Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
Application of Cellco Partnership d/b/a Verizon Wireless and SpectrumCo LLC For Consent To Assign Licenses	)	WT Docket No. 12-4
Application of Cellco Partnership d/b/a Verizon Wireless and Cox TMI Wireless, LLC For Consent To Assign Licenses	)	

Information Age Economics (IAE)
Ex Parte Comments

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Summary

The heart of the proposed set of transactions by the Applicants - Verizon and four major cable MSOs (Multiple System Operators) – comprises an integrated set of collaborative, cooperative, non-competitive, arrangements in their commercial, technical and business operations, as well as coordination of their market strategies among leading U.S. players *and competitors* across the cable TV and telecommunications company sectors of the telecommunications-information-entertainment (T-I-E) industry.

This proposed collaboration, if approved by the Federal Communications Commission (FCC) and the Department of Justice (DOJ), threatens to undermine the entire foundation of vigorous, innovative-friendly competition in the U.S. broadband market. Effective competition in this market, a basic premise and goal of the 1996 Telecommunications Act as well as the justification for the FCC's decision to classify broadband as "largely unregulated" in 2005, will be eroded and eventually disappear.

We find that approval of these transactions will constitute a decisive step toward the creation of a U.S. broadband market in which the supply of broadband and broadband-dependent services and applications will be characterized by:

(i) A national wireless duopoly; and

(ii) The carving up of the territory of the U.S. between members of a cartel – or more likely eventually two cartels[1], each one including a member of the wireless duopoly – so that in each area there is only one supplier of high speed (> 3-5 Mbps download) fixed broadband access.

The cartel/cartels will be both horizontally integrated, i.e., operating major wireless and wireline assets, and vertically integrated, i.e., offering content and other services as well as transport.

The cartel(s) will also establish a monopsony structure confronting third party owners/providers/distributors of video content and other services who depend increasingly on access to broadband networks in order to reach their customers. Furthermore, the actions and behavior of the cartel(s) will effectively be unchallengeable, and any attempts to introduce and enforce reasonable regulations on them unenforceable, since they will be operating in the largely unregulated broadband market. They will be negotiating the conditions of access to their networks by third parties (other operators and OTT players) from unassailable and asymmetric positions of strength, enabling them to marginalize those who do not accede to their terms and discriminate in favor of those who do.

The shape of this future scenario and the behavior of the cartel(s) have been presaged by a series of initiatives undertaken by the two largest telephone companies in the U.S., Verizon and AT&T, as well as cable operators, including the largest, Comcast, such as but not limited to:

[1] We are assuming that if the Verizon Wireless-SpectrumCo-Cox transaction is approved, AT&T will follow-up with its own version of a collaborating cartel between itself and another set of cable companies as given voice by AT&T's CEO, Randall Stephenson in an interview on January 26, 2012 with Fierce Cable.

- Comcast's acquisition of NBC Universal confirming its intensified focus on content-based revenues, reinforcing the incentives or benefits to its bottom line from successful or undetected discrimination against directly competitive video services providers.
- Comcast's introduction of its new Streampix video-on-demand service that is a direct competitor to Netflix and other video streaming services. Comcast will not subject Streampix's customers to any data caps imposed on its broadband services since it is delivering Streampix to customers over its cable, not its broadband channels. In contrast, Netflix subscribers who are Comcast customers depend on Comcast's broadband connections and may therefore incur data surcharges if they view "too many" videos, especially high definition ones. Hence, Comcast can effectively marginalize Netflix and other direct OTT video services competitors as they attempt to reach Comcast's cable customer base, thereby violating the spirit and intent of any Net Neutrality rules, even if those rules are enforced.
- The tacit coordination between Verizon and AT&T in introducing non-interoperability within the "beachfront" 700 MHz band, thereby creating a situation in which this band is following a path toward becoming two separate sub-bands, the lower one dominated by AT&T and the higher one by Verizon. This outcome will be almost certain if Verizon is able to implement its plan to divest its Lower 700 MHz Band A and B block frequencies, as it has announced it will do, once its transactions with the cable operators are approved. The bifurcated structure of the 700 MHz band, dominated by a duopoly of the largest mobile operators, gravely impairs the ability of other operators to use "beachfront" sub-1 GHz frequencies efficiently and at competitive costs[2]. Furthermore, by introducing non-interoperable devices, Verizon has violated the open access conditions attached to the Upper C Block frequencies, which it acquired in 2008, at a significantly lower auction price than the Lower Band 700 MHz frequencies[3].
- Decisions by Verizon to limit its deployment of FiOS and stop selling stand-alone DSL service, thereby reducing customers' choices and leaving significant numbers of residential customers, *even pre-cartel,* with only one supplier of high speed fixed broadband in their area. This action limits the options of consumers who wish to have a lower-priced (and slower) alternative to cable-based high-speed internet offerings[4].
- Verizon's, AT&T's and leading cable operators' persistent patterns of litigation[5] and other forms of opposition against any efforts or suggestions by the FCC that might limit their freedom to act however they choose, e.g., with respect to data roaming requirements, "net neutrality" rules, open access conditions, etc. While they have every right to do so, it is a right not an obligation. Their choices of what regulations to oppose and/or ignore, and the persistence and consistency

[2] Furthermore these same two companies also control the other "beachfront" sub-1 GHz i.e. 850 MHz band which they inherited from their predecessors who acquired them at no cost in the 1980s, giving them an asymmetric legacy cost as well as a sizable spectrum-related performance advantage against competitors who have had to acquire all their spectrum licenses at considerable cost.

[3] This low price can be attributed to the open access conditions and the large license areas for these blocks that excluded all but the most financially powerful companies from bidding for them.

[4] Barthold, J, "Verizon's DSL plans questioned by congressman", Fierce Telecom, May 9, 2012.

[5] "Verizon challenges data roaming rules in court," http://www.lexology.com/library/detail.aspx?g=39052f00-1228-460d-856a-755d52596b18

of their opposition, are strong indicators of how they will act if the ONLY constraint on them is self-regulation.

- The support by major telecommunications companies of legislation[6] in several states that eliminates restraints on their freedom to act, for example a bill in Connecticut, supported by AT&T, to allow any large telephone company to terminate any service it chooses, for any reason, to any customer, with no more than a month's notice.

Verizon and its new cable partners are also exhibiting a disregard in their proposed transactions for the goals of the 1996 Telecommunications Act, and also contradicting their claims of effective broadband competition that helped lead to the FCC's 2005 decision to classify "broadband" as largely unregulated, in contrast to other telecommunications services. The stimulation and sustainability of competition between services providers is *the* core motivation behind the 1996 Act. The FCC's later decision in 2005 to consider broadband as unregulated rested on a finding that the broadband market was "effectively competitive". This finding was itself based on the critical role of intermodal competition in the broadband market between telecommunications companies and cable TV operators, e.g., at the time DSL versus cable modems, which both categories of broadband provider have since touted. In light of this history, it is not credible for the Applicants to claim, in 2012, that *collaboration, not competition, is appropriate and acceptable* between a major telecommunications company and four major cable operators along the key dimensions of sales, marketing and joint development. Clearly, this collaboration, along with the transfer of a significant spectrum asset from the cable operators to Verizon to be shared between them, will strike a major blow at the foundation of competition in the U.S. broadband market.

The illustrative examples of the actions of the members of the putative cartel(s), and their "forgetfulness" about the essential role of facilities-based competition between them, prove that their arguments and claims are not based on logic, evidence or consistency. Nor are the Applicants prepared to accept any reasonable restraints on their actions to help sustain competition and the interests of customers, unless they are obliged to do so by one or more of the influences of:

(i) Enforceable and effective regulation;
(ii) The market power of strong competitors who are alternative sources of supply for customers; and
(iii) Large customers, e.g., enterprises and governments, with sufficient purchasing power, who can negotiate reasonable terms and conditions, at least on their own behalf.

These sources of healthy countervailing power will all be grievously weakened and increasingly ineffective in the cartelized scenario of the U.S. broadband market that will emerge if the Applicants' proposals are approved.

[6] For example, "SB 447: Raising Phone Rates and Putting Telephone Service At Risk for Connecticut," http://www.demos.org/sites/default/files/publications/Connecticut_Telecom-Report.pdf

The dangers to the healthy and competitive evolution of broadband in the U.S. posed by the approval of the proposed transactions between the Applicants are not speculative or controversial possibilities, nor are they unpredictable or unintended consequences. They are already plainly visible in some aspects, and in other aspects predictable. They will begin to bite and take immediate effect from Day One, if the transactions are approved.

Indeed, the Applicants have already begun to implement the critical elements of these transactions[7]. Remarkably, their haste in this respect, six or more months before the FCC's review process is scheduled to be completed, demonstrates that it is the commercial agreements (CAs), and planned joint development organization, which are the most important and fundamental ingredients of the integrated set of transactions. They will have a long lasting, irreversible and destructive impact upon the dynamics and intensity of competition in the broadband market.

Approval of the proposed transactions will establish a precedent for a broadband cartel which will only grow in scope and strength as time goes on. Furthermore, a cartel including Verizon will likely be joined by a second cartel, including the other major wireless and wireline operator in the U.S., AT&T[8]. Eventually the great majority of the U.S. population will become hostage to the unilateral business decisions and choices made by cartels in unregulated and hence unchallengeable positions.

The only solution to avert an inevitable degradation of competition and increasing relative deterioration in a global context in the performance and pricing of broadband in the U.S. is outright rejection of the Applicants' proposed transactions in their entirety.

I. The Elimination of Competition in the U.S. Broadband Market

Initiatives by the nation's two dominant telecommunications companies and four major cable TV MSOs, signal the culmination of a decade-long process that will lead to the destruction of effective competition in the broadband market, unless remedial action is taken by the FCC, the DOJ, and perhaps even the U.S. Congress. It is time to "connect the dots" between the various specific actions and consistent patterns of behavior of the leading telecommunications companies and cable operators over at least the past decade. They would prefer that each step or application to the FCC should be viewed and reviewed as separate and independent events. Despite suffering one noteworthy reversal (the withdrawal in 2011 of AT&T's application to acquire T-Mobile USA) this handful of companies has been progressively and steadily moving the U.S. toward a telecommunications services market structure which they can dominate in cartel-like fashion, and act as unchallengeable (monopsony) gatekeepers in setting the

[7] Comcast: The Broadband Battle is Starting to Heat Up," http://247wallst.com/2012/05/02/comcast-the-broadband-battle-is-starting-to-heat-up- cmcsa-twc-cvc-vz-vod-t-nflx-dtv-dish-pcs-leap-dtegy/#ixzz1u611SK3L; "Verizon Crosses Web Lines," Wall Street Journal, http://online.wsj.com/article/SB10001424052970203363504577187374053778712.html

[8] "AT&T CEO hints at possibility of joint cable promotions," http://www.fiercecable.com/story/att-ceo-hints-possibility-joint-cable-promotions/2012-01-26#ixzz1u5yyjdex

terms and conditions of network access by third party services providers and applications developers to their online customers.

If approved, the business transactions of a few giant T-I-E industry companies could delay, and even frustrate, the National Broadband Plan, developed by the Obama Administration, regarded as one key to the nation's economic and business recovery.

Broadband networks are critical gateways for the deployment of essential voice, data and video services and applications that affect every aspect of our daily lives, including education, health, job opportunities, public safety, etc. The broadband networks sit at the core of our socio-economic and business transactions and may soon be controlled by a cartel of previously fierce competitors who will now operate as virtual monopolies in local or regional wired broadband network access markets, and as a national duopoly in broadband wireless services and applications.

This outcome will frustrate the competitive goals embodied in the landmark 1996 Telecommunications Act that set the stage for the rapid growth of the Internet, the World Wide Web and the flowering of a wave of imaginative innovations by American entrepreneurs.

The stage for this undesirable and unforeseen outcome is being set by the actions and strategies of several large firms which already dominate broadband services, both wired and wireless. The momentum toward a possible and potential non-competitive environment received a huge boost with the FCC's decision in 2005 to categorize the provision of broadband services as unregulated, in contrast with telecommunications services which are regulated at both the federal and state level. This move by the FCC, perhaps premature given subsequent events, was justified on the grounds that there was "effective competition in this market" unlike other areas of telecommunications, still subject to the risk of abuses of market power.

However, the proposed transactions by Verizon and four major cable operators undermine existing competition and call into question the long-term viability of unregulated broadband services. These transactions encompass a coordinated and cooperative series of business transactions between Verizon, a dominant company in its sector, and four powerful cable MSOs - Comcast-NBC/Universal, Time Warner, Bright House, and Cox – each of which has major market power in their own respective operating territories which significantly overlap with Verizon's. As already noted, the other leading telecommunications company, AT&T, indicated in its 4th quarter 2011 earnings call in January, 2012, that it would likely pursue similar arrangements with cable operators when and if Verizon's transactions are approved.

The initial and lesser part of the transactions involves the transfer to Verizon by the cable companies of spectrum holdings in the AWS band that, despite claims of nationwide spectrum scarcity, have been left unused since their acquisition in an FCC auction in 2006. However, there are other paths now available to ensure that this hitherto unused AWS spectrum would be exploited rapidly for the deployment of additional mobile broadband capacity in the U.S., one of which was anticipated shortly before the

proposed transactions between Verizon and the cable MSOs were announced[9], and might well have been pursued had AT&T not been an obstacle, which it no longer is. That is, if T-Mobile had not been subject to possible acquisition by AT&T until recently, T-Mobile might itself have been willing to purchase this AWS spectrum from SpectrumCo (the joint venture of Comcast, Time Warner Cable, and Bright House Networks) and Cox. Such an option would not have presented the same kind of anti-competitive profile manifested by Verizon Wireless in this instance.

The more significant parts of the transactions involve a complex set of commercial agreements (CAs) that will enable cross-selling of Verizon's and the cable operators' respective services in each other's territories, and the formation of a joint development organization.

Verizon asserts that the spectrum and other elements in these transactions are independent of each other, and that only the spectrum transfer is subject to government review and approval. Verizon characterizes the CAs as standard business arrangements that are in no way related to the spectrum transfer. Furthermore, Verizon asserts that such agreements are not subject to review by the FCC.

However, in a recent interview in Politico (March 8, 2012)[10] David Cohen, a senior Comcast executive, refuted the assertion of separable transactions in his statement that "the transaction is an integrated transaction. There was never any discussion about selling spectrum without having the commercial agreements." He also argued, illogically, that this "integrated transaction" was separable into regulated and unregulated components, agreeing with Verizon that, "there is no approval right or rejection right at the FCC over these."

In the following section the current goal and bases of competition in the U.S. broadband market are assessed to demonstrate why the commercial and joint development agreements between Verizon and the four cable MSOs will destroy competition within this market, and are therefore required subjects for review by both the FCC and the DOJ. The FCC must, in fact, consider their impact upon its 2005 decision to classify broadband as largely unregulated, while the DOJ has the authority to review whether combinations between leading competitors in a vitally important market such as broadband violate antitrust law.

I.1 The Goal and Basis of Competition in the U.S. Broadband Market

A primary objective of the 1996 Telecommunications Act as recorded in the House of Representatives' Conference Report 104-458 on this Act was "…to provide for a pro-competitive, de-regulatory national policy framework designed to accelerate rapidly private sector deployment of advanced information technologies and services to all Americans by opening all telecommunications markets to competition....".

[9] "T-Mobile USA: A Better Future Without AT&T," Information Age Economics, BNA Daily Report for Executives, (194 DER B-1, 10/6/11), 10/06/2011.

[10] David Cohen, Executive Vice President of Comcast, in an interview reported by Eliza Krigman, *Comcast Executive Defends Verizon-SpectrumCo Deal*, POLITICO, March 8, 2012.

There are two ways to provide this competition, namely in "intermodal" and/or "intra-modal" models. The former involves competition between *different* network platforms for fixed broadband access, which in practice has meant competing network facilities owned and operated by cable MSOs and telephone companies. Over the last decade the goal of U.S. telecommunications policy has been to promote, and rely upon, precisely this form of "intermodal competition."

The alternative of intra-modal competition, based on the use of the *same* network platforms, i.e., telecommunications company facilities only, for the delivery of competing services (i.e., a service provider model), is dependent on enforced unbundling of network services elements and their "costs" by the FCC and State regulators, along with network sharing obligations to enable even small and medium size companies to compete. This form of competition has been ineffective in the US as evidenced by the failure of CLECs (Competitive Local Exchange Carriers) to mount effective competition in the telecommunications market. Intra-modal competition has, however, been more successful in European markets, where the regulatory approach to a "service provider model" is different.

Competition can flourish with network competition based on either the intra-modal or the intermodal model, or both, but it will die if neither is present.

Before analyzing events that have been eroding competition in the U.S. broadband market and now threaten to eliminate it, there is one key technological factor, the advent of broadband mobile networks that was not appreciated at the time of the 1996 Telecommunications Act. It is the advent of truly broadband mobile networks that is dominating the strategy behind the set of integrated transactions proposed by Verizon and its cable allies that cover both wireless and wired assets.

Unfortunately the development of mobile broadband networks, most widely associated with technological and vague acronyms, such as HSPA (High Speed Packet Access) and LTE (Long Term Evolution), have led in some quarters to an exaggeration of the capabilities of mobile broadband. Mobile broadband is frequently presented along with misleading headlines about peak speeds of tens and even hundreds of Mbps, as equivalent to, or as an effective alternative to fixed broadband. It is not. The two technologies are primarily complementary in their capabilities and value for customers and truly competitive in only a minority of circumstances.

I.2 The Relationships between Wireless and Wired Broadband and the Inseparability of the Applicants' Spectrum Transfer and their Commercial and Joint Development Agreements

There are inherent differences between the nature of broadband access provided over wired and that provided over mobile or radio access networks. The characteristics which give rise to these differences are not temporary or related to the state of technology at any point in time, but are intrinsic to the physics and engineering of these respective network infrastructures. In particular:

- The shared nature and limited bandwidth of mobile radio access networks (RANs) mean that they can never match the capacity or speeds that can be delivered to individual users or locations over wired access networks. Fiber-intensive wired networks can be engineered to deliver dedicated speeds of hundreds of Mbps or more to a location (one fiber can theoretically deliver more capacity than the entire spectrum

which is potentially usable in a mobile network) whereas mobile radio access networks involve shared capacity. Wireless networks cannot deliver anywhere near the capacity in terms of Mbps/km^2 of wired networks can, which will be needed to support the growing bandwidth demands of hundreds of simultaneous users within densely populated areas. Mobile operators recognize this limitation since they are actively implementing ways (notably Wi-Fi, as well as femtocell-based) to offload substantial proportions of mobile broadband traffic onto fixed broadband facilities wherever possible.[11]

- Unlike wired networks, mobile networks provide continuous coverage or access within wide areas and enable access when users are nomadic within a location or mobile as pedestrians or in moving vehicles.
- Furthermore, there are some locations where it is either impractical or uneconomic to reach with cables, due to the terrain or the low density of users, and hence insufficient revenue potential per km^2 to justify the investment, even if subsidized, so that wireless access, either terrestrial or satellite, is the ONLY alternative for providing broadband, or indeed any communications capability.

Wired and wireless-based broadband are complementary to each other, or mutually reinforcing, in the context of satisfying all communications demands and expectations. This goal is often expressed in terms of the ultimate or ideal capability of "anywhere, anytime, any network (and sometimes any device)" access to the same applications and services, even if realistically various devices and networks cannot all deliver the same performance.

Both network facilities owners and third party services providers and applications developers are striving to achieve this holy grail of online broadband access. The unmistakable implication is that if this broadband goal is valuable to both services providers and customers, then businesses formulate and evaluate significant initiatives, whether they involve wireless-only or wired-only assets or both, in light of their overall contribution to broadband strategy and competition.

Any FCC regulatory review must consider the entire broadband landscape, wired and wireless.

It is been asserted by the Applicants, despite all the business, technological, and market drivers of which they are fully aware, that the spectrum transfer deals between Verizon Wireless (VZW which is 55% owned by Verizon) and four of the largest Cable MSOs on one hand, and the complex commercial and joint development arrangements between these organizations that have also been announced on the other, should be viewed as separate business transactions[12]. They are characterized as having no bearing on each other, or on the public interest, which is patently not the case. Thus, the Applicants have argued that reviews by the FCC and possibly the DOJ, and hence the decision whether to approve or reject the spectrum transfers, should not take any account of the commercial arrangements for the

[11] "Wi-Fi offload poised to dominate network news - MWC 2012 preview issue," http://www.fiercewireless.com/europe/special-reports/ford-visa-and-other-outsiders-take-center-stage-mobile-world-congress-2012/wi-fi-off#ixzz1uNLsYfUN

[12] *Ex parte* filing to the FCC by the five companies, January 18, 2012, Willkie, Farr & Gallagher, LLP, http://fjallfoss.fcc.gov/ecfs/document/view?id=7021755383

various collaborative resale and marketing programs of Verizon's and the cable MSO's respective fixed and mobile services and their planned joint development venture.

However, there are obvious and inevitable major combined and/or interrelated consequences that make these "two" distinctive moves by Verizon and the cable MSOs inextricable, and reveal them unmistakably as elements of the same overall business strategy and plan.

The realities of the outcomes of the spectrum transfers from Comcast, Time Warner, Bright House and Cox to Verizon Wireless viewed are fundamentally different if they are viewed in isolation instead of in combination with the applicants' commercial arrangements. These differences can be depicted as follows:

- *Spectrum transactions alone:* Verizon, the largest mobile operator in the U.S., is to acquire additional spectrum for its Long Term Evolution-based mobile broadband deployments, while a group of potentially powerful mobile operators decides not to enter the mobile broadband market sector of the telecommunications-information-entertainment industry after hoarding, for almost six years, their valuable spectrum during a time when a shortage of spectrum for mobile broadband is being widely lamented.
- *Spectrum transactions plus commercial arrangements:* The dynamics, and hence the competitive intensity of the entire broadband market in the U.S. will be affected by these collaborative and cooperative business arrangements, and competition among them will be substantially reduced, as a result of coordinated interactions between members of a cartel-like group of companies with market power, which includes the #1 wireless service operator, and in many important local or regional markets, e.g., New York, Greater Boston, etc., the #1 and #2 fixed broadband providers. In these major regional markets where Verizon and one from among the four cable MSOs overlap, the two collaborating operators enjoy combined fixed broadband market shares of 90% plus among residences.

The fixed and mobile segments of the broadband market are becoming increasingly intertwined in the emerging era of "triple" or even "quad" plays in which companies like Verizon and Comcast (which now owns NBC Universal) seek to maximize their revenue per customer, while also increasing their market and competitive positions by offering fixed and mobile voice, broadband access, and video services to customers in various bundles. The attractiveness of these bundles is going beyond simply offering pricing discounts when a customer subscribes to more than one of them as separate services, but is also involving operational relationships between them, and/or added features, that are only available in multi-service subscriptions.[13]

In other words, it has become clear that fixed and mobile broadband services cannot any longer be treated as separate or independent markets. The capabilities and attributes of the two market segments are complementary and must be considered together. It is disingenuous for operators to argue that what they do in the mobile segment has no bearing on what they do in the fixed arena, or vice versa. In

[13] Early examples are remote control of a DVR (digital video recorder) at home from a mobile device, and multi-screen video services in which video programming can be viewed on a TV at home, or a PC, or a smartphone.

fact, statements such as this are repeatedly refuted by the advertisements from their own aggressive sales and marketing campaigns. It is also noteworthy that Vodafone, Verizon's U.K.-based partner (with a 45% stake in the mobile operator Verizon Wireless), used to proclaim that it was a wireless-only business. But more recently Vodafone has shown it is prepared and wants to make significant investments in wired networks as well[14] and has been integrating not divesting the wired assets it sometimes acquires along with wireless ones.

Furthermore, the critical impact of the new relationships between Verizon and the cable MSOs that justify an integrated review of all the initiatives that they have recently announced is reinforced by its consequences for wireless service interoperability, which is the subject of a Federal Communications Commission Notice of Proposed rule-Making (NOPRM) issued in March, 2012[15], as well as by its related implications for other competitors, most notably Sprint and its subsidiary Clearwire.

The cable MSOs have announced that they will terminate their various Mobile Virtual Network Operations (MVNO) relationships with Sprint and Clearwire, with significant competitive implications for Sprint Nextel, the #3 mobile operator. Of greater significance is the certain expectation that Verizon Wireless will deploy LTE systems in the AWS spectrum that it is seeking to acquire from the cable MSOs. If the deal is approved by the FCC and the DOJ, this will complement Verizon's LTE deployments at 700MHz. Then Verizon Wireless will surely require and encourage device suppliers to develop products with dual-band LTE capability so that its customers can make use of all its LTE capacity, thus significantly strengthening its already formidable market position based on non-interoperability of the LTE devices it offers. Since the 700 MHz part of these devices will be non-interoperable, this will result in the launch of a new generation of non-interoperable Verizon devices, backed by the most extensive LTE deployments in the U.S., and further boosted by the added sales and marketing muscle of the cable MSOs.

To take one example, if as widely anticipated an LTE-capable version of the immensely popular iPhone is launched within the next year, following Apple's LTE-enabled iPad[16], that conforms to the non-interoperable specifications of VZW (and of AT&T in a different frequency block in the 700 MHz band) the impact on the growth of the installed base of non-interoperable devices in the U.S. is likely to be considerable before any decision can be reached and implemented as result of the NOPRM referred to earlier. As a result the costs of, and the time required, for the elimination of the adverse effects of non-interoperability will be substantially augmented, and perhaps several times greater than they need be, <u>if prompt action is not taken.</u>[17] An Appendix presents a concrete product example (the latest current Apple iPad) of the consequences of non-interoperability in terms of the fragmentation of the market for

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[14] **"**Business Watch: Vodafone CWW deal hits Orbis-shaped snag**,"** http://www.mobilenewscwp.co.uk/2012/05/business-watch-vodafone-cww-takeover-hits-orbis-shaped-snag/

[15] Promoting Interoperability in the 700 MHz Commercial Spectrum; Interoperability of Mobile User Equipment Across Paired Commercial Spectrum Blocks in the 700 MHz Band, Federal Register /Vol. 77, No. 63 /Monday, April 2, 2012

[16] "New iPad can be used as Verizon LTE hotspot for over 24 hours," http://www.theverge.com/2012/3/26/2903155/new-ipad-verizon-lte-hotspot-24-hour-battery-life

[17] Even if there is no point in bolting a barn door after the horse has escaped, if the horse can be captured before it has gone very far and brought back into the barn then the damage caused can be contained before it becomes irreparable.

mobile devices, the violation of open device principles, and the competitive advantage Verizon and AT&T are building by their unilateral introduction of this structure into the 700 MHz band.

Thus another direct consequence of the proposed spectrum deal, combined with the commercial arrangements between Verizon and major cable MSOs, will be a magnification and acceleration of the spread of non-interoperability within the U.S. mobile broadband market segment. The potential damage caused by a prolongation of non-interoperability, a result of unilateral and tacitly coordinated choices by Verizon and AT&T, in one of the major bands for the initial deployment of LTE-based mobile broadband networks is considerable and long lasting, given the expectation that LTE will become the dominant mobile broadband technology in the U.S. and globally within the next ten years[18].

If allowed to proceed by the FCC and the DOJ, the magnifying effects of these business transactions among some of the nation's biggest and most powerful telecommunications-information-entertainment providers will have profound effects on the American public. These effects may be compounded by the contemporaneous process initiated by the FCC's 700 MHz interoperability rulemaking if there is no reversal of the non-interoperability whose scope is currently being spread aggressively by both Verizon Wireless and AT&T Mobility, America's two most powerful wireless services companies. The path AT&T followed in unilaterally introducing non-interoperability, which was tacitly accepted by Verizon, involved a global forum that did not include other U.S. stakeholders, e.g., other 700 MHz license holders. This behavior by AT&T has been amply documented and the justifications it advanced for this move have since been thoroughly debunked[19].

Unfortunately the rulemaking process, as now scheduled, will likely give both companies several more and perhaps many months to build more "facts on the ground" that they will use to argue that it is simply too expensive and disruptive to reverse non-interoperability. For example, Verizon has announced that all its "smartphones" will now incorporate LTE which, in its 700 MHz deployments, involves non-interoperable devices[20]. Within the next 12-15 months there are likely to be tens of millions of non-interoperable LTE devices in use in the U.S., most likely boosted by the anticipated launch of a LTE-capable iPhone sold by AT&T as well as Verizon.

This outcome will mean that a fundamental principle and cornerstone of telecommunications policy in the U.S. for many decades will have been unilaterally and perhaps irrevocably violated on a large scale by the two most powerful telecommunications operators, without any effective review of the key questions involved and the consequences of such a violation, both short- and long-term, for many

[18] "Non-Interoperability at 700 MHz: Lower Revenues & Higher Prices," Information Age Economics, http://rca-usa.org/uncategorized/non-interoperability-at-700mhz-lower-revenues-higher-prices/916674

[19] Vulcan Wireless *ex parte* presentation, December 15,2011, http://apps.fcc.gov/ecfs//document/view.action?id=7021750901; Sprint, T-Mobile, MetroPCS et al. written *ex parte* presentation, May 10, 2011, http://apps.fcc.gov/ecfs//document/view.action?id=7021750901

[20] "Verizon reconfirms 4G LTE for all future smartphones," http://news.cnet.com/8301-1035_3-57397388-94/verizon-reconfirms-4g-lte-for-all-future-smartphones/

stakeholders[21], thereby in practice pre-empting the purpose of the rulemaking on interoperability – or the lack thereof.

Verizon's action to introduce non-interoperability in the 700 MHz band is yet another indication of its failure or lack of intent to live up to the principles it claims to espouse whenever it perceives a self-serving or anti-competitive reason to ignore them. In other areas, Verizon has warmly embraced the principle of interoperability and described the benefits and value it delivers to customers. For example, in 2002 when Verizon selected an inter-carrier text messaging platform [22] Jim Straight, V.P. Wireless Data & Internet Services, Verizon Wireless commented: "In addition to InphoMatch's proven technology, expertise, and solid experience in other world markets, we selected their platform because it enables us to enhance our text messaging services for our customers in a way that is both technologically agnostic and cost-efficient," and "As the largest wireless carrier we are positioned to make the biggest impact in the growing SMS market, and we believe InphoMatch provides us the engine to deliver on that potential." He was joined by InphoMatch president and CEO Colin Matthews who stated: "Verizon Wireless' launch completes an enormous part of the interoperability puzzle. Our initial SMS interoperability results indicate that the domestic text messaging environment is poised for massive market acceleration. We have seen the U.S. growth rate for inter-carrier text traffic running ahead of what Europe experienced when it was introduced there."

I.3 The Progressive Erosion of Competition in the U.S. Broadband Market

As noted earlier, the first competition model to disappear in the U.S. after the enactment of the 1996 Telecommunications Act was intra-modal, since essential regulatory obligations for its functioning have now been removed, notably with respect to local network unbundling. The regulatory "unbundling" obligations, and local network sharing, rules were vigorously opposed by both major telephone companies and the cable MSOs. These regulatory obligations were NOT applied to the cable MSOs. The major telecommunications companies persuaded the FCC, which announced its decision in 2003, to remove the regulatory obligations imposed on them with respect to unbundling of local or access network facilities by advancing the argument of "regulatory parity" -- it was unfair to impose obligations on telecommunications companies that were not applied to their direct competitors, the cable MSOs, with whom they now propose to cooperate closely, not compete, in broadband and video markets.

Approval of the proposed transactions by Verizon and four major cable MSOs would signal the death knell for inter-modal competition. Yet because effective intra-modal competition has already been eliminated, ***the result would be a non-competitive U.S. broadband market.*** Then the worst of all possible worlds would be created in the U.S. -- a non-competitive environment for broadband and video services supplied by an unregulated or unbridled cartel (or cartels) that determine who will get which services, where, at prices and qualities determined unilaterally by its members, without any realistic,

[21] "Non-Interoperability at 700 MHz: Lower Revenues & Higher Prices," Information Age Economics, http://rca-usa.org/uncategorized/non-interoperability-at-700mhz-lower-revenues-higher-prices/916674

[22] "Verizon Wireless Deploys InphoMatch Platform To Manage Inter-Carrier Text Messaging Traffic," http://news.verizonwireless.com/news/2002/04/pr2002-04-09a.html

affordable alternatives. The financial sector clearly perceives these transactions as having the effect of severely reducing if not eliminating the competition that Verizon faces[23].

A non-competitive broadband market environment would raise formidable obstacles to innovation across most sectors of our increasingly online economy. It would also impair the nation's competitiveness on a global scale. In the absence of effective, pro-competitive, customer-friendly regulation, the cartel's members - the broadband access network and wireless market leaders – would be free to combine their operating, development, sales and marketing assets in whatever way they want, and even more broadly and closely than they now propose.

II. The Predictable Tactics and Behavior of the Cartel(s)

The cartel structure that would emerge if the proposed Verizon/cable MSO transactions are approved would encompass data, video and mobile, as well as fixed voice communications, which occupy pervasive and critical (e.g. the Internet and World Wide Web) roles throughout the economy, and our social, personal, and workday lives.

The cartel will be motivated to carve up markets between their members. The outlines of the future monopolistic-like broadband environment are already visible in places such as Boston, Philadelphia, Baltimore, Syracuse and Buffalo. Verizon's announced plans for deployment of its fiber-based FiOS network exclude significant numbers of locations in these cities, in both affluent as well as lower income neighborhoods. As a consequence, many customers in these cities already have only ***ONE*** choice of supplier of broadband access beyond first generation DSL capabilities, i.e. with download speeds above 3 Mbps[24].

II.1 Verizon Was Correct and Prescient in its Analysis in 2002

This cartel would also be able to act as a monopsony, i.e., an all-powerful buyer and/or gateway, with respect to video content, as foreseen ironically by Verizon itself ten years ago. In 2002 Verizon opposed the sale of AT&T Broadband (the cable properties of AT&T at that time) to Comcast. As Verizon itself correctly argued ten years ago, although its petition to deny was unsuccessful, the entity created by this transaction would "use that market power to lock up new broadband content services, and to deny competing distribution platforms access to that content."[25]

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[23] "Given that it no longer faces the threat of integrated cable competitors, Verizon could potentially spin off its remaining Consumer Wireline assets," along with "large" pension and benefit liabilities, the Goldman analysts said." http://www.bloomberg.com/news/2012-01-06/vodafone-lifted-to-buy-at-goldman-sachs-on-verizon-strength.html

[24] "Reply Comments of Boston, Massachusetts," before the FCC, WT 12-4, March 26, 2012, http://apps.fcc.gov/ecfs/document/view?id=7021903701; "Don't Bypass Syracuse Coalition," http://apps.fcc.gov/ecfs/comment/view?z=lpevn&id=6017026661"; Letter from Baltimore City Council, http://apps.fcc.gov/ecfs/document/view?id=7021902317; "Don't Bypass Buffalo Coalition," http://apps.fcc.gov/ecfs/comment/view?z=jwb9q&id=6017026660; "Comments of Citizen Action of New York (Capital district chapter), et al.," http://apps.fcc.gov/ecfs/document/view?id=7021903657

[25] "Petition to deny of Verizon Telephone Companies and Verizon internet solutions d/b/a Verizon.net," before the FCC, Docket MB 02-70, April 30, 2002 http://apps.fcc.gov/ecfs/document/view?id=6513188037

Now, in a memorable flip flop, Verizon denies the possibility that any harm will arise from coordinated interactions between itself and four major cable MSOs that portend far more market power in both broadband and video markets than the acquisition of AT&T's cable assets by Comcast ten years ago. Companies such as Netflix, other so-called OTT (over-the-top) companies like HBO Go, Skype, and even Google and Facebook, which rely on broadband access to and from their customers, should be afraid. Their negotiating positions with the cartel would become increasingly tenuous and fragile.

Verizon's Petition to Deny in 2002 shows that at that time it did fully appreciate the threat to fair and effective competition that would be posed by a very powerful broadband operator. Three subheadings in Chapter III of this filing tell the story with messages that are even more obviously applicable to today's much more powerful Comcast (which has since acquired NBC Universal) and the proposed collaboration with three other major cable MSOs and Verizon itself.

II.1.1 Verizon in 2002 would oppose Verizon in 2012

The subheadings from Verizon's 2002 filing are first reproduced and then rewritten below to reflect the different circumstances and players of Verizon's own proposed transactions with its new found cable allies.

Chapter III *(source: Verizon, opposing the acquisition of AT&T Broadband by Comcast in 2002)*

A. As A Result Of The Proposed Merger, AT&T Comcast Would Have Monopsony Power In The Market For The Purchase Of Video Programming.
B. The Merger Will Impede The Development Of The Internet As An Alternative Video Distribution Platform.
C. The Merger Would Enable AT&T Comcast To Stifle Intermodal Competition To Cable Modem

The application of Verizon's arguments to its own proposed transactions with four cable MSOs produces:

Chapter III Update *(source: adapted from Verizon's opposition to the acquisition of AT&T Broadband by Comcast in 2002, updated to reflect the current FCC Proceeding WT 12-4)*

A. As A Result Of The Proposed Transactions, The Applicants Would Have Monopsony Power In The Market For The Purchase Of Video Programming.
B. The Transactions Will Impede The Development Of The Internet As An Alternative Video Distribution Platform.
C. The Transactions Would Enable The Applicants To Stifle Facilities-Based Competition To Their Networks.

Opponents of the Verizon/cable MSO transactions will be hard pressed to find better, clearer or more concise language with which to make the case for their rejection than this straightforward adaptation of Verizon's own formulation of the issues they raise and the consequences if they are approved.

III. Consequences of a Cartelized U.S. Broadband Market

III.1 The Marginalization of Competition, Higher Prices and Sub-optimal Broadband Performance

The outcome of the approval of the integrated set of transactions between Verizon and four major cable MSOs will be an unprecedented creation of a broadband and video cartel which, as noted **from Day One post-approval** will, and even in part already do cover major populations and centers of economic activity within the U.S. The transactions proposed by these five firms cover as emphasized a very wide range of activities from a joint development venture through commercial sales and marketing agreements to a significant spectrum transfer from the cable operators to Verizon. If this precedent for a cartel is established then it is highly likely based on statements already referenced by its CEO that a second cartel led by the other major integrated (wireless and wireline) U.S. telephone company AT&T will be formed that similarly coordinates the business and development activities of telephone and cable operators. Hence the majority of the U.S. population and economy will be served by one or the other of a duo of cartels operating in the market for broadband transport that is not only largely unregulated, but is well on the way to becoming the dominant means of transport for ***all*** telecommunications traffic, from the narrowest band text messages through voice telephone calls up to the widest band streaming video services.

These cartels will then enjoy effectively unbridled and unregulated freedom to do whatever they want. They will be free to make use of new tools for discriminating unfairly against competitors, notably Deep Packet Inspection (DPI) technology, in ways that will be very hard to monitor. If, as seems most likely, there will be two such cartels then they will be able to coordinate their initiatives tacitly but effectively simply by paying attention to each other's moves. They may perhaps compete at the margins to maintain the illusion that there is still significant competition in the market. There will be no need for them to meet clandestinely or exchange confidential information illegally in order to plan how to coordinate their initiatives.

U.S. broadband operators which remain outside a cartel are much smaller than the cartel's instigators, and even the multibillion dollar companies among them such as CenturyLink and Windstream to all intents and purposes today offer only wireless or only wireline services and depend on the members of the cartel(s) for essential inputs such as Special Access Services. They will inevitably become marginalized in confronting the enormous and unchallengeable market power and the horizontally and vertically integrated portfolios of bundled offerings which only the cartels will be in a position to provide.

At the same time OTT (over-the-top) players which - not the broadband operators themselves - have been the predominant sources of innovations in network services and online applications over the past three decades will find themselves hostage to the strategies and choices of the members of the cartel. Cartel members will enjoy irresistible and asymmetric power as gatekeepers in negotiating and establishing the conditions under which third parties as well as customers gain access to the networks they control. The huge capital requirements for the construction of new national networks will inhibit new entrants from joining the fray, while in the absence of a strong and enforceable wholesale regime

entrants will not be able to gain access to the facilities and benefit from the sunk costs of the members of the cartel[26].

Among other consequences of this future "cartelized" scenario for broadband in the U.S. compared to a robust competitive environment in which the entrepreneurial genius and "animal spirits" of capitalism and the heralded outcomes of "creative destruction" and "disruptive technologies" can flourish will be:

- Higher prices, lower performance, and less coverage for broadband access in the U.S. than is aimed for in the National Broadband Plan[27].
- Fewer broadband-dependent opportunities for new or expanded economic activities and employment in the U.S.
- Loss of competitiveness and innovativeness of the U.S. economy compared to other countries which are on paths to improve their broadband infrastructure and services more rapidly and broadly than the U.S., including several which are already more advanced in this respect as well as some others which today still lag behind the U.S.

To give one illustration of potential longer term anti-innovative implications, if the cartel members are generating significant revenues from two-dimensional video conferencing, then they are likely to apply the same delaying and blocking tactics to a third party who offers a disruptive 3-D holographic videoconferencing service[28] as telephone companies applied for many years to VoIP services which threatened their revenues from traditional, circuit switched telephony. One can envision an innovator such as Skype bringing holographic teleconferencing services to its conferencing portfolio, but as a non-favored player in a contest with cartel members, Skype and its customers would quite possibly be locked out of access to the networks that they need. Or more subtly the new Skype service might suffer from having its traffic streams "managed" to a lower quality than the operators' own conferencing services.

III.2 The Pre-Cartel U.S. is not a Broadband "Star"

There have been several international comparisons of the performance, coverage, and pricing of broadband service between the U.S. and other countries[29], including both fixed and mobile broadband

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[26] Many of these costs (which include civil engineering) for the two largest telecommunications companies have already been paid for by the customers, i.e., ratepayers, that they served during the many years when they were local monopolies, an asymmetric (compared to several other competitors) legacy advantage. Another asymmetric legacy advantage they (Verizon and AT&T) possess is their access to "beachfront" 850 MHz frequencies, which were awarded in the early 1980s at NO COST to their predecessors, in contrast to the billions of dollars paid for spectrum licenses in other frequency bands that have since been acquired in competitive auctions.

[27] See for example "Reply Comments of Boston, Massachusetts," before the FCC, WT 12-4, March 26, 2012, which compares video services prices in locations where FiOS has been deployed within the Greater Boston metro area with prices where it has not, http://apps.fcc.gov/ecfs/document/view?id=7021903701;

[28]" 'TeleHuman' taps Kinect for 3D holographic videoconferencing," http://www.zdnet.com/blog/emergingtech/telehuman-taps-kinect-for-3d-holographic-videoconferencing/3265

[29] "International Price Comparison for Retail Fixed-line and Mobile Telecommunications Services 2011", December 15, 2011,Commerce Commission, New Zealand, ISSN no. 2230-2247; "Residential and Business Broadband Prices, Part 2: International Comparisons," December, 2010, Scott Wallsten and James Riso, Technology Policy Institute, http://www.techpolicyinstitute.org/files/residential%20and%20business%20broadband%20prices%20pt2.pdf; " Second International Broadband Data Report," Federal Communications Commission, May, 2011, http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db0520/DA-11-732A1.pdf; "U.S. ranks 23rd in Broadband

services. The most relevant comparisons involve nations which are members of the OECD (Organization for Economic Cooperation and Development).

It is difficult and controversial to find metrics that represent "apples to apples" and not "apples to pears" comparisons, so the conclusions that are drawn about the relative rankings of countries are therefore inevitably controversial. For example, definitions of broadband and the accuracy of broadband data (performance and pricing) vary across countries, tax regimes are different which affect the prices paid by customers, and the sizes of nations, as well as their topography and other conditions which legitimately affect the network costs are also far from identical. The Phoenix Center[30] points out that country rankings based upon broadband penetration per capita which are derived from household penetration inevitably make the picture for countries with larger average household sizes appear less favorable. One way to mitigate this particular criticism might be to derive a figure for the broadband *capacity* available per capita, so that for example a 20 Mbps connection to a 5-person household would be superior to a 2Mbps connection but inferior to a 5Mbps connection to a single-person household.

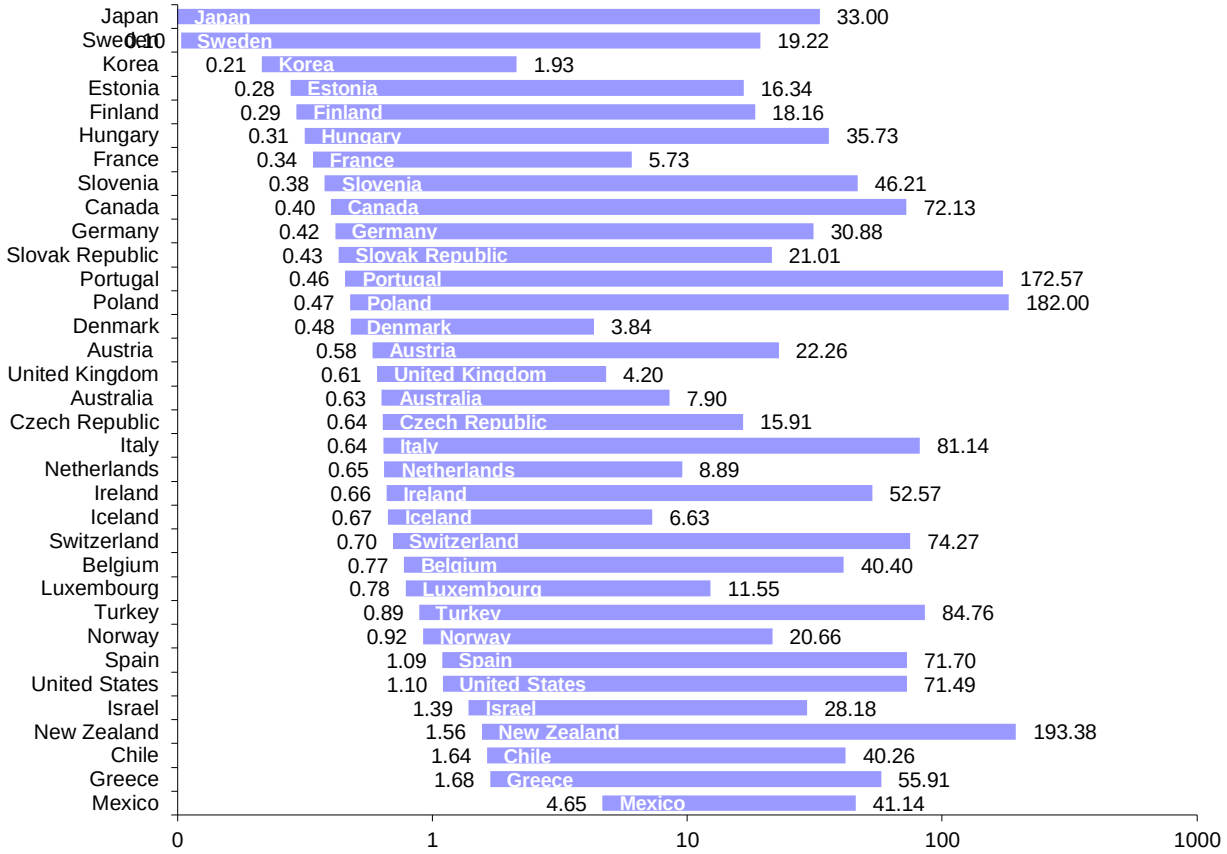
The bulk of evidence from these studies does indicate that the U.S. is today not among the leaders but more likely in the middle of the pack among OECD countries as far as the performance and the pricing of broadband data services are concerned (as in the chart below of prices per megabit per second of advertised speed calculated at purchasing power parity (PPP) exchange rates). According to Akamai[31] the U.S. ranks as twelfth with regard to the percentage of its broadband accesses that are classified as high speed (above 5Mbps), putting it behind not just the widely acknowledged global broadband leaders of Japan and South Korea, but also Latvia, Romania, and the Czech Republic.

Development," http://www.strategyanalytics.com/default.aspx?mod=PressReleaseViewer&a0=4930; see also http://www.oecd.org/sti/ict/broadband.

[30] "Fabricating a Broadband Crisis? More Evidence on the Misleading Inferences from OECD Rankings," George S. Ford, July, 2010, http://www.phoenix-center.org/perspectives/Perspective10-05Final.pd

[31] "The State of the Internet," 4th Quarter 2011, Akamai http://www.akamai.com/dl/whitepapers/akamai_soti_q411.pdf?campaign_id=F-MC-15118&curl=/dl/whitepapers/akamai_soti_q411.pdf&solcheck=1&

Source: OECD - **Broadband prices per megabits per second of advertised speed, Sept. 2011 - USD PPP**



Comparisons between major cities across countries where national differences in geography and customer density play a smaller role in influencing the costs of broadband than say comparisons that cover rural areas are one example that substantiates this "middle of the pack" ranking of the U.S. as far as performance is concerned. Furthermore, it seems that the global ranking of the U.S. in terms of broadband pricing is worse for the higher speeds, i.e., above 2 Mbps, than for its lower speed offerings[32]. Yet it is demand for these higher speeds (for which purpose DSL is "obsolete" according to AT&T's own assessment[33] and is being treated as such by Verizon) which is growing, as increasingly bandwidth-intensive applications and service become more popular. Already the *pre-cartel* initiatives of Verizon whose impact will be expanded by the foreseeable moves of the cartel if it is formed are creating and will create local and regional monopolies for fixed broadband in contrast to the duopolies which are common at the lower speeds.

Approving the proposed Verizon/cable transactions will ensure that the supply of high speed broadband services, i.e., >3-5 Mbps, will become monopoly markets in an increasing number of areas in the U.S., including some of the most densely populated areas, e.g., Boston, that are also centers of economic and

[32] Benkler, Yochai, Rob Faris, Urs Gasser, Laura Miyakawa, and Stephen Schultze. 2010. *Next Generation Connectivity: A review of broadband Internet transitions and policy from around the world*. The Berkman Center for Internet & Society. http://cyber.law.harvard.edu/publications/2010/Next_Generation_Connectivity

[33] "AT&T boss calls DSL 'obsolete'," http://www.telecomtv.com/comspace_newsDetail.aspx?n=47883&id=e9381817-0593-417a-8639-c4c53e2a2a10

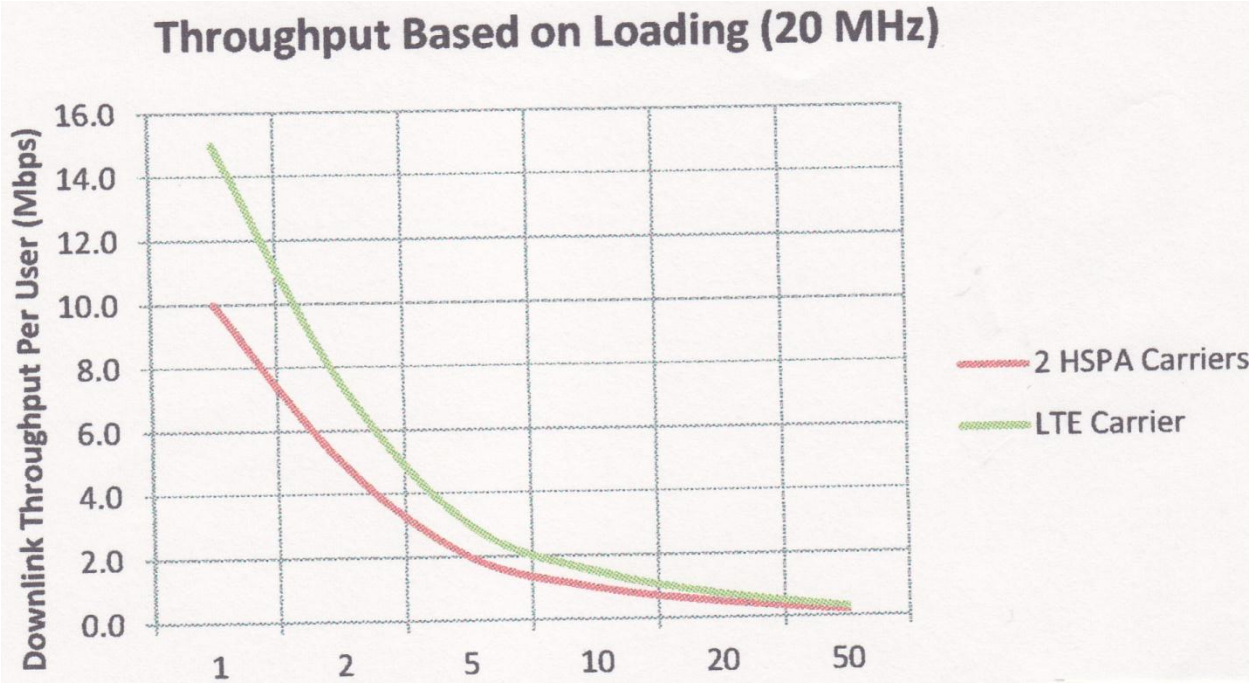
research activities, which are increasingly broadband-dependent in order to sustain leadership in their spheres of influence.

A counter-argument from Verizon may be that its recently announced plan to offer LTE-based wireless services as an alternative for fixed residential broadband will avert this outcome since it can offer speeds in the 5 Mbps range and eventually higher in future versions of LTE[34]. However, this argument should be dismissed since the speeds experienced by any user of shared wireless capacity inevitably fall off rapidly as the number of simultaneous users increases. There is no way that LTE-based residential broadband service can be a credible alternative for high speed broadband serving significant numbers of customers in more densely populated areas (see Figure below)[35]. The application of the much lower data caps that apply to users of mobile networks than those which apply (if at all) to users of wired networks (whose typical monthly data volumes are substantially higher than those of typical mobile users) further discredits the idea that residential LTE can be a satisfactory substitute for wired residential broadband service except for very low user densities.

[34] "Verizon's 4G LTE-to-the-Home Service Launches Thursday," http://www.pcworld.com/article/254900/verizons_4g_ltetothehome_service_launches_thursday.html

[35] *Source:* "The Spectrum Imperative: Mobile Broadband Spectrum and its Impacts for U.S. Consumers and the Economy - An Engineering Analysis," Peter Rysavy, March, 2011, www.mobilefuture.org/page/-/rysavy-spectrum-effects-301611.pdf

Figure 1: Mobile Customers' Downlink Throughput as a Function of the Number of Simultaneous Users



If *pre-cartel* competition has not succeeded in building a leadership position globally for the U.S. in broadband, then surely a cartel freed from the continuous stimulation of significant competition will allow this country to fall further behind current (and even future additional) potential leaders which maintain a more competitive broadband supply environment than will prevail in the U.S.

It is striking that AT&T and Verizon who assert that the markets in which they operate in the U.S., and will operate in future even if their anti-competitive initiatives are approved, present the low relative prices they charge for mobile voice minutes in their services packages compared to what the typical user pays in many foreign countries as evidence of the sustainable competitive nature of the U.S. market. The average U.S. user consumes many more minutes than most foreign average users and U.S. mobile voice minute prices for low usage customers tend to be higher than the prices paid by foreign users in their mobile subscriptions which include comparable numbers of minutes.[36]

These comparisons of mobile voice minutes are irrelevant in the broadband era in which the broadband data comparisons outlined above are the appropriate metric, especially as over time essentially all traffic from narrowband texts and voice to high bandwidth streaming high definition video will be carried over a common broadband infrastructure. Even in the narrowband arena these two telephone operators gloss over the margins they enjoy from the prices charged in the U.S. for carrying SMS (Short Message Service) texts. At $0.10-0.20 per message these revenues are almost pure profit given the negligible or even at the margin zero incremental costs incurred to transport them.

[36] http://www.oecd.org/sti/ict/broadband.

There seems to be a "Lake Wobegon Effect" at work in the broadband arena in which all key players claim that they are better than the median[37]. The CEO of Verizon's wireless partner, Vodafone, made a side comment at the Mobile World Congress in Barcelona in February, 2012 while praising the achievements of mobile operators and criticizing European regulators because of their push to reduce mobile termination fees which contradicts the claims of AT&T and Verizon, namely that mobile prices in Europe are lower than elsewhere - "…just go into any American shop…."[38]

III.3 Deep Packet Inspection (DPI): A Useful Tool and a Weapon for Discrimination

Deep packet inspection is a powerful technology that analyses packets of data that travel across the internet. It can be used to track internet users and reconstruct web pages that they visit. It is often associated with surveillance states, such as Iran and China, although it is currently being proposed by the British government as a technique for preventing terrorism.

DPI generates information extracted in real-time from the network in the form of traffic metadata, which then feeds applications with detailed visibility on all network-based activity. Network operators have been involved in classical applications around security and applications identification which remain important, but these are now being augmented by new use cases[39]. Newer applications include a growing use of DPI in traffic and congestion management, increasingly in a policy context, as well as a trend to towards using policy and DPI tools for service differentiation, based on observed subscriber behavior and demographics. Demand for DPI has been growing among mobile operators.

DPI is aimed at real time tracking of the performance of applications at the subscriber level, linked to a variety of actions, including application- and subscriber-specific service offers, e.g., top-ups, turbo boosts linked to video, or free access to social networking sites, as well as fostering commercial revenue-generating relationships with third-party applications and content providers. These developments take DPI beyond packet inspection alone. Subscriber analytics is emerging as a major theme to help operators develop differentiated services packages and subscriber-specific offers.

The implementation of DPI requires advanced and specialized expertise to cope with a large number of protocols and protocol updates and to meet the formidable challenges posed by rapidly rising bandwidth, in particular the decoding of 40 Gbps data streams. Among the sales messages of DPI system vendors[40] the following benefits for operators are presented:

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[37] " What Makes You Think You Are So Popular?' Zuckerman and Jost, Stanford University, Social Psychology Quarterly, http://www.psych.nyu.edu/jost/Zuckerman%20&%20Jost%20%282001%29%20What%20Makes%20You%20Think%20You%27re%20So%20Popular1.pdf

[38] "Vodafone CEO warns of investment slowdown," (at 17' 43" of a 19' 29" long video) http://www.mobileworldlive.com/videos/vodafone-ceo-warns-regulators-of-investment-slowdown/23384

[39] We do not discuss here other motivations or justifications for using DPI technology, such as to track criminal and terrorist communications, or meet Data Retention mandates. Nor do we cover the serious implications for individuals' privacy that the use or potential abuse of DPI raises. The purpose of this review of DPI is to draw attention to how it can be exploited for anti-competitive and discriminatory purposes by a broadband operator.

[40] DPI And Beyond: The New Use Cases That Are Driving The Market - A Light Reading Webinar, May 3rd, 2012 ("Featuring HP DRAGON for subscriber analytics")

- Precise understanding of service usage enables operators to create better plans for securing revenues.
- Understanding of subscriber behavior is a key for developing successful new ARPU-enhancing services.
- Visibility and control over OTT applications (Facebook, YouTube, Skype …) enhances bargaining power for operators.

The implication of this last message is that operators will be able to use DPI to inhibit traffic streams from or discriminate against OTT applications and services providers with which they compete directly or do not negotiate a "most favored partner" or MFP relationship. The kinds of ideas that have already been mooted as part of such MFP relationships include arrangements in which the OTT player itself as well as customers have to pay to send traffic over the broadband operator's access network[41].

In light of the obvious potential for anti-competitive abuse and highly asymmetric negotiating positions between broadband operators and third party services providers, it is disturbing that Comcast's Executive Vice President David Cohen argued in a March 11, 2008, filing to the FCC[42] on Broadband Industry Practices that the FCC has no legal power to stop Comcast from engaging in what it calls "network management practices" (critics call it peer-to-peer traffic blocking). These practices are precisely those which can be used to deny or impair customers' access to content services, as Verizon feared and anticipated in 2002, which compete directly with an operator's own offerings. Comcast claims that regulators can do nothing, even if the FCC concludes that Comcast's behavior runs afoul of the FCC's Internet Neutrality guidelines. Comcast's opinion on neutrality was upheld by the U.S. Court of Appeals in April 2010[43].

It is easy to see how Comcast, along with other members of the proposed cartel, will be able to exploit improving DPI technology, not only to manage traffic to mitigate congestion and maintain QoS, but also to discriminate against direct competitors and less or least favored third party services providers. They will be able to inhibit, or even block, innovations that they do not control or own, despite their value for customers and the U.S. economy. This anti-competitive behavior will not be easy to detect, and even more difficult to prove definitively, given the legitimate applications of DPI, before irreparable damage has been done to the businesses that are targeted.

Efforts to discriminate against specific third party providers are becoming more visible as noted in the most recent CTIA Wireless Show during which VZW's CTO argued that applications developers and content providers should pay the wireless operators directly so that customers can access their content or websites.[44]

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[41] "SBC chief: Vonage, other VoIP providers should pay to use our pipes," Ed Whitacre (then in 2005 CEO of SBC which acquired AT&T and took its name in the same year), http://www.zdnet.com/blog/ip-telephony/sbc-chief-vonage-other-voip-providers-should-pay-to-use-our-pipes/723

[42] "In re Broadband Industry Practices," WC Docket No. 07-52, http://apps.fcc.gov/ecfs/document/view?id=6519866175

[43] United States Court of Appeals for the District of Columbia Circuit, http://www.cadc.uscourts.gov/internet/opinions.nsf/EA10373FA9C20DEA85257807005BD63F/$file/08-1291-1238302.pdf

[44] Dano M., "You Tube to pay for your mobile data charges?" FierceWireless May 10, 2012.

Until and unless broadband is reclassified as a regulated service under Title II of the Telecommunications Act, any challenge brought before the FCC to Comcast's, or another large broadband operator's business practices, based on use of DPI technology, no matter how discriminatory, is certain to be challenged in the courts, and if precedent is any guide will undoubtedly fail.

DPI is an invaluable tool for managing network congestion to ensure that the performances of all of the services delivered over broadband networks are maintained fairly at the highest possible quality for all users and all the services and applications which users wish to access. But DPI also puts a powerful weapon in the hands of broadband network operators. It enables them to affect differentially and anti-competitively the quality of the services delivered by third party providers whose market share they would like to limit. This can occur in spite of the legitimate needs and choices of network users.

Network operators' motivation for this illegitimate use of DPI is to reduce or even eliminate the revenues that third party providers may take away from their own services or the services of more favored third party providers. In other words, DPI expands the potential power of broadband operators to whipsaw independent content owners/services providers/application developers in negotiating the terms for delivery of their traffic over their networks. Given the past and current behavior and the publicly stated desires of major U.S. broadband operators, it would be naïve to assume that they will not exercise this power over third party providers if left to their own devices. This power to "whipsaw" by Verizon and the four major cable MSOs would be irresistible if the proposed collaboration is approved.

IV. Findings and Conclusions

A solid body of evidence and analyses of the evolution of the U.S. broadband market and the actions and behavior of the handful of its most powerful suppliers---Verizon, AT&T and major cable MSOs—lead inexorably to the following findings and conclusions:

IV.1 Situation in 2012

- The intensity of competition within the U.S. broadband market has been steadily eroded over the past ten years, frustrating the intentions and motivations of the 1996 Telecommunications Act. As a result, the performance and price (i.e., affordability) of broadband access in the U.S. are at best in the middle of the rankings of countries at comparable levels of wealth and economic development.

- If this trend continues or is not reversed, the goals of the National Broadband Plan will not be achieved and the contributions which broadband-dependent services and applications can make to future economic growth and employment will fall short of their potential.

- Since access network sharing or unbundling obligations that sustain intra-modal competition have been removed, competition in the broadband market has relied upon facilities-based

inter-modal competition between telephone companies and cable MSOs for fixed broadband services which already constitute a duopoly in most areas of the U.S.

- The advent of true broadband mobile networks represents a factor in the overall broadband market which was not foreseen at the time of the passage of the 1996 Telecommunications Act.
    - However, contrary to the assertions of some wireless advocates, mobile broadband is much more complementary than it is an alternative to or an acceptable substitute for fixed broadband, except in areas of very low population density.

- The two largest mobile operators - Verizon and AT&T – enjoy an increasingly significant spectrum-related advantage over their competitors, that is not based on any superiority in quality of customer service or any other factor of success, simply by virtue of their partly inherited legacy dominance of sub 1 GHz frequencies.
    - They control the 850 MHz band which they inherited at NO cost from their predecessors, whereas all other mobile frequencies to which their competitors are confined have had to be acquired competitively at considerable cost.
    - They acquired the majority of frequencies in the 700 MHz band, and then unilaterally and without justification, introduced non-interoperability into this band (a structure which is unique both to this band and to the U.S.), AT&T through a surreptitious maneuver and Verizon by flouting open device conditions imposed on the frequencies it acquired. Hence license holders of other 700 MHz frequencies face significant economic and operational, e.g. roaming, obstacles in deploying their 700 MHz networks.

- **Therefore there is a significant risk that a national duopoly will emerge in mobile broadband along with the local duopolies in fixed broadband.**

- Combinations of mobile broadband and fixed broadband assets and services are becoming increasingly important in broadband operators' strategic plans and offerings, anticipating and fueling the "anywhere, any network, anytime" demands and expectations of the most lucrative customers for access to a common portfolio of services and applications.

- Major U.S. broadband operators, notably Verizon, AT&T and Comcast, have been fighting and continue to oppose any attempts to restrict their freedom of action, using all available regulatory, legal and legislative lobbying channels, their clear intention being to achieve a position as close to *de facto* if not *de jure* self-regulation as possible.

- Major U.S. broadband operators -- Comcast, Verizon and AT&T -- are expanding the range of their content and other services which compete directly with third party services providers who are dependent on their networks to reach customers. These operators' motivations and incentives to use all available means to limit the market penetration of third parties are thus

increasing over time, as is the power of the tools available to them to do so by using information collected for the purpose of congestion management.

- Third parties - not broadband operators - have been responsible for the vast majority of innovative network-based services and applications that have created value for customers and the economy for many decades and most recently. The pace and scale of these innovations would not have been possible if the network environment in the U.S. had not been opened up and the Internet allowed to flourish outside the control of a monopoly AT&T as a result of the pro-competitive regulatory initiatives of the 1970s, 1980s, and 1990s.

IV.2 Future Broadband Scenarios

- Approval of the proposed transactions between Verizon and four major cable MSOs will set a precedent for the creation of a **broadband and video cartel** between a few major broadband operators, which is then likely to be joined by a second cartel, i.e., AT&T and other cable operators.

- **The resulting "cartelization" of the U.S. broadband market** will inhibit, and in some cases even block, the launching of innovative third party broadband -dependent applications and services, and ensure a relatively high priced and low performance broadband regime in the U.S., to the detriment of the U.S. economy, its global competiveness, and U.S. consumers.

- **This future scenario is not a medium term, long term or *hypothetical possibility*. It is a *visible, imminent, and predictable outcome,* some of whose elements are already present today**.

IV.3 The Transactions between Verizon and Major Cable MSOs Must Be Denied

The proposed transactions between Verizon and the four cable MSOS must be definitively and unequivocally rejected in their entirety. This rejection must firmly and irrevocably reaffirm the principle that significant and intimate collaboration between major supposedly competitive broadband network operators is unacceptable. The scale and scope of coordinated interaction between intermodal competitors, which they propose, will destroy the very foundation of healthy, innovation-friendly competition in the broadband arena, regarded as the key to the nation's infrastructure for its socio-economic prosperity in the 21st century.

Appendix: Non-interoperability and the Apple iPad

The wireless technical specifications of the Wi-Fi+cellular version of the Apple iPad are as follows:

- Wi-Fi (802.11a/b/g/n)
- Bluetooth 4.0 technology
- Model for AT&T: 4G LTE (700, 2100 MHz)[1] ; UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- Model for Verizon: 4G LTE (700 MHz)[1] ; CDMA EV-DO Rev. A (800, 1900 MHz); UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- Data only[6]

Footnote 1: 4G LTE is supported only on AT&T and Verizon networks in the U.S. and on Bell, Rogers, and Telus networks in Canada. See your carrier for details
Footnote 6: Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability
Source: Apple Store; http://store.apple.com/us/browse/home/shop_ipad/family/ipad/select_ipad#tech-specs

Thus customers have to acquire different iPad models for use on AT&T's and Verizon's networks since these operators' 700 MHz LTE deployments are non-interoperable. Furthermore there are no LTE iPads available for the other 700 MHz blocks of frequencies.