

February 5, 2010

Electronic Filing

Marlene Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
12th Street Lobby, TW-A325
Washington, D.C. 20554

Re: *Ex Parte Letter*; GN Docket No. 09-191; WC Docket No. 07-52

Dear Ms. Dortch:

CTIA – The Wireless Association® (“CTIA”) recently filed comments in the Commission’s proceeding on “Preserving the Open Internet” detailing the policy and economic reasons why Internet neutrality rules are inappropriate for the competitive, innovative and consumer-focused wireless broadband market. CTIA argued that the Commission should not develop and apply potentially damaging net neutrality rules that are based on a fear of speculative, not actual, harms. This filing identifies why developing and applying any such rules to the competitive wireless industry based on speculation is likely to be significantly off mark, and dangerous. In the following pages, CTIA analyzes the speculative harm that was detailed by one notable critic of the wireless industry, Professor Tim Wu of Columbia University, and concludes that the dark vision of the wireless future envisioned by Professor Wu was startlingly inaccurate and has never come to pass.

In his February 2007 working paper for the New America Foundation, Professor Wu detailed a parade of harms that would befall wireless consumers absent a litany of FCC regulations. Contrary to the professor's view of how the ecosystem would evolve, in the absence of regulation, every element of the wireless ecosystem has expanded. Today, the fact that there are over six hundred devices in the U.S. offering hundreds of different capabilities for consumers, over 170,000 applications, more open networks with open developer initiatives and software development kits, the sale of phones through numerous online and retail outlets, multiple operating systems, and the launch of the newest and most innovative handsets first in the United States demonstrates that the mobile wireless ecosystem continues to evolve to serve customers, contrary to Professor Wu’s arguments.¹

Now, nearly three years later, we can look back at Professor Wu’s claims – as well as CTIA’s rebuttal and own vision of the future of wireless – and compare them to the reality of the 2010 wireless marketplace. The central thesis of Professor Wu’s

¹ This filing is not designed to address the debate within the industry regarding the concerns or benefits of exclusive handset arrangements, but rather to address the paper filed by Professor Wu and detail what has transpired in the almost three years since it was released.

paper – that regulation is required because the mobile ecosystem will not permit market forces to correct what he perceives as consumer-unfriendly behavior – was, and is, simply wrong. Rather, the consumer-oriented and innovative wireless ecosystem detailed by CTIA in filings over the past three years is thriving, benefitting U.S. consumers and the U.S. economy in terms of jobs and investment, creating unprecedented opportunities for applications developers, and continuing to lead the world in innovation. Beyond the question of whether the Commission’s reliance on speculation would survive an analysis under the Administrative Procedure Act, this filing shows how quickly rules based on speculation can be overtaken by actual events in this thriving wireless ecosystem.

As discussed above and below, the state of the market now graphically demonstrates that virtually every prediction in the Professor’s paper is incorrect:

- Professor Wu asserted that carriers had a “near lock” on the retailing of mobile devices that, presumably, would only be altered through regulatory intervention. Today, consumers can purchase handsets from carriers, directly from manufacturers, through brick-and-mortar retail chains, via Internet discounters, and through a healthy secondary market. For example, Best Buy, Target, Wal-Mart, TigerDirect.com, Amazon.com, LetsTalk.com, Apple, Nokia, Google, Motorola and many others all sell handsets directly to consumers. The recent Best Buy catalog alone lists over a hundred wireless devices for sale.
- Professor Wu argued that the U.S. market had only “a small fraction of the phones available [elsewhere],” implying that carriers restricted the diversity of handsets. Today, the U.S. market has over 630 devices manufactured by 33 different companies, including the BlackBerry® Tour 9630, Samsung Omnia, HTC TouchPro, Motorola Droid, Apple iPhone 3GS, Motorola Karma QA1, BlackBerry® Bold, Motorola Cliq, myTouch 3G, G1, BlackBerry® Pearl Flip, HTC Touch Pro2, Palm Pre, HTC Hero, Samsung Instinct S30, Cricket TXTM8, Motorola Evoke QA4, Samsung JetSet, Motorola Hint, Samsung Finesse, Samsung Messenger, LG Tritan, Samsung TwoStep, and the LG Rhythm. Of note, almost every one of the phones listed above was first launched in the United States.
- Professor Wu painted a picture of a “stalled” application market where developers were unable to create applications for mobile devices. Today, a vibrant “apps” market exists where over 170,000 applications are available for popular operating systems, and where developers as young as age 9 can navigate the approval process to become highly successful. At least seven different companies, none of whom are affiliated with wireless carriers, market the overwhelming majority of these applications.

- Professor Wu criticized carriers' control over handset design. Today, all major carriers, and most of the other carriers in the country, have extensive open network development platforms for devices and software. Intra-industry groups have developed the Open Handset Alliance (which has created the Android operating system), and several other operating systems have moved to an open platform. Additionally, as discussed above, numerous handset manufacturers are selling directly to consumers.
- Professor Wu stated that the "oligopoly" in handset sales resulted in a market where consumer-friendly capabilities, such as Bluetooth, Wi-Fi, and picture distribution, were "crippled." Today, all of these capabilities, and hundreds more that reflect a broad array of consumer desires, are available to U.S. consumers. With the wealth of options, consumers can make buying decisions based on a range of factors. This is exactly the market that consumers want, and regulators should encourage.

In sum, the bleak future painted by Professor Wu in the past is starkly at odds with the vibrant and rich reality of the wireless ecosystem today – an ecosystem that has grown and blossomed in the absence of government regulation. Nonetheless, the FCC's Net Neutrality Notice of Proposed Rulemaking now raises hypothetical fears of future market failure without evidence of current harm. The lesson to be learned from the professor's miscalculations is that theoretical claims of potential harms do not provide a sound predicate for imposing government regulations in a highly competitive wireless market.

As the Commission continues to consider net neutrality regulation for the wireless industry, CTIA urges the Commission to not rely on predictions of harm that have never materialized. Pursuant to Section 1.1206 of the Commission's rules, a copy of this letter and the attached copy of CTIA's legal analysis are being filed via ECFS with your office. Should you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

/s/ Christopher Guttman-McCabe

Christopher Guttman-McCabe
Vice President, Regulatory Affairs

Attachment

cc: Chairman Julius Genachowski
Commissioner Michael Copps
Commissioner Robert McDowell

Commissioner Mignon Clyburn
Commissioner Meredith Attwell Baker
Bruce Gottlieb
David Goldman
John Giusti
Angela Giancarlo
Louis Peraertz
Charles Mathias
Ruth Milkman

UPDATING ASSUMPTIONS

Reviewing Tim Wu's Wireless Net Neutrality Working Paper Three Years Later

CTIA – The Wireless Association[®] (“CTIA”) recently filed comments in the Commission’s proceeding on “Preserving the Open Internet” detailing the reasons why Internet Neutrality rules are inappropriate for wireless broadband service providers. CTIA argued that the Commission should not develop and apply net neutrality rules that are based on a fear of speculative, not actual, harms. This is especially true in a competitive industry characterized by dynamic change and innovation. In the following pages, CTIA analyzes the speculative harms detailed by Professor Tim Wu of Columbia University, and concludes that the dark vision of the wireless future envisioned by Professor Wu was startlingly inaccurate and has never come to pass. Professor Wu’s paper makes an excellent case study on the dangers of policy making based on nothing more than speculation, no matter how well intentioned, regarding the future development of a competitive industry, and underscores the wisdom of Alfred Kahn’s observation that even imperfect competition (let alone the highly competitive U.S. wireless market) is better than perfect regulation.

In February 2007, Professor Tim Wu published Working Paper #17 for the New America Foundation titled “Wireless Net Neutrality: Cellular *Carterfone* and Consumer Choice in Mobile Broadband.”¹ Professor Wu discusses a litany of behaviors by U.S. carriers that he believes work “to the detriment of consumers.”² Importantly, Professor Wu explicitly rejects the claim that this “anti-competitive or anti-consumer behavior will be self-correcting” and states:

The behavior of the carriers . . . refutes the argument that oligopoly competition is a cure-all. The practices documented in this paper are of manifest concern for consumers and for innovation in the markets adjacent to the carriers. Their pattern of parallel behavior casts doubt on arguments that the limited competition in a spectrum-based oligopoly can be expected to solve all problems.³

Professor Wu therefore insists that new regulations, including *Carterfone*-like rules and net neutrality, must be applied to mobile services. A mere three years later, it is clear that the wireless market has not developed as Professor Wu predicted, and without this factual predicate, there is no basis for the prescriptive regulations he proposed. In the absence of regulation, every element of the wireless ecosystem has flourished and competition has expanded. Indeed, the fact that there are over six hundred devices in the U.S. offering hundreds of different capabilities for consumers, over 170,000 applications, more open networks with open developer initiatives and software development kits, the sale of phones through numerous online and retail outlets,

¹ Tim Wu, New America Foundation, Working Paper No. #17, *Wireless Net Neutrality: Cellular Carterfone and Consumer Choice in Mobile Broadband* (Feb. 2007) (“Wu Paper”), available at http://www.newamerica.net/files/WorkingPaper17_WirelessNetNeutrality_Wu.pdf.

² *Wu Paper* at 1.

³ *Id.* at 3.

multiple operating systems, and the launch of the newest and most innovative handsets first in the United States demonstrates that the ecosystem continues to evolve and provide consumers with the innovative wireless services, devices, and applications they desire. Hindsight, which is often said to be 20-20, reveals that the marketplace and the wireless ecosystem are not rigid, but constantly changing and correcting to meet consumer demand.⁴ Notwithstanding Professor Wu's call for prescriptive regulatory intervention, the innovation that characterizes the wireless industry is the logical – and predictable -- result of the diversity and competition that characterize every layer of the wireless ecosystem.

In this paper, CTIA re-visits Professor Wu's analysis to critically examine the asserted need for regulation. Now, nearly three years later, we can look back at Professor Wu's claims – as well as CTIA's rebuttal and own vision of the future of wireless – and compare them to the reality of the 2010 wireless marketplace.

The central thesis of Professor Wu's paper – that regulation is required because the mobile ecosystem will not permit market forces to correct what he perceives as consumer-unfriendly behavior – was, and is, simply wrong. Rather, the consumer-oriented and innovative wireless ecosystem detailed by CTIA in filings over the past three years is thriving, benefitting U.S. consumers and the U.S. economy, and continuing to lead the world in innovation.⁵ These developments demonstrate how quickly rules based on speculation can be overtaken by actual events in the dynamic and competitive wireless ecosystem.

As discussed above and below, the state of the market now graphically demonstrates that virtually every prediction in the Professor's paper is incorrect:⁶

⁴ The demonstrably erroneous conclusion that the market will not “self-correct” may stem from Wu's conclusion that the wireless market is “a spectrum-based oligopoly, not the ‘fiercely competitive’ market that is sometimes portrayed.” *Wu Paper* at 3. Professor Wu attributes his competitive views to his thesis that “while entry is not impossible, under current conditions, it requires multi-billion dollar investments.” *Id.* The barriers to entry, he believes, render the market closed. However, the FCC's 700 MHz auction, which concluded in early 2008, clearly demonstrates that Professor Wu's assumptions are incorrect. In fact, the FCC itself noted that designated entities – largely small business bidders – won 379 of the 1090 licenses auctioned by the FCC. Written Statement of the Honorable Kevin J. Martin, Chairman, Federal Communications Commission, before the Committee on Energy and Commerce U.S. House of Representatives (April 15, 2008) at Exhibit 4, *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-281550A2.pdf. In fact, over half (56 of 101) of the winning bidders qualified for bidding credits based upon their status as a small or very small business. *Id.* at Exhibit. Indeed, new service providers have emerged from both the 700 MHz and Advanced Wireless Services (“AWS 1”) auctions, including EchoStar, Chevron, Cox Communications (“Cox”), and Stelera Wireless. Additionally, companies like T Mobile, Leap Wireless, and MetroPCS Communications acquired significant spectrum in the AWS 1 auction to expand service to new areas. The reality is – and has been – that there are hundreds of smaller carriers that operate in the United States that are not multi-billion dollar ventures but that nonetheless contribute to the robustly competitive market documented by the FCC, year after year, for thirteen consecutive years. *See, e.g., Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993*, Thirteenth Report, WT Docket No. 08-27 (Jan. 16, 2009) (“*Thirteenth Annual CMRS Competition Report*”).

⁵ Like CTIA's prior filings, this filing is not designed to address the debate within the industry regarding the concerns or benefits of exclusive handset arrangements, but rather to address the paper filed by Professor Wu and detail what has transpired in the almost three years since it was released.

⁶ The only significant contention not discussed herein is Professor Wu's discussion of carrier acceptable use policies for broadband data services that limit the amount of data that a subscriber can transmit or allow a carrier to

- Professor Wu asserted that carriers had a “near lock” on the retailing of mobile devices that, presumably, would only be altered through regulatory intervention. Today, consumers can purchase handsets from carriers, directly from manufacturers, through brick-and-mortar retail chains, via direct sales over the Internet, and through a healthy secondary market. For example, Best Buy, Target, Wal-Mart, TigerDirect.com, Amazon.com, LetsTalk.com, Apple, Nokia, Google, Motorola and others all sell handsets directly to consumers. The recent Best Buy catalog alone lists over a hundred wireless devices for sale. And, at any given time, tens of thousands of handsets are offered for sale on E-Bay and other Internet sites.
- Professor Wu argued that the U.S. market had only “a small fraction of the phones available [elsewhere],” implying that carriers restricted the diversity of handsets. Today, the U.S. market has over 630 devices manufactured by 33 different companies, including the Google Nexus One, BlackBerry® Tour 9630, Samsung Omnia, HTC TouchPro, Motorola Droid, Apple iPhone 3GS, Motorola Karma QA1, BlackBerry® Bold, Motorola Cliq, myTouch 3G, G1, BlackBerry® Pearl Flip, HTC Touch Pro2, Palm Pre, HTC Hero, Samsung Instinct S30, Cricket TXTM8, Motorola Evoke QA4, Samsung JetSet, Motorola Hint, Samsung Finesse, Samsung Messenger, LG Tritan, Samsung TwoStep, and the LG Rhythm. Of note, almost every one of the phones listed above was first launched in the United States.
- Professor Wu painted a picture of a “stalled” application market where developers were unable to create applications for mobile devices. Today, a vibrant “apps” market exists where over 170,000 applications are available for popular operating systems, and where developers as young as age 9 can navigate the approval process to become highly successful. At least seven different companies, none of whom are affiliated with wireless carriers, market the overwhelming majority of these applications.
- Professor Wu criticized carriers’ control over handset design. Today, all major carriers, and most of the other carriers in the country, have extensive open network development platforms for devices and software. Intra-industry groups have developed the Open Handset Alliance (which has created the Android operating

restrict uses that unacceptably degrade network performance for other users. As this paper is being written, carrier practices in this regard are changing so fast that it is impossible to capture them. Moreover, although Professor Wu labels this conduct “discriminatory,” he makes no attempt to argue or substantiate that these measures are used for anything other than reasonable network management. Indeed, the FCC, in its recent Notice of Proposed Rule Making on network neutrality, “recognize[d] that there are technological, structural, consumer usage, and historical differences between mobile wireless and wireline/cable networks.” *Preserving the Open Internet*, GN Docket No. 09-191 (rel. Oct. 22, 2009) at ¶ 159. The FCC further noted that “cellular wireless networks are shared networks (as are some types of wireline networks), with limited resources typically shared among multiple users,” that “wireless networks are more sensitive to user behavior than wireline networks, so capacity management is a constant concern of wireless engineers,” and that “[b]andwidth-intensive Internet services already create challenges for wireless networks, and these challenges are likely to increase.” *Id.* at ¶¶ 159, 172.

system), and several other operating systems have moved to an open platform. Additionally, as discussed above, numerous handset manufacturers now market handsets directly to consumers.

- Professor Wu stated that the “oligopoly” in handset sales resulted in a market where consumer-friendly capabilities, such as Bluetooth, Wi-Fi, and picture distribution, were “crippled.” Today, all of these capabilities, and hundreds more that reflect a broad array of consumer desires, are available to U.S. consumers. With the wealth of options, consumers can make buying decisions based on a range of factors. This is exactly the market that consumers want, that applications developers are thriving in, and regulators should encourage.

In sum, the bleak future painted by Professor Wu is starkly at odds with the vibrant and rich reality of today’s wireless ecosystem – an ecosystem that has grown and blossomed in the absence of prescriptive government regulation. Nonetheless, the FCC’s Internet Neutrality Notice of Proposed Rulemaking posits the need for regulation on similar hypothetical fears of future market failure such as those raised by Professor Wu just three years ago in his call for regulation. The lesson to be learned is that theoretical claims of potential harms do not provide a sound predicate for imposing government regulations in a highly competitive market.

1. The Right To Attach

The first half of Professor Wu’s paper addresses what he refers to as the “right to attach.” Professor Wu argues that carriers have erected barriers to allowing devices to be attached to the network – essentially that carriers control the retail distribution of mobile devices⁷ and use “white listing” and phone locking to enforce that control. He asserts that these barriers are then used by carriers to restrict artificially the availability of phones for U.S. consumers and to restrict the features available in those phones.⁸ As discussed below, every one of these assertions is incorrect today.

Retail Barriers to Attachment. First, Professor Wu asserts that barriers to attachment arise because “[t]he major carriers have a near-lock on the retailing of mobile wireless devices.”⁹ Professor Wu’s paper references an article citing an uncorroborated analyst statement, reciting that “between 90 percent and 95 percent of cell phones in the United States are sold by the carriers.”¹⁰ To the contrary, the facts show that consumers have a vast range of retail options for

⁷ *Wu Paper* at 7 (stating that “the market for consumer devices is unusual and distorted” because “innovative companies must seek the permission and cooperation of the carrier oligopoly”).

⁸ *Id.* (stating that the consequence of the “*de facto* [necessity] . . . to obtain the permission of the carrier to market a wireless device” is twofold, according to Professor Wu: (i) “the cellular phones widely available in the United States are just a small fraction of the phones available in the world”; and (ii) “control over attachments has given carriers enormous power over equipment design and over application markets”).

⁹ *Id.* at 8-9.

¹⁰ *Id.* (citing Marguerite Reardon, CNETNews.com, *Will ‘unlocked cell phones’ free consumers?* CNET News.com (Jan. 24, 2007), available at http://news.com.com/Will+unlocked+cell+phones+free+consumers/2100-1039_3-6152735.html?tag=st.prev).

the purchase of a mobile phone, including online retailers, discount stores, third party stores, handset manufacturers, and secondary markets.

- *Third Party Retail Stores.* Many major national retail chains offer cellular phones for sale directly to consumers, including Target, Wal-Mart, Costco and Best Buy. Target, for example, offers 19 prepaid phones, 14 unlocked phones, and retails phones with service plans through Wirefly.¹¹ Wal-Mart offers 52 prepaid phones, 22 unlocked phones, and a large number of phones with rate plans.¹² Best Buy has a monthly in-store catalog that lists over a hundred phones for sale, a significant number of which are unlocked devices.¹³ A number of smaller stores and regional chains, such as SimplyWireless, also offer cellular phones.¹⁴
- *Manufacturer-Specific Retail Stores.* Many manufacturers also operate their own, branded, retail stores, including Apple, Nokia, and Samsung. Nokia, for example, has two flagship store locations and an internet retail presence where it markets over twenty unlocked phones.¹⁵ Apple also has an extensive network of stores, as well as a popular website, and Samsung has an electronic retail store.¹⁶ Most recently, Google introduced its Nexus One phone sold exclusively through www.google.com/phone. Other manufacturers, such as Motorola, sell their devices on-line directly to consumers.¹⁷
- *Major On-Line E-Retailers.* Amazon.com, for example, advertises 520 phones with service plans from AT&T, Verizon Wireless, Sprint, T-Mobile, Kajeet, TracFone and Virgin Mobile, 42 prepaid phones, and 564 “unlocked” phones.¹⁸ Similarly,

¹¹ See http://www.target.com/Telephones-Communications-Electronics/b/ref=nav_t_spc_12_icn_8_0/182-4984845-2569168?ie=UTF8&node=1042116 (last visited Nov. 23, 2009).

¹² See <http://www.walmart.com/Cell-Phones-Accessories-Service-Plans/cp/542371> (last visited Nov. 23, 2009).

¹³ See, e.g., Buy Buy Mobile Portal, available at <http://www.bestbuy.com/site/Mobile-Phones-Office/Mobile-Cell-Phones/pcmcat190800050010.c?id=pcmcat190800050010> (showing relationships with Sprint, AT&T, Verizon Wireless, Alltel Wireless, and T-Mobile).

¹⁴ See <http://www.simplywireless.com/corphone/corpproducts.cfm> (last visited Nov. 23, 2009).

¹⁵ See http://store.nokia.com/webapp/wcs/stores/servlet/browsealldevices_10500_10101_-1_8_-1_-1_PriceH_Y_1_0 (last visited Nov. 23, 2009).

¹⁶ See <http://www.apple.com> (last visited Nov. 23, 2009); <http://samsung.letstalk.com/cell-phones/shop.htm?pgId=100&tNav=1> (last visited Nov. 23, 2009).

¹⁷ See <http://www.store.motorola.com/mot/en/US/adirect/motorola;jsessionid=90E4F2A891684C88C49D-200176A9B667.mot2?cmd=OnlineOrderingPageDisplay&entryPoint=adirect&messageType=OnlineOrderingPageDisplay> (last visited Feb. 5, 2010).

¹⁸ See http://www.amazon.com/cell-phones-service-plans-accessories/b/ref=sa_menu_wi5?ie=UTF8&node=301185&pf_rd_p=328655101&pf_rd_s=left-nav-1&pf_rd_t=101&pf_rd_i=507846&pf_rd_m=ATVPDKIKX0DER&pf_rd_r=0BJSJGH89MC882B8R54PP (last visited Nov. 23, 2009).

TigerDirect.com offers phones with service plans on AT&T, Verizon Wireless, Sprint, and T-Mobile as well as more than 120 unlocked wireless devices.¹⁹

- *Discount E-Retailers.* A large number of discount internet options exist, including J&R, Wirefly, CellHut, and TMIWireless. J&R, for example, offers phones with Verizon, AT&T, Sprint, T-Mobile, and Boost plans. CellHut sells over 100 phones, listing them by brand, by price, by feature and more.²⁰ Perhaps most interesting, and contrary to Professor Wu's next argument, the majority of handsets it offers (143 of 201) are unlocked.²¹
- *Secondary Markets.* A healthy secondary market for mobile phones also exists. At the time of this filing, for example, e*Bay's "Mobile Phones and Smartphones" category contained over 135,000 items (as of February 5, 2010), and the Washington, D.C. listings craigslist for "cellphones for sale" contained over 1,000 listings (posted between February 1 and 5, 2010).²²

Technical Barriers to Attachment. The second "barrier" to attachment cited by Professor Wu is the use of technical barriers to moving phones from network to network including, on the code division multiple access ("CDMA") side, carrier phone approval requirements and, on the GSM side, phone locking policies.²³ Professor Wu concedes that his argument that carriers regulate the devices they permit to be operated on their networks is limited to CDMA carriers and, in fact, he cites only the conduct of a single carrier.²⁴ Specifically, three years ago Professor Wu criticized Verizon Wireless' practice of permitting only white-listed phones (*i.e.*, those phones that have been approved by the carrier) to be activated on its network. Today, Verizon Wireless' practice is to "activate your existing phone provided it is compatible with our CDMA (Code Division Multiple Access) digital network."²⁵ Verizon Wireless also has

¹⁹ See "Mobile Phone Center", TigerDirect.com available at <http://www.tigerdirect.com/applications/campaigns/campaigntemplate.asp?CampaignID=1126> (last accessed Feb. 2, 2010).

²⁰ See <http://www.cellhut.com/> (last visited Feb. 5, 2010).

²¹ See <http://www.jr.com/category/office/cellular-phones/n/71/> (last visited Nov. 23, 2009). See also <http://www.wirefly.com> (last visited Nov. 23, 2009); <http://www.tmiwireless.com/> (last visited Nov. 23, 2009).

²² See http://cell-phones.shop.ebay.com/Cell-Phones-Smartphones-/3312/i.html?_catref=1 (last visited Feb. 5, 2010); <http://washingtondc.craigslist.org/mob/> (last visited Feb. 5, 2010).

²³ *Id.* at 8-9.

²⁴ Professor Wu notes that Sprint permits customer-owned phones to be activated on its CDMA network as long as the electronic serial number is not a duplicate that might indicate cloning or fraud, and does not take issue with this practice. *Wu Paper* at 8.

²⁵ See http://support.vzw.com/faqs/Equipment/faq_phones.html#item2 (last visited Nov. 13, 2009). Certain CDMA phones, for example, could be incompatible because they lack GPS chips and are not lawfully permitted to be used in the United States. Similarly, CDMA phones could operate on frequencies that are not allocated in the U.S.

an Open Development Initiative (“ODI”) that provides objective certification criteria and transparent review processes to get devices certified.²⁶

With respect to GSM carrier phone locking, Professor Wu concedes that “[b]oth [AT&T and T-Mobile] . . . appear to have a policy of agreeing to unlock telephones, on request, so long as the phone has been owned for three months,” but then argues that “[w]hat is important . . . is the status quo,” stating that “[m]ost consumers have no idea what a phone lock is.”²⁷ Today, signs prominently posted at the front door of Best Buy stores urge consumers to ask about unlocked phones, and other retailers advertise “unlocked” phones in their ads and on their store fronts.

Availability of Diverse Phones in the U.S. Oddly, although Professor Wu states “the cellular phones widely available in the United States are just a small fraction of the phones available in the world,”²⁸ he provides no real discussion of this point. His statements about domestic phone diversity, in fact, are limited to stating “[o]f the many mobile devices sold even by major providers like Nokia and Motorola, only a fraction effectively make it to the U.S. market” and “[t]he bottleneck also deters other potential market entrants.”²⁹ This contradicts evidence on file with the FCC. As CTIA recently noted in an *ex parte*, for example, “[t]here are over 630 handsets sold in the United States, manufactured by 33 companies.”³⁰ By contrast, there are only 147 models available to consumers in the United Kingdom.³¹

Traditionally the most advanced handsets in the world have been available in the U.S. In addition to the Google Nexus One, this includes – all introduced in the 2008/2009 timeframe – the BlackBerry® Tour 9630; Samsung Omnia, HTC TouchPro, Motorola Droid (Verizon Wireless); Apple iPhone 3GS; Motorola Karma QA1; BlackBerry® Bold (AT&T Mobility); Motorola Cliq; myTouch 3G; G1; BlackBerry® Pearl Flip (T-Mobile USA); HTC Touch Pro2; Palm Pre; HTC Hero; Samsung Instinct S30 (Sprint Nextel); Cricket TXTM8; Motorola Evoke QA4; Samsung JetSet (LEAP); Motorola Hint; Samsung Finesse; Samsung Messenger (MetroPCS); and, LG Tritan; Samsung TwoStep; LG Rhythm (US Cellular). Of note, almost every one of the phones listed above was first launched in the United States.

Coercive Product Design and Crippled Phones. As a second consequence of purported retail and technical barriers to device attachment, Professor Wu asserts that manufacturers are forced by carriers: (i) “to disable services or features that might be useful to consumers” and (ii)

²⁶ See <https://www22.verizon.com/opendev/> (last visited Nov. 17, 2009).

²⁷ *Wu Paper* at 9.

²⁸ *Wu Paper* at 7.

²⁹ *Id.* at 9.

³⁰ Letter from Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA-The Wireless Association, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 08-27; RM-11361 (filed May 12, 2009) at 11.

³¹ *Id.*

“to add elements to telephones that the designers do not think are what consumers want.”³² He specifically discusses the removal or limitations on the following types of functionality:

- *Call Timers*. Professor Wu asserts, without citation, that “[d]evelopers report that carriers have often forced them to remove or limit ‘call timers’ from their phones.”³³ In a market characterized by large (and even “unlimited”) buckets of minutes service plans, typically including unlimited wireless-to-wireless and night and weekend calling, Professor Wu speculates that carriers “are concerned that consumers might easily develop an independent and possibly different record of their mobile phone usage.”³⁴
- *Picture Messaging*. Professor Wu asserts that “many carriers successfully forced equipment developers to make photo-sharing services the only way to get photos off of a camera-equipped phone” as a means of driving revenue to proprietary or subscription photo sites.³⁵
- *Web Access*. Professor Wu argues that carriers forced manufacturers to develop WAP (Wireless Application Protocol) browsers because “various carriers strongly opposed the availability of “full” Internet browsers on the devices.” Even at the time of the paper, the Professor admits “the carriers relented, demanding only that their site be the first site available on any browser” and noted “[u]ltimately, WAP proved a commercial failure and has been abandoned in the United States.”³⁶
- *Bluetooth*. Professor Wu asserts that Verizon Wireless required manufacturers to disable certain Bluetooth functionality in mobile devices and that “Sprint and AT&T have also, at various times, disabled various Bluetooth capabilities—particularly on smartphones like the Treo line.”³⁷ Professor Wu asserts that this is detrimental to consumers because “uncertainty which makes it difficult or impossible for developers to create secondary markets based on full Bluetooth capabilities.”³⁸
- *Wi-Fi*. As a final example, Professor Wu states that, “over the last five years, American wireless carriers have strongly resisted and blocked the installation of Wi-Fi capabilities in cellular phones.”³⁹ He states further that “In the United States,

³² *Wu Paper* at 9.

³³ *Id.* at 9.

³⁴ Professor Wu’s theory fails to recognize how the popularity of innovative rate plans offering unlimited calling for “circle of friends,” wireless-to-wireless, night and weekend, and even all of a customer’s calls diminishes the utility of a call timer.

³⁵ *Id.* at 10.

³⁶ *Id.* at 11.

³⁷ *Wu Paper* at 11.

³⁸ *Id.* at 11.

³⁹ *Id.* at 11.

with a few notable exceptions, it is difficult today to find a Wi-Fi capable cell phone.”⁴⁰

In his paper, Professor Wu failed to address the general fact that not every product made by multi-national corporations is sold in every country. He also failed to address the fact that the U.S. market had, and still has, an amazing array of products. More specifically, a cursory review of mobile devices available today demonstrates that the situation described by Professor Wu is manifestly not accurate. The chart below provides a breakdown – for a number of popular new devices – of the relevant capabilities in the categories discussed by Professor Wu. The table notes, for example, whether Wi-Fi capabilities are present, whether the phone supports Multimedia Messaging Services (“MMS”), which allows the easy transmission of pictures to third parties, the types of Bluetooth profiles supported by the phones, and whether the phone has a full HTML browser.

			HTML Browser	Wi-Fi	MMS	Headset (HSP)	Handsfree (HFP)	Stereo (A2DP)	Other Bluetooth Profiles
Apple	iPhone 3GS	AT&T Mobility	Y	Y	Y	Y	Y	Y	PBAP, AVRCP, PAN
BlackBerry®	Bold	AT&T Mobility	Y	Y	Y	Y	Y	Y	SPP, AVRCP
Motorola	Karma QA1	AT&T Mobility	Y	X	Y	Y	Y	Y	n/a
Cricket	TXTM8	LEAP	X	X	Y	Y	Y	Y	n/a
Motorola	Evoke QA4	LEAP	Y	X	X	Y	Y	Y	n/a
Samsung	JetSet	LEAP	Y	X	Y	Y	Y	Y	DUN, PBAP, BPP, OPP, FTP
Motorola	Hint	MetroPCS	X	X	X	Y	Y	Y	n/a
Samsung	Finesse	MetroPCS	Y	X	X	Y	Y	Y	BPP, DUN, FTP, OPP, PBAP, SPP
Samsung	Messenger	MetroPCS	X	X	Y	Y	Y	Y	FTP, OPP
HTC	Hero	Sprint Nextel	Y	Y	Y	Y	Y	Y	GAP, SPP, AVRCP
Palm	Pre	Sprint Nextel	Y	Y	Y	Y	Y	Y	PBAP, AVRCP
Samsung	Instinct S30	Sprint Nextel	Y	N	Y	Y	Y	Y	AVRCP, DUN, FTP, OPP, PBAP, SPP
BlackBerry®	Pearl Flip	T-Mobile USA	Y	Y	Y	Y	Y	Y	SPP
Motorola	Cliq	T-Mobile USA	Y	Y	Y	Y	Y	Y	AVRCP, PBAP, OPP
myTouch	3G	T-Mobile USA	Y	Y	Y	Y	Y	Y	n/a
T-Mobile	G1	T-Mobile USA	Y	Y	Y	Y	Y	Y	n/a
LG	Rhythm	USCellular	X	X	Y	Y	Y	Y	n/a
LG	Tritan	USCellular	Y	X	Y	Y	Y	Y	n/a
Samsung	TwoStep	USCellular	X	X	X	Y	Y	Y	DUN, FTP, OPP, PBAP, SPP
BlackBerry®	Tour 9630	Verizon Wireless	Y	X	Y	Y	Y	Y	SPP, DUN, AVRCP
HTC	Touch Pro	Verizon Wireless	Y	Y	Y	Y	Y	Y	DUN, SPP, OPP, FTP, BPP, HID, AVRCP
Motorola	Droid	Verizon Wireless	Y	Y	Y	Y	Y	Y	AVRCP, PBAP, OPP
Samsung	Omnia	Verizon Wireless	Y	Y	Y	Y	Y	Y	DUN, SPP, OPP, FTP, BPP, HID, AVRCP

Figure 1: Phone Capabilities (Source: Carrier and Manufacturer Data)

It should be readily apparent that a rich selection of phones is available from a variety of sources, as described above, absolutely refuting Professor Wu’s view of the mobile market.⁴¹ Indeed,

⁴⁰ *Id.* at 12.

⁴¹ Although call timers are not specifically discussed in the table, most phones appear to have some form of monitoring. It should also be noted that, in addition to capabilities on the phone, carriers have actually introduced a series of products for monitoring and controlling usage of minutes under plans. *See, e.g.,*

there are substantial numbers of devices that have WiFi, Bluetooth, photo sharing and full web access readily available for subscribers to most any carrier's network.

Given the variations in Bluetooth implementation, that category deserves some special attention. Professor Wu appears to conclude that carriers' desire to cripple various Bluetooth features has inhibited the growth of a consumer-friendly Bluetooth accessory market. However, Professor Wu fails to note that Bluetooth is a suite of "profiles" and configurations, and manufacturers themselves have elected to pick and choose among the capabilities. For example, while the Headset Profile (HSP), Handsfree Profile (HFP) and Advanced Audio Distribution Profile for Stereo (A2DP) have become relatively common, other Bluetooth profiles – the Phone Book Access Profile (PBAP), Audio/Video Remote Control Profile (AVRCP), Basic Printing Profile (BPP), Dial-up Networking Profile (DUN), File Transfer Protocol Profile (FTP), Generic Access Profile (GAP), Human Interface Device (HID), Object Push Profile (OPP), Personal Area Network Profile (PAN), Serial Port Profile (SPP) – appear to be implemented at the discretion of the manufacturer.

2. Application Stall

Professor Wu's final condemnation of the wireless marketplace was that "all is not well in the world of mobile software development."⁴² More specifically, Professor Wu states that "[m]any application developers believe that the mobile applications market is stalled, or much less active than it might be" because: "(1) access to phone capabilities, (2) extensive qualification and approval procedures, and (3) pervasive lack of standards in many areas."⁴³ Based on recent reviews of the state of application development for the mobile devices, it should be clear that the applications market not only is not stalled, but is thriving, and in fact accelerating at a dramatic pace. The paper cites particularly to issues with addressing SMS-based services and location-based services.

CTIA, in its original comments on the FCC's Innovation NOI, noted that:

Apple's iTunes, Google's Android, Nokia's Symbian platform, Palm's PalmOS platform, Palm's WebOS platform, and Research in Motion's BlackBerry platform now all have online stores dedicated to providing users access to applications for their wireless devices. Press reports indicate that Microsoft is planning a store for its Windows Mobile platform while Verizon Wireless is planning its own Vcast App Store.⁴⁴

http://www.wireless.att.com/answer-center/main.jsp?t=solutionTab&ft=browseTab&ps=solutionPanels&locale=en_US&_dyncharset=UTF-8&solutionId=52112&isSrch=Yes; http://ecenter.custhelp.com/app/answers/detail/a_id/678; <http://support.t-mobile.com/doc/tm10032.xml>; <http://www.verizonwireless.com/b2c/myaccount/selfserve.jsp>.

⁴² *Wu Paper* at 14.

⁴³ *Id.* at 15.

⁴⁴ CTIA Comments at 38 (citing <http://www.apple.com/iphone/apps-for-iphone/> (last visited Sept. 24 2009); Elizabeth Woyke, Nokia's Gigantic App Store (May 7, 2009), available at

CTIA noted that “[t]his element of the wireless ecosystem . . . now boasts over 100,000 applications and growing.” Notably, even in the short time since those comments were filed, the number of applications available has crossed the 170,000 threshold, with Apple alone having more than 3 billion downloads.⁴⁵

Professor Wu’s suppositions regarding the difficulty of meeting developer requirements and the lack of standards for development are also clearly inapt. Lim Ding Wen is purportedly the world’s youngest iPhone developer, with twenty apps to his credit, including one app that reached number nine on the iPhone free application list on iTunes with a three and a half star user rating.⁴⁶ Lim Ding Wen is nine years old.⁴⁷

Professor Wu’s paper also failed to foresee or predict the massive industry shift to open architectures and development. Verizon Wireless, for example, has its ODI program⁴⁸ and sponsored a “Verizon Developers Conference” to foster the development of new applications.⁴⁹ AT&T hosts a devCentral website with specifications and tools for software developers, including software development kits and device emulators. Both Verizon Wireless and AT&T sponsor prize programs to identify innovative applications.⁵⁰ Wireless industry members also created the Open Handset Alliance, which developed an open mobile phone operating system

<http://www.forbes.com/2009/05/07/nokia-ovi-store-technology-wireless-nokia.html> (last visited Sept. 24, 2009); http://software.palm.com/us/html/top_products_treo.jsp?device=10035300025 and <http://appstore.pocketgear.com/palm/> (last visited Sept. 24, 2009); <http://developer.palm.com/> (last visited Sept. 24, 2009); <http://na.blackberry.com/eng/services/appworld/> (last visited Sept. 24, 2009); Brad Linder, “Windows Mobile Marketplace photos, rules released,” Download Squad available at <http://www.downloadsquad.com/2009/05/05/windows-mobile-marketplace-photos-leaked-rules-released/> (last accessed Sept. 30, 2009); Nicholas Kolakowski, Microsoft Windows Mobile 6.5 Will Debut in 3 LG Electronics Smartphones (Sept. 3, 2009), available at <http://www.eweek.com/c/a/Mobile-and-Wireless/Microsoft-Windows-Mobile-65-Will-Debut-on-3-LG-Electronics-Smartphones-120351/> (last visited Sept. 22, 2009); Marguerite Reardon, Verizon challenges Apple with Vcast app store (July 28, 2009), available at http://news.cnet.com/8301-1035_3-10297904-94.html (last visited Sept. 24, 2009).

⁴⁵ “Apple’s App Store Downloads Top Three Billion,” <http://www.apple.com/pr/library/2010/01/05appstore.html>. Press Release, Apple, “Apple’s App Store Downloads Top Two Billion” (Sept. 28, 2009), <http://www.apple.com/pr/library/2009/09/28appstore.html> (last visited Nov. 18, 2009).

⁴⁶ <http://www.reuters.com/article/idUSTRE5140FI20090205>, see also Shane Burley, Touchtip, “World’s Youngest iPhone Developer” (Feb. 14, 2009), available at: <http://www.touchtip.com/iphone-and-ipod-touch/worlds-youngest-iphone-developer/>.

⁴⁷ *Id.*

⁴⁸ See <https://www2.verizon.com/opendev/> (last visited Nov. 18, 2009).

⁴⁹ Verizon Wireless To Host Open Development Conference March 19-20, 2008 In New York City, Press Release (Jan. 22, 2008), available at https://www2.verizon.com/opendev/012208_news.aspx.

⁵⁰ Press Release, Verizon Wireless, “Apply Your Ideas Contest from Verizon Invites All Developers to Create Innovative Mobile Applications” (Aug. 13, 2009), available at <http://news.vzw.com/news/2009/08/pr2009-08-13a.html> (last visited Sept. 24, 2009); AT&T, “2009 Fast-Pitch Platinum Award Winners Announced”, available at http://developer.att.com/developer/index.jsp?page=event&id=6.3_v1_4600081.

popularly known as Android.⁵¹ T-Mobile (G1), Sprint (Hero) and Verizon Wireless (Droid) all offer Android phones and AT&T recently announced that it would begin carrying Droid devices.⁵² If that were insufficient, venture capital has also focused on the app market.⁵³ To say that the app market is anything but robust defies logic and reality.

3. Conclusion

Three years later, we now have empirical proof that the central thesis of Professor Wu's paper – that regulation is required because the mobile ecosystem will not permit market forces to correct what he perceived as consumer-unfriendly behavior – was simply wrong. In the absence of regulation, every element of the wireless ecosystem has expanded. The fact that there are over six hundred devices in the U.S. offering hundreds of different capabilities for consumers, over 170,000 applications, more open network with open developer initiatives and software development kits, the sale of phones through numerous online and retail outlets, multiple operating systems, and the launch of the newest and most innovative handsets first in the United States demonstrates that the ecosystem continues to evolve and provide consumers innovative technologies and applications without any regulatory intervention.

Even the most cursory review of the facts demonstrates that the wireless industry is so dynamic that all of the behavior Professor Wu cited as being anti-competitive or anti-consumer either never materialized or is no longer relevant. The U.S. market is flooded with a diverse range of devices and applications, broadly available through multiple retailers and distribution channels, and possessing a wide range of capabilities, to meet consumers' needs. Even though every device may not be capable of being operated on every network, a competitive marketplace exists where consumers can acquire the features and functions they deem important. This competition extends throughout the wireless ecosystem, beginning at the physical layer (carrier networks and digital air interfaces), and extending through wireless devices, operating systems, applications and downloadable content. In short, Professor Wu was incorrect. Not simply on the facts, but most importantly on his ultimate conclusion that competition would not deliver the

⁵¹ In November 2007, the Open Handset Alliance was formed by an alliance of 34 handset makers, wireless providers and other technology companies led by Google, T-Mobile, High Tech Computer Corporation, Qualcomm, and Motorola. Press Release, Open Handset Alliance, "Industry Leaders Announce Open Platform for Mobile Devices" (Nov. 5, 2007), available at http://www.openhandsetalliance.com/press_110507.html.

⁵² Press Release, Sprint Nextel, "The Innovation and Openness of a True Mobile Internet Experience Coming Soon to America's Most Dependable 3G Network from Sprint on HTC Hero with Google" (Sept. 3, 2009), available at http://newsreleases.sprint.com/phoenix.zhtml?c=127149&p=irolnewsArticle_newsroom&ID=1327394&highlight=Android.

⁵³ The BlackBerry® Partners Fund, for example, has \$140 million to invest in companies developing applications like e-mail management and business-travel guides. "BlackBerry Fund Looks Beyond '99-Cent' Programs," Hugo Miller, Bloomberg.com (Sept. 23, 2009), <http://www.bloomberg.com/apps/news?pid=20601204&sid=aSF9UERzYUOs> (last visited Nov. 18, 2009). Similarly, the Kleiner Perkins Caufield & Byers run iFund has \$100 million to invest in companies designing iPhone applications for location-based services, social networking, mCommerce, communications, and entertainment. Press Release, Kleiner Perkins Caufield & Byers, "Kleiner Perkins Caufield & Byers Launches \$100 Million iFund for iPhone Application Developers" (March 6, 2008), <http://www.kpcb.com/initiatives/ifund/pressrelease.html> (last visited Nov. 18, 2009).

benefits of innovative best-in-the world wireless service to the Nation's wireless users. It was an interesting and provocative paper, but we now know there was no market failure, and that Professor Kahn was right.