Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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

REPLY COMMENTS OF NICHOLAS BRAMBLE INFORMATION SOCIETY PROJECT AT YALE LAW SCHOOL*

FURTHER INQUIRY INTO UNDER-DEVELOPED ISSUES IN THE OPEN INTERNET PROCEEDING

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I. INTRODUCTION

In comments before the Commission, a wide variety of telecommunications providers have requested the ability to set up specialized or managed service zones and wireless network management practices where open Internet protections do not apply. For instance, AT&T has offered a list of "specialized services" (including utility meters, remote health monitors, wireless dog collars, and broadband-enabled vending machines and picture frames) that it suggests do not offer "open-ended Internet connectivity" and should not be subject to the Commission's open Internet rules.[1] On the wireless side, T-Mobile and others have argued that the Commission should not "impos[e] any restrictions that limit the flexibility of wireless broadband providers with respect to the devices and applications running on their networks."[2] Indeed, carriers have contended that they should not even be subject to disclosure rules regarding their management of specialized services and wireless access.[3]

The Commission was wise to focus on the question of how wireless and specialized services interact with proposed open Internet rules. Both types of services, if left unaddressed

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[1] *See* Comments of AT&T, GN Docket No. 09-191 at 4-6 (Oct. 12, 2010) ("AT&T Comments") (arguing that the imposition of open Internet rules would "throw a wet blanket of investment-chilling regulatory uncertainty on the nascent market" for these services).

[2] *See* Comments of T-Mobile USA, GN Docket No. 09-191 at 22 (Oct. 12, 2010) ("T-Mobile Comments").

[3] *See, e.g.*, AT&T Comments at 39 ("AT&T would have no objection to general, high-level information requests by the Commission concerning the types of service that providers are offering. . . . [H]owever, AT&T *would* object to any effort to force providers to divulge the technical details of their services to the public at large when consumers do not need to know those details . . . . Compelled disclosure of such details would be both unnecessary to protect consumers and potentially destructive."); *id*. at 70 ("[T]here is no need for prescriptive disclosure *rules* in this context because wireless broadband providers already provide effective and comprehensive disclosures to consumers"); Comments of Verizon and Verizon Wireless at 11 (Oct. 12, 2010) ("There is no need for the Commission to adopt prescriptive consumer disclosure rules at this time. Consistent with the Internet's successful history of self-governance, the Commission should encourage the development by all providers throughout the Internet ecosystem of best practices, self-regulatory principles, and similar guidelines to promote the dissemination of accurate and relevant information in plain language to consumers."); *id.* at 42 ("[T]here is no need for additional technical disclosure requirements to enable third parties to develop innovative devices and applications either for Verizon Wireless' networks or more generally."); T-Mobile Comments at 6, 8 (arguing that an obligation to disclose the technical network-management mechanisms used by a wireless provider "would confuse the average consumer and add little value to their understanding of their service" and that "[t]oo much information can lead to confusion and make it harder for the consumer to discern what is actually relevant").

by the Commission's rulemaking process, could weaken the open Internet rules of the road that ultimately emerge from the Commission's process. Were the Commission to permit separate rules – or even no rules at all – to govern the different methods by which users obtain access to the Internet, it would compromise not just its own capacity to analyze and compare network management techniques across different providers, but also the ability of innovators at the content, application, and service layers to build and distribute new products and services upon an open and consistent architecture.

With those concerns in mind, the following reply comment proposes that a two-step path is necessary to ensure that the Commission's rules of the road are not eviscerated by overbroad definitions of specialized services or by discriminatory wireless network management practices that preclude effective access to the Internet.

II. SPECIALIZED SERVICES

First, the Commission should limit the category of "specialized services" to non-general-purpose services that cannot be offered over the best-efforts Internet. In practice, this would mean clarifying that "specialized services" are services that either (a) cannot be offered over the best-efforts Internet – and have not traditionally been offered over the Internet – due to performance or reliability requirements or (b) do not involve two-way transmission of user-requested information. Examples might include high-definition telemedicine, and applications or devices that either only transmit or only receive information (and thus have no need for a user interface). Other communicative activities that *can* be performed or transmitted over best-efforts Internet connectivity or that do require active user input would not be included within the definition.

In applying the components of this definition of "specialized services," it would be wise to err on the side of underinclusion, given that an item such as a wireless dog collar that might initially seem to have only a single function – transmitting GPS coordinates of the dog's location when lost[4] – might eventually serve additional functions that the specialized service provider had not originally contemplated and that would require a greater degree of Internet connectivity in order to function properly. For instance, a wireless dog collar might be modified to:

- alert the dog and its owner when friends of the dog (or its owner) are nearby through a check-in functionality on Foursquare or Facebook;
- record user-requested environmental and sensory details beyond mere location;
- transmit a record of the dog's movement and physical activity throughout the day to MapMyRun;
- provide an input for the dog or its owner to tag or add further details at a given location and send this information to a geotagging website or Wikipedia;
- provide a more sophisticated Internet-based input/output system such that the dog could hear or visualize commands issued by its owner via an @dogname signal from Twitter and respond in such a way that its actions (barking, sitting down, moving towards a certain direction, etc) could be recorded and communicated via an @-based reply back to its owner on Twitter;
- or send a message to emergency officials, in a situation where the dog had not left a confined area for a certain period of time, indicating that the dog's owner might be hurt or incapacitated.

The point of this filing is not to provide an exhaustive list of potential dog-collar functionalities that might one day rely upon Internet connectivity. It is simply to make the point that an open network allows a wide variety of differentially motivated users to develop such functionalities and to transform a specialized service into a general service.[5] In addition, placing the packets associated with such functionalities on the open Internet, rather than within a specialized service managed by a single provider, fosters a level and competitive

[4] *See* AT&T Comments at 6.
[5] The user-driven development of such functionalities would also require placing the decision in the hands of users, rather than a single service provider, as to whether a given functionality should be the beneficiary of a higher quality of service.

playing field in which the manufacturer with the best wireless dog collar (*i.e.*, the one that is able to attract the most users or the highest degree of user-generated innovation) wins, not the manufacturer who is able to strike the first or most exclusive deal with a carrier.[6] The second half of the following section offers a more detailed justification of the centrality of questions about innovation to the Commission's implementation of Open Internet rules.

III. MANAGEMENT OF WIRELESS ACCESS TO THE INTERNET

Few would object that wireless networks differ from wireline networks with respect to propagation characteristics, mobile usage properties, and other capacity constraints, but these differences do not indicate that the core purpose of wireless Internet access differs from the purpose of wireline Internet access from the perspective of users.[7] Any regulatory framework that grapples with the user-based challenges of wireline networks should and must also be capable of grappling with the user-based challenges of wireless networks. Adopting divergent regulatory frameworks for convergent modes of Internet access is both unnecessary and harmful to innovation.

In the course of explaining why a convergent framework is necessary, this section first explains that the real differences between wireless and wireline Internet access can be adequately addressed by rules of network management that respond to constraints on network capacity rather than to individual applications or services. It then discusses the harms to

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[6] *See* Barbara van Schewick, INTERNET ARCHITECTURE AND INNOVATION 351 (2010) (summarizing the stories of PayPal and Flickr as demonstrative of the principle that "giving application developers direct access to users lets them experiment and change their product offerings in response to user feedback").

[7] *See* Comments of Brighthouse Networks, GN Docket No. 09-191 at iii (Oct. 12, 2010) ("The distinction between 'wireless' and 'wired' networks has become entirely artificial. Wireless devices . . . all initially communicate with a nearby antenna, but then immediately transfer their Internet communications to a 'wired' network. Moreover, CMRS-based devices like the iPhone and many Android-based phones, are, increasingly, WiFi devices as well, allowing users to switch between CMRS and WiFi networks at will, further blurring any distinction that may once have existed.")

innovation that might arise if carriers were granted free rein to decide which devices and applications should and should not be permitted to run on their networks.

A. Reasonable Network Management of Wireless Internet Access Services

The rule for distinguishing reasonable from unreasonable wireless network management should be kept simple. Wireless network management is reasonable if it is targeted to deter patterns of heavy bandwidth usage in a content-, application-, and service-*neutral* manner. Such management must be neutral both in its intent and in its effect, and must be applied only in response to actual constraints on network capacity. By contrast, if wireless network management is targeted at a *specific* high-bandwidth application or service in such a way that the speed or quality of this application or service will be degraded while some other similarly high-bandwidth application or service would not be degraded, then the management is presumptively unreasonable.

Through flexible application of this rule, and through allowances of other typical forms of network management necessary to block harmful traffic such as spam and malware,[8] the Commission will be fully capable of accounting for the technical management challenges of wireless Internet access services. In addition, if the Commission follows this simple route, it will avoid placing itself in a position where it is tasked with dividing up the Internet into zones where carrier-based discrimination is and is not permissible.

B. Potential Harms to Innovation in the Absence of Wireless Open Internet Rules

With a uniform set of open Internet protections in place, with a presumption against granting "specialized service" status unless the service cannot be offered over the open Internet, and with a proper degree of flexibility built into the concept of "reasonable

[8] *See* Open Internet NPRM ¶¶ 138-39. Wireless carriers would additionally retain the opportunity to manage their networks through metered pricing and charging different users more for faster baseline access speeds.

management" of networks with identifiable bandwidth constraints, the Commission will be equipped to ensure that wireline, wireless, and managed Internet access services are essentially interoperable and not capable of foreclosing the development of the wide variety of higher-layer services characteristic of today's competitive Internet content and applications ecosystem.

In contrast, without baseline open Internet protections in place on wireless networks (and suitable allowances for reasonable network management), the shape, market structure, and innovative ecosystem of wireless Internet services would likely begin to diverge quite rapidly from that of wireline Internet services. If carriers were to implement the unmonitored wireless network management capabilities cited in their comments,[9] there will be nothing to stop them from offering different carriage agreements to different content and application providers, granting more favorable carriage terms to affiliates, and generally picking and influencing which innovations at these other layers will succeed and which will fail.

This elimination of the universal carriage assumption – and replacement by a vertical integration or keiretsu assumption – could give rise to a number of troubling scenarios.

First, network-specific management rules that permit carriers to optimize carriage arrangements for certain content and application providers may harm outsiders who cannot cut similar deals with individual carriers or whose value the carriers cannot contemplate *ex ante*. Under such a regime, the owner of the last-mile infrastructure will be under considerable economic pressure in the form of a front-end business decision to justify its decision to carry or not to carry specific kinds of high-bandwidth content and applications.

[9] *See, e.g.*, T-Mobile Comments at 22; AT&T Comments at 59-62; Verizon Comments at 31-35.

Such integration would likely actively suppress content and applications that do not immediately assist in building a subscriber base or attracting sufficient revenues.[10]

But more importantly, perhaps, this new management regime would make it difficult for innovators to develop the kind of content or application that relies upon the network effects of a supply of "Internetworked" users – *i.e.*, users who are undifferentiated at the network level. On a non-unified Internet, a developer who wants to release a "universal" service – that is, the kind of service we currently associate with the open Internet – will need to strike separate agreements with each carrier as well as negotiate interoperability agreements between the carriers' managed networks.[11] This necessity of navigating a web of separate agreements will hold true even if an individual carrier opts to subsidize an outside innovator, as this innovator will still need to enter into paid agreements with and between the other carriers in order to reach every potential user.

The transaction costs and opportunities for holdup generated by such a web of contractual undertakings are clear. Each such agreement represents a point of control and an opportunity for carriers to extract additional tolls from, or place additional conditions upon, the prospective developer.[12] Carriers would also be able to exert leverage via these points of

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[10] For instance, it would be hard to imagine a site like Wikipedia developing in an atmosphere focused on short-term advertising revenue returns and the locking-in of a subscriber base. Even if certain carriers opt to subsidize outside content and application providers or grant them a share of the additional rents obtained from vertical integration – perhaps in the hope of providing a competitive alternative to other more locked-down managed services, or increasing complementary externalities – anticompetitive concerns will still likely arise given the limited number of carriers with which prospective content and application providers would be capable of entering into vertical partnerships. The number of competitors in a given content, application, or service market might converge towards the number of carriers with whom those competitors could enter into partnerships.

[11] In the absence of the Commission's promulgation of clear and simple rules to govern wireless networks, it is possible that the recent breakdown in negotiations between content providers and service providers seen in Fox-Cablevision will become increasingly common on the Internet, resulting in significant losses to wireless consumers.

[12] *See* Jonathan Zittrain, "An Impenetrable Web of Fees," http://www.nytimes.com/roomfordebate/2010/8/9/who-gets-priority-on-the-web/an-impenetrable-web-of-fees ("[W]hen each ISP can, in effect, speak on behalf of its unwitting subscribers, serving as the troll under the

control to lock in users to proprietary versions of search, application, and content delivery services that were once universally shared.[13] This world is one in which it will be exceedingly unlikely that an under-funded or under-connected outsider can expect to draw in the number of users necessary to propagate now-ubiquitous services like Twitter, Skype, Pandora, Netflix, Wikipedia, Hulu, Google, or Facebook from scratch.[14]

Finally, giving operators of the lower layers of a network architecture greater power and incentive to influence the higher layers of the network will likely yield a network that is less and less evolvable toward new services and applications not contemplated at the time of the network's design.[15]

CONCLUSION

The Commission will be best equipped to ensure continued vibrancy and competition on the open Internet by instituting uniform baseline rules of the road that apply to all the modes by which access to Internet-based content and communications is granted. Rules of the road can be implemented in two parts: first, by limiting the category of "specialized services" to non-general-purpose services that cannot be offered over the best-efforts Internet, and second, by limiting wireless network management to those practices that target patterns of bandwidth usage rather than specific applications or services. These sets of rules can be

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bridge offering up different conditions for access to them, the economics of the Net will start to favor the consolidated, the well-connected, the well-heeled.").

[13] *See* John Blevins, *The Internet That Might Have Been*, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1661516 (describing how the Internet might have evolved in a non-unified direction in a world free of governmental regulation).

[14] *See* Zittrain, *supra* note 3 ("But much more dangerous is if ISPs get to pick and choose: one deal for Google, another for the New York Times, a third for eBay, and no deal at all for mynewamazingwebsite. In a medium in which so many of the giants were yesterday's scrappy upstarts – eBay, Google, even the Web itself – it would be a travesty to freeze out the next round of innovation from odd corners by deploying an impenetrable web of contracts and fees.").

[15] Because the decision of whether and how to optimize and integrate must often be made at an early stage of network design, the pressure towards vertical integration may lead to a network architecture that is pegged towards the particular kinds of services that happened to be predominant during that early version of the network's implementation.

enforced by issuing a set of *ex ante* guidelines as to what specialized service offerings and wireless Internet management practices are generally unacceptable, and then by conducting *ex post* examinations with a technical advisory group to penalize egregious or intentional violations of these guidelines.