
**Before the
Federal Communications Commission
Washington, DC 20554**

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

To: The Commission

**COMMENTS OF THE
TELECOMMUNICATIONS INDUSTRY ASSOCIATION
REGARDING UNDERDEVELOPED ISSUES IN THE OPEN INTERNET
PROCEEDING**

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TABLE OF CONTENTS

I.	INTRODUCTION AND SUMMARY	1
II.	THE COMMISSION SHOULD EFFECTUATE CONSENSUS VIEWS BY MODIFYING THE <i>POLICY STATEMENT</i> , NOT BY REPLACING IT WITH INTRUSIVE REGULATION.....	3
A.	The Flexible <i>Policy Statement</i> Framework Has Been a Great Success and Should Be Maintained.....	3
B.	With Limited Exceptions, TIA Generally Supports the Five Elements of Agreement Enumerated in the <i>Public Notice</i>	4
1.	Any Future Anti-Discrimination Principle or Rule Should At Most Bar <i>Anticompetitive</i> Discrimination.....	5
2.	TIA Supports a <i>Consumer</i> -Based Disclosure Principle that Does Not Single Out Specific Offerings, such as Specialized Services	6
C.	The Commission Could Successfully Promote the Consensus Described in the <i>Public Notice</i> by Updating the <i>Policy Statement</i>	8
III.	THE COMMISSION MUST RECOGNIZE THE BENEFITS OF SPECIALIZED SERVICES AND APPROACH THESE SERVICES WITH REGULATORY CAUTION.....	8
A.	The Commission Should Define Specialized Services Broadly and Should Not Impose Restrictions on Their Offering	9
B.	An Open Internet Framework Can Accommodate Specialized Services as Well as a Robust Public Internet.....	11
IV.	ANY REGULATION OF WIRELESS BROADBAND SERVICE MUST RECOGNIZE THE UNIQUE FEATURES OF THE WIRELESS PLATFORM AND STRIVE TO MAXIMIZE BENEFIT TO CUSTOMERS.	14
A.	The Open Internet Must Be Managed in Order to Provide a Neutral, Fair, and Equitable Experience for All Consumers, Regardless of the Platform.....	14
B.	Broadband Wireless Networks Face Unique Management Challenges	16
1.	Wireless Broadband Networks Face Bandwidth and Capacity Constraints Due To Spectrum Availability.....	17
2.	Wireless Broadband Networks Must Be Carefully Managed To Meet End User Expectations.....	19
V.	CONCLUSION.....	21

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I. INTRODUCTION AND SUMMARY

The Telecommunications Industry Association (“TIA”) appreciates the opportunity to address the “underdeveloped issues” identified by the September 1, 2010 *Public Notice* in this docket.¹ TIA’s 600 member companies manufacture or supply the products and services used in the provision of broadband and broadband-enabled applications in every industry and market, including healthcare, education, security, public safety, transportation, government, military, environment, and entertainment. As such, TIA is – like the Commission itself – deeply committed to policy outcomes that promote the deployment and adoption of broadband solutions, and that do so in a way that best ensure transparency and maximize consumer benefit.

As detailed below, TIA generally supports the consensus views identified in the *Public Notice*. However, we believe that this consensus would most appropriately and effectively be

¹ See *Further Inquiry Into Two Under-Developed Issues in the Open Internet Proceeding*, GN Docket No. 09-191, WC Docket No. 07-52, Public Notice, DA 10-1667 (rel. Sept. 1, 2010) (“*Public Notice*”).

promoted through amendment of the flexible *Internet Policy Statement*, rather than through the adoption of prescriptive rules. For five years, the *Policy Statement* framework has protected consumers while fueling aggressive broadband growth. TIA supports amendment of the *Policy Statement* to encourage consumer-based disclosure regarding the material details of a user's service plan. In contrast, third-party disclosure requirements would undercut Internet Service Providers ("ISPs") ability to manage their networks. Likewise, a non-discrimination mandate would dramatically undermine investment, innovation, and consumer demand. If the Commission nevertheless opts to impose such a mandate, it must at least limit its scope to prohibit only *anticompetitive* discrimination.

TIA also urges the Commission to recognize and protect the consumer benefits associated with the proliferation of specialized services. The heavy-handed requirements contemplated by the *Public Notice* – which include affirmative limits on the scope of permissible specialized offerings and mandates regarding the ways in which ISPs offer Internet access – would stifle innovation and deprive consumers of the services they demand. Rather, the Commission should afford ISPs a wide berth by defining specialized services broadly, permitting a wide range of medical, educational, entertainment, and business-related applications to develop based on consumer needs rather than regulatory prescription. As described below, this course is wholly compatible with the development of a robust and open "public" Internet, in which ISPs will continue to invest.

Finally, the Commission must approach the regulation of wireless broadband services mindful of the wireless platform's unique features. TIA has long argued for technology-neutral policies that do not adversely impact or benefit one particular platform. Wireless broadband networks, like other broadband networks, require extensive management, and always have. In at

least some cases, the inherently shared nature of the spectrum resources on which wireless ISPs rely, as well as capacity limitations associated with that spectrum, may pose unique management challenges. The Commission's policy framework must recognize those challenges.

II. THE COMMISSION SHOULD EFFECTUATE CONSENSUS VIEWS BY MODIFYING THE *POLICY STATEMENT*, NOT BY REPLACING IT WITH INTRUSIVE REGULATION

A. The Flexible *Policy Statement* Framework Has Been a Great Success and Should Be Maintained.

At the outset, it is important to emphasize that the Commission's ongoing regulatory approach, as reflected in its 2005 *Policy Statement*, has been successful in promoting a vibrant Internet ecosystem and in encouraging significant investment in the development and deployment of broadband infrastructure.² As TIA has explained in the past, the *Policy Statement* provides a flexible framework under which the Commission and industry can adapt more readily to the rapid evolution and convergence of technologies and innovations than under a detailed, inflexible regulatory regime.³ Indeed, several of the elements of agreement highlighted in the *Public Notice* – such as the rights of consumers to send and receive lawful content and use lawful applications and services, and the ability of broadband providers to reasonably manage their network – are directly derived from the *Policy Statement*.

The benefits that have flowed from the *Policy Statement* stem from its flexibility and the signals it sends to market actors, rather from any prescriptive, heavy-handed requirements. Put

² See *Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities, Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA Safeguards and Requirements; Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Policy Statement, 20 FCC Rcd 14986 (2005) (“*Policy Statement*”).

³ See Comments of the Telecommunications Industry Association, GN Docket No. 09-191, WC Docket No. 07-52, at 17-22 (filed Jan. 14, 2010) (“TIA Open Internet Comments”); Comments of the Telecommunications Industry Association, GN Docket No. 10-127, at 7-10 (filed July 15, 2010) (“TIA Third Way Comments”).

differently, the *Policy Statement*'s lack of detailed mandates and prohibitions is not a sign of its weakness, but rather a critical component of its strength.⁴ Industry and consumers have responded to the *Policy Statement* and the related regulatory framework favorably, with unprecedented levels of investment and innovation. For these reasons, in considering the “complex issues” raised in the *Public Notice*,⁵ the Commission should recognize that the *Policy Statement* is in fact the ideal vehicle to govern this inquiry. For example, rather than becoming embroiled in an effort to develop a specific set of restrictions and limitations on specialized services⁶ that may be outdated in a year or two, the Commission should continue to rely on the flexibility of the *Policy Statement* to guide its regulatory oversight – while continuing to ensure that the innovation, vitality and openness that characterize today’s Internet are maintained in the future.

B. With Limited Exceptions, TIA Generally Supports the Five Elements of Agreement Enumerated in the *Public Notice*

In the *Public Notice*, the Commission has identified five elements of purported agreement in the proceeding (at least with respect to fixed or wireline broadband platforms):

- (1) That broadband providers should not prevent users from sending and receiving the lawful content of their choice, using the lawful applications and services of their choice, and connecting the non-harmful devices of their choice to the network.
- (2) That broadband providers should be transparent regarding their network management practices.
- (3) That with respect to the handling of lawful traffic, some form of anti-discrimination protection is appropriate.

⁴ See, e.g., *Preserving the Open Internet, Broadband Industry Practices*, Notice of Proposed Rulemaking, 24 FCC Rcd 13064, 13118 (2009) (“Since the adoption of the *Internet Policy Statement* in 2005, alternative platforms for accessing the Internet have flourished, unleashing tremendous innovation and investment. In particular, wireless broadband Internet access has emerged as a technology that, from a consumer’s perspective, now supports many of the same functions as DSL and cable modem service.”) (“*Open Internet NPRM*”).

⁵ *Public Notice* at 2.

⁶ For purposes of these Comments, TIA uses the term “specialized services” to refer to specialized and managed offerings, as those terms are used in the *Open Internet NPRM* and the *Public Notice*.

- (4) That broadband providers must be able to reasonably manage their networks.
- (5) That enforcing high-level rules of the road through case-by-case adjudication is a better policy approach than promulgating detailed, prescriptive rules.⁷

Except as detailed below, TIA generally supports these observations and believes that the *Policy Statement* could easily be modified to accommodate these key elements. Continued reliance on an updated *Policy Statement* would allow the Commission to monitor the market and, in conjunction with other agencies, take action against anticompetitive conduct in the unlikely event that competition does not thwart such behavior.⁸

1. Any Future Anti-Discrimination Principle or Rule Should At Most Bar Anticompetitive Discrimination

If the Commission opts to impose a non-discrimination principle or rule notwithstanding the deleterious effects such a rule would have for investment, innovation, and consumer demand in the broadband marketplace, that rule must at the least be qualified such that it proscribes only *anticompetitive* discrimination. TIA has agreed with the parade of commenters in this proceeding urging the Commission to reject any proposed “strict” nondiscrimination requirement in favor of a standard that permits and promotes flexible, consumer-oriented development of the Internet.⁹ There simply is no basis for a blanket rule barring all traffic prioritization or quality of

⁷ *Public Notice* at 1-2.

⁸ See TIA Open Internet Comments at 20. While the Commission has appeared quick to perceive limits to its current oversight approach following the *Comcast* case, that decision does not require the Commission to explore alternative legal theories for broadband regulation, particularly as the Commission retains direct authority over broadband service with respect to certain key policy goals. In addition, the *Comcast* court acknowledged that the Commission could exercise its ancillary authority over matters reasonably related to those Congressional statements of policy when combined with other “express delegations of authority.” Because broadband Internet service is classified as an information service, the Federal Trade Commission also retains jurisdiction to enforce the Federal Trade Commission Act’s prohibition against unfair, deceptive, or anticompetitive practices by broadband Internet service providers. TIA Third Way Comments at 27-31.

⁹ For example, Amazon.com, a long-time proponent of “net neutrality” rules, has urged modification of the FCC’s proposed non-discrimination rule to allow various types of discrimination. See Comments of Amazon.com, GN Docket No. 09-191, WC Docket No. 07-52, at 2 (filed Jan. 14, 2010). Alcatel-Lucent correctly explains not only that the Commission’s consideration of an unqualified nondiscrimination standard is unsupported by any clear showing that the current rules are inadequate, but also that such a strict regulation, which typically has been limited to monopoly markets, “will harm the very innovation and investment the Commission is seeking to protect.”

service enhancements.¹⁰ If, nonetheless, the Commission ultimately decides to modify the *Policy Statement* to adopt a non-discrimination principle, then it should limit that principle to bar only “anticompetitive” – or at most “unreasonable” – discrimination. Such an approach would still allow the Commission to pursue potential “bad actors” but would also allow providers and manufacturers some level of flexibility to manage, innovate and invest in their networks.

2. TIA Supports a *Consumer*-Based Disclosure Principle that Does Not Single Out Specific Offerings, such as Specialized Services

It is axiomatic that free markets require the free flow of information regarding the goods and services for sale. Indeed, economists often cite a lack of information as one of the two main causes of market failure.¹¹ This principle applies to the broadband market as well. For this reason, TIA has long urged the Commission to adopt a *consumer*-based disclosure principle that calls for consumers to receive relevant information regarding their broadband service plans.¹² Consumers should have meaningful information regarding key aspects of their service plans, including upstream and downstream throughput speeds, bandwidth usage limitations, the use of

Comments of Alcatel-Lucent, GN Docket No. 09-191, WC Docket No. 07-52, at 24 (filed Jan. 14, 2010) (“Alcatel-Lucent Comments”). Nokia Siemens emphasizes that the draft rule’s “starting premise that all ‘discrimination’ is unwarranted is fundamentally flawed.” Comments of Nokia Siemens Networks US LLC, GN Docket No. 09-191, WC Docket No. 07-52, at 3 (filed Jan. 14, 2010) (“Nokia Siemens Comments”). As Cisco notes: “At the very most, if the Commission does adopt some form of the proposed nondiscrimination rule, it should only adopt a requirement barring anticompetitive discrimination that results in substantial consumer harm. Absent these qualifiers, a blanket nondiscrimination requirement would affirmatively bar even practices that are widely recognized as enhancing consumer welfare.” Comments of Cisco Systems, Inc., GN Docket No. 09-191, WC Docket No. 07-52, at 8 n.14 (filed Jan. 14, 2010).

¹⁰ Communications Workers of America write that the “strict nondiscrimination language would prohibit broadband Internet services providers from providing different levels of quality-of-service.” Comments of Communications Workers of America, GN Docket No. 09-191, WC Docket No. 07-52, at 14-16 (filed Jan. 14, 2010) (“CWA Comments”).

¹¹ See, e.g., Robert S. Pindyck & Daniel L. Rubinfeld, *Microeconomics* 294 (5th ed. 2001) (“Market failure can also occur when consumers lack information about the quality or nature of a product and so cannot make utility-maximizing purchase decisions. Government intervention (e.g., requiring ‘truth-in-labeling’) may then be desirable.”). The other principal cause for market failure is the presence of externalities. *Id.*

¹² See High Tech Broadband Coalition Letter to Michael K. Powell, Chairman, Federal Communications Commission, CS Docket No. 02-52 *et al.* (Sept. 25, 2003) (“HTBC September 2003 Letter”). See also HTBC filings in CS Docket No. 02-52; GN Docket No. 00-185; CC Dkt Nos. 02-33, 95-20 & 98-10.

technologies designed to block spam, viruses, or other content deemed to be harmful, and any other limitations associated with a particular service plan.¹³ The provision of such meaningful information will allow consumers to make informed decisions among competing providers and will enable the Commission to rely on the market in the first instance, rather than on heavy-handed regulation, to prevent misconduct.¹⁴

Yet, while TIA has long agreed that the market will function best with a *consumer*-based disclosure principle, it is troubled by the *Public Notice*'s suggestion that providers would be required to "disclose information sufficient to enable consumers, third parties, and the Commission to evaluate and report on specialized services, including their effects on the capacity of and the markets for broadband Internet access service and Internet-based content, applications, and services."¹⁵ There is no indication that the provision of specialized services has a direct effect on the performance of broadband Internet access service, and the proposed disclosure requirement would far exceed what any reasonable consumer would need in order to determine whether or not to subscribe to a broadband service. Also, absent a clear track record of harm, it is unclear why the Commission would potentially upset the management of the broadband network by requiring broadband Internet access providers distribute to unnamed "third parties" detailed information about the management and operation of the underlying network. Thus,

¹³ See Comments of the Telecommunications Industry Association, WC Docket No. 07-52 *et al.*, at 23 (filed Feb. 13, 2008) (filed in response to *Comment Sought on Petition for Declaratory Ruling Regarding Internet Management Policies*, Public Notice, 23 FCC Rcd 340 (2008); *Comment Sought on Petition for Rulemaking to Establish Rules Governing Network Management Practices by Broadband Network Operators*, Public Notice, 23 FCC Rcd 343 (2008)).

¹⁴ As Atkinson and Weiser comment: "To the extent that [broadband usage policies are transparent], it is quite possible that the most effective protection for consumers will be their own vigilance about what services network providers offer them. To facilitate such vigilance, all providers should be required to state clearly to what extent content and services enjoy preferential delivery opportunities and to what extent limitations exist on the ability of consumers to access the content and services of their choice." Robert D. Atkinson and Philip J. Weiser, *A Third Way on Network Neutrality*, The New Atlantis (Summer 2006).

¹⁵ *Public Notice* at 3.

while TIA supports a new principle of *consumer* disclosures, it cannot support the Commission’s proposal to require sweeping disclosure related to specialized services as set forth in the *Public Notice*.¹⁶ Such an approach would be highly intrusive into the customer-provider relationship and could hamper the ability of providers to compete and to secure their networks.

C. The Commission Could Successfully Promote the Consensus Described in the *Public Notice* by Updating the *Policy Statement*

Notwithstanding the identification of “under-developed” issues in the *Public Notice*, TIA believes that the Commission need not attempt to solve the many questions raised, given the evolving market place with respect to both specialized services and wireless broadband. Rather, the broadband ecosystem would best be served by a Commission approach to network management that reflects the successful *Policy Statement* and adds a consumer-based disclosure principle. Given the lack of demonstrated harm with respect to specialized services and wireless broadband, the Commission should continue to embrace the *Policy Statement* and the flexibility it affords all broadband service providers and infrastructure manufacturers.

III. THE COMMISSION MUST RECOGNIZE THE BENEFITS OF SPECIALIZED SERVICES AND APPROACH THESE SERVICES WITH REGULATORY CAUTION

In the *Open Internet NPRM*, the Commission was correct to recognize the consumer benefits of specialized services and to view any regulation of these services with caution.¹⁷ Thus, it is particularly troubling that the *Public Notice* contemplates a number of heavy-handed approaches to regulating specialized services – such as allowing “broadband providers to offer only a *limited* set of new specialized services” or *requiring* providers “to continue providing or

¹⁶ As previously discussed, TIA was a member of the HTBC, which first set forth broadband “connectivity principles” over six years ago. First among these was a principle stating that “[c]onsumers should receive meaningful information regarding their broadband service plans.” See *HTBC September 2003 Letter*.

¹⁷ *Open Internet NPRM*, 24 FCC Rcd at 13116-17. Specifically, the Commission notes that the “existence of [managed and specialized] services may provide consumer benefits, including greater competition among voice and subscription video providers, and may lead to increased deployment of broadband networks.” *Id.* at 11316.

expanding network capacity allocated to broadband Internet access service” – in order to address unsupported “concerns” that were raised during the comment cycle.¹⁸ Absent a clear and documented problem, the Commission must not act to stifle the development of specialized services in the manner suggested by the *Public Notice* given their clear public interest benefits, as documented below.

A. The Commission Should Define Specialized Services Broadly and Should Not Impose Restrictions on Their Offering

Although all services that fall within the umbrella of the “managed” or “specialized services” label may share some common traits and characteristics, the Commission should proceed cautiously as it seeks “Definitional Clarity” with regard to these services.¹⁹ Any steps toward narrowly defining specialized services could have the unintended consequence of freezing the innovation that is the hallmark of these valuable services, contrary to the public interest. In considering a definition, the Weldon Declaration submitted with TIA’s Open Internet Comments makes clear that “we are entering a period of tremendous change in the definition of managed services” and, as a result, “there is a very real risk that any attempt to explicitly and narrowly define what is a ‘Managed Service’ or to limit the number or variety of such services that are permitted, will seriously miss the mark and stifle innovation.”²⁰ Thus, to the extent the Commission considers defining specialized services at all, it should only do so in the broadest possible way.

¹⁸ *Public Notice* at 4 (emphasis added).

¹⁹ *Id.* at 3. See also *Open Internet NPRM*, 24 FCC Rcd at 13117 (asking “how should we define the category of managed or specialized services?”).

²⁰ Declaration of Marcus Weldon at 9 (“Weldon Declaration”) (submitted with TIA Open Internet Comments). See also Declaration of Kenneth Ko and Kevin Schneider at 23 (“Ko & Schneider Declaration”) (submitted with TIA Open Internet Comments).

Commenters before the FCC have acknowledged the difficulties presented by fashioning a coherent and long-lasting definition for specialized services.²¹ To date, policymakers have principally identified managed and specialized services by example. In the *Open Internet NPRM*, the Commission highlights AT&T's UVerse, eLearning, telemedicine and smart grid applications as examples of managed and specialized services.²² Indeed, as individual business, government and consumer requirements differ greatly, so too do the characteristics of what many consider to be managed and specialized services. Specialized services generally require one or several of the following elements: (i) guaranteed (low) packet loss; (ii) guaranteed (low) packet delay; (iii) secure, private connectivity; and (iv) guaranteed bandwidth.²³ These attributes are not universal, however, further complicating efforts to define these services.²⁴ In addition, different managed and specialized services may reside at different places within and across different networks in the future.²⁵ In light of these varied attributes, the nascency of the

²¹ See, e.g., Comments of AT&T, Inc., GN Docket No. 09-191, WC Docket No. 07-52, at 101 (filed Jan. 14, 2010) ("AT&T Comments") (The Commission "w[ill] be hard-pressed . . . to come up with any type of workable definition of "managed services." That category would have to be defined broadly enough to encompass the range of evolving services that broadband providers and their partners will develop (if permitted) over the coming years."); CWA Comments at vii ("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."); Comments of Public Knowledge *et al*, GN Docket No. 09-191, WC Docket No. 07-52, at 32 (filed Jan. 14, 2010) ("At present, the Commission should not define or classify such managed services because the record is not yet clear on what types of services would fall under this category."); Comments of US Telecom, GN Docket No. 09-191, WC Docket No. 07-52, at 54 (filed Jan. 14, 2010) ("[I]t will be difficult for the Commission to define the precise services that constitute managed services. While the Commission notes some possible examples, such as specialized telemedicine, smart grid, or eLearning applications, these are just some of the many existing and potential applications and services.").

²² *Open Internet NPRM*, 24 FCC Rcd at 13116-17; Similarly, in their consideration of managed services, the National Telecommunications and Information Administration and the Rural Utilities Service chose only to define these services by example, citing telemedicine, public safety communications, and distance learning applications, which use private network connections rather than the public Internet. Broadband Initiatives Program; Broadband Technology Opportunities Program Notice, 74 Fed. Reg. 33104, 33111 (July 9, 2009) ("*Broadband NOFA*").

²³ See Weldon Declaration at 1-2.

²⁴ See *id.* at 2-3. For example, audio communications services require minimal packet delay and a minimum bandwidth guarantee but may not have stringent packet loss requirements. In contrast, video communications do require minimal delay, a bandwidth guarantee and low packet loss.

²⁵ A second, emerging category of specialized services are requested directly by the end consumer as a result of an enhanced QoS need and represent a far more diverse array of services (e.g., cloud computing and web content

specialized services marketplace,²⁶ and the lack of documented problems, it would be premature for policymakers to intervene with any regulation in this area.

B. An Open Internet Framework Can Accommodate Specialized Services as Well as a Robust Public Internet

It is important for the Commission to recognize the numerous benefits that specialized services currently offer to American consumers and the U.S. economy. Specialized services provide potentially life-saving benefits in the form of telehealth, entertainment options such as IPTV or online gaming, and energy savings through the use of remote home monitoring. For government and public users, specialized services can provide necessary quality of service (“QoS”) and security protections for public safety communications and emergency messaging.²⁷ For businesses, specialized services can permit cutting-edge remote “telepresence”; reduce and stabilize costs, including IT operations and transport expenses; increase the ease of communication; promote efficient business practices; provide access to the latest technology with limited risk; and make it easier to adapt to changing business conditions. To these ends, specialized services also drive marketplace expansion and network innovation.

In turn, global markets as well as the U.S. workforce and citizenry expect that their managed and specialized services will work in an uninterrupted and timely fashion. There is little to no tolerance for latency, jitter, packet loss or lack of availability for these business- or mission-critical services. A misguided decision to restrict the development of specialized

delivery). Whereas the first category of services are generally provided over managed IP networks, the second category would be delivered over the public Internet to the edge of the operator network, at which point the services will take advantage of the typical managed IP delivery architecture. *See id.* at 5.

²⁶ Comments of Alliance for Telecommunications Industry Solutions, GN Docket No. 09-191, WC Docket No. 07-52, at 5 (filed Jan. 14, 2010); Comments of Comcast, GN Docket No. 09-191, WC Docket No. 07-52, at 64-67 (filed Jan. 14, 2010); Comments of Qualcomm, GN Docket No. 09-191, WC Docket No. 07-52, at 25 (filed Jan. 14, 2010).

²⁷ National Broadband Plan Policy Framework, December 16, 2009 – FCC Open Meeting, at 33-34, *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-295259A1.pdf (noting National Broadband Plan goals and options relating to public safety, including “preserve broadband communications during emergencies.”).

services in one form or another (as contemplated in the *Public Notice*) would severely undermine the expectations of enterprise and retail customers.²⁸

The prescriptive approaches offered in the *Public Notice* would severely undercut the substantial benefits associated with specialized services. Many specialized services are deliberately offered outside of the best-effort Internet precisely on account of the value or sensitivity of the content or the need for quality-of-service guarantees not available on the best effort Internet. A managed service “offers the end user content, applications and services in a manner that has a higher level of QoS when compared to best effort broadband Internet access service,”²⁹ The *Public Notice*, however, threatens to deprive providers and users of the options afforded by these services. For instance, the Commission’s suggestion that it might limit providers to only offer specialized services “with functionality that cannot be provided via broadband Internet access service”³⁰ could compromise a provider’s ability to offer IPTV, or could undermine that service’s security and integrity.³¹ Indeed, the *Public Notice*’s concerns about the ‘weakening’ of “Open Internet protections”³² seems to ignore the fact that prioritization is critical to many specialized services. Similarly, and likely in direct conflict with the *Public Notice*’s suggested disclosure approach, specialized services typically are offered as complete products to end users, and the network management and security tools used therein may be proprietary, such as those used for traditional VPN services.³³ Mandatory public disclosure of specialized services protocols and other sensitive information could compromise

²⁸ See Weldon Declaration at 10-12.

²⁹ *Id.* at 12.

³⁰ *Public Notice* at 4.

³¹ Weldon Declaration at 11.

³² *Public Notice* at 2.

³³ *Id.* at 3 (“Require providers to disclose information sufficient to enable consumers, third parties, and the Commission to evaluate and report on specialized services, including their effects on the capacity of and the markets for broadband Internet access service and Internet-based content, applications, and services.”).

the QoS or security guarantees that are essential to the viability of managed and specialized services.³⁴

Finally, it wholly inappropriate for the FCC to somehow link the allocation of network capacity for broadband Internet access services to that used for specialized services.³⁵ Managed and specialized services promote the public interest; they do not harm or threaten the public Internet. The Weldon Declaration makes clear that service providers' business plans depend on both robust specialized services as well as high speed Internet.³⁶ To date, specialized service offerings have peacefully coexisted with and complemented the public Internet, and there is no evidence that this balance is at risk. Just like firms in other industries, network providers have reason to develop distinctive and complementary products to serve different consumer needs. Providers have every reason to promote the development and use of the public Internet, which will continue to be a transformative technology for the foreseeable future, even while they develop specialized services to address specific needs of public and private entities whose needs are not served by that public Internet.³⁷

All of the prescriptive approaches outlined above will simply serve to derail the innovation and investment in specialized services that has characterized the market to date and will lead to the disruption of the many public interest benefits resulting from the robust development and deployment of specialized services. Regulatory constraints on specialized services would cap their growth and possibly preclude consumer adoption of the services they

³⁴ Weldon Declaration at 12-13.

³⁵ *Public Notice* at 4 (“Require broadband providers to continue providing or expanding network capacity allocated to broadband Internet access service, regardless of any specialized services they choose to offer.”).

³⁶ *Id.* at 5.

³⁷ Indeed, continued development of specialized services can only promote the advancement of the Internet, because research, development, and innovation with respect to the former will surely be adapted to improve the latter.

want. As the Commission contemplates specialized services in this proceeding, it must recognize the innovations that specialized services have begun, and will continue, to yield.

IV. ANY REGULATION OF WIRELESS BROADBAND SERVICE MUST RECOGNIZE THE UNIQUE FEATURES OF THE WIRELESS PLATFORM AND STRIVE TO MAXIMIZE BENEFIT TO CUSTOMERS.

TIA has long believed that technologies should succeed or fail based on their merits, not on the advantages conferred by government regulation, or lack thereof.³⁸ Thus, as it considers the application of Open Internet principles to mobile wireless platforms in the *Public Notice*, TIA urges the Commission not to take action that will significantly (and negatively) impact one particular broadband platform over another. Ultimately, the Commission is best served by continuing to rely on the flexible *Policy Statement*, so that providers can implement network management techniques – consistent with the four existing principles and a new consumer-based disclosure principle – that best apply to the technology platform at hand and best meet the needs of their broadband customers.

A. The Open Internet Must Be Managed in Order to Provide a Neutral, Fair, and Equitable Experience for All Consumers, Regardless of the Platform

TIA has stressed in this proceeding that the open Internet is, and always has been, a managed Internet.³⁹ TIA has chronicled the movement over the past three decades to drive more and more intelligence into the network core through the use of a variety of management techniques.⁴⁰ This development has significantly promoted the user experience during a time of

³⁸ See, e.g., Comments of the Telecommunications Industry Association, In the Matter of American Recovery and Reinvestment Act of 2009 Broadband Initiatives, Docket No. 090309298-9299-1, at 10-11 (Apr. 10, 2009) (“*TIA BTOP/BIP Comments*”) (“Additionally, to generate the maximum benefit of broadband funds available, NTIA and RUS should take a technology-neutral position on grant awards so that all innovative technologies can be included in the BTOP and RUS programs. All forms of broadband service – wireline, wireless (of all types), satellite, or a combination thereof – offer distinct qualities that render them useful in different circumstances and regions.”).

³⁹ See TIA Open Internet Comments at 2-3, 10; Reply Comments of the Telecommunications Industry Association, GN Docket No. 09-191, WC Docket No. 07-52, at 3 (filed Apr. 26, 2010) (“*TIA Open Internet Reply Comments*”).

⁴⁰ See TIA Open Internet Comments at 3-17. See also Comments of Verizon and Verizon Wireless, GN Docket No. 09-191, WC Docket No. 07-52, at 66-67 (filed Jan. 14, 2010) (“*Verizon Comments*”) (“[A] prohibition on

exponential growth of consumer demand.⁴¹ As the Commission rightly acknowledges in the *Public Notice*, there is consensus among a number of commenters “that broadband providers must be able to reasonably manage their networks, including through appropriate and tailored mechanisms that reduce the effects of congestion or address traffic that is unwanted by users or harmful to the network.”⁴² Thus, the continued development of an intelligent managed network, not an unmanaged network, truly is the best way to ensure fair distribution of bandwidth and maximize the customer experience.⁴³

Any approach to network management must recognize that each provider will utilize specific management tools depending on its own network and associated operational considerations. For example, there may be significant differences among the scheduling algorithms used for allocating bandwidth resources among contending users on cable, wireless, and fiber platforms, based on the unique characteristics of the various platforms, and any one of the algorithms may be wholly unsuited to other platforms.⁴⁴ Thus, the Commission should not attempt to provide guidance or rules that are based on any one network or platform, because that

‘discrimination’ in the Internet context inherently lacks meaning and would be virtually impossible to interpret or apply because different forms of traffic have long been treated differently. For example, the use of content delivery networks and caching services and differing arrangements between networks for handing off traffic depending on the type of traffic involved mean that not all traffic is treated equally on the Internet today.” (citation omitted).

⁴¹ TIA Open Internet Comments at 6-11.

⁴² See *Public Notice* at 1. See also Joint Comments of Google and Verizon, GN Docket No. 09-191, WC Docket No. 07-52, at 7 (filed Jan. 14, 2010) (“We also continue to agree – as do virtually all parties – on the importance of network management. Network operators must have flexibility to manage their networks to deal with a range of network-impacting issues, including traffic congestion, spam, ‘malware’ and denial of service attacks, as well as other network threats or challenges that may emerge in the future.”).

⁴³ See Comments of George Ou, GN Docket No. 09-191, WC Docket No. 07-52, at 3 (filed Jan. 14, 2010); TIA Open Internet Comments at 10 (“The open Internet is . . . preserved through an intelligent network that uses numerous tools to meet the evolving demands of consumers.”).

⁴⁴ See generally Ko & Schneider Declaration; Declaration of Matt Tooley and Don Bowman (submitted with TIA Open Internet Comments); Declaration of Matt Grob (“Grob Declaration”) (submitted with TIA Open Internet Reply Comments).

could result in policies that put other networks and platforms at a disadvantage, contrary to the Commission's longstanding commitment to technology-neutral policies.⁴⁵

B. Broadband Wireless Networks Face Unique Management Challenges

While all broadband providers face bandwidth challenges, broadband wireless providers face a particularly unique operating environment because wireless networks are operated within limited and dynamically changing radio resources.⁴⁶ Simply put, wireless operators must contend with an environment of mobility, set spectrum resources, interference, and other unique factors that change rapidly and quickly.⁴⁷

While some have argued that there are no technical barriers precluding broadband wireless providers from complying with specific rules, these commenters misunderstand the challenges of managing a wireless broadband network and the impact such rules could have on

⁴⁵ See, e.g., *Bringing Rural Broadband to America: A Report on Rural Broadband Strategy*, 24 FCC Rcd 12791, 12800 (2009) (noting that, in assessing rural broadband, “[d]ecision makers therefore should proceed on a technology-neutral basis--by considering the attributes of all potential technologies--in selecting the technology or technologies to be deployed . . .”).

⁴⁶ Alcatel-Lucent Comments at 27; *id.* at 10 (“Notably, for wireless networks, some applications tie up a radio bearer with ‘keep alive’ control messages, but do not actually transmit any data over this bearer, effectively wasting this precious resource (spectrum).”); Comments of Clearwire Corporation, GN Docket No. 09-191, WC Docket No. 07-52, at 10 (filed Jan. 14, 2010) (“Clearwire Comments”) (“In mobile broadband networks, spectrum assets are inherently shared, creating a greater potential for network congestion than is found with a wireline broadband network, where each end user has dedicated access. The same wideband radio channel must be shared among many user sessions that may each involve many different types of data streams and protocols.”).

⁴⁷ See, e.g., Comments of T-Mobile USA, Inc., GN Docket No. 09-191, WC Docket No. 07-52, at 16-18 (filed Jan. 14, 2010) (noting that the need for wireless network management is exacerbated by the well-recognized shortage of wireless spectrum and that 3G networks worldwide could be overwhelmed by congestion in just one or two years); AT&T Comments at 142 (FCC’s focus should be on allocating more spectrum for wireless broadband, as NTIA and DOJ urged, not saddling it with new regulations); Comments of the Internet Innovation Alliance, GN Docket No. 09-191, at 9 (filed Jan. 12, 2010) (“Rather than battle over net neutrality, the FCC should lead the effort to expand spectrum availability for commercial use, identifying hundreds more megahertz that can support high-speed Internet services.”).

provider flexibility.⁴⁸ As is reflected in the declaration of Matt Grob, submitted with TIA’s Open Internet Reply Comments, wireless networks are intricate systems. These networks rely on base transceiver stations, mobile switching centers (“MSCs”), and base station controllers to link calls to the public switched telephone network or to serve as a gateway to the Internet.⁴⁹ Wireless networks must employ network management techniques to meet dramatically increased demand for wireless broadband and ensure the most efficient use of available spectrum.⁵⁰ As the Grob Declaration makes clear: “[W]ireless operators require absolute flexibility to manage their networks in light of spectrum and bandwidth limitations. Without this flexibility, the experience for all users will suffer.”⁵¹

1. Wireless Broadband Networks Face Bandwidth and Capacity Constraints Due To Spectrum Availability

The technical challenges of managing a wireless broadband network are further compounded by the increasing growth in demand for wireless broadband services in recent years.⁵² While the industry continues to develop new technologies (including HSPA, EV-DO

⁴⁸ See Comments of New America Foundation, *et al.*, GN Docket No. 09-191, WC Docket No. 07-52, at 5 (filed Jan. 14, 2010); Comments of Free Press, GN Docket No. 09-191, WC Docket No. 07-52, at 126 (filed Jan. 14, 2010) (“Fundamental to the concept of nondiscrimination and device attachment policy, for both fixed and mobile broadband networks, is that network operators should not be permitted to exercise control over the devices and applications used on an Internet access service. Consistent with this, the Commission should remain skeptical of any actions by providers of mobile broadband Internet access service to restrict the use of applications on devices, as such actions likely mask (or, less commonly, admittedly are) anti-competitive and anti-consumer behaviors that undermine the goals of this proceeding.”) (citation omitted).

⁴⁹ See Grob Declaration at 2 (“In a typical cellular wireless system, geographic areas are divided into cell sites, each of which is served by a base transceiver station (‘BTS’). To complete a call, a wireless user connects to the local BTS, which interfaces to the Mobile Switching Center (‘MSC’) via a Base Station Controller (‘BSC’)”).

⁵⁰ See *id.* at 5.

⁵¹ *Id.* at 6. See also *id.* at 5 (“In short, the growth in mobile usage in the United States has been, and continues to be, enormous.... [N]etwork congestion management techniques are essential to addressing this exponential growth as well as constantly changing traffic patterns across networks.”).

⁵² See, e.g. Grob Declaration at 4 (noting that monthly worldwide mobile data traffic in 2014 will exceed total traffic on all platforms for 2008) (citation omitted); see also *id.* at 5 (“The Pew Research Center found in April 2009 that usage of mobile devices to access the Internet had grown 73% from their prior study, which was completed just 16 months earlier. The April 2009 study found that on a typical day, approximately 19% of all Americans use the Internet on a mobile device.”) (citation omitted).

Rev. B, and LTE) to achieve higher data rates by using spectrum more efficiently,⁵³ the Grob Declaration rightly notes that “there is now, and will continue to be . . . a wireless bandwidth shortage.”⁵⁴ This is an unprecedented time of growth and technological development for mobile broadband, and indeed the entire broadband sector. In this transformative environment, the Commission should not replace the flexible framework of the *Policy Statement* with prophylactic rules for any platform, including wireless broadband.⁵⁵

It is important to recognize that the spectrum used to provide wireless broadband service are inherently shared among the operator’s customers, and that limited throughput capacity can lead to a greater potential for network congestion than is found with a wireline broadband network.⁵⁶ Indeed, “one strand of fiber-optic cable has greater capacity than the entire RF spectrum.”⁵⁷ Consequently, the same wideband radio channel must be shared among many user sessions that may each involve many different types of data streams and protocols.⁵⁸ As a result, “[i]nterference limits capacity in a wireless system on a dynamic basis, varying by location and from one millisecond to the next, and this problem has no counterpart in wireline systems.”⁵⁹

⁵³ See *id.* at 3.

⁵⁴ *Id.* at 6.

⁵⁵ See Comments of Qualcomm Incorporated, GN Docket No. 09-191, WC Docket No. 07-52, at 11 (filed Jan. 14, 2010) (“All of this growth in usage underscores the need for wireless operators to retain the unfettered flexibility to manage their networks and undermines the *NPRM*’s conclusion that the Commission should regulate wireless network management.”). See also Comments of the National Organizations, GN Docket No. 09-191, WC Docket No. 07-52 at 18 (filed Jan. 14, 2010) (The National Organizations – sixteen civil rights, professional, service and elected officials’ organizations have observed that wireless is the only broadband technology for which minority adoption and use currently indexes at higher levels than for White Americans. For these and other reasons, the group urges the Commission to allow “broadband providers the flexibility necessary to maintain the proper functioning of their networks matters for all broadband platforms, and particularly in the wireless context.”).

⁵⁶ See Clearwire Comments at 10.

⁵⁷ Rysavy Research, *Net Neutrality Regulatory Proposals: Operational and Engineering Implications for Wireless Networks and the Consumers They Serve*, at 10 (attached to Comments of Mobile Future, GN Docket No. 09-191, WC Docket No. 07-52 (filed Jan. 14, 2010)).

⁵⁸ See Clearwire Comments at 10.

⁵⁹ See Jeffrey H. Reed & Nishith D. Tripathi, *The Application of Network Neutrality Regulations to Wireless Systems: A Mission Infeasible*, at 22 (attached to AT&T Comments).

Wireless network management practices thus require use of a wide variety of algorithms, including admission-control, load-balancing, handover or handoff, scheduling, power-control, and limitations on applications causing network management issues.⁶⁰ Each of these tools is meticulously and dynamically managed to optimize capacity.

2. Wireless Broadband Networks Must Be Carefully Managed To Meet End User Expectations

The Grob Declaration highlights a variety of wireless network management techniques – including power control, vocoders, strength of signal measurements – which providers regularly use to maximize the customer’s mobile broadband experience.⁶¹ But factors outside a provider’s control, such as the number of subscribers concentrated within a specific cell, the capabilities of the customers’ wireless device, and whether the subscriber is within the provider’s coverage area, are also capable of impacting the wireless network at any time.⁶² These approaches require minute-to-minute, second-to-second, and millisecond-to-millisecond adjustments from broadband wireless providers. Such adjustments are facilitated by queuing and scheduling algorithms, along with other evolving network management techniques that vary based upon individual network attributes.⁶³ These techniques, designed to “provide particular quality of

⁶⁰ *Id.* at 26. *See also* Verizon Comments at 64 (“For example, to operate the network efficiently and optimize data throughput, operators may use sophisticated queuing and scheduling algorithms that send more packets of data to users during times of good signal-to-noise conditions and less when signal-to-noise conditions are bad. They also may restrict applications and devices that can degrade the service of other users, such as applications that keep an access connection alive for more than is needed for typical usage through the use of ‘keep alive’ and retry functions, which tie up available resources without providing any benefit to customers.”) (citations omitted).

⁶¹ *See* Grob Declaration at 7-8. *See also* Comments of Nokia Siemens Networks at 7 (“For example, in a typical UMTS/HSPA mobile radio access network today, QoS techniques can be used to differentiate treatment of traffic to ensure sufficient quality for all services while maximizing the number of users served by the available capacity.”) (“Nokia Siemens Comments”).

⁶² *See* Comments of Leap Wireless International, Inc. and Cricket Communications, Inc., GN Docket No. 09-191, WC Docket No. 07-52, at 6-7 (filed Jan. 14, 2010).

⁶³ *See* Grob Declaration at 6. *See also id.* at 10 (“When it comes to network management tools, there is no set menu of tools that carriers look to implement. The congestion management techniques that carriers use are constantly changing and evolving. In addition, each carrier takes a different approach to network management, which depends

service levels required by end users,”⁶⁴ would be threatened by the adoption of prophylactic rules that inevitably will limit network operator flexibility.⁶⁵ Further, the proposed regulations would “inhibit advances in management techniques and have direct, unintended, and likely harmful consequences upon wireless broadband service deployments, applications, devices, and innovative business models.”⁶⁶

In no way does the above discussion with regard to the need for wireless networks to engage in active management mean that wireless networks should be exempt from the principle that broadband providers should be transparent regarding their network management practices. As noted above, TIA is generally supportive of that principle, and believes that it should be applied in a technology-neutral manner to all platforms, both wireline and wireless.

upon the network configuration and deployed service (which vary on a customer-by-customer basis), as well as end-user demands, equipment, and location.”).

⁶⁴ *Id.* at 6.

⁶⁵ For example, in the case of wireless data, both 3G and 4G networks have quality of service management built into the standards. See Hannes Ekström, *QoS Control in the 3GPP Evolved Packet System*, 47 IEEE Communications Magazine, Issue 2 at 76-83 (Feb. 2009), available at <http://archive.ericsson.net/service/internet/picov/get?DocNo=5/287%2001-FGB%20101%20256&Lang=EN&HighestFree=Y>. Under the LTE standards, the network manages QoS even for non-QoS-aware applications, taking into account factors such as whether guaranteed bandwidth is necessary (and, if so, how much), the maximum bandwidth for the data stream, the user’s aggregate bandwidth budget, and the data stream’s tolerance for packet loss and delay. *Id.* at 77-80.

⁶⁶ *Id.*

V. CONCLUSION

For the foregoing reasons, TIA encourages the Commission to take action in this proceeding consistent with the recommendations set out above.

Respectfully submitted,

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