Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	GN Docket No. 09-191
	)	
Preserving the Open Internet	)	WC Docket No. 07-52
	)	
Broadband Industry Practices	)	

COMMENTS OF COMMUNICATIONS WORKERS OF AMERICA

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SUMMARY

CWA supports Commission action to adopt rules to protect an open Internet. Preserving an open and free Internet consistent with the need to promote job-creating investment in our nation's high-speed networks is critical to safeguard our nation's economic, social, and democratic fabric and future. CWA has long recognized that high-speed Internet is the essential communications infrastructure of the 21st century, providing a critical foundation for economic growth and democratic communications.

The Commission initiates this proceeding in the midst of a major recession and a persistent ten percent unemployment rate. This economic environment, coupled with the urgent need to upgrade our nation's communications networks to world-class standards, command that the Commission give the highest priority to investment and job creation in formulating open Internet principles and rules. Therefore, the Commission must ensure that its open Internet rules do not have the unintended consequence of dampening the private investment needed to build the next-generation broadband networks that will bring our nation's broadband capability up to global standards and create and maintain jobs. Broadband network providers create and maintain far more, and typically better-paying, jobs than the applications and content sectors. The rules that the Commission adopts to ensure an open Internet must ensure that there is sufficient future investment and job creation to propel not only economic opportunity, but a permanent bridging of the digital divide.

The framework that we propose will preserve free speech on the Internet while encouraging job-creating investment and a network platform that encourages innovation at the edge. This framework will allow network providers to manage their networks and provide specialized services, as long as they offer specialized services to all who want to purchase them

without unjust or unreasonable discrimination. This framework would also allow network providers to manage their networks efficiently to avoid congestion and to ensure that time-sensitive traffic receives priority over less time-sensitive traffic, again so long as providers reveal their traffic management practices and do not unreasonably or unjustly discriminate in a way that harms consumers or competition. At the same time, the open Internet protections we propose will ensure that no participants in the Internet ecosystem – whether broadband, application, content, or service providers – use their market power to harm consumers or competition.

As the Commission notes in the *NPRM*, the Internet plays a unique role in promoting free speech and the civic participation that is so integral to our democracy. CWA has long maintained that we must protect free speech on the Internet so that people are able to go to the websites they want and to download or upload what they want when they want, without any degradation or suppression of any viewpoints or lawful content, particularly when engaged in issues that involve civic engagement, governance, and our democracy.

Broadband Definition. The Commission must carefully define "broadband Internet access services" to protects users' ability to access any websites they want on the public Internet. An overly broad definition would have the unintended consequence of sweeping into the definition many popular single-purpose, web-enabled products – such as GPS navigational systems or the Kindle book device -- that are not designed to provide access to the public Internet. We propose that the Commission define "broadband Internet access" as "access to all or substantially all publicly accessible end points that have an Internet Assigned Numbers Authority (IANA) address."

Applicability of the Proposed Rules. The Commission proposes to codify the four original Internet Principles that protect consumers' access to content, devices, applications, and

competition on the Internet (subject to law enforcement and reasonable network management) and the new nondiscrimination and transparency principles in a way that makes them solely the obligation of broadband Internet access service providers. This would narrow those principles in a way that would be detrimental to consumers. In particular, the Commission's original fourth Internet Principle entitled consumers to competition among network providers, application and service providers, and content providers.

As the Internet ecosystem has continued to evolve, the lines between various types of Internet ecosystem entities have blurred. Many application and service providers today offer services that traditionally have been offered by, and now compete with, broadband Internet access providers. The Commission should maintain the original intent of the Internet Principles, and the fourth Principle in particular, by adopting open Internet rules that apply to all entities – including application, content, and service providers – that may act as Internet gatekeepers.

Nondiscrimination. The *NPRM's* proposed strict nondiscrimination language would restrict many practices that would benefit consumers. It would prohibit broadband Internet access providers from providing QoS offerings and content delivery network services, like caching content closer to end-users, to content, application and service providers for a fee. These prohibitions would adversely effect broadband investment and innovation.

To protect an open Internet while promoting broadband deployment and innovation, the Commission's goals would be better served by modifying the *NPRM*'s proposed nondiscrimination rule to incorporate Section 202(a)'s standard of "unjust or unreasonable discrimination." Unlike a "strict" nondiscrimination standard, the "unjust or unreasonable" standard would permit more network service innovation and more diversity in network services while, at the same time, extending the nondiscrimination principle in a way that protects free and

open Internet discourse and protects consumers and competition. Unlike the *NPRM*'s proposed inflexible and "unqualified" nondiscrimination standard, the "unjust or unreasonable" standard allows network providers the flexibility to offer different types and classifications of service, as long as those services and classifications are themselves reasonable and made available nondiscriminatorily to all similarly situated customers. The *NPRM*'s proposed strict nondiscrimination standard, in contrast, places greater restrictions on broadband Internet access providers than current Title II does on common carriers.

Transparency. The *NPRM*'s proposed transparency rule would provide critical benefits to broadband subscribers, content, application and service providers, and policymakers, and therefore should apply to all segments of the Internet ecosystem. Public disclosure and transparency are essential to maintain competitive and effective markets, to provide policymakers with information they need to detect abusive practices, and to help consumers make informed choices and hold providers accountable to deliver the purchased services as promised. Transparency also benefits commercial enterprises with uniformity and predictability by ensuring that all providers must live by the same disclosure requirements.

CWA supports the New America Foundation's broadband truth-in-labeling proposal to require providers to furnish common, clear information to consumers about the products and services they offer, including price, fees, advertised and actual speeds, reliability, latency, traffic management policies, service limits and guarantees, legal and privacy policies, and contract terms. As with the other Internet rules, the transparency rule should *not* be limited only to broadband Internet access providers.

Network Management. CWA supports the *NPRM's* "reasonable network management" definition. This definition – in combination with an "unjust or unreasonable" non-discrimination

principle – strikes the appropriate balance in protecting consumers while allowing providers to manage their networks to benefit consumers.

Managed Services. The *NPRM* struggles to define "managed" or "specialized" services in a way that would draw a predictable and meaningful distinction between those services and other commercial broadband Internet access-related services provided over the public Internet. While it is appropriate to exclude private network services from open Internet rules, the Commission could solve much of this problem by adopting (1) the "broadband Internet access" definition we propose, and (2) the § 202(a) "unjust or unreasonable" discrimination standard we propose.

Wireless. Wireless broadband services differ significantly from wireline broadband services in several respects. These unique wireless attributes and the nascent development of wireless broadband counsel caution in the extension to wireless of any open Internet rules adopted in this proceeding. The Commission should therefore refrain for now from extending to wireless broadband any open Internet access rules adopted in this proceeding. Instead, the Commission should separately address the application of open Internet rules to wireless after it has adopted such rules for wireline services.

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COMMENTS OF
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I. INTRODUCTION.

The Communications Workers of America ("CWA") supports the Commission's Notice of Proposed Rulemaking ("*NPRM*")[1] to adopt rules to protect an open Internet. Preserving an open and free Internet consistent with the need to promote job-creating investment in our nation's high-speed networks is absolutely critical to safeguard our nation's economic, social, and democratic fabric and future.

CWA represents 700,000 workers in communications, media, airlines, manufacturing, and public service, including more than 300,000 employees who work in the communications industry. CWA has long recognized that high-speed Internet is the essential communications infrastructure of the 21st century, providing a critical foundation for economic growth and democratic communications.[2] In that vein, CWA launched our "Speed Matters: High-Speed Internet for America" campaign dedicated to promoting programs and policies that build universal, affordable high-speed networks and good jobs for workers in the industry.[3] CWA has

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[1] *Preserving an Open Internet*, Notice of Proposed Rulemaking, 24 FCC Rcd 13064 (Oct. 22, 2009).
[2] CWA's Comments in *In the Matter of A National Broadband Plan For Our Future*, GN Docket No. 09-51, filed June 8, 2009 ("CWA Broadband Plan Comments") at i.
[3] *Id.* at ii-iii; see also CWA's Reply Comments in *In the Matter of A National Broadband Plan For Our Future*, GN Docket No. 09-51, filed Sept. 8, 2009, incorporating the Speed Matters August 2009 survey and data on Internet speeds ("CWA Reply Comments").

consistently emphasized the importance of an open Internet to ensure the free and unimpeded flow of information among all Internet users.

The urgent need to upgrade our nation's communications networks to world-class standards, coupled with the current economic downturn and a persistent ten percent unemployment rate, command that the Commission give the highest priority to investment and job creation in formulating open Internet principles and rules. Therefore, the Commission must ensure that its open Internet rules do not have the unintended consequence of dampening the private investment needed to build the next-generation wireline and wireless networks that will bring our nation's broadband networks up to global standards and create and maintain jobs.

The Commission has a statutory responsibility consistent with the public interest goals of the Communications Act to formulate policies that spur the investment needed to increase the nation's broadband capacity and close the unrelenting digital divide. Section 706 of the Telecommunications Act of 1996 directed the Commission to "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans," and periodically to inquire and report on the "the availability of advanced telecommunications capability to all Americans."[4] More recently, in the American Recovery and Reinvestment Act of 2009 ("ARRA"),[5] Congress instructed the Commission to develop a national broadband plan "to ensure that all people of the United States have access to broadband capacity."[6] As the Commission formulates and implements the National Broadband Plan, it must ensure that its open Internet policies are consistent with this congressional mandate.

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[4] Pub. L. No. 104-104, § 706, 110 Stat. 56, 153 (1996), *codified as amended at* 47 U.S.C. § 157 note, as amended by Pub. L. 107-110, Title X, § 1076 (99), 115 Stat. 2093 (2002) ("Section 706").
[5] Pub. L. No. 111-5, 123 Stat. 115 (2009).
[6] ARRA, § 6001(k)(2), 123 Stat. 516.

Fourteen years after Section 706 was enacted, the United States is still woefully behind other industrialized nations in broadband deployment and adoption, and too many Americans encounter a significant digital divide based on geography, race, and income.[7] According to data compiled by the Commission's National Broadband Task Force, 3 to 6 million U.S. households still do not have access to any broadband infrastructure.[8] The United States ranks 28th in the world in broadband speeds, limiting the capability of our broadband networks to deliver high-bandwidth applications, services, and content that provide multiple benefits to consumers.[9] The latest Pew Internet survey finds that broadband adoption varies significantly across demographic groups, and African Americans, Hispanics, rural residents, and lower-income Americans trail the national average in home broadband adoption.[10] According to Pew, this disparity has negative implications for non-adopters in the areas of employment, education, news, healthcare, and consumer welfare.[11]

The rules that the Commission adopts to ensure an open Internet must also ensure that there is sufficient future investment and job creation to propel not only economic opportunity, but robust high-speed broadband capability and a permanent bridging of the digital divide. The Commission's National Broadband Task Force estimates that it will take $350 billion dollars to

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[7] CWA Broadband Plan Comments at i.

[8] Federal Communications Commission, National Broadband Task Force September Presentation Commission Meeting (Sept 29, 2009) page 34, *available at* http://traunfoss.fcc.gov/edocs-public/attachmatch/DOC-293742A1.pdf ("Task Force Presentation").

[9] "Speed Matters: A Report on Internet Speeds in All Fifty States," Communications Workers of America, Aug. 2009 at 1 *available at* http://files.cwa-union.org/speedmatters/state_reports_2009/CWA_Report_on_Internet_Speeds_2009.pdf ("Speed Matters").

[10] *See* Lee Rainie, Pew Internet & American Life Project, "Internet, broadband, and cell phone statistics" (Jan. 5, 2010) at 2 (reporting on results of a survey conducted from Nov. 30 to Dec. 27, 2009) *available at* http://www.pewinternet.org/~/media//Files/Reports/2010/PIP_December09_update.pdf. Only 47 percent of rural adults subscribe to broadband at home, compared to 64 percent among suburban households and 61 percent among urban households. Only 42 percent of low-income households earning less than $30,000/year subscribe to broadband compared to 62 percent for those earning $30,000 to $49,999, 73 percent for those earning between $50,000 and $74,999, and 83 percent among those earning over $75,000/year. The racial divide also persists, with 63 percent of whites, 52 percent of blacks, and 47 percent of Hispanics with broadband at home.

[11] *Id. See also NPRM* at ¶ 82 & note 194.

upgrade our nation's networks to world-class 100 mbps downstream standards.[12] With the exception of universal service funding of about $7 billion a year and the ARRA's one-time broadband stimulus infrastructure grants, we will have to rely largely on private investment to build and sustain these networks. Therefore, it is imperative that the Commission adopt open Internet rules that support and sustain job-creating private sector network investment.

The framework that we propose will preserve free speech on the Internet while encouraging job-creating investment and a network platform that encourages innovation at the edge. This framework will allow network providers to manage their networks to allow IP applications and content providers to purchase the specialized services they need to deliver such services, such as voice over the Internet or telemedicine applications, as long as network providers offer that service to all who want to purchase it without unjust or unreasonable discrimination. This framework would also allow network providers to manage their networks efficiently to avoid congestion and to ensure that time-sensitive traffic, such as a voice call, receives priority over less time-sensitive traffic, so long as providers reveal their traffic management practices and do not unreasonably or unjustly discriminate in a way that harms consumers or competition. At the same time, the open Internet protections we propose will ensure that no participants in the Internet ecosystem – whether broadband, application, content, or service providers – use their market power to harm consumers or competition.

II. OPEN INTERNET RULES SHOULD PROMOTE FREE SPEECH CONSISTENT WITH JOB-CREATING INVESTMENT, INNOVATION, AND EFFICIENT NETWORK MANAGEMENT.

The Commission has proposed, and CWA generally supports, the several goals of this proceeding. These include promoting free speech, encouraging civic engagement, stimulating Internet investment and innovation, protecting competition in all segments of the Internet

[12] Task Force Presentation at 45.

ecosystem, preserving broadband providers' ability to manage their networks efficiently to alleviate congestion, and protecting users' interests.[13] The Commission must also ensure that broadband providers are able to provide quality of service ("QoS") offerings to those applications and content providers that need such services, as long as network providers offer QoS capability to all who want to purchase them without unjust or unreasonable discrimination.

As the Commission notes in the *NPRM*, the Internet plays a unique role in promoting free speech and the civic participation that is so integral to our democracy. Congress has correctly emphasized that the Internet "offer[s] a forum for a true diversity of political discourse, unique opportunities for cultural development, and myriad avenues for intellectual activity."[14] Therefore, CWA has long maintained that we must protect free speech on the Internet so that people are able to go to the websites they want and to download or upload what they want when they want on the Internet. It is absolutely essential to protect free speech on the Internet so that individuals and groups can communicate with each other what they want when they want on the Internet, without any degradation or suppression of any viewpoints or lawful content, particularly when engaged in issues that involve civic engagement, governance, and our democracy.

At the same time, policies to protect the open Internet must not lead to the unintended consequence of delayed or deferred broadband network investment and job creation, particularly well-paying job creation. The current bleak economic climate and our country's future economic wellbeing require Commission action in this proceeding and others that will produce both short-term and long-term economic benefits and create good jobs. While there is clearly a virtuous circle of innovation on the Internet in which expanded network capacity enables innovations in applications and services, which in turn drive the need for more network investment, it is also

[13] *NPRM* at ¶¶ 51-54 & 67-80.
[14] *Id.* at ¶ 75 (citing 47 U.S.C. § 230(a)(3)).

clear that the capital expenditures required and the jobs created to build, maintain, and service the underlying network far exceed the capital expenditures and jobs generated by "edge" companies. Given these differences, the Commission must ensure that its open Internet rules do not favor one part of the Internet ecosystem over another.

Over the past three years, the largest broadband network companies – including wireline, wireless, cable, and satellite companies -- invested more than $166.5 billion dollars in capital expenditures: $63.7 billion in 2007, $63.4 billion in 2008, and $39.4 billion through third quarter 2009, according to company annual reports filed with the Securities and Exchange Commission (SEC). The two largest network providers -- AT&T and Verizon -- invested $95 billion from the beginning of 2007 through the third quarter 2009. That is more than 11 times the total investment by Google and Yahoo of $8.5 billion over the same period. AT&T's $48.5 billion capital expenditure over this period dwarf's Google's $6.8 billion.[15]

Similarly, the broadband network operators employ many more workers than the Internet "edge" companies. While CWA appreciates the innovation that has occurred on the edge of the network, the *NPRM* considerably overstates the Internet "edge's" transformative effect on job creation to date.[16] The *NPRM*'s example (at ¶20) of the purported 600,000 Americans "that earn part of their living by operating on eBay's auction platform" does not translate into the numbers and/or types of well-paying jobs that are needed to strengthen our weak economy and to ensure that America is competitive globally.

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[15] *See* Communications Workers of America, "The U.S. Broadband Industry, Investment and Employment," January 2010, based on company SEC 10-K annual reports for the year ending December 31, 2009 and third quarter 2009, attached as Exhibit A. ("CWA Investment and Employment Report). *See also* Robert C. Atkinson and Ivy E. Schultz, Columbia Institute for Tele-Information, "Broadband in America: Where It Is and Where It Is Going (According to Broadband Services Providers)," A Preliminary Report Prepared for the Staff of the FCC's Omnibus Broadband Initiative, Nov. 11, 2009, *available at* http://www.broadband.gov/docs/Broadband_in_America.pdf.
[16] *NPRM* at ¶ 20.

Simply put, broadband network providers create and maintain far more, and typically better-paying, jobs than the applications and content sectors. Moreover, these jobs are dispersed in communities through the United States, including some of the regions most hard-hit by the current recession. In 2008, almost 800,000 people were employed by the largest wireline, cable, wireless, and satellite companies, nearly ten times more than the number of jobs at 21 leading Internet applications companies:[17]

Jobs at Broadband Network Companies Far Exceed Jobs at Applications Companies

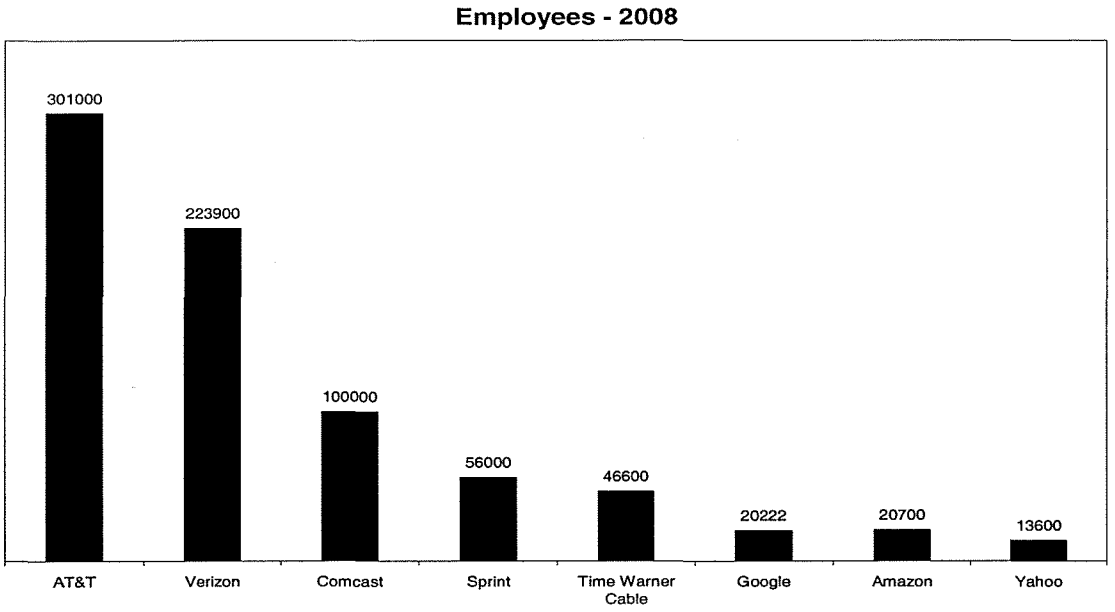
Network Providers	Employees	Applications Providers*	Employees
AT&T	301,000	Amazon	20,700
Verizon	223,900	Google	20,200
Comcast	100,000	Yahoo	13,600
Sprint	56,000	Ebay Inc.	16,200
Time Warner Cable	46,600	Expedia	8,050
Qwest	30,500	IAC	3,200
Cablevision	17,800	Cbeyond	1,691
Windstream	7,300	Facebook	800
Frontier	5,400	TiVo Inc	463
MediaCom	4,400	Linkedin	320
Cinn Bell	3,300	Zynga	250
Total	**796,200**	Craigslist	30
		Digg	68
		Flickr	Owned by Yahoo
		Meetup	NA
		Mozilla	40
		OpenDNS	NA
		Skype	Owned by Ebay
		Twitter	NA
		Vuze	30
		Youtube	owned by Google
		Total	**85,642**

Network providers include 11 largest telecom, cable, wireless employers, excluding privately-held Cox Cable for which data is not available.
Applications providers includes signatories of letter to FCC Chairman Julius Genachowski on open Internet policies

Source: yahoo.com; Craigslist.com; allthingsdigital.com; Lexis/Nexis; SEC Forms 10-K for year ending 2008

[17] *See* CWA, Industry Investment and Employment report at chart entitled "Jobs at Broadband Network Companies Far Exceed Jobs at Applications Companies."

As a further example, AT&T had 301,000 employees in 2008 compared to Google's worldwide total of 20,200, 15 times higher:[18]



Recognizing the broadband Internet access service network providers' fundamental role in investment and job creation, the Commission must ensure that its open Internet rules encourage and stimulate continued growth in these sectors.

III. THE FCC SHOULD REVISE THE "BROADBAND INTERNET ACCESS" COMPONENT OF THE *NPRM*'S PROPOSED "BROADBAND INTERNET ACCESS SERVICE" DEFINITION.

As an initial matter, the Commission must carefully define "broadband Internet access services" in a way that protects users' ability to access any websites they want, but does not have the unintended consequence of sweeping into the definition many popular and important single-purpose, web-enabled products or services that would go out of business if they were required to abide by the Commission's open Internet rules. Unfortunately, the proposed definition for "broadband Internet access services" in paragraph 55 of the *NPRM*, fails to meet that test. We

[18] *Id.* Many Google employees are located overseas.

therefore propose that the Commission separately define the "broadband Internet access" component of this definition as "access to all or substantially all publicly accessible end points that have an Internet Assigned Numbers Authority ("IANA") address."

Certainly, we acknowledge the Commission's challenge in defining "broadband Internet access services," since there is little Commission or congressional precedent. Therefore, the definitional issue is of paramount importance. The Commission proposes to define "broadband Internet access services" to which open Internet rules would apply as follows: "[A]ny communication service by wire or radio that provides broadband Internet access directly to the public, or such classes of users as to be effectively available directly to the public." This definition, modeled in considerable part after the Communications Act's "telecommunications service" definition, 47 U.S.C. § 153(46), is clearly intended to serve the *NPRM*'s goal of ensuring that any rules that the Commission adopts will have "broad application so that the protections we propose are widely enjoyed." *NPRM* at ¶ 55.

While CWA generally shares the Commission's goal to ensure that the open Internet protections apply throughout the Internet ecosystem, the *NPRM*'s proposed "broadband Internet access services" definition inadvertently sweeps too broadly. Read literally, the proposed definition could transform a host of single-purpose, end-user device-based services into "broadband Internet access services," thereby subjecting such single-purpose, end-user device service providers to all of the open Internet rules that the Commission adopts. That, in turn, would render these specialized, end-user device services economically untenable, thus depriving consumers of their benefits.

A few examples will illustrate the point. Vehicular GPS navigational services, such as Garmin, enable customers to access a narrow, discrete number of GPS-related Internet sites to

retrieve navigational information and directions . The GPS service providers purchase Internet access service from a broadband Internet access provider, and include the cost of Internet access in the price they charge their customer for the GPS navigational service. Because the GPS navigational service is a "service by wire or radio" that provides, albeit in a limited form, broadband access to the Internet "directly to the public," it would therefore seem to fall within the *NPRM*'s proposed "broadband Internet access service" definition. But if such a GPS service fell within the definition and therefore were required to adhere to the Commission's open Internet rules, the GPS service provider would have to make general Internet access available to its GPS customers. That, however, would make the entire GPS service offering economically untenable. The GPS service provider's devices are not equipped to handle general Internet access, nor do they have the wireless network capacity to make the entire Internet available to their customers.

Other limited, single purpose Internet-related end-user device services share these same traits. Examples include Kindle and other e-book-reading services, smart meter services and heart-monitoring devices and services. There will surely be many more specialized end-user device services of this nature in the future – at least there would be unless the Commission adopts the *NPRM*'s overly broad proposed definition of "broadband Internet access service," which would squelch such innovation. Imposing open Internet obligations against blocking and unreasonable discrimination on such specialized end-user device services would render them impractical. That, in turn, would not only deprive consumers of these very popular services; it also would reduce demand for, and revenue that could be generated from, the underlying broadband Internet access providers' network. This would have unintended and adverse effects

on broadband network investment and deployment, broadband adoption, and on the broader economy and employment as well.

The *NPRM*'s proposed "broadband Internet access service" definition transforms any specialized end-user device service that accesses information from a limited, narrow class of Internet sites into a "broadband Internet access service." While the end-user device service retrieves information from the Internet and is generally made available to the public, it is not designed to provide its customers with access to the entire Internet.

To avoid this problem, we propose the following definition of "broadband Internet access:" "access to all or substantially all publicly accessible end points that have an Internet Assigned Numbers Authority (IANA) address." This would exclude limited access, end-user device services from the definition, thereby promoting their growth and development. At the same time, this definition would serve the Commission's goals of achieving widespread application of the open Internet rules. In our example, the underlying broadband Internet access service provider on whom Garmin relies for its vehicular GPS service would be subject to the open Internet rules.

IV. CODIFYING THE ORIGINAL FOUR INTERNET PRINCIPLES.

The Internet is a complex ecosystem. Some have likened the Internet to a biological ecosystem with the dominant or keystone species being content providers, access providers, and transport providers; with a host of other species (hardware and software providers, advertising companies, payment services, etc.) complementing the keystone ones; and with the ecosystem inhabitants constantly interacting with each other and with an environment of Internet users.[19]

[19] TeleSonera International Carrier, "The Natural Evolution of the Internet Ecosystem," at 3, Sept. 2009, *available at* http://www.teliasoneraic.com/files/TeliaSonera%20International%20Carrier/Articles/Insight/White%20papers/White%20paper%20-%20The%20new%20internet%20eco%20system.pdf.

Promoting the virtuous cycle of investment and innovation on the Internet to increase consumer benefit requires openness throughout the entire ecosystem. To date, the Commission's four original Internet principles have worked well to protect consumers, and it is appropriate for the Commission to codify them as rules. The Commission proposes to add two new Internet principles – a nondiscrimination principle and a transparency principle.[20] The Commission proposes to codify the four original principles and the new nondiscrimination and transparency principles in a way that makes them solely the obligation of broadband Internet access service providers rather than functionalities and performance to which all consumers are entitled, regardless of the type of Internet entity that provides them. This would narrow those principles in a way that would be detrimental to consumers. As originally crafted by the Commission in its 2005 *Internet Policy Statement*,[21] consumers were entitled to (1) access the lawful Internet content of their choice; (2) run applications and use services of their choice, subject to the needs of law enforcement; (3) connect their choice of legal devices that do not harm the network; and (4) competition among network providers, application and service providers, and content providers, all subject to reasonable network management.[22] The proposed rules would in effect flip these principles by having them apply only to broadband Internet access service providers.

By making the proposed rules binding on broadband Internet access service providers alone, and not on other key Internet ecosystem players such as dominant application, service, and content providers, Internet users and consumers would not be fully protected. In particular, the Commission's original Internet Principle 4 entitled consumers to competition among network providers, application and service providers, and content providers. Narrowing this principle

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[20] *NPRM* at ¶¶ 88-90 &103-132.
[21] *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities,* Policy Statement, 20 FCC Rcd 14986 (2005) (*Internet Policy Statement*).
[22] *NPRM* at ¶ 30.

violates the Communications Act's and the Commission's express goal of "[p]romoting competition for Internet access and Internet content, applications, and service."[23] Narrowing this obligation would also undermine the Commission's stated view when adopting the *Internet Policy Statement* of "the importance of such competition not only 'among network providers,' but also among 'application and service providers, and content providers.'"[24]

The importance of promoting and ensuring competition among application, service, and content providers has become even more critical since the Internet Principles were adopted in 2005. As the Internet ecosystem has continued to evolve, the lines between various types of Internet ecosystem entities have blurred. Many application and service providers today offer services that traditionally have been offered by, and now compete with, broadband Internet access providers. The *NPRM* acknowledges that the growing voice and video services "are increasingly delivered over the Internet in actual or potential competition with... the offerings of companies that provide broadband Internet access."[25] One such example is Google Voice, an Internet voice service launched by Google in March 2009.

The Commission should maintain the original intent of the Internet Principles, and Principle 4 in particular, by adopting open Internet rules that apply to all entities – including application, content, and service providers that may serve as Internet gatekeepers. While "the question of Internet openness at the Commission has traditionally focused on providers of broadband Internet access" as Internet gatekeepers,[26] other players in the ever-evolving Internet ecosystem increasingly have the ability to become Internet gatekeepers as well. Search engine providers like Google, for example, serve as Internet gatekeepers by prioritizing the websites to

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[23] *Id.* at ¶ 52 (citing § 230 of the Telecommunications Act).
[24] *See id.*
[25] *Id.* at ¶ 85.
[26] *Id.* at ¶ 101 and note 223.

which they direct Internet users.[27] Another example is the blocking by Hulu (a content provider website that provides commercially-supported streaming video of TV shows) of any consumer using Boxee, a social media center networking software, to access Hulu content.

Application and service providers thus can be, and many are, as influential a component on Internet users' experience as the physical network provider. Because there is a compelling need to ameliorate all gatekeeper power on the Internet, the Commission should extend its rules, including the new proposed transparency and nondiscrimination rules, to content, application, and service providers.

V. OPEN INTERNET RULES SHOULD PROTECT CONSUMERS FROM UNJUST OR UNREASONABLE DISCRIMINATION.

The Commission proposes to add a new nondiscrimination principle to ensure that broadband Internet access services develop in an environment that ensures the free and unimpeded flow of information and viewpoints, promotes competition in services, content and applications, and protects consumers from abuse. The proposed non-discrimination rule would require broadband Internet access providers to treat all lawful content, applications, and services in a "nondiscriminatory" manner. *NPRM* at ¶ 119.

This strict nondiscrimination language, modeled after the "unqualified" nondiscrimination standard of Section 251(c)(2)(D) and coupled with the ill-defined contours of the *NPRM*'s discussion of "managed" or "specialized" services (*see* Part VIII *infra*), poses the risk of an open Internet rule that would restrict many practices that would benefit consumers. The strict nondiscrimination language would prohibit broadband Internet services providers from

[27] *See* Adam Raff, *Search, but You May Not Find*, N.Y. Times, Dec. 28, 2009, at A27, *available at* http://www.nytimes.com/2009/12/28/opinion/28raff.html ("Raff"). CWA Broadband Plan comments at 8; *In the Matter of Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol Subscribership*, WC Docket 07-38, CWA Comments filed June 15, 2007 at 8-9 and Reply Comments filed July 13, 2007 at 7, 9.

providing different levels of quality-of-service ("QoS"). A strict nondiscrimination standard also would prohibit a network operator from prioritizing a voice-over-the-Internet ("VoIP") call over an e-mail. And it would bar a broadband provider from providing QoS needed to transmit a high-resolution medical CAT Scan. MIT's David Clark put it succinctly at the Commission's workshop on Internet Innovation, Investment, and the Open Internet: "Quality of Service is pro-innovation. It allows people to do new things."[28] The Commission's current Chief Technologist made the same point in a paper he penned in 2007. "Discrimination with respect to QOS," John Peha wrote, "is also important because different applications have different QOS needs." Peha emphasized that some discrimination benefits consumers, and should be permitted. According to Peha, a policy designed to protect beneficial uses of discrimination would allow network operators to provide "different quality of service to different classes of traffic using explicit prioritization or other techniques. These techniques can be used to favor traffic with stricter quality of service requirements and/or traffic sent using a higher-priced service."[29] A strict nondiscrimination standard, however, would prohibit such QoS prioritization. A strict nondiscrimination standard would also prohibit broadband Internet access providers from offering content delivery network services, like caching, to content, application and service providers for a fee. *NPRM* at ¶ 57-58. Both of these prohibitions would adversely effect broadband investment and innovation.

To protect an open Internet while promoting broadband deployment and innovation, the Commission's goals would be better served by modifying the *NPRM*'s proposed nondiscrimination rule (¶ 104) to incorporate Section 202(a)'s "unjust or unreasonable

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[28] Statement of David Clark, MIT Computer Science & Artificial Intelligence Laboratory, at FCC Workshop on Innovation, Investment, and the Open Internet, January 13, 2010.

[29] John M. Peha, "The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy," *International Journal of Communications* 1 (2007), pages 644-668, *available at* http://web.si.umich.edu/tprc/papers/2006/574/Peha_balanced_net_neutrality_policy.pdf.

discrimination" standard. Unlike a "strict" nondiscrimination standard, the § 202(a) standard would permit more network service innovation and more diversity in network services while, at the same time, extending the nondiscrimination principle in a way that protects free and open Internet discourse and protects consumers and competition.

A. The Commission Should Permit Broadband Internet Access Service Providers to Provide Content Delivery Network Services and Quality of Service Offerings, Subject to the Unjust or Unreasonable Standard.

The *NPRM* proposes, through its strict discrimination standard, to prohibit broadband Internet access providers from offering any enhanced or prioritized services to content, application or service providers for a fee (at ¶¶ 106 & 112). The *NPRM*'s proposed absolute bar on broadband Internet access provider offering, and earning revenue from, content delivery services would discourage broadband investment and growth and would place greater restrictions on broadband Internet access providers than Title II currently imposes on common carriers.

The *NPRM*'s proposal appears to be based in significant part on a misimpression about the nature of broadband Internet use. More specifically, Diagram 2 of the *NPRM* (at ¶ 106) rests on the assumption that content, application, and service providers, on the one hand, and end-user subscribers of broadband Internet access services, on the other, are separate and distinct categories. But they are not. One of the greatest benefits of broadband service is that every end-user can also become a content, application, or service provider, and many have. Absent the ability to purchase content delivery network services and QoS offerings from a broadband Internet access provider, new, small-entrant content, application, or service providers could not enter and compete against large content, application, or service providers like Google that have built their own geographically dispersed networks of servers that enable them to prioritize their own services to end-users.

Moreover, prohibiting broadband Internet access providers from providing content delivery network services and QoS offerings for a fee would deprive them of the revenue stream from caching and other content delivery network services and QoS offerings that some broadband Internet access providers currently enjoy today, and which are likely to provide a growing revenue stream in the future. Such a prohibition would leave broadband Internet access providers with the choice of (1) deriving lower revenue streams from their networks, thereby reducing their return and therefore incentive to invest in the network, or (2) increasing end-user subscriber rates for broadband Internet access service, thereby dampening demand for, and thus consumer adoption of, those services.

The *NPRM* (at ¶ 65) recognizes this problem, but apparently concludes it is outweighed by concerns about the potentially adverse effects that permitting content delivery network services and QoS offerings may have on the "edge" markets of content and application providers (*id.* at ¶¶ 62-64 & 67-73). The *NPRM* gives too little weight to the detrimental effects on broadband network investment that would result from denying network providers multiple revenue streams from end-user subscribers and from content, application, and service providers that also use that network. Moreover, prohibiting broadband Internet access providers from offering and charging content, application, and service providers for content delivery network services and QoS offerings would send inefficient market signals, subsidizing content, application, and service providers that make heavy use of broadband Internet access at the expense of lighter users (small, new-entrant CAS providers and residential end-users). Those counterproductive market signals would inhibit competitive entry in the content, applications, and service provider market and also discourage additional broadband Internet access provider network investment.

B. Section 202(a)'s "Unjust or Unreasonable" Discrimination Test is Adequate to Protect the Free Flow of Information, Consumers and Competition While Simultaneously Promoting Network Investment and Innovation.

The *NPRM*'s presents a false choice between the goal, on the one hand, of protecting against unreasonably discriminatory practices and, on the other, of promoting efficiency, investment and consumer choice. Rather, the § 202(a) "unjust or unreasonable discrimination" standard provides the Commission with a means to maximize both objectives.

The Section 202(a) nondiscrimination standard is sufficiently strong to protect against the type of improper discrimination that the *NPRM*'s proposed nondiscrimination is intended to prevent: provider interference with the free flow of information and viewpoints over the Internet and anticompetitive and consumer abuses. Indeed, the heart of § 202(a) is protection against network provider favoritism of, or preferences for, particular customers or their communications.

Unlike the *NPRM*'s proposed inflexible and "unqualified" nondiscrimination standard (at ¶ 109), the § 202(a) standard allows network providers the flexibility to offer different types and classifications of service, as long as those services and classifications are themselves reasonable and made available nondiscriminatorily to all similarly situated customers.

The *NPRM*'s proposed strict nondiscrimination standard, in contrast, places greater restrictions on broadband Internet access providers than Title II does on common carriers. The *NPRM*'s proposed nondiscrimination standard restricts broadband Internet access providers to a single class of end-user broadband Internet access service, and prohibits them from providing any kind of content delivery network service or QoS offerings to network users. Yet Title II common carriers, consistent with § 202(a), have offered a variety of different kinds of telecommunications transport services, including high-capacity and low-capacity services and services with different service quality or delivery characteristics.

A Section 202(a) nondiscrimination standard would permit broadband Internet access providers to offer different classes of service, as long as those service classifications are themselves reasonable and made available nondiscriminatorily to all customers. Thus, if a broadband Internet access provider offers a content delivery network service to a particular content, application, or service provider, it must also make that content delivery network service available, on nondiscriminatory terms and conditions, to all other similarly situated content, application, or service providers.

To be sure, there would be potential disputes about whether a broadband Internet access provider's classifications of service or customers truly are an objective class rather than a *de facto* preference for an individual content, application, or service provider or an improperly favored small group of content, application, or service providers. But those are factual disputes which the case-by-case approach of § 202(a) is well-suited to resolve.[30] The Section 202(a) standard provides for a more structured, and precedent-based, approach to discrimination issues than the one proposed in the *NPRM*. And it also would fulfill the purpose of the nondiscrimination standard: to ensure the free flow of information over the Internet and protect competition and consumers from abuse.

C. The Section 202(a) Standard is More Protective of Content, Application, and Service Providers' and End-Users' Interests Than Exclusive Reliance on a "Managed" or "Specialized" Service Classification.

The Section 202(a) standard would also provide a more structured, and predictable, vehicle for dealing with various kinds of content delivery network services, as well as QoS offerings, than exclusive reliance on the *NPRM*'s suggested separate categorization of "managed" or "specialized" services. Many disputes concerning content delivery network

[30] *See, e.g.*, *Offshore Tel. Co. v. South Central Bell Tel. Co.*, 2 FCC Rcd 4546 (1987) (§ 202(a) determinations are "made on a case-by-case basis and ... depend[] upon the circumstances of an individual case").

services and QoS offerings could be addressed through the more flexible § 202(a) standard rather than through some newly crafted, and thus untested and therefore unpredictable, up-or-down dispute over whether or not the service is a "managed" or "specialized" service.

This would provide benefits to broadband Internet access providers and broadband Internet service customers. For broadband Internet access providers, the § 202(a) standard would provide greater guidance than a "managed" or "specialized" service classification in developing permissible content delivery network services and QoS offerings. That, in turn, would promote broadband Internet access provider investment and innovation.

For content, application, and service providers and other end users, the § 202(a) standard would provide assurance that any apparent discrimination or differential treatment would be subject to challenge and Commission review. If content delivery network or QoS offerings were instead only to be allowed as "managed" or "specialized" services, the Commission would face increasing pressure to expand those definitions to accommodate services that seem socially or economically desirable but that would not survive the *NPRM*'s absolute nondiscrimination standard. That, in turn, would pose the risk that such "managed" or "specialized" services might be completely immune from some or all of the six Internet principles.

To be sure, the Commission could avoid this problem by applying the six Internet Principles to all "managed" and "specialized" services as well. But that would seem to defeat the whole purpose of separately categorizing "specialized" and "managed" services. *See NPRM* at ¶¶ 148-153. If the Commission were to apply the principles to such services, it would simply complicate matters further, forcing resolution of whether a given offering is a "managed" or "specialized" service enough though, after that determination is made, the same Internet

Principles would apply to that service that would have applied if were not a "managed" or "specialized" service.

VI. THE PROPOSED TRANSPARENCY RULE WILL HELP PRESERVE AN OPEN INTERNET AND SHOULD APPLY TO ALL SEGMENTS OF THE INTERNET ECOSYSTEM.

The *NPRM*'s proposed transparency rule would provide critical benefits to broadband subscribers, content, application and service providers, and policymakers, and therefore should apply to all segments of the Internet ecosystem. *NPRM* at ¶ 119.

Public disclosure and transparency are essential to maintain competitive and effective markets, to provide policymakers with information they need to detect abusive practices, and to provide consumers with the information they need to make informed choices and hold providers accountable to deliver the purchased services as promised. Moreover, transparency benefits commercial enterprises with uniformity and predictability by ensuring that all providers must live by the same disclosure requirements. If transparency rules had been in place at the time Comcast began blocking large peer-to-peer file transfers, it is possible that Comcast would have refrained from, or at least revised this practice, or, alternatively, policymakers and consumers would have learned of this anti-consumer practice earlier and have taken appropriate action under the Internet Principles sooner.

As part of its transparency rules, the *NPRM*'s proposes (at ¶ 125) requiring broadband Internet access providers to provide information on "actual" (as opposed to advertised) transmission rates and capacity. CWA has consistently advocated for disclosure of actual rather than advertised broadband transmission speed data to inform both consumer decisions and

broadband policymaking.[31] As the Commission is aware,[32] the difference between advertised and actual transmission speeds in today's broadband market is often disturbingly wide. According to the National Broadband Task Force presentation to the Commission, actual median download speeds lag advertised speeds by 50 percent.[33]

The Commission should move forward expeditiously to implement a broadband truth-in-labeling requirement applicable to all providers in the broadband Internet ecosystem. The New America Foundation's broadband truth-in-labeling proposal would require broadband providers to provide common, clear information to consumers about the products and services they offer, including price, fees, advertised and actual speeds, reliability, latency, traffic management policies, service limits and guarantees, legal and privacy policies, and contract terms. The Commission should also provide and promote voluntary consumer speed tests – similar to the speed test on the speedmatters.org website – on its and other governmental websites. This would provide consumers with important information about the actual speed of their broadband connection, and collect millions of data points for research to guide good policymaking.

As with the other Internet rules (*see* Part IV above), the transparency rule should *not* be limited only to broadband Internet access providers. Just as consumers are entitled to know what actual transmission speed, prioritization and network management practices they will encounter from broadband Internet access providers, they also are entitled to know the relevant prioritization, management and (in some cases) blocking practices of other large and dominant

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[31] CWA Reply Comments at 3-4; Communications Workers of America, "Speed Matters, Affordable High Speed Internet For All," (Oct. 2006), *available at* http://www.speedmatters.org/page/-/SPEEDMATTERS/Publications/SpeedMattersCWAPositionPaper.pdf?nocdn=1

[32] Task Force Presentation at 16, 26, 28, 99, 121, 127, 151, 157; New America Foundation, "Open Technology Initiative Broadband Truth-in-Labeling," filed Sept. 24, 2009, GN Docket No. 09-51, *available at* http://fjallfoss.fcc.gov/ecfs/document/view?id=7020039312.

[33] Task Force Presentation at 26.

participants in the Internet ecosystem, such as Google, Yahoo and Microsoft.[34] The Commission's transparency rule would fail to achieve its open Internet goal of ensuring informed subscribers if large and dominant application providers remained free to engage in the very same type of undisclosed content preferences and prioritizations that the proposed rule would require broadband Internet access providers to disclose.

VII. THE COMMISSION CORRECTLY CONDITIONS ITS OPEN INTERNET RULES TO ALLOW BROADBAND PROVIDERS REASONABLE NETWORK MANAGEMENT.

The *NPRM* appropriately subjects its open Internet rules to "reasonable network management" (¶ 135). The proposed definition of "reasonable network management" would allow "(a) reasonable practices employed by a provider of broadband Internet access service to (i) reduce or mitigate the effects of congestion on its network or to address quality-of-service concerns; (ii) address traffic that is unwanted by users or harmful; (iii) prevent the transfer of unlawful content; or (iv) prevent the unlawful transfer of content; and (b) other reasonable network management practices." *Id.* This definition – in combination with an "unjust or unreasonable" non-discrimination principle – strikes the appropriate balance in protecting consumers while allowing providers to manage their networks to benefit consumers. As the Commission notes, reasonable network management must be construed in a flexible manner, both to take into account the technology platform that a broadband Internet access provider uses (¶ 137) and to permit broadband Internet access providers "to experiment and innovate as user needs change" (¶ 140).

As suggested in paragraph 141 of the *NPRM*, best practices in the network engineering community, industry standards, and standards created by accepted standards bodies are useful and reliable guideposts for the Commission to use in determining whether a given practice falls

[34] *See* Raff, *supra*.

within the "reasonable network management" definition. Network security practices, for instance, should be presumed to be a reasonable network management practice if they are consistent with protocols of accepted standards bodies, based on a legitimate network security concern, and rationally related to that concern.

VIII. MANAGED OR SPECIALIZED SERVICES.

The *NPRM* recognizes that the open Internet rules should apply to the *public* Internet only. The Commission recognized in the *AT&T/BellSouth Order* that open Internet obligations should not apply to "specialized" or "managed" services.[35] The *NPRM* proposes, therefore, to exclude what it calls "managed" or "specialized" services, and offers examples of such services, including IP-based voice and subscription video services, IP-based business enterprise services, IP-based telemedicine, smart grid and e-learning services, and public safety services. *NPRM* at ¶ 150. However, the *NPRM* struggles to define "managed" or "specialized" services in a way that would draw a predictable and meaningful distinction between those services and other commercial broadband Internet access-related services provided over the public Internet.

The Commission could resolve this problem by adopting (1) the "broadband Internet access" definition proposed in Part III *supra*, and (2) the § 202(a) "unjust or unreasonable" discrimination standard proposed in Part V *supra*. This would subject all traffic on the public Internet (defined as access to all or substantially all publicly accessible end points that have an Internet Assigned Numbers Authority[36]) to the Commission's Internet rules, and prohibit "unjust or unreasonable" discrimination with respect to such traffic, subject to reasonable network management. Under this approach, for example, broadband Internet access providers would remain free to develop new and innovative business service offerings for enterprise customers or

[35] *NPRM* at ¶ 34.
[36] *Id* at ¶ 48, n. 103.

other end users, as long as any such offerings were also made available to other similarly situated business customers or end users.

IX. THE COMMISSION SHOULD OPEN A SEPARATE PROCEEDING TO EXPLORE THE APPROPRIATE OPEN INTERNET RULES FOR WIRELESS SERVICES.

As the *NPRM* correctly notes (at ¶ 159), wireless broadband services differ significantly from wireline broadband services in several respects. Wireless services face spectrum capacity constraints and signal strength, interference and variability issues that wireline services do not. Unlike wireline services, wireless services are, of course, mobile in nature, which creates unique technical challenges and network management requirements. The wireless broadband Internet access market is just developing, and the roll-out of 4-G wireless technologies over the next few years will completely transform the industry. Moreover, wireless services have developed in a completely different historical regulatory environment than landline services, meaning that extension of the six Internet rules to wireless would likely require much more substantial change from the status quo than in the wireline environment. These unique wireless attributes and the nascent development of wireless broadband counsel caution in the extension to wireless of any open Internet rules adopted in this proceeding.

The Commission's 2005 Internet Principles applied only to wireline services. The Commission has had more than four years to see how those principles played out in the marketplace and in its own enforcement efforts. But the Commission has not yet developed the record that it needs to understand how to craft rules that would apply to wireless networks.

Therefore, the Commission should refrain for now from extending to wireless broadband any open Internet access rules adopted in this proceeding. Instead, the Commission should separately address the application of open Internet rules to wireless after it has adopted such rules for wireline services, has had a chance to assess the impact of those rules in the wireline

context, and has had an opportunity to develop a more complete record and understanding of the challenges of the wireless environment as new wireless broadband technologies and networks develop.

CONCLUSION

For the foregoing reasons, CWA urges the Commission to (1) make job-creating investment and innovation a high-priority goal in this proceeding; (2) define "broadband Internet access" to mean access to all or substantially all publicly accessible end points that have an IANA address; (3) apply all open Internet rules adopted in this proceeding not only to broadband Internet access providers, but to all Internet ecosystem participants that serve as Internet gatekeepers; (4) adopt Section 202(a)'s "unjust or unreasonable" discrimination standard as its open Internet nondiscrimination rule; (5) adopt the proposed transparency rule but apply it to all Internet ecosystem participants; (6) adopt its proposed "reasonable network management" rule; and (7) open a separate proceeding to consider the applicability of open Internet rules to wireless services.

Respectfully submitted,

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EXHIBIT A

The U.S. Broadband Industry

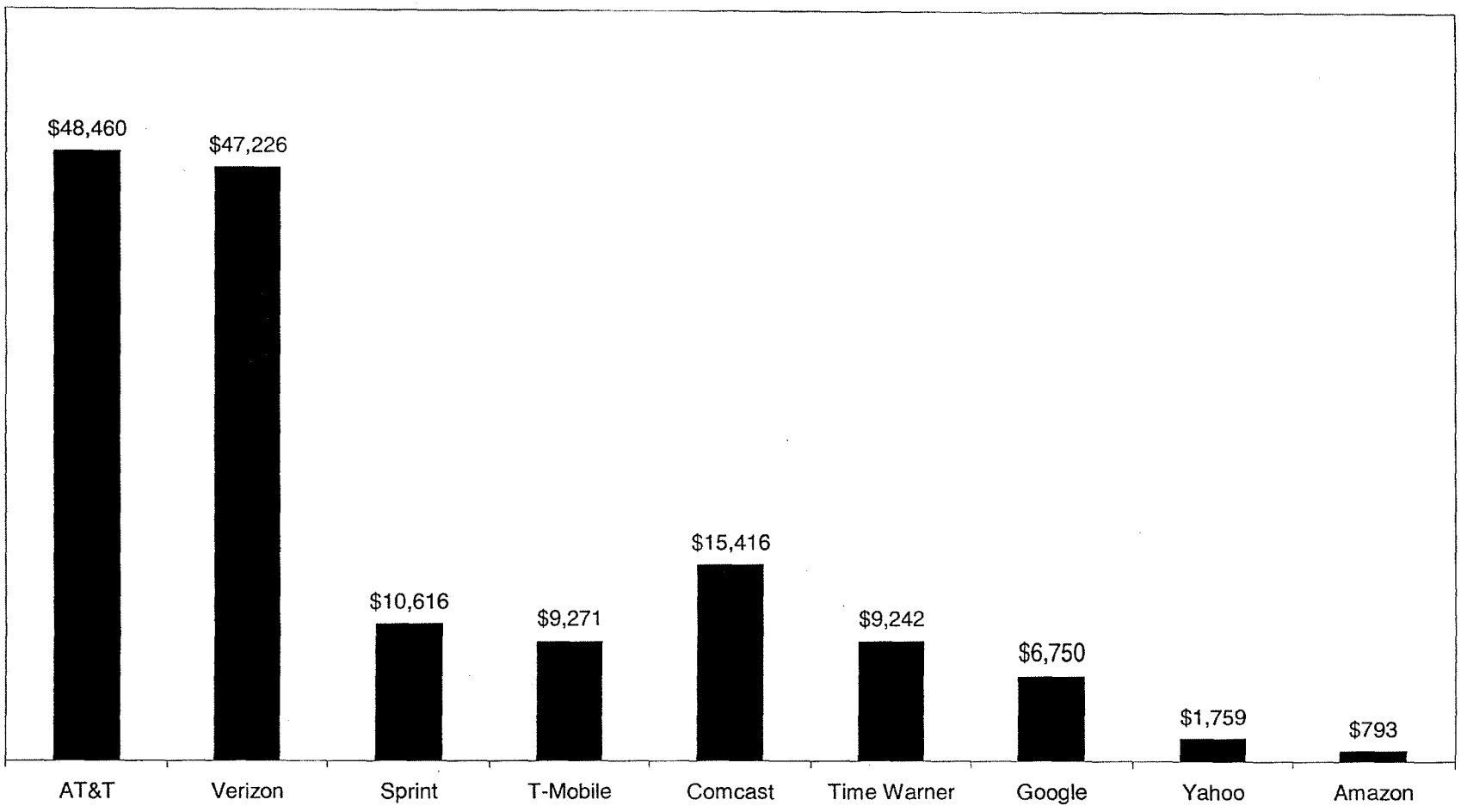
Investment and Employment

Communications Workers of America
January 2010

Capital Expenditures

2007 through Third Quarter 2009

$ millions



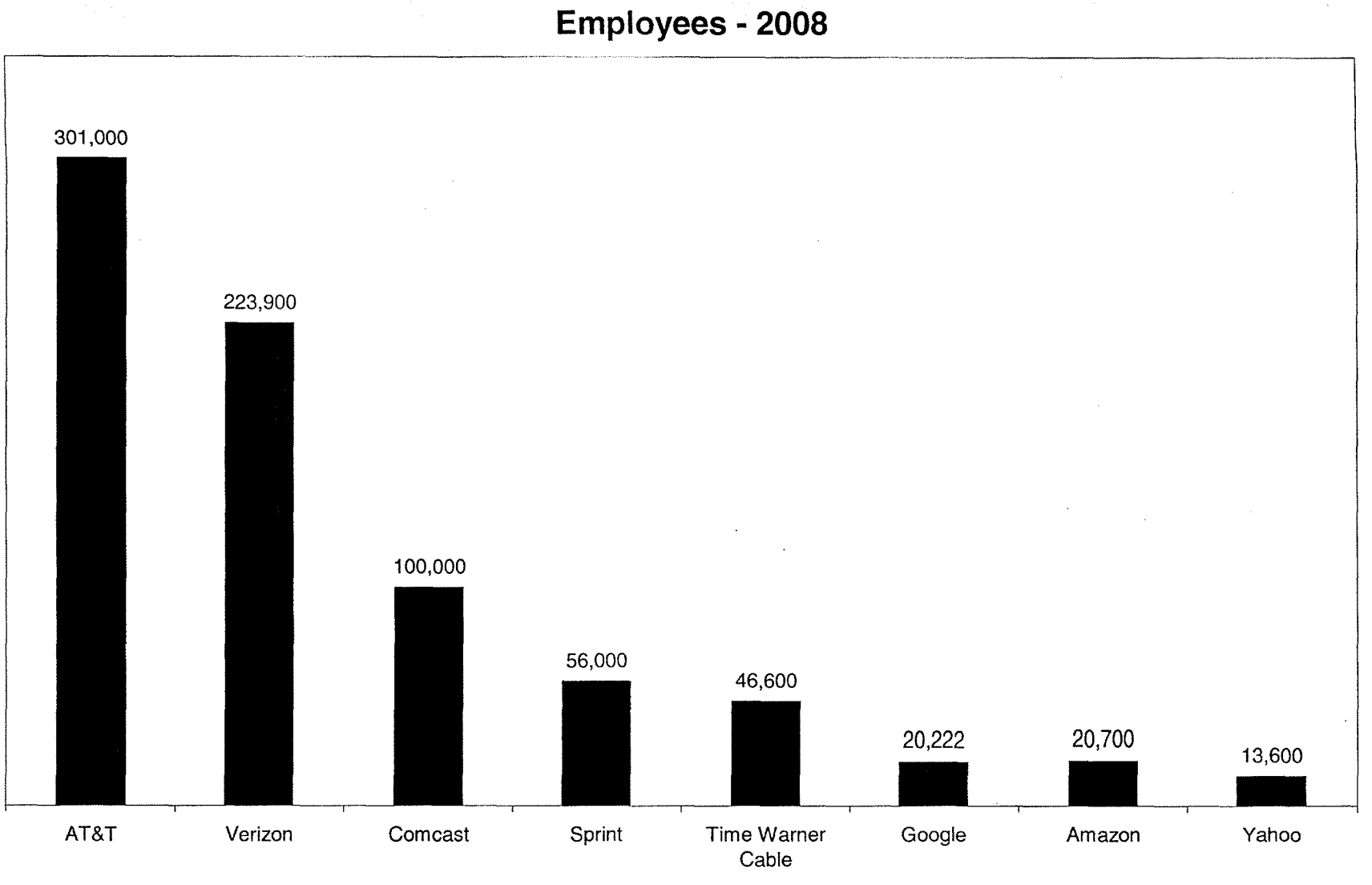
Capital Expenditure, 2007 - Third Quarter 2009

$ millions

	2007	2008	3Q09	Total	% Total
AT&T	$ 17,717	$ 19,676	$ 11,067	$ 48,460	27.6%
Verizon	$ 17,538	$ 17,238	$ 12,450	$ 47,226	26.9%
Qwest	$ 1,270	$ 1,404	$ 821	$ 3,495	2.0%
Century Tel*	$ 326	$ 287	$ 417	$ 1,030	0.6%
Embarq	$ 829	$ 686		$ 1,515	0.9%
Windstream	$ 366	$ 317	$ 207	$ 890	0.5%
Cinn Bell	$ 234	$ 231	$ 142	$ 607	0.3%
Sprint	$ 6,322	$ 3,882	$ 1,119	$ 11,323	6.4%
T-Mobile	$ 2,677	$ 3,603	$ 2,991	$ 9,271	5.3%
US Cellular	$ 565	$ 586	$ 358	$ 1,509	0.9%
MetroPCS	$ 768	$ 955	$ 636	$ 2,359	1.3%
Leap	$ 505	$ 796	$ 577	$ 1,878	1.1%
Comcast	$ 6,158	$ 5,750	$ 3,508	$ 15,416	8.8%
Time Warner	$ 3,433	$ 3,522	$ 2,287	$ 9,242	5.3%
Cox	-	-			
Cablevision	$ 781	$ 909	$ 583	$ 2,273	1.3%
TWT	$ 260	$ 277		$ 537	0.3%
DirecTV	$ 2,523	$ 2,101	$ 1,508	$ 6,132	3.5%
DISH	$ 1,445	$ 1,130	$ 724	$ 3,299	1.9%
Network Operators Total	**$ 63,717**	**$ 63,350**	**$ 39,395**	**$ 166,462**	**94.7%**
Google	$ 2,402	$ 2,358	1,990	$ 6,750	3.8%
Yahoo	$ 602	$ 674	483	$ 1,759	1.0%
Amazon	224	333	236	$ 793	0.5%
Content Providers Total	**$ 3,228**	**$ 3,365**	**$ 2,709**	**$ 9,302**	**5.3%**
Network Operators + Content Providers Total	**$ 66,945**	**$ 66,715**	**$ 42,104**	**$ 175,764**	**100%**

Source: SEC Forms 10-K and 10-Q

* CenTel 3Q09 includes Embarq


Employees - 2008
301,000
223,900
100,000
56,000
46,600
20,222
20,700
13,600
AT&T
Verizon
Comcast
Sprint
Time Warner Cable
Google
Amazon
Yahoo

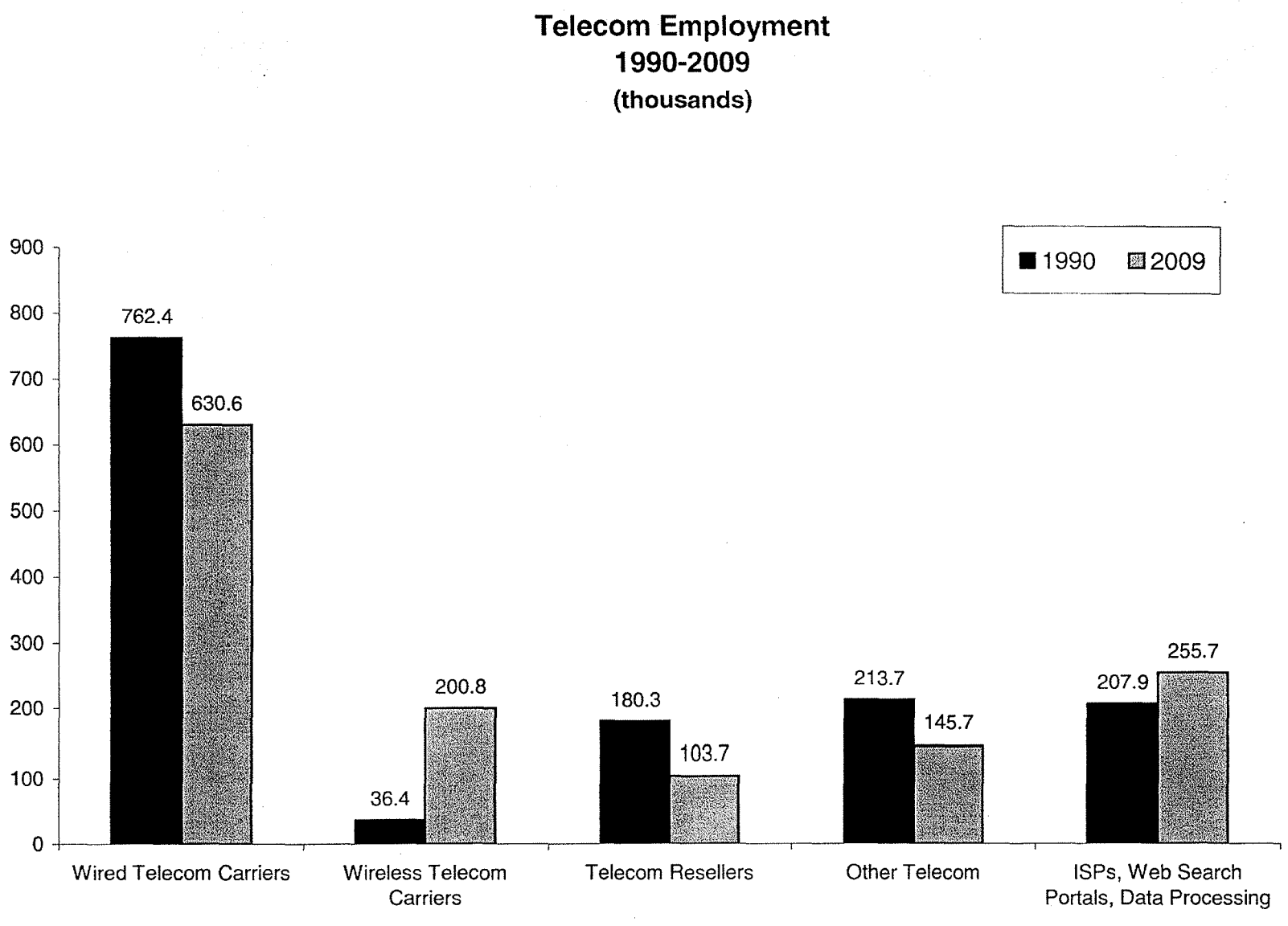
Jobs at Broadband Network Companies
Far Exceed Jobs at Applications Companies

Network Providers	Employees	Applications Providers*	Employees
AT&T	301,000	Amazon	20,700
Verizon	223,900	Google	20,200
Comcast	100,000	Yahoo	13,600
Sprint	56,000	Ebay Inc.	16,200
Time Warner Cable	46,600	Expedia	8,050
Qwest	30,500	IAC	3,200
Cablevision	17,800	Cbeyond	1,691
Windstream	7,300	Facebook	800
Frontier	5,400	TiVo Inc	463
MediaCom	4,400	Linkedin	320
Cinn Bell	3,300	Zynga	250
Total	**796,200**	Craigslist	30
		Digg	68
		Flickr	Owned by Yahoo
		Meetup	NA
		Mozilla	40
		OpenDNS	NA
		Skype	Owned by Ebay
		Twitter	NA
		Vuze	30
		Youtube	owned by Google
		Total	**85,642**

Network providers include 11 largest telecom, cable, wireless employers, excluding privately-held Cox Cable for which data is not available.

Applications providers includes signatories of letter to FCC Chairman Julius Genachowski on open Internet policies, dated Oct. 19, 2009

Source: yahoo.com; Craigslist.com; allthingsdigital.com; Lexis/Nexis; SEC Forms 10-K for year ending 2008



Source: BLS, Current Employment Statistics Survey

Employment in Communications, 2004 Percent Minority, Percent Female Median Weekly Earnings – Union v Non-Union				
			Median Weekly Earnings (full-time)	
Industry	**Percent Minority**	**Percent Female**	**Union**	**Non-Union**
Wired Telecom	33.8%	45.2%	$931	$631
Wireless & Other Telecom	40.8%	54.3%	$920	$581
Radio/TV/Cable	38.3%	41.2%	$697	$588
ISPs	28.8%	44.4%	n/a	$538

Source: Institute for Women's Policy Research, *Making the Right Call: Jobs and Diversity in the Communications and Media Sector,* 2006