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Senate Committee on Commerce, Science, and Transportation

Hearing on the Consumer Wireless Experience, June 17, 2009

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Good afternoon Mr. Chairman and Senators. Thank you for inviting me to contribute to this discussion on the consumer wireless experience.

I hold the Pioneers Chair and serve as a Professor of Telecommunications and Law at Penn State University. As a teacher, researcher, [1] observer of student behavior, and cellphone service subscriber I am working to understand the potential for wireless handsets to stimulate innovation, particularly as these devices becomes even more widespread and essential.

Three major developments in the wireless marketplace have a substantial impact on consumers and innovation:

1) The wireless handset will provide a "third screen" for users, [2] no less important than what the first screen, television, and the second screen, the personal computer monitor, have provided. Wireless handsets have started the migration from cordless telephones to a much more diverse "Swiss Army Knife" collection of features and functions. But the scope of innovation in handset design depends on a difficult balancing between the sometimes divergent interests of consumers, carriers, and handset makers.

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[1] For more comprehensive examination of wireless handset access to content and services, *see* Rob Frieden, *Lock Down on the Third Screen: How Wireless Carriers Evade Regulation of Their Video Services*, 23 BERKELEY TECHNOLOGY LAW JOURNAL (2009) (in production); draft available at: http://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=102928; *Hold the Phone: Assessing the Rights of Wireless Handset Owners and Carriers*, 69 PITTSBURGH LAW REVIEW, No. 4, 675-725 (2008); draft available at: http://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=102928; *Wireless Carterfone--A Long Overdue Policy Promoting Consumer Choice and Competition* (New America Foundation, Wireless Future Program, Working Paper No. 20), available at http://www.newamerica.net/files/Wireless_Carterfone_Frieden.pdf.

[2] *See, e.g.*, Nick Wingfield, *Time to Leave the Laptop Behind*, THE WALL STREET JOURNAL, (Oct. 27, 2008), *available at* http://online.wsj.com/article/SB122477763884262815.html, Int'l Telecommunication Union, *The Regulatory Environment for Future Mobile Multimedia Services*, http://www.itu.int/osg/spu/ni/multimobile/index.html.

2) Near exclusive reliance by wireless carriers and their agents on a single business model, which combines wireless service and the handset used to access this service, strongly influences what kinds of services handsets can perform, and what kinds of software subscribers can download. In exchange for the opportunity to use a subsidized handset, wireless subscribers must agree to a one or two year service commitment and accept significant limitations on what services their handsets can access and what features their handsets offer. The ability to combine handsets and service creates incentives for carriers to secure exclusive distribution rights for choice handsets, such as the Apple iPhone. It also motivates carriers to favor ways to recoup their handset subsidies, rather than to concentrate on offering unconditional access to features within the handset, or services available by downloading software and content to the handset.

3) Even as some subscribers resort to "self-help" strategies to remove limitations, [3] legislation should direct the Federal Communications Commission ("FCC") to ensure nondiscriminatory access to wireless networks and services, and to order carriers to eliminate handset exclusivity arrangements. Forty years ago, the FCC established its *Carterfone* policy that specified the right of consumers to own phones and to attach them and other devices, such as fax machines and modems, to the wired telephone network. [4] Applying the *Carterfone* policy to wireless would stimulate innovation in handset design, promote competition, and motivate carriers to make their networks more accessible.

Third Generation Wireless and Beyond

Wireless technology has developed along three generations of service. In the first generation, from 1984 to the early 1990s, analog cellphones almost exclusively provided voice telephone service. The second generation, which approaches its conclusion, offers digital technologies capable of providing many enhancements, including text messaging, music downloading, photography, and slow speed access to the Internet. The third generation, promises a variety of features at least in theory no less numerous and diverse than what consumers can access via computers and television sets.

I use the phrase "in theory," because the combination of handset and service enables wireless carriers to impose limitations on what handsets subscribers can use, the functions performed by these handsets, and what applications subscribers can download to their handsets.

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[3] Wireless subscribers violate service contracts and lose warranty coverage when they "unlock" their handsets for use on unauthorized networks. Wireless subscribers "jailbreak" a handset "which allows a user to install on his device third-party applications unapproved by the provider." *See* Sarah Perez, *Why You Have To Jailbreak the iPhone*, N.Y. TIMES (Jan. 12, 2009), http://www.nytimes.com/external/readwriteweb/2009/01/12/12readwriteweb-why_you_have_to_jailbreak_the_iphone.html.

[4] *See* Hush-a-Phone v. United States, 238 F.2d 266, 269 (D.C. Cir. 1956) (ordering the FCC to eliminate telephone company tariff restrictions on customers' right to attach non-electronic acoustic devices to telephones). In 1968, the FCC extended the right to include attachment of electronic devices. Use of the Carterfone Device in Message Toll Tel. Serv., 13 F.C.C.2d 420 (1968), *recon. denied*, 14 F.C.C. 2d 571 (1968).

Even the much-touted Apple iPhone has significant limitations. Apple now offers over 30,000 diverse applications, [5] quite a large number as compared to what other handsets can download. But consider 30,000 in the context of the millions of applications available via personal computers. Innovators with hopes for offering the next "killer application" have limited prospects if one or more of the major wireless carriers choose not to allow subscribers to access the service, or download the software.

The list below identifies many of the handset limitations wireless carriers have imposed:

Locking handsets so that subscribers cannot access competitors' networks (by frequency, transmission format, firmware, or software). Some carriers even lock handsets designed to allow multiple carrier access by changing an easily inserted chip, commonly referred to as the Subscriber Identity Module;

Using firmware "upgrades" to "brick," i.e., render inoperative, the handset, or alternatively disable third party firmware and software;

Disabling handset functions, e.g., bluetooth, Wi-Fi access, Internet browsers, GPS services, and email clients;

Specifying formats for accessing memory, e.g., music, ringtones, and photos;

Creating "walled garden" access to favored video content of affiliates and partners; and

Using proprietary, non-standard interfaces making it difficult for third parties to develop compatible applications and content.

The most recent limitation affects when and how iPhone subscribers can use their handsets to access services that provide voice communications via the Internet, a service commonly referred to as Voice over the Internet Protocol ("VoIP"). [6] AT&T will allow subscribers to exploit VoIP innovation supplied by Skype, when they have Wi-Fi Internet access, currently available in various standalone "islands" such as coffee shops, libraries, hotels, offices, and residences. However, once a subscriber no longer has Wi-Fi access, the iPhone contains programming that blocks access to Skype via the AT&T wireless network. [7] Additionally, AT&T has not yet set a date when iPhone

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[5] *See* Apple, Inc., App Store and Applications for iPhone, http://www.apple.com/iphone/appstore/.

[6] Voice over the Internet Protocol ("VoIP") offers voice communications capabilities, much like ordinary telephone service, using the packet-switched Internet, for all or part of the link between call originator and call recipient.

[7] Brad Stone, *Skype, the Web Phone Giant, Brings Cheap Calls to Cellular*, THE NEW YORK TIMES, Internet, Inside Technology (March 29, 2009); available at: http://www.nytimes.com/2009/03/30/technology/internet/30skype.html.

subscribers can activate built-in features in their handsets to link lap top computers with the Internet via their phone, or to offer enhanced multimedia messaging. [8]

AT&T, to its credit, wants to promote a robust, versatile, and innovative wireless handset, an interest in synch with that of Apple, its manufacturing partner, and with consumers. But AT&T part ways when handset innovation prevents it from maximizing revenues and profits in providing long distance telephone services, particularly costly international calls. Skype offers free international VoIP calls when both parties use the Internet, and retails service at pennies a minute when a call leaves the Internet and travels via conventional telephone networks. AT&T and other wireless carriers charge a substantially higher rate for international calls.

Wireless subscribers suffer when carriers and handset manufacturers lack clear incentives to offer the most versatile services and handsets possible. Understandably, wireless carriers need to recoup subsidies in handsets and to offer new services, in addition to offering the basic commodity of wireless transmission time. But when carriers and handset manufacturers can readily implement strategies to lock down handsets, and to lock out consumers from competing services and features, the potential for Swiss Army Knife versatility in handsets diminishes.

Bear in mind that the limitations imposed by wireless carriers apply regardless of whether a subscriber uses an unsubsidized handset, and these restrictions extend even after completion of the service commitment by subscribers using subsidized handsets. I know of no wireless carrier in the United States that offers lower rates, and more relaxed software and third party access policies for subscribers who activate service with an existing handset, thereby freeing the carrier of having to make a subsidy. These type subscribers pay the same rates, on a month-to-month basis, as subscribers reimbursing carrier subsidies.

Liberating Handsets and Spurring Innovation

Consumers' right to own and attach any technically compatible device will spur competition and innovation in the development of handsets and other devices, as well as the software that can customize services. The FCC's *Carterfone* policy, established in 1968, made it possible not only for consumers to consider the telephone a fashion accessory, but more importantly, to have the

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[8] "Tethering is the ability to connect your mobile phone (either wirelessly, over Bluetooth, or via a cable) to your PC and use it as a wireless modem. MMS is a format for sending multimedia, such as photos, over the wireless network. In both cases Apple displayed lists of carriers around the world who would support these features, and AT&T was not on them." Brad Stone, *AT&T: Tethering and MMS Coming to the iPhone*, THE NEW YORK TIMES, Technology, Bits, (June 8, 2009); available at: http://bits.blogs.nytimes.com/2009/06/08/att-tethering-and-mms-coming-to-the-iphone-in-us/.

freedom to decide what types of devices and functions would best serve their needs. More fundamentally, separation of service and equipment supports consumers in their freedom to decide how to use the telecommunications and information services available from wireless handsets now and in the future.

We take for granted the right to own and attach telephones to the wired network and that freedom should extend to wireless networks, subject to legitimate and readily addressed network management and spectrum interface concerns. Television broadcasters have no right to determine how consumers use their television sets, including accessing video content from competing sources such as cable television and DVDs. Likewise, no personal computer manufacturer or software vendor can regulate what consumers see on their monitors and what services they can access.

Remarkably, the 270.3 million wireless cellphone subscribers in the United States [9] do not have the same freedoms for the third screen as they do for television sets, computer monitors, and wired telephone service. If the wireless handset marketplace worked like its wired counterpart, carriers would derive limited benefit from exclusive handset distribution agreements, and they could not program restrictions on the limited types of phones they make available. Manufacturers would have great reluctance in disabling features, or refraining from devising new ones that carriers do not want consumers to have.

Applying *Carterfone* Policy to Wireless Service Promotes Innovation, Helps Consumers, and Offers Carriers the Opportunity to Pursue Different Business Models.

Wireless carriers seem to perceive a wireless *Carterfone* policy as technologically infeasible, imposing more regulation, guaranteeing greater subscriber churn, and adversely impacting profitability. Just as wired carriers did in the 1960s, wireless carriers dismiss any likelihood that separating handsets from service providers will generate more opportunities to develop networks that stimulate usage, customer loyalty, and diversification of services available from a wireless network. I see no basis for concluding that the upside benefits accruing from the wired *Carterfone* policy somehow will not apply to wireless networks.

The wired *Carterfone* policy triggered widespread innovation in handsets and other devises located on customer premises. Such advancement did not shut down parallel progress in wired telecommunications, but instead promoted increased network use by a diversifying array of equipment. Rather than cause harm to telephone employees and networks, consumers' freedom to attach devices of their choice enhanced the utility of the network and the satisfaction of subscribers with the network.

When we move from a discussion about the benefits of wired *Carterfone* to wireless networks, carriers seek to frame the issue as one involving burdensome regulatory intrusions,[10] unnecessary

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[9] CTIA, The Wireless Association, *Wireless Quick Facts* (as of Dec., 2008); available at: http://www.ctia.org/advocacy/research/index.cfm/AID/10323 [hereinafter cited as CTIA Wireless Quick Facts].

[10] A prominent *Wall Street Journal* industry analyst has concluded that the wireless carriers have succeeded in creating the inference that they are unregulatable:

and inappropriate in light of how competitive, innovative, and successful the wireless industry has become. Applying the *Carterfone* policy does not impose new, or additional regulations. Cellphone companies operate as telecommunications service providers, already obligated by Title II [11] and III of the Communications Act of 1934, as amended, to comply with FCC common carrier regulations. [12] The fact that wireless carriers now offer information and video services does not diminish their common carrier responsibilities. [13]

Wireless carriers also assert that the *Carterfone* policy had a legitimate and necessary function only back in the time when a monopoly Bell System dominated all aspects of telephone service. The

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> A shortsighted and often just plain stupid federal government has allowed itself to be bullied and fooled by a handful of big wireless phone operators for decades now. And the result has been a mobile phone system that is the direct opposite of the PC model. It severely limits consumer choice, stifles innovation, crushes entrepreneurship, and has made the U.S. the laughingstock of the mobile-technology world, just as the cellphone is morphing into a powerful hand-held computer. . . . That's why I refer to the big cellphone carriers as the 'Soviet ministries.' Like the old bureaucracies of communism, they sit athwart the market, breaking the link between the producers of goods and services and the people who use them.

Posting of Walt Mossberg to All Things Digital (Mossblog), *Free My Phone*, (Oct. 21, 2007) available at: http://mossblog.allthingsd.com/20071021/free-my-phone/.

[11] Title II of the Communications Act, as amended, 47 U.S.C. §201 *et. seq.* (2008) requires providers of basic telecommunications services to operate on a nondiscriminatory basis, providing services on just and reasonable charges and also subject to numerous entry regulations, tariffing, interconnection, and operating requirements.

[12] *See* Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, 107 Stat. 312, Pub. L. No. 103-66, Title VI, § 6002(b), amending the Communications Act of 1934 and codified at 47 U.S.C. §332(c) creating a hybrid, streamlined regulatory classification for Commercial Mobile Radio Service Providers, commonly known as cellular telephone carriers. The term "commercial mobile service" is defined by the Communications Act of 1934, as amended, as "any mobile service ... that is provided for profit and makes interconnected service available (A) to the public or (B) to such classes of eligible users as to be effectively available to a substantial portion of the public, as specified by the Commission." Communications Act § 332(d)(1), 47 U.S.C. § 332(d)(1)(2008). "Mobile service" is defined at Section 3 of the Act. Communications Act § 3(27), 47 U.S.C. § 153(27)(2006). The term "commercial mobile service" came to be known as the "commercial mobile radio service." 47 C.F.R. §20.3(2008).

[13] *See* Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers, Report and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd. 15817 (2007).

FCC has applied its "venerable," [14] longstanding, [15] and "widely respected" [16] *Carterfone* policy in many ways and for many different types of competitive industries well after divestiture of AT&T and its Bell System. For example, the FCC included the *Carterfone* open access concept in the Commission's 2005 Policy Statement of what freedoms consumers have a right to expect when accessing the Internet. [17] The Commission also established an "Open Platform" requirement for a portion of the choice 700 MHz spectrum made available by the conversion to digital television. [18] Speaking of digital television, the FCC established a long conversion period, and Congress extended it, [19]so that consumers could acquire the necessary digital converter to continue watching broadcast television without having to replace their existing analog sets. [20]

The FCC has ordered cable television companies to continue offering service to "cable ready" analog televisions that do not require installation of a set top box. [21] Additionally, the FCC

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[14] "[O]ur venerable Carterfone principles, for example, were first established via adjudication and then codified into rules." Formal Complaint of Free Press & Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications, 23 FCC Rcd.13028, 13050 (2008) *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-183A1.doc[hereinafter cited as Free Press Complaint].

[15] *See, e.g.*, Pub. Util. Comm'n of Tex. v. FCC, 886 F. 2d 1325, 1329 (D.C. Cir. 1989) (noting long established FCC policy that carriers and non-carriers alike have a federal right to interconnect to the public telephone network in ways that are privately beneficial if they are not publicly detrimental); Am. Tel. & Tel. Co.'s Proposed Tariff Revisions, 53 F.C.C.2d 473, 477 (1975), *aff'd sub nom.* Mebane Home Tel. Co. v. FCC, 535 F.2d 1324, 1329 (D.C. Cir. 1976); Telerent Leasing Corp., 45 F.C.C.2d 204, 205 (1974), *aff'd sub nom.* N.C. Util. Comm'n v. FCC, 537 F.2d 787 (4th Cir. 1976), *cert. denied,* 429 U.S. 1027 (1976).

[16] "[T]he Commission adopted the widely respected Carterfone principles via adjudication." Free Press Complaint, 23 FCC Rcd. at 13045.

[17] "Internet, consumers are entitled to connect their choice of legal devices that do not harm the network." Appropriate Framework for Broadband Access to the Internet Over Wired Facilities, Policy Statement, 20 FCC Rcd. 14986, 14988 (2005).

[18] Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Second Report and Order, 22 FCC Rcd. 15289(2007).

[19] DTV Delay Act, Pub. L. No. 111-4, 123 Stat. 112 (Feb. 11, 2009).

[20] Implementation of the DTV Delay Act, MB Docket No. 09-17, Third Report and Order and Order on Reconsideration, 24 FCC Rcd. 3399 (2009).

[21] FCC rules ensure "that all cable TV viewers, including the 98 million analog-only cable TV viewers, retain the same access to their local stations after the transition as they have today. The rules require cable operators to comply with the statutory viewability requirement by choosing to either: (1) carry digital signals in analog format, or (2) for all-digital systems, carry the signals only in digital format, provided that all subscribers have the necessary equipment to view the broadcast

prevents device lock in by requiring cable television operators to support CableCard access to programming in lieu of mandatory leasing of a cable company supplied set top box for watching digital television service tiers. [22] To guard against cable operators exploiting the ability to favor content created by affiliates, Congress prohibited exclusive program access deals. [23] Even in the wireless marketplace, the FCC has mandated number portability to prevent locking in subscribers by preventing them from using the same telephone number when shifting carriers. [24]

Wireless carriers appear to have concluded that applying the *Carterfone* policy could lead to higher rates of customer churn, because fewer subscribers might acquire a subsidized phone and accordingly would not have to commit to a one, or two year term of service. The policy does not absolutely guarantee increases in churn, particularly if wireless carriers work harder to customize service, to respond to consumers' diverse service requirements, and to provide service via any functioning handset. Wireless carriers would have to consider implementing alternative business models, including ones where customers initiate service using an existing handset instead of using a new one subsidized by the carrier. Under this scenario, the carrier might have to offer a discounted rate, but service diversification and discounting constitute two strategies any business must consider in a maturing market.

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content. The viewability requirements apply from June 12, 2009 through February 2012, subject to review by the Commission during the last year of this period. Carriage of Digital Television Broadcast Signals: Amendment to Part 76 of the Commission's Rules, CS Docket No. 98-120, Third Report and Order and Third Further Notice of Proposed Rule Making, 22 FCC Rcd 21064 (2007).

[22] "[A] CableCARD . . . plugs into a slot in a host navigation device, permitting the device to perform both the security and non-security functions." Charter Communications, Inc. v. Federal Communications Commission, 460 F.3d 31, 34 (D.C. Cir. 2006) available at: http://www.cesweb.org/shared_files/edm/2006/govalert/DCCircuitAdvanceNewhousevFCCOrder081806.pdf.

[23] *See* Implementation of the Cable Television Consumer Protection and Competition Act of 1992, Development of Competition and Diversity in Video Programming Distribution: Section 628(c)(5) of the Communications Act: Sunset of Exclusive Contract Prohibition, MB Docket No. 07-29, Report and Order and Notice of Proposed Rulemaking , 22 FCC Rcd. 17791 (2007).

[24] "The ability of end users to retain their telephone numbers when changing service providers gives customers flexibility in the quality, price, and variety of telecommunications services they can choose to purchase. Number portability promotes competition between telecommunications service providers by, among other things, allowing customers to respond to price and service changes without changing their telephone numbers. The resulting competition will benefit all users of telecommunications services. Indeed, competition should foster lower local telephone prices and, consequently, stimulate demand for telecommunications services and increase economic growth." Telephone Number Portability, CC Docket No. 95-116, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 8352, 8368 (1996).

After having achieved a nearly saturated market of 87% penetration, [25] wireless carriers should consider service diversification and as well differentiating their brand by something other than the likelihood of getting reliable service and the handset choices they offer.

Conclusions and Recommendations

Technological and marketplace convergence favor increasing reliance on the Internet as a medium for delivering all kinds of information, communications and entertainment services. Already the Internet makes it possible for carriers and consumers to combine traffic onto a single Internet conduit in lieu of using separate networks to carry voice, data, and video traffic. Wireless access to the Internet, via next generation networks, will offer consumers the potential to use a truly broadband information superhighway. [26] However, if wireless carriers continue to limit subscribers' handset options, the breadth and scope of wireless access will not achieve parity with wired alternatives.

I see no compelling case why wireless networks should not offer consumers the same access opportunities as available from wired broadband networks. Any limitations on access can frustrate consumers, stifle innovation in wireless services and software applications, and adversely affect the international competitiveness of United States equipment and services. Many nations do not permit the bundling of wireless service and handsets. Such separation does require wireless consumers initially to pay more for their handsets, in light of the absence of a carrier subsidy. But bear in mind that because U.S. wireless carriers do not operate as charities, consumers surely pay for their upfront subsidy over the one, or two year service commitment. In nations prohibiting the bundling of handsets and service, carriers typically offer a broader array of service plans, including many more pre-paid, calling card opportunities for low volume callers.

Mandating consumer access freedom supports development of separate wireless handset and service markets. This will create incentives for wireless equipment manufacturers to offer customized solutions to diverse user requirements. Additionally, it will create greater incentives for wireless carriers to come up with innovative service plans, and to compete based on how many different services wireless devices can access.

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[25] CTIA, Wireless Quick Facts.

[26] "Few doubt that the future of telecommunications will rely mostly on broadband and wireless technologies. Wireless and broadband technologies are transforming the telecommunications market, offering users ubiquitous access to voice, data, and internet services. The number of mobile subscribers has already surpassed that of end-user switched access lines served by local exchange carriers." National Regulatory Research Institute, *Methods for Analyzing the Effects of Broadband and Wireless Services on Competition in Local Telephony*, Project Announcement; available at: http://www.nrri.ohio-state.edu/current-projects/telecommunications/methods-for-analyzing-the-impact-of-broadband-and-wireless-services-on/