# Regulation and Net Neutrality

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**Abstract:** This paper seeks to inform the network neutrality debate by looking at the role existing government regulation has played in shaping the market for broadband access. Prior research has concluded that network externalities that exist in the market for broadband services justify government intervention (Economides and Tag, 2012). This literature takes limited competition among broadband providers as given rather than questioning why competition is limited in the first place. I argue here that limited competition among broadband providers is not the result of a market failure but rather stems from barriers to entry erected by government regulation, notably municipal "rights-of-way." The key to improving consumer welfare is therefore not to impose additional regulations on broadband providers, but to clear the way for capital investments in the expansion of new infrastructure and the improvement of existing infrastructure by removing existing regulatory barriers to entry. I conclude that deregulation rather than more regulation would improve Internet access and result in a more level playing field for all content providers.

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In the past few months, the Federal Communications Commission (FCC) has received nearly 4 million public comments on its proposed revisions of its "Open Internet" rules, also known as "network neutrality" (Gayomoli, Nov. 10, 2014). Network neutrality is the principle that all Internet traffic be treated equally (FCC, "Open Internet"). President Obama recently added comment to the subject in a statement issued on Nov. 10, 2014. He called for the FCC to reclassify broadband as a public utility, which would subject Internet service providers to greater government oversight, including network neutrality rules (Gayomoli, Nov. 10, 2014). The president's statement highlights the main line of argument provided by the regulation's advocates: network neutrality prevents Internet providers, which have monopoly power in the regions they serve, from extracting rents from content providers and Internet consumers to the detriment of both.

Network neutrality advocates raise two main concerns about the current practices of broadband providers with monopoly status. The first is that broadband providers will erect barriers that reduce the innovation of Internet content by charging content providers to access their networks of subscribers. Forcing website and application developers to pay a so-called "toll" to reach consumers is a practice that regulators fear will favor incumbent content providers like Google and hamper innovation by newcomers to the market. The second concern is anticompetitive behavior by broadband providers in which broadband providers throttle or, in extreme cases, completely block the online services of competitors. Such an extreme case of anticompetitive behavior has required government intervention in North Carolina. A telecommunications firm named Madison River blocked its Internet subscribers from accessing VoIP services like Vonage in an effort to protect its telephone services from

online competitors. In 2005, Madison River paid a $15,000 fine to the FCC and agreed to stop its discriminatory network management policies (McCullagh, Mar. 3, 2005).

Business practices like those by Madison River raise great concern, and justifiably so. The discrimination of data by broadband providers purely for the purposes of raising profits is of great detriment to consumers and content providers. Extortions of rent from consumers and content providers can only be sustained in a market in which broadband providers either do not face sufficient competition or collude with competitors to increase profits. The diagnosis of the problem with the Internet–lack of competition among broadband providers–is correct; the proposed solution of network neutrality rules is incorrect.

This paper examines the forces that have shaped the market of Internet service to its current state of limited competition among broadband providers. Previous economic literature on network externalities that affect the supply of Internet content and the demand for Internet access provide support for network neutrality regulation (Lee and Wu, 2009; Economides and Tag, 2012), but these papers assume limited competition for broadband services instead of questioning why competition is restricted in the first place. My research finds that government regulation has stifled competition among broadband providers. The solution to correcting the losses in consumer welfare in this heavily regulated market is not the enforcement of network neutrality regulation but rather deregulation of the construction of Internet infrastructure. My paper begins with a review of network neutrality and the previous economic literature that analyzes the Internet as a two-sided market with considerable network externalities. I then consider the role government regulation has had in establishing Internet providers as monopolies before giving my concluding remarks.

## The Changing State of Network Neutrality

The network neutrality principle dictates broadband providers make a "best effort" to transmit data on their networks on a first-come, first-served basis (Brito and Ellig). It has guided the activities of content and broadband providers since the origin of the Internet. Without coercion by government rule-making, broadband providers have sustained "neutral" network management policies for many years, even past the turn of the century (Becker et. al, 2010).

The current push for legally enforceable network neutrality regulation is motivated by a growing concern that insufficient competition among broadband providers will result in market failure (Becker et. al, 2010; Hahn and Wallsten, 2006). Figures 1 through 3, below, show the limited amounts of competition among "wired" broadband providers, especially in areas outside major metropolitan areas.

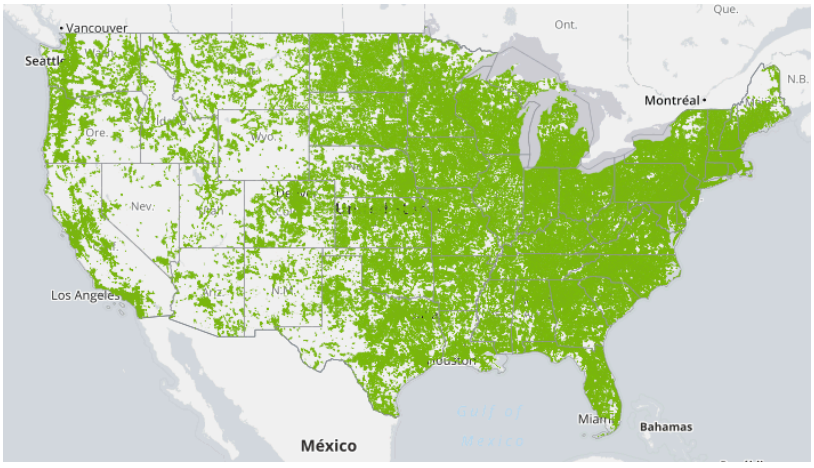


**Figure 1:** The areas highlighted in green represent areas with between one and six wired broadband connections available (source: NTIA and FCC, http://broadbandmap.gov).

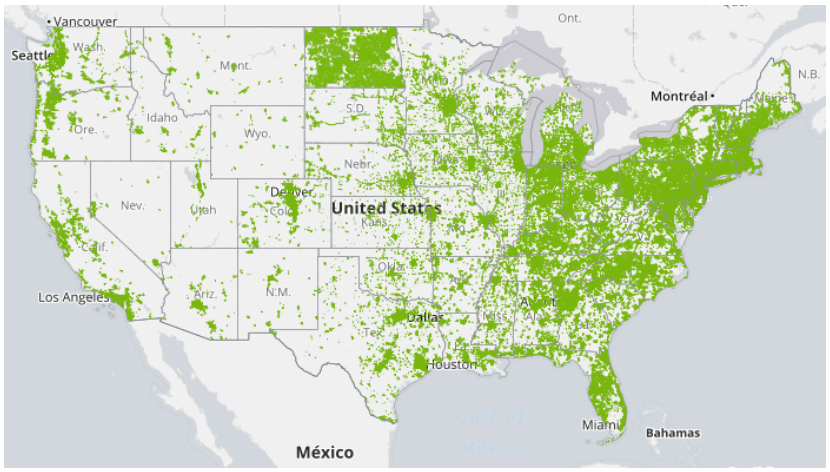


**Figure 2:** The areas with between two and six wired broadband providers available (source: NTIA and FCC, http://broadbandmap.gov).

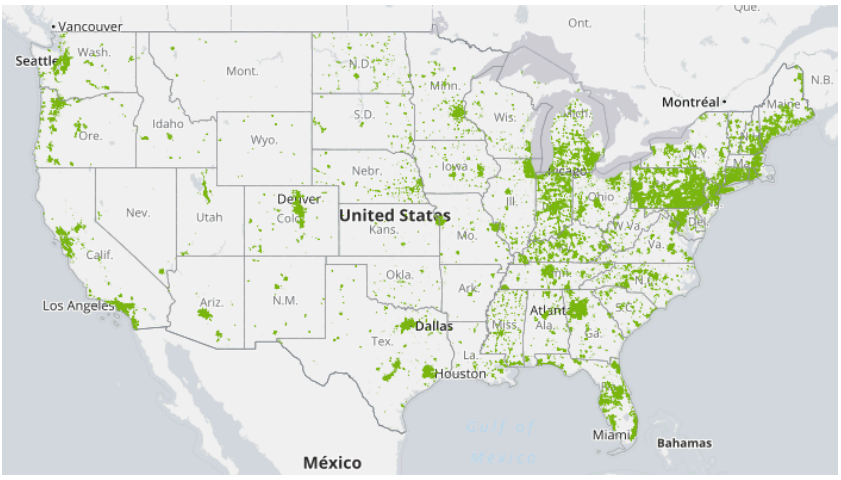


**Figure 3:** The areas with between three and six wired broadband providers available (source: NTIA and FCC, http://broadbandmap.gov).

Without competition, consumer advocates and regulatory watchdogs fear broadband providers will change their network management policies to extract increased profits from consumers and/or content providers at the detriment of both (Becker et. al, 2010). Evidence of these shifts in the market has already appeared. Recent agreements made between content providers and broadband providers suggest the network neutrality principle that governed the Internet for decades has come undone.

For instance, the online video streaming service Netflix came to terms with Comcast on a deal for data prioritization in February 2014 (Wyatt and Cohen, Feb. 23, 2014). Figure 4 shows a sharp uptick in Netflix download speeds for Comcast subscribers after the deal was reached. Network neutrality advocates likened this situation to the Madison River case and saw Comcast's demand for Netflix to pay for improved service as an extortion of rent by a firm with too great market power (*The Washington Post*, Apr. 25 2014).

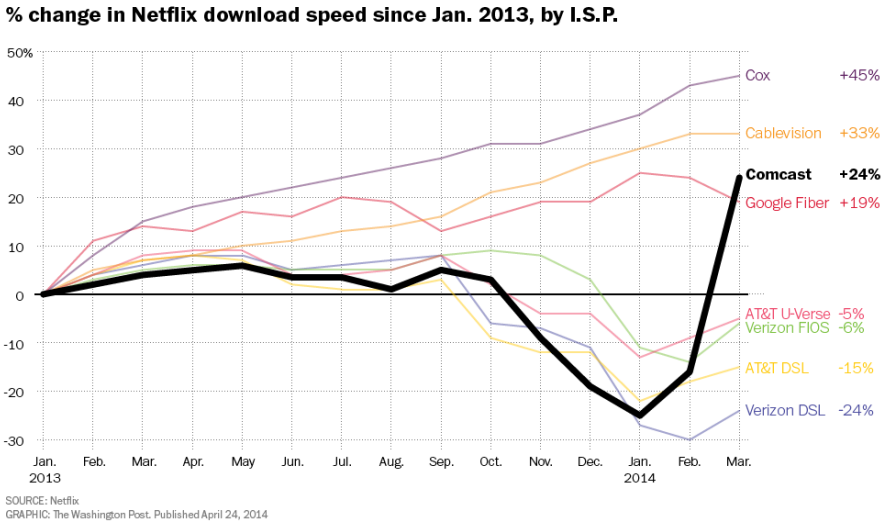


**Figure 4:** The bold line shows the steady decline leading up to and the sharp uptick in Netflix download speeds for Comcast subscribers following a deal between Netflix and Comcast in which Netflix paid for data prioritization, which is seen as a violation of network neutrality principles (source: *The Washington Post*, Apr. 25, 2014).

The proposed rules under consideration by the FCC aim to prevent future extortions of rent. Network neutrality rules effectively act as a price regulation preventing broadband providers from collecting fees from content providers for access to broadband subscribers (Hahn and Wallsten, 2006). One provision of network neutrality regulation is the "no-blocking" rule: broadband providers are not allowed to

block or throttle (slow down) any packets on the basis of what the content is or from which content provider data comes. All content providers must be guaranteed "a minimum level of access that is sufficiently robust, fast and dynamic for effective use by end users [consumers] and edge [content] providers" (FCC, "Open Internet NPRM," May 15, 2014). In addition, proposed network neutrality regulation dictates broadband providers cannot accept a premium payment from content providers for prioritization of their data, described in the rhetoric as a so-called "fast lane" (FCC, "Open Internet NPRM," May 15, 2014).

The economic justification provided for network neutrality rules relates to the fact that the Internet is a two-sided market, in which Internet providers act as "middle men" between content providers and consumers. Lee and Wu (2009) explain that Internet access, like other two-sided markets, is greatly benefited by positive network externalities. Setting to zero the price broadband providers can charge content providers for access to their "last mile connections" allows for increased entry for content providers into the market, which leads to increased innovation in online content and applications. Due to the network externality, improvements in online content increase the demand for Internet access. This network externality is easily observed in the growing number of consumers "cutting the cable" and choosing to subscribe to online streaming services like Netflix, Amazon Prime and Hulu. Lee and Wu (2009), as well as Economides and Tag (2012), suggest broadband providers maintaining neutral network management policies improves consumer welfare by promoting innovation among content providers.

However, the very innovation network neutrality advocates are seeking to protect has grown the demand for Internet access to the point at which neutral network management policies of broadband providers are no longer financially viable nor best

for consumers (Becker et. al, 2010). The number of Americans using the Internet has increased 18 percent between 2007 and 2012, after accounting for total population growth during that time (NTIA, 2014). In addition, individuals have increased the amount of Internet content they consume. Over 60 percent of peak-time data is high-quality streaming audio or video (FCC, "Remarks by Chairmen Wheeler," Sept. 4, 2014). Another report has indicated video streaming services Netflix and YouTube, which is owned by Google, represent 50 percent of peak-hour traffic (Spangler, Nov. 11, 2013). The increased use of streaming video and audio services that require greater amounts of bandwidth makes much of the Internet infrastructure incapable of satisfying consumer demand. Figure 5 shows that the number of providers available to consumers decreases as speeds increase.

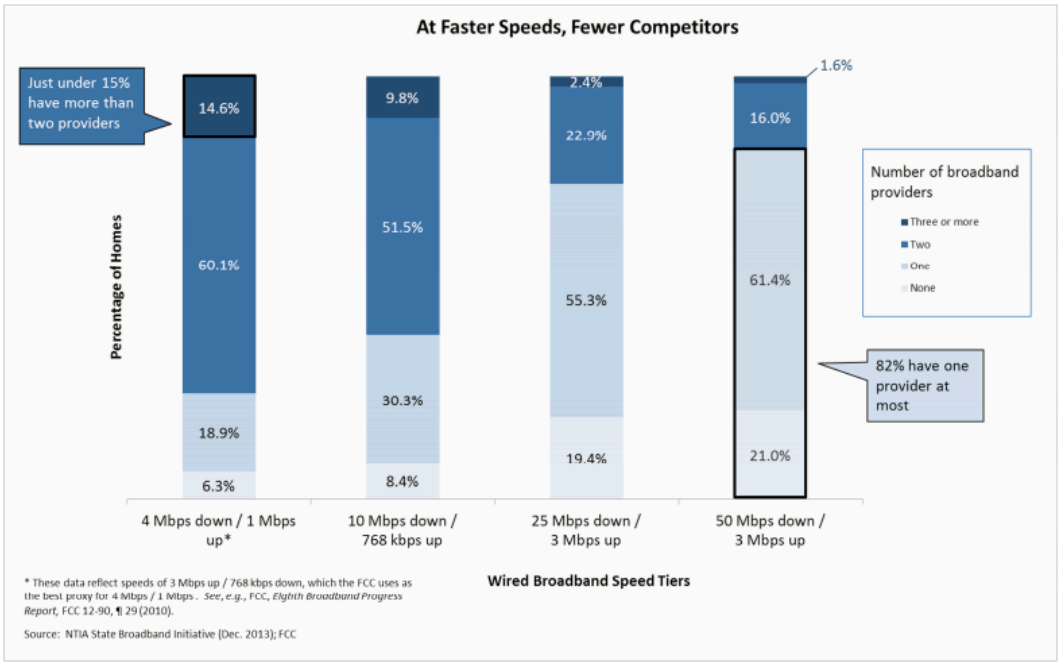


**Figure 5:** The amount of competition between broadband providers decreases as the speeds provided increase. Facilitating the construction of better infrastructure by new entrants to the market, like Google Fiber, will work to increase competition at the faster speeds consumers demand (source: Federal Communications Commission, "Prepared Remarks by Chairman Wheeler," Sept. 4, 2014).

Consumers have sufficient choice for broadband at slower speeds of 4 Mbps and 10 Mbps but almost no choice for providers of the speeds they require to satisfy their increased consumption of Internet content. In fact, 74.7 percent of households have either zero or one broadband provider capable of delivering 25 Mbps download speeds. Only under such conditions can the observed anticompetitive practices be continued.

Great increases in the demand for Internet content have made capital investments in the expansion of broadband access and the improvement of existing infrastructure critical to continued innovation by content providers and the betterment of consumer welfare. Facilitating the construction of better infrastructure by new entrants to the market, like Google Fiber, will work to increase competition at the faster speeds consumers demand. FCC Chairman Tom Wheeler describes facilitating improvements in infrastructure as a "virtuous cycle: the better the available broadband performance, the more that edge providers will take advantage of that performance with new applications, which in turn will drive more investment to meet that demand for next-generation broadband" (FCC, "Remarks by Chairman Wheeler," Sept. 4, 2014). The next section of this paper focuses on government regulation that restricts the improvement of Internet infrastructure.

## The Nature of Broadband Monopolies

Firms providing broadband service exist in a market heavily regulated by the Federal Communications Commission and the Federal Trade Commission (Brito and Ellig). In comments to the FCC, the National Telecommunications Cooperative Association (NTCA) wrote, "The current patchwork of federal, state, and local municipal regulations slows down the application review process, delays the build out of infrastructure, and increases the associated network costs" (FCC, "Reply Comments,"

Sept. 30, 2011). Regulations at the federal level that limit broadband providers include spectrum licensing, including the 22 MHz radio spectrum auctioned by the FCC for commercial wireless service (Brito and Ellig, 2007).

Municipal governments erect the greatest barriers to entry for broadband providers. In order to construct Internet infrastructure, broadband providers have to be granted access to "public rights-of-way" to lay wire. In addition, broadband providers must come to terms with public utility providers to have access to utility poles or underground conduits (Szoka et. al, July 16, 2013). Fees charged by municipalities and public utility companies can increase the costs of constructing Internet infrastructure by between 20 and 100 percent. In addition, applications completed by firms to be granted permission to build often are held up for years before a decision is made (FCC, "Reply Comments," Sept. 30, 2011).

It appears the monopoly extracting rents is not the broadband providers but rather municipal governments and public utilities. Both have the power to determine the regulatory barriers those building Internet infrastructure face (Szoka et. al, July 16, 2013). Government regulation creates artificial barriers to entry that stifle competition among broadband providers. The solution to the problems with the Internet pointed out by network neutrality advocates is not to enforce regulation on broadband providers with monopoly power but to eliminate their monopoly power by lowering the existing regulations that keep competitors out.

### Not All Data is Created Equal, Nor Should it be Treated So

The argument for network neutrality rests on the belief that all data is created equal and that all content providers should have equal opportunity to reach consumers. Advocates believe an Internet without network neutrality will create an environment in

which online content and applications developed by new start-ups will literally not be able to keep up with their established competitors. Pres. Obama wrote in his statement supporting network neutrality policy, "We cannot allow Internet service providers (ISPs) to restrict the best access or to pick winners and losers in the online marketplace for services and ideas" (Gayomoli, Nov. 10, 2014).

In a more competitive market for broadband services, providers would most likely charge differential prices for different levels of access, but average prices would most likely also be lower (as they usually are in more competitive markets).[1] Data prioritization is a mutually beneficial exchange negotiated between broadband providers and content providers. The assertion that all data should be treated equally by network management policies does not acknowledge that quality of service matters a great deal more to certain content provider than others. Netflix negotiated a deal with Comcast to improve its download speeds to Comcast subscribers because the streaming quality Netflix customers experience is paramount to its profitability. The benefit Netflix gains by faster download speeds is considerably greater than the benefit this author would receive by increasing download speeds for his blog readership. This fact is clearly reflected in Netflix's willingness to pay for data prioritization. Neither regulators nor the public should be so quick to attribute different prices broadband providers charge content providers to anticompetitive business practices. Differences in price reflect the higher cost associated with providing higher quality service, as demonstrated in Figure 4 by the higher quality of service shown Netflix received after purchasing data prioritization from Comcast (Becker et. al, 2010).

1. Price theory suggests that prices will be lower in more competitive markets. See for example Mankiw (2007: 303).

The panacea for the Internet's ills is not to impose further regulation on broadband providers but to remove existing regulation, which makes entry into the market for broadband services difficult and therefore benefits existing producers, notably public "rights-of-way" regulations set by municipalities. Removing existing barriers to entry would result in an increase in competition in the market for Internet service providers and ultimately in lower prices and a better product for consumers. The economic literature has demonstrated that price regulations mandated by network neutrality can increase consumer surplus, but this is just one of many possible pricing schemes that are of greatest efficiency (Becker et. al, 2010). The positive network externalities present in the interactions between consumers and content providers may be such that the efficient outcome is for broadband providers to charge content providers a fee for access (Economides and Tag, 2012). These fees could allow for the reduction of subscription fees, which would attract more consumers to the Internet and incentivize innovation by both broadband and content providers (Becker et. al, 2010). Regulation is not the answer to maximizing the welfare of Internet subscribers. Rather, the key to maximizing consumer welfare and maintaining innovation among content provides is to take deregulatory actions that will allow broadband providers to satisfy growing demand for Internet content and the construction of improved infrastructure.

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