that treats all traffic the same does not exactly offer equality.

[37] Tim Wu, *Why You Should Care about Network Neutrality*, SLATE MAGAZINE (May 1, 2006) (argument in favor of treating the Internet more like an interstate freeway); Tim Wu, *The Broadband Debate, A User's Guide*, 3 J. TELECOMM. & HIGH TECH. L. 69, 75

depending on your semantic choice) refute the above claims by stating that it would be contrary to BSPs' interests to degrade customers' service or block websites and therefore there is no reason to mandate network neutrality.[38] They caution the public about the specter of increased governmental regulation of the Internet, and cite independent reasons for why they should be able to assess fees from content providers for their use of priority services.[39] BSPs assert that they have invested billions of dollars in capital in upgrading the nation's network infrastructure and that content providers, like Yahoo and Google, who are reaping large profits from utilization of this infrastructure, should contribute to the BSP's recoupment of this investment.[40] Any contrary course of action, BSPs claim, would be free-riding by content providers.[41]

Scholars in support of network diversity primarily remark that network neutrality proponents' fears are unwarranted because market forces are

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(2004) (presents argument of "Openists" who advocate the Internet should become like the nation's electrical grid in order to continue its success)

[38] James S. Granelli, *Phone, Cable May Charge Dot-Coms That Want to Race Along the Internet*, L.A. TIMES, Apr. 9, 2006, at A1. (AT&T Chairman, Edward Whiteacre states that his company will not block or downgrade anyone's service.)

[39] Priority or preferred access features include increased speed, reliability, and security of delivered content. *Id.*; *see also* Hands Off the Internet, *at* http://www.handsofftheinternet.com.

[40] Interview with Edward Whiteacre, *At SBC It's All About "Scale and Scope"*, BUSINESSWEEK, Nov. 7, 2005. (Then SBC-CEO, Whiteacre comments that his company, along with cable companies, have spent capital building the network that Internet content providers like Google and Yahoo would now like to use for free. Whiteacre does not plan to let them do this).

[41] *Id.*

sufficient to counteract any potential anti-competitive actions that BSPs might take.[42] Moreover, it is argued that adopting a network neutrality regime could potentially foreclose benefits offered by a "diverse" Internet.[43]

## III. UNWARRANTED FEARS AND MASKED BENEFITS

If incumbent BSPs choose to implement preferred access schemes on their networks, regulation should not prevent them from doing this. There is little chance of BSPs oppressing content providers because this would be counter to their own incentives. If oppression were to occur, the already existing competitive, legal, and regulatory protections would likely provide more than enough defenses against any anti-competitive practices. Further, allowing preferred access to prosper would stimulate innovation in firms that take advantage of the priority data transport.

### *A. Unwarranted Fears*

"Internet freedom is under attack."[44] "[T]he forces of corporate greed are winning the day in Congress" when votes are cast against Network neutrality legislation.[45] "Without Net Neutrality, startups and entrepreneurs

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[42] *See* Yoo, *supra* note 32.

[43] *Id.* at 57-59; Adam Thierer, *Are "Dumb Pipe" Mandates Smart Public Policy? Vertical Integration, Net Neutrality, and the Network Layers Model*, 3 J. TELECOMM. & HIGH TECH L. 275, 289-292 (2005).

[44] Subject of Moveon.org email from Eli Pariser (May 1, 2006), on file with author.

[45] Arianna Huffington, *"Net Neutrality": Why are the Bad Guys So Much Better at*

will be muscled out of the marketplace."[46] These are but a few of the quotes from groups and individuals that fear about what may become of the Internet if BSPs are able to offer some websites the ability to prioritize their traffic. As illustrated below, these fears are largely unwarranted.

The solution to the problem that network neutrality proponents worry about – BSPs hindering the delivery of content – lies in looking not at what actions BSPs might take in relation to their server-side customers (e.g., web sites), but rather how their client-side customers (e.g., households and businesses who subscribe to Internet access) might react to what BSPs do in the server-side of their operations. If client-side customers feel mistreated by BSP server-side actions, such as a BSP making a certain web site unacceptably slow just to grant an exceptionally high QoS to another site, they will seek out alternate BSPs from which they could achieve a more satisfactory level of service. BSPs, mindful of the possibility for this type of consumer behavior, will therefore hesitate before taking action which might alienate their current customers. As such, network neutrality proponent's fears would likely fail to materialize since competitive pressures will keep BSPs from taking oppressive actions that might run counter to their economic interests.

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*Naming Things?*, HUFFINGTON POST, May 3, 2006, *at* http://www.huffingtonpost.com/arianna-huffington/net-neutrality-why-are_b_20311.html.

[46] Save the Internet: Frequently Asked Questions, *at* http://www.savetheinternet.com/=faq (last accessed May 17, 2006).

The fact that network neutrality proponents' fears persist suggests that they may be founded on the erroneous assumption that BSPs have sufficient market power to impose potentially oppressive network restrictions without suffering any adverse competitive consequences. Since nearly fifty-nine percent of individuals have a choice between two or more cable-based BSPs or phone-based (DSL) BSPs, and 34 percent have a choice of three or more providers,[47] competition between these BSPs is likely to provide sufficient incentive for them to not take actions that would be deemed by their client-side customers as unacceptable.[48] Network neutrality proponents nevertheless also cite the fact that many households lack a choice between BSPs and that the market would therefore fail to protect them against oppression.[49] A fear about localized monopolies is also unwarranted. We need not assume that just because some percentage of individuals currently lack a choice between BSPs in their service area, that this will continue indefinitely.[50]

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[47] High-Speed Services for Internet Access: Status as of June 30, 2005, Table 16, FCC Wireline Competition Bureau (Apr. 2006), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-264744A1.pdf.

[48] Yoo notes that "recent merger decisions suggest that the survival of three firms may be sufficient to preserve the benefits of competition." Christopher S. Yoo, *Beyond Network Neutrality*, 19 HARV. J. L. & TECH. 1, 61 (2005). Based on the current trend of increasing numbers of BSPs, three BSP choices for most individuals appears to be a tangible goal that should be achieved in the near future.

[49] Save the Internet: Frequently Asked Questions, *at* http://www.savetheinternet.com/=faq (last accessed May 17, 2006) (47 percent of Americans have to decide between either cable or DSL as the BSP). Based on FCC data, *supra* note 47, it appears that this is closer to actually only 26 percent of zip codes that have a choice of only one ADSL or cable-modem provider.

[50] FCC, *supra* note 47. Chart 7 and Table 11 indicate that the number of high-speed

In areas where customers lack BSP choice and dislike their incumbent BSPs, this creates demand for alternate forms of Internet access.[51] Alternate BSPs are possible because of the nature of Internet access since there exist 1) acceptable substitutes, and 2) sufficient demand for these substitutes should oppression occur. Moreover, this model gathers support from observing innovation and investment already occurring in substitute markets driven by content providers' understandable precautionary anxiety about potential oppression by incumbent BSPs.

1. Acceptable Substitutes Exist

The most prevalent of alternate BSPs are wireless technologies, though broadband over electrical wires (BPL) is fast emerging as another contender.[52]

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Internet providers continues to increase.

[51] Yoo suggests that "network diversity might make it possible for three different last-mile networks to coexist: one optimized for traditional Internet applications such as e-mail and website access, another incorporating security features to facilitate ecommerce and to guard against viruses and other hostile aspects of Internet life, and a third that prioritizes packets in the manner needed to facilitate time-sensitive applications such as streaming media and VoIP." Yoo, *supra* note 12, at 31. This highly plausible theory provides additional support for why the current trend in more BSPs entering the market would continue its steady increase.

[52] *See* High-Speed Services for Internet Access: Status as of June 30, 2005, FCC Wireline Competition Bureau (April 2006), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-264744A1.pdf. The report already indicates a steady increase in the number of high-speed Internet access line providers serving individual zip codes, especially in high-density urban areas.

a. Wireless

Currently several major types of wireless technologies exist through which users can access the Internet: WiFi, WiMax, and 3G/4G. To varying degrees, all possess the potential to act as mediums through which new BSPs could provide alternatives to traditional broadband access (i.e., cable or DSL).

Many Internet users are likely to already be familiar with WiFi. This wireless technology is based on 802.11x standards and integrated into many notebook computers, PDAs, and other mobile devices.[53] Users take advantage of the connectivity that WiFi offers through being able to wirelessly access the Internet in their homes, businesses, and many public areas such as airports and coffee shops.

The greatest potential for WiFi to act as an alternative to cable or DSL, however, lies at the creation of municipal wireless broadband networks. These networks are based on WiFi access points placed around metropolitan or rural areas through which users obtain broadband connectivity.[54] The viability of these municipal broadband networks as acceptable substitutes to traditional cable or DSL access may be hinted at

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[53] Wi-Fi Alliance – Knowledge Center – Consumers, *at* http://www.wi-fi.org/knowledge_center/consumers/ (Feb. 15, 2006).

[54] *See* Wireless Philadelphia, *at* http://www.phila.gov/wireless/; Tim Gnatek, N.Y. TIMES, May 3, 2006, at Services / Technology Section (detailing development of rural wireless broadband networks).

by the vigorous opposition that city-sponsored wireless networks have faced from incumbent BSP lobbies.[55] Telecom industry lobby groups convinced several states to prohibit cities from sponsoring wireless broadband so as to not discourage private BSPs from providing Internet services.[56] Without commenting on the merits of the BSPs' concerns, the simple fact that BSPs took the threat of municipal broadband seriously indicates that, based on their expertise, they viewed municipal broadband networks as potentially cutting into their business by acting as an alternate BSP. In spite of BSP opposition, municipal broadband networks have continued to grow and it is estimated that over eighteen percent of U.S. zip codes now currently have available some form of "fixed wireless" service.[57] Moreover, proposed federal telecommunications legislation prohibiting state bans on municipal broadband networks could further stimulate their development.[58] In sum, WiFi alternatives are likely to become even more prevalent and provide a viable alternative for users who may become dissatisfied with their current BSP.

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[55] Amol Sharma, *Companies That Fought Cities on Wi-Fi, Now Rush to Join In*, WALL ST. J., at B1 (Mar. 20, 2006).

[56] Tom Spring, *Public Broadband Hits Speed Bumps*, PCWORLD.COM, *available at* http://www.pcworld.com/news/article/0,aid,121832,RSS,RSS,00.asp (July 15, 2005).

[57] Municipal broadband and wireless projects map, CNET.COM, *at* http://news.com.com/Municipal+broadband+and+wireless+projects+map/2009-1034_3-5690287.html (last visited May 22, 2006); FCC, *supra* note 47, at Table 16. Note, fixed wireless may include other wireless services such as WiMax in addition to WiFi.

[58] Anush Yegyazarian, *A Gated Net: The Sequel*, WASH. POST (May 5, 2006); Communications Opportunity, Promotion, and Enhancement (COPE) Act of 2006 (HR.5252), § 401(a) (introduced May 1, 2006 by Rep. Barton (R-TX))

WiMax[59] is a wireless technology that was specifically designed for "metropolitan area networks" and features a range of up to 50 miles from an antenna and the ability to use licensed spectrum (decreasing possible interference), thereby making it another compelling alternative to cable and DSL.[60] In terms of speed, WiMax is expected to support connections up to 40 Mbs for fixed applications (mounted antennas) and 15 Mbps for mobile applications (laptops, PDAs).[61]

While WiMax has not yet penetrated the United States market fully and the technology continues to develop, it has strong growth potential and market demand for alternative BSPs could be the increased demand that stimulates wider WiMax technology deployment.[62]

Sprint Nextel, specifically, has announced plans to develop and deploy a wireless "4G broadband network"[63] in the United States that will use the mobile WiMax standard, with an intended investment of $2.5-3 billion in the project during 2007 and 2008.[64] On the heels of Sprint Nextel's

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[59] WiMax: Worldwide Interoperability for Microwave Access.

[60] WiMax Forum – Frequently Asked Questions, *at* http://www.wimaxforum.org/technology/faq/ (last visited May 21, 2006).

[61] *Id.*

[62] It is assumed that WiMax would fall under the "fixed wireless" FCC classification. Most recent FCC data on BSPs, *see supra* note 47, does not distinguish between variants of fixed wireless, thus specific WiMax penetration data is not readily available.

[63] 4G refers to a "fourth-generation" wireless network. S*ee* John Boyd, *Sneak Peek At Cellphone Future*, IEEE SPECTRUM ONLINE, June 2006, *at* http://www.spectrum.ieee.org/jun06/3672.

[64] Press Release, Sprint Nextel Announces 4G Wireless Broadband Initiative with Intel, Motorola and Samsung, *at* http://www2.sprint.com/mr/news_dtl.do?id=12960 (Aug. 8, 2006). Download speeds are expected to be between 2-4Mbps, comparable to existing DSL and cable service. Associated Press, Sprint Nextel to Form Network With WiMax,

announcement, the New York Times commented that "Sprint has positioned itself as a substitute to the Bell companies, which own Cingular and Verizon Wireless."[65] This type of substitute infrastructure development is precisely what this Comment argues will prevent any one BSP from becoming too oppressive in terms of implementing their network preferences.[66] Further, new wireless technologies are being developed which have already been tested at speeds of 3.6 Mbps[67] in mobile situations and could potentially deliver transfer rates of 2.5 Gbps.[68] There exists no reason why other carriers could not take advantage of these technologies to provide even more options for consumers and thereby supply additional competitive pressure.

b. Broadband-over-Powerline (BPL)

Finally, the wired technology of Broadband over Power Lines (BPL) has the potential to offer another compelling alternative to traditional cable

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N.Y. TIMES, Aug. 9, 2006.

[65] John Markoff and Ken Belson, Sprint Will Build an Intel-Backed Network, N.Y. TIMES, Aug. 9, 2006, at C1.

[66] Most users should be able to access these new services since "the Sprint Nextel 4G mobility network will use the company's extensive 2.5GHz spectrum holdings, which cover 85 percent of the households in the top 100 U.S. markets." Press Release, *supra* note 64. Also, FCC data indicate that at lease one current high-speed wireless internet provider is available to users in 53 percent of zip codes. FCC, *supra* note 47, at Table 16.

[67] NTT DoCoMo: HSDPA, *at* http://www.nttdocomo.com/features/HSDPAand4G02.html (last visited on May 22, 2006).

[68] NTT DoCoMo, HSDPA and 4G (Part 2), *at* http://www.nttdocomo.com/features/HSDPAand4G04.html (last visited on May 22, 2006).

and DSL service.[69] This technology offers broadband Internet access, comparable to the DSL and cable speed, by utilizing electric utility companies' power lines.[70] Given that power lines reach nearly every residence and business in the United States, this type of service could, not only act as a substitute for cable and DSL, but also increase broadband penetration rates by providing service in areas without current BSPs.[71] Though some BPL interference issues are still being worked out, this is a technology with substantial promise for introducing additional competition into the BSP market.[72]

c. Caveat: Alternate BSPs Still Rely on Backbone Networks

The fact that all of the mentioned alternative BSPs are essentially only different mediums for delivering last-mile service poses a potential problem in countering an incumbent's preferences because many of the incumbent BSPs also control Internet backbone networks.[73] If an incumbent BSP

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[69] Report and Order, FCC 04-245, ¶1, In the Matters of Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems, ET Docket No. 04-37 and Carrier Current Systems, including Broadband over Power Line Systems, ET Docket 03-104 (released October 28, 2004).

[70] *Id.*

[71] Current FCC data combines BPL providers with those offering Internet services through "other" technologies, thus penetration data for BPL is not currently available. FCC, *supra* note 47, at Table 16.

[72] FCC, s*upra* note 69, at ¶7.

[73] AT&T and Verizon, prominent providers of last-mile DSL service, also own and operate a significant portion of the Internet backbone. Cable companies do not own a significant amount. Ben Worthen, CIO BLOGS (March 17, 2006), *at*

implements its preferred access for a certain content provider on its backbone network, then an alternate BSP utilizing this network for its access would have to contend with receiving already-prioritized traffic and could potentially have difficulty changing the priority of the traffic that it is receiving. Essentially, the danger exists that the alternate BSP might not be an alternate at all but merely a propagator of the preferences that the incumbent has already implemented. If this were the case, then client-side BSP customers would have no incentive to switch to another BSP if they would become dissatisfied with their level of content provision (slow access to certain web sites, etc.) since their other BSP choices could potentially leave them similarly dissatisfied. If these users would have no incentive to switch, then BSPs would not be punished by market forces for their oppressive actions and network neutrality proponents' fears about BSP oppression could become warranted.[74]

While incumbent BSP control of backbone networks could remain an

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http://blogs.cio.com/node/209; Verizon Business Solutions Group, *at* http://www.verizonmarketing.com/bsg/products/data_dedicated.asp (mentioning Verizon's global Internet backbone network); AT&T IP Services, *at* http://www.cerf.net/about/Bbone-map.html (map of AT&T's CERFnet OC/12 backbone network).

[74] An analogy may help to explain this situation. Assume that Internet service is like water from a mountain spring and individual BSPs are separate bottlers of this water. If one company controls the mountain spring that is the source for all the separate bottlers, and somehow alters the water, then this alteration would get passed on to all the other separate bottlers. In this case, having many separate bottlers would still not give consumers a choice in getting un-altered water. Similarly, if an incumbent controls the backbone (mountain spring) and imposes its preferences (alterations), then there exists the risk that all downstream alternate BSPs (separate bottlers) would have to accept their internet traffic as already containing preferences and consumers would be left without

issue to be watchful of, serious immediate concern about this issue would likely be premature. None of the major BSPs have indicated how, and if, they would prioritize traffic on their backbone networks and therefore alternate BSPs may still retain the ability to de-prioritize their traffic. Further, some informal evidence suggests that incumbent BSP control of backbone networks is not sufficiently large to presently pose a problem.[75] If incumbent BSPs were to prioritize traffic on their backbone networks, which they have not indicated that they would do, alternate BSPs could probably connect to other network backbone providers whose traffic would not contain such preferences.

Nevertheless, some concern is warranted. The available backbone ownership data has not analyzed factors such as a how much data passes through the routers owned by various backbone networks and who controls crucial Internet peering points where large amounts of data are exchanged between BSPs.[76] A dominant presence by incumbent BSPs in traffic volume or peering points could pose a problem for alternate BSPs de-prioritizing traffic that they are receiving or choosing other backbone providers for their backbone connections. Moreover, incumbent BSPs

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viable alternatives.

[75] Worthen, *supra* note 73. (A mapping of Internet routers by the chief scientist at Lumeta [http://www.lumeta.com/research/mapping.asp], a network intelligence company, indicates that though Verizon and AT&T own a substantial amount of the routers in North America, they are not in a position to exert market power because alternate backbone providers exist). Further Internet mapping is also available at the Cooperative Association

could (and most likely would) enter into Service Level Agreements with neighboring networks to continue the priority treatment of traffic originating on their networks.[77] These inter-locking SLAs could limit the number of "preference-free" backbone providers available for alternate BSPs.

On the other hand, the current glut of unused fiber capacity could offer the opportunity (through lower costs of entry) for entirely new alternate backbone networks to be created if the demand from alternate last-mile BSPs would exist for their services.[78] Such new entrants into the backbone market could act to preserve competitive pressures that might otherwise be compromised by incumbent backbone control.

2. Sufficient Demand for Substitutes

If an incumbent BSP would oppress users without an existing choice in BSPs by blocking or downgrading the availability of web site content, this would create sufficient demand for the services of potential alternative BSPs mentioned above. While it remains doubtful that BSPs would take

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for Internet Data Analysis (http://www.caida.org).

[76] Ben Worthen, CIO.COM BLOGS, March 23, 2006, *at* http://blogs.cio.com/node/223.

[77] *See* Part I.B discussion about Service Level Agreements (SLAs).

[78] Google appears to be buying up unused fiber capacity, perhaps in an effort to create just such an alternate backbone network. Evan Hansen, *Google wants 'dark fiber'*, CNET NEWS.COM, (January 17, 2005), *at* http://news.com.com/Google+wants+dark+fiber/2100-1034_3-5537392.html. Also see, *infra*, notes 87 and 88. Google's investment in last-mile (wireless and BPL) services and backbone services could position it to counteract any

such action, if they were to degrade any traffic it would be that of non-latency sensitive applications or content providers in order to offer that bandwidth to latency-sensitive providers. As noted in Part II.A, latency-sensitive applications are the ones presently disfavored by the current "best efforts" Internet architecture and preferred access would seek to change this. Given the fair assumption that most Internet traffic still remains non-latency sensitive, unacceptably degrading delivery of the content that users demand the most would automatically create a large group of dissatisfied users who could be prime candidates for switching to alternate BSPs.[79] The potential creation of this large group of incumbent BSP defectors should be sufficient to keep BSPs from abusing their preferred access powers.

A concrete example illustrates this phenomenon. While latency-sensitive applications, like streaming audio/video and VoIP, use may be on the rise, they are still relative newcomers to the Internet. Empirical studies

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efforts by incumbent BSPs to degrade Google's delivery of their data.

[79] Since network routers only examine the header data and not what is in the payload of packets, it is difficult to gather strictly objective statistics on what uses the Internet is being put to. Instead, surveys and anecdotal evidence must be relied upon. Early surveys indicated that households mainly used the Internet for researching information and sending/receiving email. John Townley, *Survey: Streaming Still Dreaming*, INTERNETNEWS.COM, *at* http://www.internetnews.com/bus-news/article.php/8161_500371 (November 1, 2000) (only 6% of Internet users go online initially seeking entertainment). While usage patterns have undoubtedly changed with broadband available in many more households, it remains fair to assume that the majority of Internet applications – especially for business uses – still involve research and text-based communication, with streaming (latency-sensitive) content remaining in the minority. Anecdotal evidence from examining popular websites, such as MySpace.com, support this hypothesis since most content on these websites consists of text and images, with streaming media (while popular and a large

of Internet traffic would likely prove that the majority of business and personal internet use still remains with traditional non-latency sensitive applications like email, web browsing, and file transfer. If a BSP were to dramatically degrade the service of a non-latency sensitive services like email, or web sites like Amazon.com or the New York Times.com,[80] to favor a latency sensitive service such as Vonage (VoIP) or a web site such as Movielink.com (movie downloads), which garner fewer overall users, then the far greater number of email and Amazon.com users would form the target market for alternate BSPs. These BSPs would then have an opportunity to enter the market by offering to provide a level of service these users had come to expect from their non-latency sensitive applications and web sites.[81] In short, demand for alternate BSPs would be created when client-side BSP customers exercise their ability to switch to alternate BSPs if they become dissatisfied with the actions their current BSP is taking concerning their server-side customers.

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draw, especially for music), retain less of a focus.

[80] Excluding NYTimes.com's limited provision of streaming video, it serves mostly non-latency sensitive text and image content.

[81] A possible scenario could exist where large non-latency sensitive web sites, such as Amazon and NYTimes, pay "protection money" to BSPs to prevent the downgrading of their service and the brunt of content degradation then only affects smaller websites who cannot afford to pay these fees. This is one of the fears that network neutrality proponents have, as discussed *supra* in Part II. While this situation remains plausible, it should not be of great concern. Realistically, because bandwidth continues to increase, BSPs would likely not have to degrade anyone's present level of service to able to offer enhanced service to latency-sensitive applications. Moreover, as a fail-safe mechanism, the FCC still retains authority to engage in *ad hoc* adjudication against any BSPs whose actions prove to be unduly oppressive and uncorrected by market forces. *See* Part.III.A.4. for further discussion.

The high likelihood that greater demand exists for non-latency sensitive content also demonstrates a flaw in one of Professor Tim Wu's arguments in favor of network neutrality. Wu contends that network neutrality can be imposed without worry of substantial adverse consequences because "if the neutral network is no good for certain applications,… [then] new facilities will be built" for such applications.[82] Wu appears to mean by this that if, for example, network neutrality prohibits a BSP from offering a gaming web site the ability to offer its users enhanced service through latency guarantees, new BSP facilities would be built to provide gamers the preferred access that they demand. The flaw in this argument resides in Wu failing to take into the account the difference in the number of users who exclusively demand latency-sensitive content and those who do not. As mentioned earlier, Internet consumption likely consists of mostly latency-insensitive uses when compared with latency-sensitive uses. Thus it should not be automatically expected that there would be a sufficient number of users available to create the critical mass of demand necessary to support an entirely new online service that offers optimized treatment of latency-sensitive content.[83] Most users would instead probably bear with the sub-

[82] Wu, *supra* note 37, at 92.

[83] There exists no current metric to determine what would constitute a critical mass of users and this assertion is based on general observations (the discussion that follows in the main text indicates conditions on how the present situation of greater demand for latency-insensitive content could change).

Also, a network neutrality mandate would necessitate that an entirely new private

optimal performance of their latency-sensitive applications under a neutral Internet regime rather than incur the cost of obtaining an entirely new online service for their relatively few latency-sensitive applications.[84]

Nevertheless, this is not to say that Internet usage will remain forever skewed toward non-latency-sensitive content. For example, it could very well be the case that streaming content becomes a much more significant portion of Internet users' online activities. In particular, the move toward business applications being served over the Internet rather than run locally from individual computers could be the "killer app" for preferred access that could stimulate the creation of new BSPs.[85]

Until that time is reached, though, it would be poor policy to put the burden on emerging latency-sensitive applications to find a whole new means of delivering their content while denying them the opportunity to

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network be created (new "online service") just to cater to certain latency-sensitive uses because a new BSP that would be part of the general Internet might potentially not be allowed to prioritize its packet delivery because of network neutrality restrictions. Creation of a new network and online service requires a much larger investment, and therefore demand, than would be necessary to support an alternate BSP that would still offer Internet service, but just engage in some specialized packet processing.

[84] Christopher Yoo refers to this issue as the "heterogeneity of demand" and lists it as a concern for implementing network diversity as well. The success of network diversity, Yoo argues, "presumes that there are different product segments to target" for smaller, more specialized BSPs who will enter the market to provide specialized services. However, if consumer preferences are not as strong for the specialized services as they are for the mainstream services, then these specialized services may not develop. Yoo explains this situation as being similar to a localized monopoly "enjoyed by a lone gas station along a desert highway even in the absence of entry barriers [for other gas stations] when the overall volume of traffic is not sufficient to support a second station." Yoo, *supra* note 12, at 19.

[85] Jeffrey Kaplan, Software-as-a-Service Myths, BUSINESSWEEK ONLINE, April 17, 2006, *available at*

prosper under network diversity. A network neutrality regime would erroneously favor those applications which are already most developed (latency-insensitive) by maintaining a network environment for which they are best suited. All the while, this regime would be placing a substantial burden on those applications that are just in their infancy (latency-sensitive) by legally prohibiting BSPs from providing an environment conducive for their optimal performance. Such an outcome appears contrary to stated Internet policy, by both sides of this debate, that innovation of new applications should be encouraged rather than stifled.

3. Observable Support for Model

Recent announcements of investment in wireless systems and BPL technology development support a theory that predicts the creation of alternate BSPs in the face of even potential oppression by incumbents.

- M2Z Networks, a Silicon Valley company, has filed an application with the FCC to allocate and assign 20 Mhz of radio spectrum to enable it to cover the United States with wireless high-speed Internet access.[86]

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http://www.businessweek.com/technology/content/apr2006/tc20060417_996365.htm (detailing the advantages of and significant growth in Software-as-a-Service).

[86] Matt Richtel, *Company Asks U.S. to Provide Radio Space for Free Internet*, N.Y. TIMES, May 23, 2006; M2Z Networks, Application for License and Authority to Provide National Broadband Radio Service in the 2155-2175 Mhz Band (May 4, 2006), *available*

- Sprint Nextel will to develop and deploy a wireless "4G broadband network" in the United States that will use the mobile WiMax standard, with an intended investment of $2.5-3 billion in the project during 2007 and 2008.[87]
- Google has been buying up unused backbone capacity and, together with Earthlink, won a bid to build an $8-10M wireless network in San Francisco through which Google would provide free wireless access to city residents.[88]
- Google (along with Hearst Communications and Goldman Sachs) has invested $100M in Current Communications, a BPL provider.[89]

This sampling of announcements provides strong evidence of the present and emerging competition in the BSP market and sheds doubt on the claim that cable and DSL operators would take any oppressive action if allowed to implement network diversity. Should these incumbent BSPs nevertheless choose to do so, viable alternate BSPs would be readily available for their customers to switch to.

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*at* http://www.m2znetworks.com/pdf/Application.pdf.

[87] Press Release, Sprint Nextel Announces 4G Wireless Broadband Initiative with Intel, Motorola and Samsung, *at* http://www2.sprint.com/mr/news_dtl.do?id=12960 (Aug. 8, 2006). Download speeds are expected to be between 2-4Mbps, comparable to existing DSL and cable service. Associated Press, Sprint Nextel to Form Network With WiMax, N.Y. TIMES, Aug. 9, 2006. *See also* discussion in Part III.A.1.a.

[88] Wireless Bid in California, N.Y. TIMES, April 6, 2006; Holman W. Jenkins, *That 1999 Show: Return of the 'Open Access' Wars*, WALL ST. J., November 16, 2005, at A19. (Google has been buying up unused backbone capacity and may be developing a network of wireless hotspots).

[89] Tim Gray, *Google in $100 Million BPL Investment*, INTERNETNEWS.COM, Jul. 7,

4. Protections in Addition to Competition

The prospect of competition should dispel most fears of irreparable damage being caused to Internet innovation and freedom if BSPs are allowed to offer preferred access. A BSP that only caters to large websites while noticeably sacrificing the speed of smaller ones, that prefers its own Internet services (VoIP, etc.) while stifling those of competitors, or that acts as a content censoring "gatekeeper," will suffer direct adverse consequences to its revenue when its client-side customers defect to competing BSPs whose practices are more in line with these customers' preferences.[90] Since we reasonably assume that the managers of BSPs are rational economic actors, it would be highly unlikely for them to take actions which could potentially decrease their user base.[91] In fact, the CEOs of major BSPs have publicly pledged to not degrade anyone's service by adopting preferred

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2005, *available at* http://www.internetnews.com/bus-news/article.php/3518341.

[90] *See*, *supra* part II, discussion of network neutrality opponents' fears. Also, another objection concerns BSPs allegedly "charging customers twice" when they implement preferred access – once for access to the Internet, and another time through some pass-through cost from a website. It is incorrect to view this as double-charging. Web sites would likely only pass on their preferred access costs to consumers if the consumers received some premium service – i.e., faster downloads, less ads, etc. Thus, any additional payment by customers would be justified by an increased level of service that they would receive.

[91] This assumes that revenue lost from client-side customer defection would be greater than revenue gained from server-side preferred access fees. If this were to not be the case, competitive protections would likely have to be supplemented by regulatory, legal, or legislative protections, as discussed *infra*.

access.[92]

Nevertheless, it should be acknowledged that competition alone may not provide full protection against potentially anti-competitive BSP actions, especially in the short-run. Consumer defection to competitors is not instantaneous and BSP users may suffer for some time with poor Internet service before actually switching providers. By the time BSPs feel the pressure from defecting customers, the disfavored content provider may have already experienced serious injury. BSPs could also collude with one another to downgrade access for a disfavored content provider. In such a situation, a BSP customer could potentially have no meaningful alternative BSP that would serve its preferences. Finally, it may turn out to be the case that all BSPs rationally decide that it makes economic sense for them to just favor large content providers and relegate smaller providers to the "slow lane." All of these outcomes are possible and should be prevented. Fortunately additional remedies in the form of *ad hoc* FCC regulatory authority, antitrust laws, and, if necessary, legislative remedies, as a last resort, already exist to supplement competitive pressures. Therefore, the likelihood of these potentially oppressive scenarios coming true, or their

[92] *Qwest Boss Debunks Net Neutrality*, DATAMONITOR NEWSWIRE, Mar. 16, 2006 (Qwest CEO, Richard Notebaert, stated at the VON VoIP Industry Conference that Qwest would not block services or access, and there would be no degradation of quality for non-prioritized content); James S. Granelli, *Phone, Cable May Charge Dot-Coms That Want to Race Along the Internet*, L.A. TIMES, Apr. 9, 2006, at A1 (AT&T Chairman, Edward Whiteacre states that his company will not block or downgrade anyone's service.)

severity if they occur, is nearly entirely eliminated.

a. FCC Regulatory Protections

The FCC is capable of utilizing its regulatory authority to engage in *ad hoc* adjudications in order to quickly remedy anti-competitive actions by BSPs, thereby limiting even short-run injury from bad practices. In a highly publicized incident, Madison River Communications was alleged to be blocking its customers' ability to use Vonage VoIP services.[93] Within a month of Vonage contacting the FCC regarding Madison River's blocking activity, the FCC had entered into a consent decree with the company whereby Madison River agreed to pay a $15,000 fine and to not impair its customer's use of VoIP services in any way.[94] Such rapid enforcement action by the FCC should provide a strong disincentive to companies contemplating engaging in any kind of content blocking or degradation activity.[95]

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[93] Stephen Lawson, V*onage Says ISP Blocking Its Calls*, PCWORLD.COM, February 16, 2005, *available at* http://www.pcworld.com/news/article/0,aid,119695,00.asp.

[94] Consent Decree, In the Matter of Madison River Communications, LLC and affiliated companies, DA 05-543 (released March 3, 2005), ¶¶ 4-5; Stephen Lawson, *Vonage CEO Slams VoIP Blocking*, PCWORLD.COM, Mar. 8, 2005), *at* http://www.pcworld.com/news/article/0,aid,119919,00.asp.

[95] In light of the Supreme Court's decision in *NCTA v. Brand X*, 125 S.Ct. 2688 (2005), the FCC may have to rely on its, admittedly, more vague authority under Title I to prevent anti-competitive actions by BSPs. In the Madison River consent decree, the FCC relied primarily on its Title II authority to regulate common carrier practices under 47 USC § 201(b). However, because Madison River's provision of Internet access would be considered an information service after *Brand X*, and therefore not subject common carrier

b. Antitrust Protections

Antitrust law could supply protection against BSPs colluding with one another to disfavor a certain content provider. Two (or more) BSPs entering into an agreement, explicitly or implicitly, to deliberately exclude a certain content provider from having the ability to obtain preferred access would likely be tantamount to an illegal practice in restraint of trade.[96]

No rational economic reason comes to mind for why one BSP would agree with another BSP to not provide a certain service to one of its clients aside from this being used as a means of BSPs agreeing to fix prices between themselves through the creation of a product-standardizing cartel.[97] Through this practice, both BSPs could charge the content provider the same supracompetitive price for network services and neither BSP could "cheat on the cartel" by enticing the content provider through offering it preferred access treatment for its content. Fortunately, antitrust law provides a remedy for persons or entities injured by this scheme and violators could be held liable for treble damages under antitrust law. The

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regulation, it's unclear whether the FCC continues to have authority under § 201(b) to inquire into bad practices by BSPs. *See* Dissenting Statement of Commn. Michael J. Copps, In the Matter of Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities, 17 FCC Rcd 4870 (2002) (discussing the shortcomings of Title I authority).

[96] 15 USC § 1 (West 2006) ("Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal") also known as § 1 of the Sherman Act.

possibility of such liability should be sufficient to deter most BSPs from agreeing to deny preferred access services to a specific content provider.[98]

c. Legislative protections

If all other protections against anti-competitive BSP action fail to be effective and BSPs independently decide that they should cater to only large content providers at the expense of smaller ones, both the FCC and Congress can then enact appropriate rules of general applicability or legislation to combat this. Currently proposed telecommunications legislation correctly recognizes legislative protections as a remedy of last resort and appropriately directs the FCC to investigate the competitive health of the Internet under a scheme of network diversity before taking any "corrective" action.[99] It is the thrust of this Comment's argument that if, and only if, competitive, legal, and regulatory protections fail, should legislative protections be looked to for a solution.

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[97] *See* C-O-Two Fire Equipment Co. v. U.S., 197 F.2d 489, 494 (9th Cir. 1952).

[98] Yoo also suggests that the standardization inherent in network neutrality, which forces "networks to compete solely on the basis of price and network size," could further entrench the largest BSPs in their dominant position. Especially when competition is limited to price, the largest companies have an inherent scale economy advantage and can seize the entire market. Yoo, *supra* note 12, at 29.

[99] Communications, Consumer's Choice, and Broadband Deployment Act of 2006 (S.2686), § 901(a) (Introduced May 1, 2006 by Sen. Stevens (R-AK)).

### *B. Masked Benefits*

When network neutrality proponents tout the benefits of standardization and seek to have the Internet become more like in the United States' electrical grid and interstate highway system,[100] they fail to recognize that neither the Internet nor its applications have yet evolved to a point where a single network would suit them all equally well.[101] In contrast, automobiles, in spite of their differences, have all developed tires that make most of them well suited for a standard grade of paved road. Similarly, appliances, notwithstanding regional voltage differences, have all been designed to function equally well on a standard amount of current available from the electrical grid. Internet applications, however, are not yet suited for one-size-fits-all Internet. Some applications tolerate lost or delayed packets without a problem, but others do not. Until network capacity expands to the point where "best efforts" delivery would be almost synonymous with guaranteed delivery, a standardized/neutral Internet would actually hinder the innovative process that its proponents seek to preserve.[102]

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[100] *See* discussion, *supra* part II.

[101] Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. TELECOMM. & HIGH TECH. L. 141, 148 (2003).

[102] Best efforts delivery that is synonymous with guaranteed delivery would exist when latency-sensitive applications do not encounter lost packets, or Internet applications are developed to such a point where even latency-sensitive applications can tolerate lost packets without service-level degradation.

As discussed above, should a Network diversity scheme prove to have anti-competitive effects, new BSP entrants would likely appear.[103] Mandated Network neutrality, though, would lessen the incentives for alternate BSPs to enter the market and develop new technologies for delivering content.[104] Yet, of even larger concern is Network neutrality's stifling of innovation for new latency-sensitive applications. Imposing Network neutrality essentially prohibits the creation of new Internet applications that could take advantage of preferred access services, thereby preventing these new applications from being created.

1. New Service Innovation

An analogy between Internet data traffic delivery and delivery of physical goods aptly illustrates the shortfalls of mandated Network neutrality. Let us assume that the United States Postal Service (USPS) is similar to a neutral Internet, meaning that it delivers letters and packages to its customers on a "best efforts" basis. Like a "best efforts" Internet, the USPS delivers its letters and packages most of the time, but there are no

[103] Granted, new BSPs might appear even under a Network neutrality regime to merely provide competition in "best efforts" delivery of content. Nevertheless, under a neutrality regime, new BSPs would likely enter at a slower rate than under Network diversity.

[104] Yoo, s*upra* note 12, at 31. ("Network diversity allows for greater experimentation with different ways to take advantage of technological differences."); *Id.* at 52. ("It is indefensible when 3G, WiFi, powerline, and other technologies are actively searching for capital to impose network neutrality, which risks reducing incentives to invest in these new last-mile technologies.")

guarantees for basic service and the occasional misplaced item is not unheard of.[105] Further, assume that expedited courier services from FedEx and UPS are like the Quality of Service guarantees that BSPs would like to offer their customers through preferred access.[106] Those businesses that do not find it economically feasible to ship their goods through expedited courier services, or use preferred access services that BSPs might offer, are likely at a competitive disadvantage in relation to their counterparts that are able to utilize these services. Depending on the severity of these firms' disadvantage, it is plausible that their competitive shortcomings could force them out of business. Some entrepreneurs without sufficient capital to afford these services may also be discouraged from even beginning to offer their services. Innovation, naturally, suffers through the existence of this diversity in opportunity. Yet, in spite of the competitive differences that basic and expedited mail service creates, we do not legislatively prohibit FedEx from offering overnight service just because not everyone can afford it.[107]

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[105] See *supra* Part I.A (explaining why the basic Internet operates on a "best efforts" basis).

[106] See *supra* Part I.B (explaining how preferred access protocols could alleviate network congestion and solve some of the problems with "best efforts" delivery).

[107] *See* 39 C.F.R. § 320 (West 2006) (allowing private carriage of mail). If private carriers of mail would decide to not accept packages from certain sources or based on the content that was inside, they would face competitive pressures similar to those that may be encountered by incumbent BSPs that unreasonably oppress their customers. Similarly, only if the market proves to the ineffective, should legislative remedies be contemplated. If private carriers engaged in actions that may be prohibited under other laws, i.e., red-lining, then regulatory or legislative action may be looked to as a more immediate response.

The Internet should be treated no differently. The lack of prohibition on expedited mail delivery services has allowed companies like FedEx and UPS to flourish and also spawned new business offerings which rely on the availability of expedited delivery.[108] Without network neutrality prohibitions, new services on the Internet could also be made possible through preferred access offerings.[109] Following are a few examples.

a. Quality of Service Guarantees for Sensitive Data Transport

Imagine a grandmother in a nursing home who is too ill to travel, but whose family wants to allow her to see her daughter's marriage ceremony

[108] Time-sensitive business transactions have become greatly facilitated through the offering of expedited delivery; internet businesses have also grown because they have been able to compete with brick-and-mortar stores by offering expedited delivery of goods.

[109] It could be argued that the foregoing analogy to FedEx/UPS might actually support the network neutrality proponent's position of establishing separate networks for preferred access services so as to not potentially downgrade existing web sites who do not sign up for (or need) preferential treatment. After all, FedEx/UPS also utilize an infrastructure separate from that of the USPS (mostly) and, quite likely, a glut of overnight packages from FedEx would not result in USPS mail being delivered any slower. This argument, however, fails to consider the discrepancy in demand for latency-sensitive and non-latency sensitive traffic. As illustrated *supra* in Part III.A.2, critiquing Tim Wu's advocacy for the creation of separate networks, latency-sensitive traffic – the type that would have the most demand for preferred access services – still likely comprises a minority of all Internet traffic and its volume would therefore be insufficient to support the creation of an entirely new network. Stretching the above analogy, the lack of current volume in latency-sensitive traffic might be seen as similar to a situation of there not being enough demand for overnight package delivery to make it cost-effective for FedEx/UPS to exist. As explained in Part III.A.2, it would be poor policy to put the burden on emerging latency-sensitive applications to find a whole new means of delivering their content while denying them the opportunity to prosper under network diversity. A network neutrality regime would erroneously favor those applications which are already most developed (latency-insensitive) by maintaining a network environment for which they are best suited, all the while placing a substantial burden on those applications that are just in their infancy (latency-sensitive) by legally prohibiting BSPs from providing an environment suited for

in real time through a web video feed.[110] A pause in the video stream because of network congestion is unacceptable as all bits are priceless. This grandmother's family may have demand for a web site which would offer guaranteed streaming video by contracting with a BSP and prioritizing its video bits for delivery. However, under a Network neutrality mandate, a BSP would be prohibited from treating the bits of this hypothetical specialty website any different than those of another website, and such a guaranteed-video-delivery web service could not exist.

While the above example may be thought of trivial, it only scratches the surface of the possible services that could exist without Network neutrality.

- Telemedicine might utilize a guaranteed data transmission service to ensure that a doctor's valuable time is spent, for example, reading x-rays remotely, rather than possibly waiting on a congested network to transfer images.
- Corporations might be more willing to adopt VoIP for their mission-critical call centers if a VoIP provider could guarantee that Internet congestion would not interfere with its ability to receive or place calls, or their quality.

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them. Accordingly, creating separate networks is not currently a viable option.

[110] The following hypothetical is based on Dan Brenner's statement on NPR's All Things Considered - "Preserving User Parity" (April 25, 2006).

- Online gaming enthusiasts would likely be willing to pay extra for a service which would guarantee that they need not worry about the latency of their connections while competing.[111]
- A service like iTunes or Movielink could offer users the option of paying a little extra to download their media faster. For example, a user could pay iTunes $2.49 to download a television show in 5 minutes instead of $1.99 and having to wait 20 minutes.
- The Internet could be utilized for public safety communications during an emergency without worry about network congestion. For instance, a VoIP user dialing 911 could be guaranteed a clear conversation, notwithstanding other network traffic.

A network neutrality mandate would prohibit all of these services from being offered. This prohibition on new services would therefore substantially hinder innovation that would otherwise be taking place.

A counter-argument may be that these services could still come into existence as long as the size of the broadband pipe into the home or business continues its present increase and network capacity keeps expanding. While this may be true to a certain extent, the assertion suffers in two respects.

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[111] See StreamEngine Gamer, *at* http://gamer.ubicom.com/index.html (detailing the importance of latency in online gaming).

First, even higher capacity network pipes would deliver their data on a "best efforts" basis on a neutral network and thus Internet service or application providers still could not offer reasonably certain Quality-of-Service guarantees to their customers. Especially as broadband pipes into BSP's client-side customer's premises expand, the likely traffic bottleneck will no longer exist at the client's premises but rather at some other point on the Internet. Larger premises capacity would not solve such congestion issues. Thus, though it may be true that the chance of congestion would decrease as the middle-mile and backbone network capacity expands, delivery to the client-side BSP customer still could not be guaranteed.

Second, more generally, expanding network size just to ensure delivery of some content would result in inefficient network resource use. Network congestion occurs as a result of a "peaking problem" – network resources are usually sufficient to handle the traffic load that is put on them and are only strained during certain peak demand periods. Increasing network capacity to eliminate the possibility of any network strain would leave a network's capacity inefficiently underutilized for the majority of the time. An analogy comes to mind of building 10-lane city streets just to make sure that no matter what the level of automobile traffic, an emergency vehicle could still pass through those streets without delay and without disrupting anyone else's driving experience. Such a system wastes resources because

the level of emergency traffic pales in comparison to that of ordinary traffic. A better system involves other cars moving to the side of the road to let the emergency vehicle pass when this is needed. Preferred traffic under a network diversity scheme is like an emergency vehicle that has engaged its siren while traveling down a city street. Upon hearing this preferential access signal, other traffic gives way, but only when it is necessary to do so. At all other times, traffic operates normally and this yields a more efficient utilization of resources.

## CONCLUSION

The Internet has thrived through a hands-off approach that has allowed it to develop and change according to the needs of its users. A move toward implementing preferred access by BSPs, while significant, is yet another step in the evolution of the Internet and should be embraced rather than feared as it will likely be a change that will create rather than destroy. As illustrated above, no compelling reason exists to suspect that the Internet might be damaged if BSPs are allowed to implement a preferred access scheme and adequate safeguards already exist to deal with any potentially problematic situations. Quite simply, this Comment argues that network diversity should be given a chance to succeed rather than stamped out through network neutrality legislation before any of its benefits can be realized.

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