

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Applications for Consent to the)	
Transfer of Control of Licenses)	
)	MB Docket No. 07-57
)	
XM Satellite Radio Holdings Inc.,)	
Transferor,)	
)	
to)	
)	
Sirius Satellite Radio, Inc.,)	
Transferee)	

COMMENTS
ON NOTICE OF PROPOSED RULEMAKING
FCC 07-119
Released June 27, 2007
Submitted by
U.S. Electronics, Inc.

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EXECUTIVE SUMMARY

U.S. Electronics, Inc. (USE) is engaged in the sale and distribution of electronic devices to major retailers in the United States. USE entered into a license agreement with Sirius Satellite Radio, Inc. (Sirius) to design, develop and distribute satellite radio receivers for Sirius' satellite radio network services. USE offers these comments to provide information relevant to the issues raised by the instant Notice of Proposed Rulemaking.

The principal issue on which the Commission seeks comments concerns the restriction the Commission adopted when Sirius and XM Satellite Radio Holdings Inc. (XM) (together, the Applicants) were first awarded their respective licenses – that one DARS licensee would not be permitted to acquire control of the only other DARS licensee – and whether this restriction is a final and binding rule or whether it is a policy. Whether a rule or policy, the restriction constitutes an express prohibition requiring the denial of the applications filed by the Applicants for approval of their proposed corporate merger. The Commission has the power and authority to modify or eliminate the restriction, provided that in doing so it provides a reasoned explanation for its action. *See, e.g., DirectTV, Inc. v. FCC*, 110 F.3d 816 (D.C. Cir. 1997). Specifically, the Commission must explain why the original reasons for adopting a rule or policy are no longer dispositive. *Fox Television Stations, Inc. v. FCC*, 489 F.3d 444 (2d Cir. 2007).

In doing so, the Commission must examine and determine whether, based on a preponderance of the evidence submitted by the Applicants, the public interest will not be harmed but, rather, will be served, by modifying or eliminating the restriction.¹ The record has

¹ The Commission must also consider reasonably obvious alternatives, *e.g.*, allowing the merger as proposed but auctioning off one of the merging party's spectrum to preserve competition in the satellite radio market. It must also provide reasons for rejecting reasonable alternatives, sufficient to allow meaningful review. *See Fox Television Stations*, 489 F.3d at 456-57.

focused on whether, by creating a single provider of satellite radio, competition will be eliminated with adverse effects on the public in terms of pricing and service. In addressing these concerns, the Applicants have defended the merger by claiming that they compete with many forms of delivery of audio entertainment, and by promising price ceilings, differing pricing packages and, most recently, à la carte pricing plans.

What has been overlooked thus far is the issue addressed in these comments, namely what has occurred, and is still occurring, with the design, development, manufacture and distribution of satellite radio receivers, the devices essential to consumers' access to and use of satellite radio services today and in the future. USE raises this issue because it is a critical part of the Commission's public interest analysis with present and future consequences for the public if this issue is not examined and effectively dealt with in this Docket.

USE understands that the Applicants are changing from using multiple suppliers of satellite radio receivers to sole source supply arrangements. Specifically, Sirius has supported and is believed to be entering into an exclusive distributorship with Directed Electronics, Inc. (DEI).² XM is also negotiating an exclusive arrangement with Audiovox Corporation.

Sole source supply arrangements will eliminate all intra-brand competition in the design, development, manufacturing and distribution of satellite radio receivers. If the Applicants are permitted to merge, the only existing inter-brand competition – between Sirius and XM – to develop and manufacture the best and most attractive receivers will be eliminated as well.

² In a recent communication to investors, DEI referred to itself as Sirius' "[e]xclusive retail hardware partner." Directed Electronics, Inc., Form 8K Exhibit at 16 (July 10, 2007), http://files.shareholder.com/downloads/DIRECT/155997935x0x118058/ed7d35b7-2c53-4896-9046-206bd0fb2135/DEIX_070607_IR_Presentation.pdf.

The control that Sirius and XM wield over the entire production of the necessary receivers allows them to use hardware pricing as a tool to promote self-serving practices that can harm the consumer. This unilateral capability to control the development and manufacture of hardware required to access satellite radio network services cannot be considered a benefit to the consumer.

The Applicants have suggested that certain consumer pricing benefits will flow from the merger but have not made clear how many current customers will benefit from them, what cost savings could actually be expected since many current pricing plans are offered below the \$12.95 rate, or whether the recently announced à la carte subscription plans will be made available to consumers even if the merger is not approved. Sirius recently announced that à la carte pricing plans could be available by Fathers Day 2008. Since Sirius also announced that interoperable hardware might require two-and-a-half years to complete (even though this hardware development was mandated by the FCC over ten years ago), it is apparent that the à la carte plans Sirius announced will not include content from both the Sirius and the XM services. The other pricing benefits the Applicants have offered can be implemented without a merger.

As the Commission is aware, elimination of competition in devices essential to consumer access to network services results in the loss of creative and innovative design, higher prices, limited options and closed access to services. For over 50 years, Commission policies and rules have followed the precedents established in the watershed cases of *Hush-a-Phone* and *Carterphone* to ensure a robust, highly diversified and vigorously competitive market for a vast array of devices connected to the telephone network to the benefit of consumers. Within only the past few days, the Commission itself has applied this policy to the new wireless network facilities that will be opened to auction early next year.

Consumers of satellite radio services are entitled to the same rights as consumers of other wireless services and networks. The public interest imperative here is therefore clear. A merger of Sirius and XM that creates a sole supply source for satellite radio receivers would eliminate the only competitive force spurring product enhancement and innovation in the devices through which consumers access the service. If the merger is to be approved, the merged entity must be prohibited from limiting the availability of satellite radio receivers to those designed, developed, manufactured and distributed by the network provider directly or through a single agent. Robust competition must be encouraged through unlimited open access, and financial incentives for the development and distribution of receivers that could distort open competition must not be left to the unfettered discretion of the merged entity.

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Released June 27, 2007

Submitted by

U.S. Electronics, Inc.

On behalf of U.S. Electronics, Inc. these comments are submitted in response to the Notice of Proposed Rulemaking in this Docket released June 27, 2007 (NPRM).

I. INTRODUCTION

1. USE is an importer and distributor of a wide variety of electronic devices that are retailed to the American public through some of the largest retail outlets in the country. The

Commission's records will show that USE entered into a license agreement with Sirius to supply it with satellite radio receivers for its digital satellite radio services.¹

2. USE's performance of its agreement with Sirius was interdicted by Sirius' determination to use a single supplier for its network's satellite radio receivers, Directed Electronics, Inc.

II. BACKGROUND

3. Pursuant to the Commission's decision in *Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band*, 12 FCC Rcd 5754 (1997) ("SDARS Report & Order"), the Applicants collectively use all of the spectrum assigned by the Commission for the provision of satellite radio service in the United States.² In consequence, the SDARS Report & Order contained the following language:

Transfer. We note that DARS licensees, like other satellite licensees, will be subject to rule 25.118, which prohibits transfers or assignments of licenses except upon application to the Commission and upon a finding by the Commission that the public interest would be served thereby. Even after DARS licenses are granted, one licensee will not be permitted to acquire control of the other remaining satellite DARS license. This prohibition on transfer of control will help assure sufficient continuing competition in the provision of satellite DARS service.³

¹ See File No. EB-06-SE-273 of the Commission's Enforcement Bureau's Spectrum Enforcement Division. USE is currently in litigation with Sirius in connection with its agreement. Sirius has described this litigation in recent SEC filings. *Sirius Satellite Radio Inc. Quarterly Report Pursuant to Section 13 or 15(D) of the Securities Exchange Act of 1934*, Form 10-Q at 24, Commission file number 0-24710 (For the quarterly period ended March 31, 2007); http://sec.gov/Archives/edgar/data/908937/000093041307004301/c48413_10-q.htm.

² The Commission has allocated the entire 2310-2360 MHz band for use by SDARS. The 2310-2320 MHz band and 2345-2360 MHz band have been assigned for use by the Wireless Communications Service, but the spectrum remains allocated for SDARS. See 47 C.F.R. § 2.106.

³ *SDARS Report & Order*, 12 FCC Rcd at 5823 ¶ 170 (This language is found under the subheading "Safeguards.") In the quoted language, the term "DARS" refers to the same service that we refer to in this document as "SDARS."

4. The Applicants maintain that the above-quoted language is a policy statement under the Administrative Procedure Act and not a binding Commission rule because it was not codified in the Code of Federal Regulations.⁴ They argue, however, that to the extent the Commission considers the above-quoted language a binding rule prohibiting their proposed license transfer, the Commission should waive, modify, or otherwise alter the rule to the extent necessary to permit the proposed merger.⁵

5. The Commission seeks comment on these contentions, and specifically on the Applicants' assertion that the Commission should waive, modify, or otherwise alter the prohibition to the extent necessary to permit the merger because the proposed merger, on balance, would serve the public interest. In evaluating this claim, the Commission must review the Applicants' license transfer applications to determine whether approval would serve the public interest, convenience, and necessity under Section 310(d) of the Communications Act of 1934 (as amended, the Act).⁶ And the Commission correctly points out that its associated review

⁴ See *Applications of XM Satellite Radio Holdings Inc., Transferor, and Sirius Satellite Radio Inc., Transferee, For Consent to Transfer Control*, MB Docket No. 07-57 (filed March 20, 2007) (collectively, the Consolidated Application) at 50.

⁵ *Id.* at 51-52.

⁶ See 47 U.S.C. § 310(d); see also *Applications for Consent to the Assignment and/or Transfer of Control of Licenses Adelpia Communications Corporation (and subsidiaries, debtors-in-possession), Assignors, to Time Warner Cable Inc. (subsidiaries), Assignees; Adelpia Communications Corporation, (and subsidiaries, debtors-in-possession), Assignors and Transferors, to Comcast Corporation (subsidiaries), Assignees and Transferees; Comcast Corporation, Transferor, to Time Warner Inc., Transferee; Time Warner Inc., Transferor, to Comcast Corporation, Transferee*, 21 FCC Rcd 8203, 8217 ¶ 23 (2006) (“*Time Warner-Comcast-Adelpia Order*”); *Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations from MediaOne Group, Inc., Transferor, to AT&T Corp., Transferee*, 15 FCC Rcd 9816, 9818 ¶ 1 (2000); *Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations from Tele-Communications, Inc., Transferor, to AT&T Corp., Transferee*, 14 FCC Rcd 3160, 3168 ¶ 13 (1999).

of the Consolidated Application pursuant to this standard must include an assessment of whether the proposed transaction complies with specific provisions of the Act, other statutes, and the Commission's rules.⁷

6. If the Commission were to conclude that the transaction would not violate a statute or rule of continued applicability, it must nevertheless consider whether the transaction could result in public interest harms by substantially frustrating or impairing the objectives or implementation of the Act or related statutes. In these situations, the Commission generally weighs any such potential harms against any potential public interest benefits.⁸ The Applicants carry the burden of proving by a preponderance of the evidence that the proposed transaction, on balance, serves the public interest.⁹

7. A principal tenet of the Applicants in support of their proposed transfer and merger is that the prohibition need not be continued "because the preservation of two separate satellite radio licensees is no longer required to 'help assure sufficient continuing competition,'" which, it is maintained, was the original purpose of the restriction set forth in the 1997 *SDARS Report & Order*.¹⁰ Further, the Applicants have asserted that the Commission has sufficient justification to

⁷ See *Time Warner-Comcast-Adelphia Order*, 21 FCC Rcd at 8217 ¶ 23; *General Motors Corporation and Hughes Electronics Corporation, Transferors, and The News Corporation Limited, Transferee*, 19 FCC Rcd 473, 484 ¶ 16 (2004) ("*News Corp.-Hughes Order*").

⁸ *Time Warner-Comcast-Adelphia Order*, 21 FCC Rcd at 8217 ¶ 23; *News Corp.-Hughes Order*, 19 FCC Rcd at 477 ¶ 5.

⁹ See e.g., *Time Warner-Comcast-Adelphia Order*, 21 FCC Rcd 8218 at ¶ 23; *News Corp.-Hughes Order*, 19 FCC Rcd at 483 ¶ 15. See also *AT&T-BellSouth Order*, 22 FCC Rcd 5662, 5672 ¶ 19; *SBC-AT&T Order*, 20 FCC Rcd at 18300 ¶ 16; *Verizon-MCI Order*, 20 FCC Rcd at 18443 ¶ 16; *Comcast-AT&T Order*, 17 FCC Rcd at 23255 ¶ 26.

¹⁰ Consolidated Application at 50-51 (citing *SDARS Report & Order*, 12 FCC Rcd at 5786 ¶ 77). The Applicants contend that a merger would not enable them to exercise market power because the two companies currently serve only a very small fraction of what they define as the relevant

waive, modify or otherwise alter the prohibition and approve the proposed transfers of control, because, they contend, the competitive environment within the “audio entertainment” marketplace has changed since 1997, when the Commission adopted the *SDARS Report & Order*.¹¹ Based upon these changed market conditions, the Applicants have asserted that continuation of the prohibition would not serve the public interest.¹² The Commission seeks comment on this argument and request.¹³

A. Commission Authority

8. Whether the restriction is considered a binding rule or a policy, it is clear that the Commission has the authority to modify and even eliminate the restriction. “The Commission has wide latitude to change its policies through rulemaking ‘as long as it provides a reasoned explanation for doing so.’” *DirectTV, Inc. v. FCC*, 110 F.3d 816, 826 (D.C. Cir. 1997) (quoting

market, and because consumers can readily substitute other products and services for satellite radio. *Id.* at 21-47. The Applicants further assert that a merger would not adversely affect competition among programmers, given their commitment to programming diversity and the myriad outlets available to programmers. *Id.* at 47.

¹¹ *Id.* at 50. For purposes of this rulemaking, one of the Applicants’ key contentions is their assertion that, given a robustly competitive media marketplace, a merger of the two satellite radio companies would not have any adverse effects on competition. *Id.* at 20-21. The Applicants claim that despite its strong initial growth, satellite radio accounts for only 3.4 percent of all radio listening. *Id.* at 22 (citing Phil Rosenthal, *Satellite Deal Foes Don’t Hear Message*, CHICAGO TRIBUNE, Feb. 28, 2007, available at <http://www.chicagotribune.com/business/columnists/chi-0702280164feb28,0,1928140.column?coll=chi-navrailbusiness-nav> (last visited May 2, 2007) (summarizing the results of the Arbitron study)). The Applicants also posit that the relevant market for purposes of the Commission’s competitive review of the Consolidated Application should be the “market for audio entertainment services,” which they state includes terrestrial radio, HD Radio, Internet radio, iPods and other MP3 players, mobile phones, and CD players. *See* Consolidated Application at 24-39.

¹² *Id.* at 52.

¹³ The Commission has itself declared that it has legal authority to repeal or modify the prohibition on transfer of control pursuant to the statutory provisions contained in 47 U.S.C. §§ 151, 154(i), 303(r), and 310(d). NPRM at n.16.

Comm. for Effective Cellular Rules v. FCC, 53 F.3d 1309, 1317 (D.C. Cir. 1995)). Thus, a reviewing court's inquiry focuses on "whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment." *Id.* (quoting *Motor Vehicle Mfrs. Ass'n of the United States, Inc., v. State Farm Mut. Auto Ins.*, 463 U.S. 29, 43 (1983)). This principle was underscored by the Second Circuit just weeks ago in *Fox Television Stations, Inc. v. FCC*, 489 F.3d 444 (2d Cir. 2007). There the court noted that "agencies are of course free to revise their rules and policies." *Id.* at 456 (citing *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837 (1984) ("An initial agency interpretation is not instantly carved in stone.")). Such a change, however, must provide a reasoned analysis for departing from prior precedent. As the Second Circuit has explained:

[W]hen an agency reverses its course, a court must satisfy itself that the agency knows it is changing course, has given sound reasons for the change, and has shown that the rule is consistent with the law that gives the agency its authority to act. In addition, *the agency must consider reasonably obvious alternatives and, if it rejects those alternatives, it must give reasons for the rejection, sufficient to allow for meaningful judicial review.* Although there is not a "heightened standard of scrutiny . . . *the agency must explain why the original reasons for adopting the rule or policy are no longer dispositive.*" Even in the absence of cumulative experience, changed circumstances or judicial criticism, an agency is free to change course after reweighing the competing statutory policies. But *such a flip-flop must be accompanied by a reasoned explanation of why the new rule effectuates the statute as well as or better than the old rule.*

Id. at 456-7 (quoting *N.Y. Council Ass'n of Civilian Technicians v. Fed. Labor Relations Auth.*, 757 F.2d 502, 508 (2d Cir. 1985)). The consequence of these decisions is clear: the Commission may modify or remove the restriction provided it does so in accordance with the principles enunciated by the courts.

B. The Proper Context

9. In determining whether it is justified in changing course in regard to the restriction imposed in the SDARS Report & Order, the Commission must begin its analysis in the proper context. By its express terms, the restriction was imposed to protect competition in the provision

of SDARS services. The proper context, then, in which to analyze whether a “reasoned basis” exists or can be found to support a change in the restriction must rest directly on proof of changed competitive circumstances having occurred since 1997 in that market. Change in the financial condition of the parties or proposed product offerings or cost savings that are alleged to redound to the benefit of subscribers are not relevant.

10. If the market is limited to SDARS, as the Commission obviously determined in 1997, it tortures logic and common sense to find now that removing the restriction will protect competition when it is undeniable that doing so will permit a merger to monopoly in the SDARS market. On the other hand, if the market is to be considered broader than SDARS, the Applicants must be required to substantiate why competition in a broader market (still itself to be defined) is different today than it was in 1997 and how the “benefits” of the merger would respond to those competitive changes.

11. Importantly, the purportedly subscriber-friendly offers the Applicants cite in support of their merger come nowhere near filling this void. The Applicants cannot merely proffer a series of potential benefits to SDARS subscribers (whom they obviously want to retain despite the merger). Rather, they must show by a preponderance of the evidence that their SDARS-specific benefits are responsive to changes in the broader market over the last ten years and that they redound to the benefit of competition and consumers in the broader market. What the Applicants promote in reality are but short-term fixes, and self-interested ones at that. But the merger lasts forever, and the benefits the Applicants cite cannot be counted on to preserve competition over the long-term. Moreover, as demonstrated in the discussion that follows, these “fixes” are limited and specious and will not broadly serve the public interest.

III. SOLE SOURCING UNDULY LIMITS CONSUMER NETWORK ACCESS

12. An issue that has escaped attention thus far in review of the Consolidated Application and the effect of the prohibition contained in the SDARS Report and Order is the impact on the development, manufacture, distribution and sale of the satellite radios receivers needed to receive the satellite radio networks' programming. USE is a licensee of Sirius authorized to produce and supply Sirius with receivers for its network.

A. *Applicants' Sole Sourcing For Receivers*

13. Sirius has negotiated and intends to enter into an exclusive distributor agreement with DEI. This exclusive arrangement raises a number of issues that have not been specifically identified by the NPRM or in the call for comments issued June 8, 2007, including:

- whether the public interest is harmed if the merger is approved and access to the satellite radio network is restricted to receivers whose development, manufacturing and distribution will be in the sole control of the merged network operator;
- whether control of network access through network operator restrictions on the development, manufacture and distribution of access devices (the receivers) is contrary to communications law, precedents and policy, anti-consumer and anti-competitive;
- whether control of network access by network operator restrictions on the development, manufacture and distribution of access devices (the receivers) enables the merged network operator to use pricing for the receivers as means to undercut whatever concessions it purports to make on pricing for its network offerings; and
- whether the Applicants' failure to disclose their sole source supplier approach to obtaining receivers needed for access to the merged operator's network is an undisclosed material fact that directly affects the Commission's ability to properly weigh the public interest harms against any benefits in deciding whether to approve the merger.

14. The major concern raised by the sole sourcing approach to receivers is that the competition between Sirius and XM that has spurred, and is needed to continue to spur, downstream innovation for SDARS consumers will be lost if the merger takes place. The Commission can rectify that public harm by requiring an open supply of receivers and related

accessories. Any other result flies in the face of a multitude of the Commission's "open network access" precedents first established over a half-century ago. These precedents are controlling authority requiring the Commission to ensure that a multitude of downstream sources are available in this market and to provide a reasoned basis for its decision if it does not.

15. The country's economic system tolerates substantial vertical integration, sole distributorships, and similar structures, because it is presumed that these relationships promote inter-brand competition. Absent such competition, downstream exclusivity almost by definition means a loss in innovation and increased prices. Here, the merged entity will not only control and dictate the development, manufacture and distribution of the receivers, but it will also be able to exercise monopoly power over the technology that is built into the receivers. If the merged entity continues to pursue a sole source philosophy, it will give its appointed supplier an insurmountable advantage in capturing and exploiting (or stifling) new uses for devices capable of accessing the network. Additionally, acts of God, defects, quality control problems and regulatory compliance problems can completely cripple the network providers' ability to deliver new products or repair and replace existing products for existing consumers under this monopolistic approach. A sole source distribution model subsumes great risk that could be detrimental to current and future consumers.

16. The Applicants only recently moved toward a sole sourcing model for the design, development and distribution of satellite radio receivers. Previously, each Applicant followed the path for competitive supply of these receivers. Their current pursuit of sole sourcing raises additional problems affecting the public interest, including:

- subsidies used to reduce receiver prices so receivers can be sold to consumers at a reasonable suggested retail price could be arbitrarily reduced or eliminated which would increase retail prices and harm consumers;

- information useful to consumers that would accompany the competitive promotion of receivers disappears; and
- as other suppliers lose access to current technology, their ability to step in should the sole source relationship fail is substantially diminished, and their relationships with trading partners and retailers dissipate. These effects erode competition over the long term and harm the public interest in encouraging investment and competition in the SDARS receiver market. For current SDARS subscribers, the effects could be devastating because they may become locked into a stagnant technology.

17. Because the inherent economic structure of today's satellite radio receiver design, production and distribution requires that receiver manufacturers and suppliers be provided with financial incentives to balance the risk of lost investments in developing state of the art and innovative receiver designs, subsidies have always been an essential part of the equation between the satellite radio providers and their suppliers. A shift to sole sourcing quickly transforms these subsidies from a necessary and justified economic incentive into an anti-competitive weapon to drive innovators out of the market. USE experienced this directly. Sirius made the arbitrary decision to favor and subsidize only one distributor, DEI. Once merged, the Applicants would be better able to misuse their subsidies as a weapon against, rather than an inducement to, a competitive supply of receivers.

18. That result would circumvent the policies adopted over a half-century ago and reaffirmed but a few days ago by the Commission.¹⁴ By paying a subsidy to a single distributor, the ultimate merged entity would create another monopoly in the downstream supply for satellite radio receivers, *i.e.*, a monopoly at the distribution and consumer retail levels. By discretionary use of subsidies to limit suppliers, Sirius has made, and the merged entity will have an even

¹⁴ FCC Public Notice, *FCC Revises 700 MHz Rules to Advance Interoperable Public Safety Communications and Promote Wireless Broadband Deployment*; (July 31, 2007), Second Report and Order (FCC 07-132); WT Docket Nos. 06-150,01-309, 03-264, 06-169, and 96-86; CC Docket No. 94-102; PS Docket No. 06-229.

stronger incentive to make, itself the gatekeeper wielding power to bar competition at the distribution and retail levels and to permit market entry only as it advances private interests, rather than the public's interests.

19. Currently, Sirius also pays retailers a subsidy. Because Sirius fixes the retail pricing of receivers, the effect of this retail subsidy is to raise the major retailers' profit margins to acceptable levels. With complete control over all aspects of product development, manufacturing and distribution, and a lack of any competition from other distributors or other satellite radio providers, these retail subsidy payments may be discontinued. Such an outcome could be extremely detrimental to the approximately 20 million current subscribers of the two service providers who will be required to purchase new and currently unavailable dual chipset hardware to receive the combined programming content the Applicants have promised, as well as to any new subscribers.

B. *Additional Consumer Issues Arising From Sole Source Receiver Supply*

20. Sirius developed a receiver category known as UDLP (Universal Down Link Processor).

UDLP receivers serve three basic purposes:

- to connect directly and be controlled by an aftermarket car stereo, e.g., Sony, Alpine, and Pioneer;
- to connect directly to any incompatible car stereo via hardwired FM connection with a separate display and controls; and
- to convert a GM vehicle from XM to Sirius.

21. These products were exclusively distributed by DEI. Approximately 20,000 units per month were sold from January through June of 2007. These receivers (as well as OEM receivers) have some severe limitations for the consumer. They do not incorporate many of the features found in basic "plug and play" transportable receivers available in the retail market. They may not offer the time shifting device that is available on most plug and play receivers and

used by many sports and Howard Stern fans. They do not offer Game Alert, which updates scores and notifies the subscriber when his/her selected sports team is playing. They also do not have Artist or Song Seek, which alert subscribers that their favorite content is playing on a different channel of the network. Although these features have been available for at least two years, they have not been offered to the UDLP customer base. If Sirius had introduced UDLP hardware through a second distributor, rivalry between the distributors likely would have led to new features, reduced costs and, of course, multiple choices for the consumer.

22. XM has a product marketed exclusively by Audiovox called Passport, which is basically the XM chipset enclosed in a small package that can be plugged into a compatible host device, turning the host device into an XM receiver. Passport has already been incorporated into portable navigation units, home stereo receivers and other devices. Although this technology has existed for some time, it has not been adopted into the OEM market.

23. It would seem to make a great deal of sense to incorporate Passport into the OEM sales channel that now accounts for almost 80 percent of new SDARS subscribers. The OEM subscriber would pay a single subscription and take his/her receiver with him/her anywhere, much as do consumers who have purchased a plug and play receiver. Instead, OEM customers must purchase additional hardware and subscriptions to have access to satellite radio service outside their vehicles. Offering them a Passport-like option would have many benefits across the board, including:

- The service provider would not have to subsidize chipsets in all vehicles, saving unnecessary expense since nearly 50 percent of vehicle buyers do not become paying customers after the free trial period.
- A car manufacturer would spend less money implementing hardware that is not used by half of its customers and might increase the percentage of vehicles that include the technology.

- Consumers would not be forced to purchase additional equipment and subscriptions if they wish to enjoy satellite programming outside their vehicles.
- The network service provider could recycle promotional “free trial” chipsets supplied to OEM customers during trial periods and further reduce costs.

24. Why have Sirius and XM not implemented this technology in the OEM channel? Additional development partners would certainly be likely to bring this technology to market faster and with immediate benefits to the OEMs, increased compatibility with other devices (which can also increase subscription rates and usage), and more competitive consumer pricing.

IV. APPLICANTS’ PURPORTED CONSUMER BENEFITS FAIL THE PUBLIC INTEREST TEST

25. The Applicants have advanced numerous arguments¹⁵ in support of the public interest benefits of their merger, including a variety of programming packages such as “à la carte programming,” described as follows:

. . . After the merger, customers may elect to receive fewer channels at a monthly price lower than \$12.95; substantially similar programming at the existing \$12.95 price; or more channels, including some of the “best of both” networks, at a modest premium to the cost of one service, and considerably less than the cost of subscribing to both services. . . . Subscribers could continue to use their existing radios or eventually purchase new radios capable of receiving all of the content of both services when they become available.¹⁶

26. According to the Applicants, the à la carte programming plans they propose to offer as a merged entity start at \$6.99 for 50 stations, or nearly half the current rate of \$12.95 for about 150 stations. For \$14.99, consumers could pick their 100 favorite stations. Both would allow

¹⁵ The arguments proffered publicly by the Applicants are set forth in Exhibit 1 hereto.

¹⁶ Consolidated Application at 9-10. This assertion ignores the Applicants’ failures over 10 years to provide radios with interoperability so that consumers could chose either service using the same receivers. Sirius justified this failing by stating that they were required to develop interoperable hardware, not sell it.

customers to add channels for 25 cents each. Six other packages would also be available, including a family-friendly lineup for \$11.95, and News, Sports and Talk for \$9.99.¹⁷

A. *À la Carte Pricing Offer*

27. In evaluating this offer, the Commission must take into consideration the fact that this offer is potentially realistic only if the merged entity is able to retain the entire spectrum currently licensed to Sirius and to XM. Sirius' à la carte pricing plan fails to recognize that a potential competitor, Primosphere, has made public its willingness to enter the market and offer competition to the merged entity. Moreover, if the Commission provides any indication that it would consider other entrants, there may be other companies or consortiums (such as conventional territorial broadcasters) interested in obtaining half of the spectrum recaptured by a grant of the merger conditioned on one of the Applicants' vacating the spectrum under its current license in order to offer consumers another choice in national satellite radio programming. Indeed, the Commission could generate additional revenue from another auction for the recaptured spectrum. It should also be noted that many of the proposed à la carte programming options, discussed below, do not require a merger and can be implemented for current subscribers with their existing hardware.

28. A technological basis exists to support limiting the merged entity to only one licensee's bandwidth. Placing all the bandwidth under one merged licensee would limit the content capable of being broadcast over the merged networks. This result is actually made evident from the announced à la carte option, which offers only 11 channels of the non-surviving licensee's content on the other network. This limitation arises because there is insufficient bandwidth to offer more of the programming of the non-surviving licensee on the surviving licensee's merged

¹⁷ *Id.*

operation. This limitation also means that there would be no “free space” for special interest programming as has been promised, impliedly at least, in the general press and at Congressional hearings on the merger.

29. This is not to say that the limitation cannot eventually be resolved. But doing so would require the surviving licensee to replace the non-surviving licensee’s hardware with receivers compatible with the surviving licensee’s network. This is an expensive proposition for both the merged entity and consumers who will need new hardware, and also poses significant compatibility issues for the OEM market segment (new vehicles), currently the predominant source of existing and new subscribers for both Sirius and XM. The OEM subscribers’ single chipset receivers would have to be replaced with dual chipset receivers, which would require lengthy testing and development of new hardware approved for production by the “OEM partners.”

30. Adding dual chipsets to the receivers is an expensive undertaking that will increase retail pricing. The expense will increase subscriber acquisition costs, and these increased costs likely will be passed on directly to consumers. Every purchaser of an OEM vehicle equipped with a dual chipset receiver will pay this cost increase, even though it cannot be expected that every subscriber will select the expensive à la carte option of receiving content from both services.

31. There also may be an issue with Sirius’ current antennas in the market. OEM carmakers incorporate AM/FM, satellite and WB into a single antenna. Sirius antennas incorporate circuitry that blocks XM’s signal, since XM broadcasts a stronger signal and the overlapping bandwidth can interfere with the Sirius transmission. In-vehicle antennas may need to be replaced to allow a Sirius OEM customer to receive an à la carte service that includes XM content. This replacement would be quite labor intensive and costly to the vehicle

manufacturers, who may decline to pursue it or pass along the costs to customers if they do. There is no indication that Sirius is addressing any of these issues, nor has it acknowledged the time, expense and difficulty involved in offering OEM customers à la carte programming from both services.¹⁸ Further information is essential to assessment of the à la carte pricing plan proposed by Sirius which, upon further investigation, may prove to be inherently implausible. Of course, each of Sirius and XM is free to offer subscribers à la carte pricing for its own content today.

B. *Post-Merger Conventional Pricing Issues*

32. The Applicants have claimed that after the merger, a customer will receive the same services he/she now receives for \$12.95. The record must reflect the fact that all current customer bases do not pay \$12.95 per month, which is a standard monthly billing rate, because 3, 6, or 12-month prepaid plans are offered, along with lifetime subscription plans, at discounted rates. In a public interest analysis, these discounted offerings must be expected to continue. There is no evidence of the effect on current subscribers of the proffered ceiling price of \$12.95, nor is there any evidence of how long the merged entity proposes to leave the price ceiling in place. These purported pricing benefits may prove to be illusory.¹⁹

33. Moreover, Sirius has also promoted a lifetime plan over the past few months at \$399 with installment billing. But no information has been released on how such lifetime subscriptions

¹⁸ XM Chairman Gary Parsons recently reported that the OEM automotive sector increasingly dominates overall sales. Of XM's 338,000 net new subscribers last quarter, 295,000 were OEM car subscribers. Becoming more OEM-centric likely would put the à la carte pricing plan out of reach for the merged entity's core business until the 2010 model year at best, because the expense of retrofitting current OEMs would be staggering.

¹⁹ Sirius' limited option of 50 channels for \$6.95 is also not a great deal for the consumer. This amounts to less than 30% of content for 46% of the cost.

would be treated after the merger. Sirius has charged \$75 to exchange the hardware for a lifetime subscriber and imposed a limit of three hardware changes. Since à la carte programming demands new hardware, is the lifetime subscriber expected to purchase a new receiver, pay an additional \$75, and use one of his limited opportunities to upgrade in order to receive this option?

34. Sirius has also identified “savings” for future dual subscribers. But is it using real figures based on the average monthly payments of its subscribers, or is the analysis (if any) based on savings compared to the highest priced current option? The proposed new pricing plans do not offer significant savings for the yearly subscriber, and more data is needed to evaluate the benefits to subscribers in other payment plans. The number of dual subscribers should also at least be estimated, as it is likely small, yet dual subscribers are the only subscribers who could potentially benefit from this aspect of the Applicants’ pricing proposals.

V. ESTABLISHED PRECEDENTS AND POLICIES REQUIRE UNHAMPERED CONSUMER NETWORK ACCESS

35. A Sirius-XM merger that results in network access being restricted by the merged entity would fly in the face of the well-established policies first enunciated over 50 years ago in *Hush-a-Phone*²⁰ and followed by the landmark decision in *Carterfone*.²¹ With these watershed decisions, the Commission recognized the benefits of allowing consumers the ability to access the network via equipment produced by entities other than the network operator, as long as the alternatives do not have a detrimental effect on the network. Together, these cases demolished AT&T’s longstanding argument that anything connected to its network could be harmful and

²⁰ *Hush-a-Phone Corp. v. FCC*, 238 F.2d 266 (D.C. Cir. 1956).

²¹ *In the matter of use of the Carterfone Device in Message Toll Telephone Service*, 13 FCC 2d 420 (1968), *recon. denied*, 14 FCC 2d 571 (1969).

should be subject to tariff. Neither the Hush-a-Phone nor the Carterfone presented a physical threat to AT&T's network, but both presented huge economic threats. When these two cases were decided against AT&T, an important wall to competition was eroded and doors were opened to manufacturers of devices that interconnected with the telephone network. The Commission's *Carterfone* policy generated competition among equipment providers, lowered equipment prices, and provided consumers with nearly unlimited choice in products.

A. *The Hush-a-Phone and Carterfone Decisions*

36. In *Hush-a-Phone*, AT&T claimed the Hush-a-Phone device violated its tariff provision that prohibited certain attachments. The Commission found that if the use of a Hush-a-Phone did not impair telephone service, a tariff provision barring use of the device would be unjust and unreasonable under the Communications Act.

37. AT&T appealed, and the United States Court of Appeals for the District of Columbia found that the tariffs were an unwarranted interference with the telephone subscriber's right to reasonably use his telephone in ways that are privately beneficial without being publicly detrimental.²²

38. On the heels of *Hush-a-Phone*, the Commission was faced with a device known as the Carterfone. The Carterfone allowed users of mobile radio systems to interconnect their landline telephones with the radio system to permit mobile and fixed users to communicate with each other. AT&T informed its customers that use of the Carterfone would subject them to penalties pursuant to AT&T's tariff. In response, Carter (the inventor of the Carterfone) filed a private antitrust suit against AT&T that was then referred by the Court to the FCC.

²² *Hush-a-Phone*, 238 F.2d at 269 (citing 47 U.S.C. § 205(a)).

39. The Commission found that AT&T failed to demonstrate how the Carterfone would harm the network. Relying on *Hush-a-Phone*, the Commission concluded that AT&T's tariff was unreasonable and discriminatory in that the Carterfone device filled a need and its use did not adversely affect the telephone system. As such, the Commission ordered the restrictive tariff provisions stricken.²³

B. Carterfone Policy and Part 68

40. The import of *Hush-a-Phone* and *Carterfone* and the application of their principles cannot be overemphasized. Indeed, as Commissioner Michael Copps articulated:

More than thirty-five years ago, the Commission decided to let consumers attach devices like the Carterfone to the end of the network. And you know what? The doomsday loss of quality and control didn't come to pass. Instead, a right to attachment came into being. It brought consumers the basic freedom to attach any device to the network as long as it causes no network harm. And look at its benefits – fax machines and computer modems are direct descendants of this principle.²⁴

As one observer notes, "*Carterfone* was and still is among the most fundamental rules in telecommunications policy—the *Magna Carta* of telecommunications competition."²⁵

41. The principle of consumer usage of non-telephone company manufactured equipment with the public switched telephone network, outlined by the Commission in *Carterfone*, was subsequently codified as Part 68 of the FCC's rules. See 47 CFR Part 68. In restraining the boundaries of AT&T's market power and opening the network to competition, the FCC believed that it was advancing the public interest:

²³ *Carterfone*, 13 FCC 2d at 423.

²⁴ Michael J. Copps, Opening Comments of Michael J. Copps, (posted June 23, 2004), Compiled as part of Open Architecture as Communications Policy at 6, cyberlaw.stanford.edu/blogs/cooper/archives/002272.shtml#comments.

²⁵ Tim Wu, *Wireless Net Neutrality: Cellular Carterfone on Mobile Networks*, Working Paper #17, ver. 2.1, attached as Exhibit 2.

[W]e find the interconnect competitive marketplace has been characterized by innovation on the part of both interconnect and telephone companies, thereby affording the public a wide range of choices regarding the terminal device or private communications system which best serves their needs. Benefits include availability of new equipment features, improved maintenance and reliability, improved installation features including ease of making changes, competitive sources of supply, option of leasing or owning, and competitive pricing and payment options. Although it is difficult to predict future innovative developments, because so much is dependent on new product lines and new marketing strategies adopted by the telephone carriers in response to competition, it appears likely that the public will continue to benefit from the competitive interconnect marketplace in terms of innovation in the immediate future.²⁶

42. Part 68 was first adopted in 1975 as part of the Commission's WATS rulemaking in response to telephone company delay in modifying tariffs to permit consumers to attach their own equipment to the public network. Part 68, which addresses connection of terminal equipment to the public telephone network, permits consumers to connect equipment from any source to the public network if such equipment fits within the technical parameters outlined in Part 68. Competitive manufacturers of equipment were able, by means of the Commission's equipment registration and certification procedures, to build and deploy an incredible variety of voice and data equipment for use with the public network, without seeking prior permission from either the Commission, or more importantly, the monopoly telephone companies.

43. Through *Carterfone* and Part 68, the Commission opened the door to manufacturers of devices that interconnected with the telephone network and offered value-added services and capabilities. This led to a plethora of devices to be used with the network and created an industry, the Interconnect industry, that has promoted competition and produced lower prices, veritably unlimited consumer choices, continuing innovation and greater and better use of the phone network.

²⁶ *In the matter of Economic Implications and Interrelationships Arising from Policies and Practices Relating to Customer Interconnection, Jurisdictional Separations and Rate Structures*, 61 FCC 2d. 766 (1976).

C. *Carterfone Policies Today*

44. The philosophy underlying the half-century old *Carterfone* and Part 68 policies apply with equal force today in other industries and should apply in the satellite radio industry.

Open Access to the Internet

45. Commissioner Michael Copps explained the significance of applying the Commission's long-standing policy of open network access and competition to the Internet:

In its *Computer Inquiries*, another Commission said that common carriers which own transmission pipes used to access the Internet must offer those pipes on non-discriminatory terms to independent ISPs, among others. With these decisions we preserved competition in the information services market by ensuring that customers could reach independent providers . . . Internet openness and freedom are threatened whenever someone holds a choke-point that they have a legal right to squeeze. That choke-point can be too much power over the infrastructure needed to access the internet. And it can also be the power to discriminate over what web sites people visit or what technologies they use . . . [the Commission should] play a positive role to ensure that the networks are open for innovation and the focus should be on maintaining and enhancing openness and freedom on the Internet and to fight discrimination over ideas, content and technologies.²⁷

Open Access to Wireless Industry

46. These same principles were echoed by FCC Chairman Martin, along with Commissioners Jonathan Adelstein and Michael Copps, in supporting *Carterfone*-style rules that impose open access conditions on spectrum to be auctioned to the wireless industry. Most recently, on July 31, 2007, the FCC officially approved a measure that gives consumers the right to use any cell phone and software they want on a network built on wireless frequencies that will be auctioned next year.²⁸

²⁷ Remarks of Michael J. Copps, Federal Communications Commissioner, *The Beginning of the End of the Internet? Discrimination, Closed Networks, and the Future of Cyberspace*; New America Foundation, Washington, D.C., October 9, 2003. A copy of Commissioner Copp's speech is attached as Exhibit 3.

²⁸ FCC Public Notice, *FCC Revises 700 MHz Rules to Advance Interoperable Public Safety Communications and Promote Wireless Broadband Deployment*; (July 31, 2007), Second Report

47. This latest action confirms that the Commission recognizes the difference between net neutrality, which would allow others to control and operate portions of a network for their offerings to the public and require that consumers be allowed access to a network's offering by means of any device that does not cause harm to the network.²⁹

Open Access to Cable Set-Top Bases

48. A third parallel can be drawn from the recent action by the Commission to open the cable set-top box market to competition.³⁰ From July 1, 2007 forward, consumers who purchase cable television subscriptions will no longer be forced to lease integrated set-top boxes provided by their cable operators. Now, operators must provide their customers with set-top boxes that include a slot for the new CableCARD.

49. As a result, consumers will eventually be able to choose from an assortment of competing set-top boxes from various providers, either for lease or purchase, without restriction by their cable operator. Quality, prices and consumer choice will all benefit with the Commission's action.

and Order (FCC 07-132): WT Docket Nos. 06-150, 01-309, 03-264, 06-169, and 96-86; CC Docket No. 94-102; PS Docket No. 06-229.

²⁹ Because the full text of the FCC's decision was not released at the time of this filing, USE respectfully reserve the right to supplement its comments once the full text is released.

³⁰ *In the Matter of Implementation of Section 306 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices Compatibility between Cable Systems and Consumer Electronics Equipment*, CS Docket No. 97-80, PP Docket No. 00-67 (Adopted June 27, 2007); *In the Matter of Armstrong Utilities, Inc., Atlantic Broadband Finance, LLC, Bresnan Communications, LLC, Cable & Communications Corporation, and Mid-Rivers Telephone Cooperative, Inc., Cequel Communications, LLC, d/b/a Suddenlink Communications Knology, Inc., NPG Cable, Inc., Orange Broadband Operating Company, LLC and Carolina Broadband, LLC, The World Company d/b/a Sunflower Broadband, Request for Waiver of Section 76.1204(a)(1) of the Commission's Rules Implementation of Section 304 of the Telecommunications Act of 1996 Commercial Availability of Navigation Devices*, DA 07-2916 (Rel. June 29, 2007).

50. As Chairman Martin's press statement accompanying this announcement expressed:

In 1996, Congress explained: "Competition in the manufacturing and distribution of consumer devices has always led to innovation, lower prices and higher quality."

With the Commission's Orders, consumers will enjoy greater choice and reap the benefits of exciting and innovative features ... [and the Orders] will further spur the creation of a competitive set-top box market.³¹

51. The Commission should take the lesson it learned from the cable industry and its exclusive access device situation and apply it to the satellite radio industry. Indeed, the mere fact that it took the Commission many years to finally force the cable industry to open set-top boxes to competition serves as a strong warning that it is better to prevent exclusive access now than to try and force it on the satellite radio industry at a later time.

D. *Analogies Between the Satellite Radio and the Wireless Industries*

52. Satellite services fall in the wireless category at the FCC. The Commission's recent opening of wireless frequencies to be auctioned off next year represents real-time affirmation that the half-century-old model for consumer open network access is alive and as valid today as when first adopted.

53. There is a readily apparent parallel between AT&T's wire line telephony monopoly and the proposed satellite radio monopoly. If the Applicants are permitted to merge, there will exist one company with both the incentive and the unilateral ability to stifle competition in adjacent markets such as satellite radio receivers. Applying *Carterfone* principles to the satellite radio industry is consistent with the 1996 Telecommunications Act's objective to promote competition and consumer choice in the market for certain types of equipment. With open access

³¹ Chairman Martin's full press statement is attached at Exhibit 4.

requirements, consumers will be provided greater freedom to select among alternative satellite radio receivers and other products and benefit from enhanced competition in these markets.

54. If the Commission determines that lifting the restriction on the merger of the satellite radio licensees is in the public interest, it should expressly adopt the *Carterfone* policies of free and open network access to the satellite radio network and mandate that the use of any satellite radio device that can be connected to the network without causing harm, no matter by whom supplied, is permitted. The necessary corollary is that the merged entity should be prohibited from entering sole source licensing arrangements for satellite radio receivers and other devices, and from using subsidies to favor one distributor over another.

55. Departing from the established *Carterfone* principles would be not just a high hurdle for the Commission to overcome, but one that is insurmountable. The Commission's long-standing policy emanating from the legacy of the *Hush-a-Phone* and *Carterfone* cases recognizes the value to consumers and the public in requiring open access. This legacy remains a cornerstone of FCC policy and must be followed. To do otherwise at this juncture would be arbitrary and capricious, for there can be no valid justification for the Commission to ignore one of its central policies in the satellite radio market.

VI. CONCLUSION

56. Whether the Commission's restriction that one DARS licensee would not be permitted to acquire control of the only other DARS licensee is determined to be a final and binding rule or a policy, the Commission may only modify or eliminate the restriction if it provides a reasoned explanation for doing so, *See, DirectTV, Inc. v. FCC*, 110 F.3d 816 (D.C. Cir. 1997) and explains why the original reasons for adopting the restriction are no longer dispositive. *Fox Television Stations, Inc. v. FCC*, 489 F.3d 444 (2d Cir. 2007). The Commission must also consider

reasonably obvious alternatives and if it is to reject those alternatives provide reasons for the rejection, sufficient to allow for meaningful court review. *Id.* at 456.

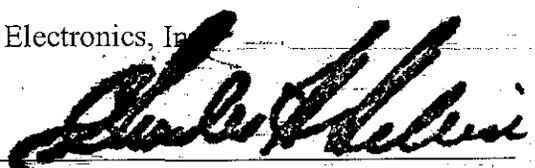
57. In doing so, the Commission must examine and determine that the public interest will not be harmed but, on the contrary, will be served by modifying or eliminating the restriction. The Applicants must provide proof by a preponderance of the evidence that the public interest benefits they hold out are real, substantive, and specific to the proposed merger, not a meaningless promotion of the Applicants' goals or something they would accomplish without the merger.

58. There can be no debate that the Commission must apply the *Carterfone* principles and prohibit the merger from becoming a vehicle to deprive consumers of choice among the devices by which they choose to access the satellite network. Should the Commission determine for other reasons to withhold its approval of the merger, it should nonetheless take the necessary steps to prevent the current licensees from continuing their arbitrary use of financial incentives to advance the sole source approach to the design, manufacture and distribution of receivers. Continuation of such sole sourcing will stifle innovation, frustrate consumer choice, and expose consumers to higher priced but less functionally capable and less feature-rich receivers, a result clearly in violation of the *Carterfone* principles.

Respectfully submitted,

U.S. Electronics, Inc.

By


Charles H. Helein
Their Counsel

Of Counsel:

Helein & Marashlian, LLC
The CommLaw Group
1483 Chain Bridge Road, Suite 301
McLean, VA 22102
703-714-1300
703-714-1330
chh@commllawgroup.com

EXHIBIT 1

Applicants' Arguments in Support of Merger

"Sirius and XM . . . obtained satellite radio licenses in 1997 . . . their qualifications to hold those licenses are a matter of public record and have been reviewed and endorsed in prior proceedings.¹

. . . subscribers' satellite radios may be installed in homes, automobiles, boats, and aircraft, or may be carried as portable radios."²

". . . After the merger, customers may elect to receive fewer channels at a monthly price lower than \$12.95; substantially similar programming at the existing \$12.95 price; or more channels, including some of the "best of both" networks, at a modest premium to the cost of one service, and considerably less than the cost of subscribing to both services. . . . Subscribers could continue to use their existing radios or eventually purchase new radios capable of receiving all of the content of both services when they become available."³

"The merger . . . will generate . . . public interest benefits. The synergies . . . will allow . . . lower prices and more programming . . . Subscribers will . . . continue to use their existing radios and eventually purchase new radios capable of receiving all of the content of both services."⁴

"When interoperable radios are commercially available, consumers who want to have access to the complete offerings of both companies will be able to do so on a single device for significantly less than the current price of \$25.90."⁵

"In the near term, however, subscribers will have to own two legacy receivers (one XM receiver and one Sirius receiver) to receive the complete offerings of both services. This is due to the fact that the combined company must continue to operate both legacy systems. Neither system

¹ Consolidated Application at i.

² *Id.* This assertion is a truism and hides the fact that most satellite radios today are permanently installed or embedded in vehicles. Sirius has suggested the development of interoperable radios could be completed in 1 to 2.5 years, but mentions nothing about their availability to consumers.

³ *Id.* at 9-10. This assertion ignores the Applicants' failures over 10 years to provide radios with interoperability so that consumers could chose either service using the same receivers. Sirius justified this failing by stating that they were required to develop interoperable hardware, not sell it.

⁴ *Id.* at 9-10 n. 3

⁵ *Id.* at 12 n. 3

currently has enough capacity to offer both companies' full programming lineup. *See infra* Section III.C.”⁶

“ . . . the combined company will be able to improve on products . . . ”⁷

“As a result of the merger, consumers also will be able to choose between a wider range of low cost, easy-to-use, multi-functional devices because of efficiencies in chipset and radio design and procurement.”⁸

“ . . . The common engineering standards and protocols which would come from a combined effort will accelerate the involvement of third party manufacturers and technology partners in developing and offering innovative devices and services.”⁹

“Today, XM and Sirius have approximately 20 million radios in the market, including millions built into vehicles manufactured by automakers. This merger will neither interrupt nor affect customers' use of these existing radios. After the merger, current subscribers may choose to continue to receive substantially similar service at the same price over their existing satellite radio. No customer will need to purchase a new radio in order to keep substantially similar service.”¹⁰

“ . . . In originally implementing rules for the satellite radio service, the Commission required the companies to develop designs for a radio capable of receiving the signal of either system. . . . In accordance with this requirement, Sirius and XM created a jointly funded engineering team that has developed a radio that is interoperable with each other's networks. . . . These interoperable radios are currently larger, consume more power, and are more expensive and less feature rich than the current single-system radios.”¹¹

“ . . . Satellite radio is a capital-intensive and expensive business given . . . the significant investment each Applicant has made to design chipsets and encourage their distribution . . . ”¹²

⁶ *Id.* at n. 27, n. 3. The Consolidated Application provides no timetables, descriptions of technical issues, plans for addressing the problem. Something must be provided by the Applicants or this assertion must be disregarded.

⁷ *Id.* at 14, n. 3

⁸ *Id.* at n. 35, n. 3

⁹ *Id.* at 14-15. As explained above, this assertion is highly suspect.

¹⁰ *Id.* at 15.

¹¹ *Id.* at 15-16.

¹² *Id.* at 19.

“*Finally*, the conduct of XM and Sirius demonstrates that both already have been responsive to market forces. . . . The emergence of Internet radio and MP3 players has forced the companies to make changes as well, such as by developing new features for their radios like recording and time-shifted listening, improving device performance, and permitting subscribers to listen through the Internet. Both XM and Sirius have introduced satellite radios with built-in MP3 players that allow users to store MP3s that they have purchased, as well as to listen to and record satellite radio. Sirius’ first MP3 receiver, the S50, was introduced in October 2005. . . . During the past year, Sirius rolled out a new MP3 receiver, the Stiletto 100, which has more functionality than the S50. . . . XM introduced hand-held, recordable radio receivers—MyFi, Tao, and AirWare—in late 2004 and 2005 . . . and MP3 players/recordable radios—Helix, Inno, and NeXus—in 2006.” (Emphasis in original.)¹³

“. . . As reflected in the very broad range of offerings in their respective channel line-ups, the Applicants are highly committed to providing a wide diversity of viewpoints to consumers; the merger will not change the combined company’s strong incentives to continue this practice in the future.”¹⁴

“Section 310(d) of the Communications Act requires the Commission to consider the qualifications of the proposed transferee as if it were applying for licenses directly under Section 308 . . . Sirius’ and XM’s qualifications to hold and control FCC licenses are a matter of public record and have been reviewed and endorsed in prior proceedings.”¹⁵

“In addition, the combined company will benefit from a highly experienced management team from both companies. . . . Accordingly, Sirius and XM remain qualified to hold and control the licenses and authorizations involved in the proposed transaction.”¹⁶

¹³ *Id.* at 44-45.

¹⁴ *Id.* at 47.

¹⁵ *Id.* at 48.

¹⁶ *Id.* at 49. The record should reflect that XM’s CEO has recently announced his resignation. *Washington Post*, July 24, 2007, “Sidelined XM Satellite CEO Panero to Step Down,” at D8. As reported by Kim Hart in the article, “When plans to merge XM and Sirius Satellite Radio of New York emerged in February, Panero became the odd man out.”

EXHIBIT 2

NEW AMERICA FOUNDATION

WIRELESS FUTURE PROGRAM

Working Paper #17 ver. 2.1

February 2007

Wireless Net Neutrality: CELLULAR *CARTERFONE* ON MOBILE NETWORKS

By Tim Wu*

Over the next decade, regulators will spend increasing time on conflicts between the private interests of the wireless industry and the public's interest in the best uses of its spectrum. This report examines the practices of the wireless industry with an eye toward understanding their influence on innovation and consumer welfare.

In many respects, the mobile wireless market is and remains a wonder. Thanks to both policy and technological innovations, devices that were science fiction thirty years ago are now widely available. Over the last decade, wireless mobile has been an "infant industry," attempting to achieve economies of scale. That period is over: today, in the United States, there are over 200 million mobile subscribers, and mobile revenues are over \$100 billion. As the industry and platform mature, the wireless industry warrants a new look.

This report finds a mixed picture. The wireless industry, over the last decade, has succeeded in bringing wireless telephony at competitive prices to the American public. Yet at the same time, we also find the wireless carriers aggressively controlling product design and innovation in the equipment and application markets, to the detriment of consumers. In the wired world, their policies would, in some cases, be considered simply misguided, and in other cases be considered outrageous and perhaps illegal.

Four areas warrant particular attention:

1. ***Network Attachments*** – Carriers exercise excessive control over what devices may be used on the public's wireless spectrum. The carriers place strong controls over "foreign attachments," like the AT&T of the 1950s. The FCC's *Carterfone* rules, which allow consumers to attach devices of their choice to the wired telephone networks, do not apply to wireless networks.

* Tim Wu is Professor, Columbia University School of Law.

These controls continue to affect innovation and the development of new devices and applications for wireless networks.

2. ***Product Design and Feature Crippling*** – By controlling entry, carriers are in a position to exercise strong control over the design of mobile equipment. They have used that power to force equipment developers to omit or cripple many consumer-friendly features. Carriers have also forced manufacturers to include technologies, like “walled garden” Internet access, that neither equipment developers nor consumers want. Finally, through under-disclosed “phone-locking,” the U.S. carriers disable the ability of phones to work on more than one network. A list of features that carriers have blocked, crippled, modified or made difficult to use, at one time or another, include:

- Call timers on telephones,
- Wi-Fi technology,
- Bluetooth technology,
- GPS services,
- Advanced SMS services,
- Internet browsers,
- Easy photo file transfer capabilities,
- Easy sound file transfer capabilities,
- Email clients, and
- SIM Card mobility.

3. ***Discriminatory Broadband Services*** – In recent years, under the banner of “3G” services, carriers have begun to offer wireless broadband services that compete with Wi-Fi services and may compete with cable and DSL broadband services. However, the services are offered pursuant to undisclosed bandwidth limits and usage restrictions that violate basic network neutrality rules.

Most striking is Verizon Wireless, which prominently advertises “unlimited” data services. However, it and other carriers offer broadband service pursuant both to bandwidth limits, and to contractual limits that bar routine uses of the Internet, including downloading music from legitimate sites like iTunes, the use of Voice over IP, and the use of sites like YouTube.

4. ***Application Stall*** – Mobile application development is by nature technically challenging. However, the carriers have not helped in fostering a robust applications market. In fact, they have imposed excessive burdens and conditions on application entry in the wireless application market, stalling what might otherwise be a powerful input into the U.S. economy. In the words of one developer, “there is really no way to write applications for

these things.” The mobile application environment is today, in the words of one developer, “a tarpit of misery, pain and destruction.”¹

Most of the carriers exhibit similar practices in the areas discussed in this paper. However, in each area, there are variations between the four largest carriers: AT&T, Verizon Wireless, Sprint-Nextel, and T-Mobile. Speaking generally, Verizon Wireless and AT&T have the most restrictive policies; Sprint is slightly less restrictive. The fourth and smallest competitor, T-Mobile, tends to be the least restrictive on consumers and application developers. The reliance on a fourth competitor for serious variation in industry practice must be kept in mind when considering any future consolidation.

The report makes four major recommendations:

1. ***Cellphone Carterfone*** – The basic and highly successful *Carterfone* rules in the wired world allow any consumer to attach any safe device to his or her phone line through a standardized jack. The same rule for wireless networks would liberate device innovation in the wireless world, stimulate the development of new applications and free equipment designers to make the best phones possible.²
2. ***Basic Network Neutrality Rules*** – Wireless carriers should be subject to the same core network neutrality principles under which the cable and DSL industries currently operate. Consumers have the basic right to use the applications of their choice and view the content of their choice. Wireless carriers who offer broadband services should respect the same basic freedoms. Carriers can tier or meter pricing for bandwidth without blocking or degrading consumer choice.
3. ***Disclosure*** – Consumer disclosure is a major problem in the wireless world. In addition to the disclosure of areas lacking coverage and rate-plan information, carriers should disclose—fully, prominently, and in plain English—any limits placed on devices, limits on bandwidth usage, or if devices are locked to a single network.
4. ***Standardize Application Platforms*** – The industry should re-evaluate its “walled garden” approach to application development, and work together to create clear and unified standards for developers. Application development for mobile devices is stalled, and it is in the carriers’ own interest to try and improve the development environment.

Part I: The State of Wireless

1. Introduction to the U.S. Wireless Industry

In Washington, D.C., the wireless world is sometimes described as a nirvana for consumers brought on by competition and enlightened government policy. Some consumers and groups depict a very different story: a “cell hell” of “dropped calls, dead zones, billing errors, and unexpected fees and charges.”³ The truth lies somewhere in the middle. Relative to its history, the state of the wireless industry is greatly improved.⁴ Since the 1990s, when the Federal Communications Commission began to auction wireless spectrum suitable for telephones and other devices, wireless telephony has taken off. But now, a decade later, the industry is no longer an infant. As mobile platforms mature, and as consumer markets reach saturation, the state of the wireless world warrants greater scrutiny.

Some observers argue that the oligopoly structure of the wireless market makes scrutiny of the industry unnecessary, because any anti-competitive or anti-consumer behavior will be self-correcting. In the words of AT&T spokesman Mark Siegel, “this is a fiercely competitive industry,” which has grown “almost entirely through the force of competition in the marketplace, [and] more innovative devices and services.” Put simply, since there is no single cell phone monopoly, attention to these issues is unwarranted—in Siegel’s words, “this whole issue is a giant red herring.”⁵

Part IV of the paper addresses these issues directly. In short, the carrier market is simply not an open market. While entry is not impossible, under current conditions, it requires multi-billion dollar investments. The consequence is a spectrum-based oligopoly, not the “fiercely competitive” market that is sometimes portrayed. The wireless market may be relatively competitive by the standards of the telecommunications industry and regulated industries like energy generation. But the U.S. wireless market is nothing like the market for blue jeans or vodka, and it is a mistake to so pretend.⁶ The behavior of the carriers, moreover, 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.

If it is accepted that the wireless industry warrants attention, several important justifications are usually raised for the industry’s practices. It is often asserted that industry practices are made necessary by spectrum scarcity and the need to maintain network security. These arguments are important—no one wants a world of calls that never go through, or widespread identity theft practiced through cell networks. Yet, critically,

these arguments cannot be accepted as blanket justification for any and all carrier practices.⁷ Just as the network security and quality claims made by AT&T for much of the 20th century were eventually questioned, the claims made by the mobile carriers today must be examined far more closely.

The historic parallel is instructive. Wired voice telephone networks had more or less reached their full potential under AT&T by the 1960s. To reach the next stage, the most important steps were not technological but deregulatory—destroying impediments created by AT&T that restricted innovation and competition. As Eli Noam writes, “in almost all other fields of communications the US is heavily dominant. Why not in mobile wireless? The one different variable is policy.”⁸ To reach the “next stage” in wireless communications, the most important step may be opening the networks to true competitive entry. This paper specifies how that could happen.

Finally, many readers may be puzzled by the carriers’ behavior in this area. The last part of the paper addresses an important puzzle: Why would a carrier want to cripple products in the first place? Companies usually like to sell the best product possible. If a phone with Wi-Fi is a better phone, why not sell that?

This paper introduces three possible explanations. The first is that the carriers are engaging in a form of price discrimination—crippling products so that they might sell the crippled product at a cheaper price to poorer customers. This form of price discrimination, while not uncontroversial, is defensible. The problem with this explanation is that the wireless carriers do not also make available a fully-capable product for a higher price. Instead, wireless carriers demonstrate an incomplete price-discrimination strategy: offering the crippled product, but not the fully functional one.

That suggests two other explanations. First, the carriers may be acting to protect existing revenue streams. If a feature like Wi-Fi might endanger 3G or voice revenue, the carrier may block it to protect its income, or in industry jargon, “prevent revenue leakage.” That behavior is an example of a *negative spillover* or *externality*: behavior that helps the carrier, but hurts society.

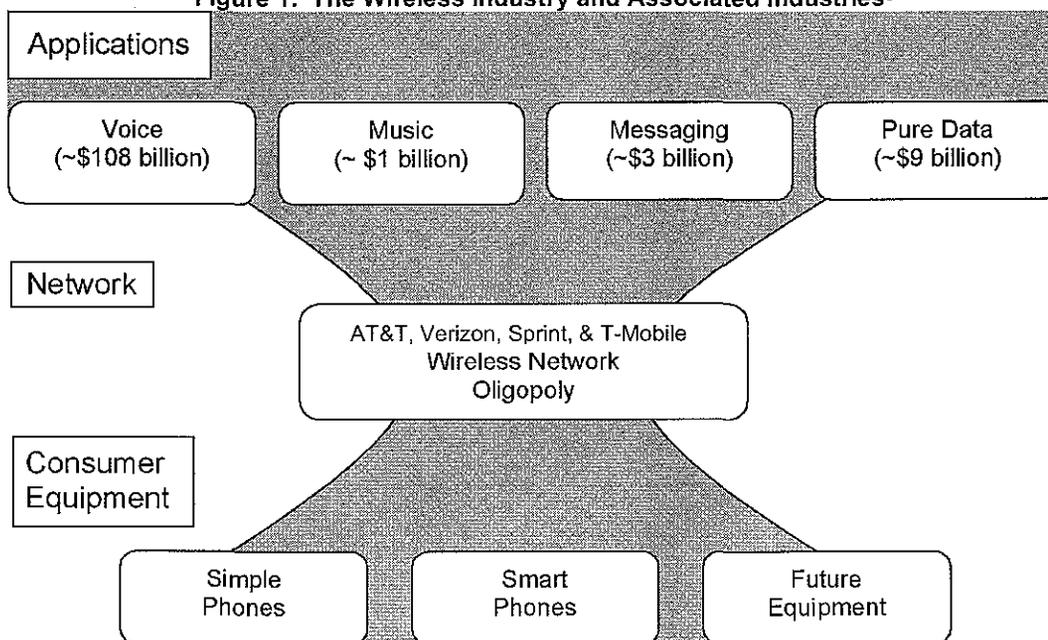
Second, in some instances the carriers may simply be making the wrong decisions. For example, when it comes to software development, the carriers and some equipment manufacturers have pursued a quixotic strategy. They have failed to standardize, and have placed controls on software development that reflect an interest in maximizing control over any new services that may arise. That strategy, according to many developers, has inhibited the growth of a strong mobile software market. Companies and industries do make mistakes, and the carriers’ current application strategy may simply be an error.

One point should be clear. This paper is written to examine what carrier practices may be harmful for consumers or society. It is intended to shed light on practices that might, for one thing, be dissipated by consumer pressure and competition, and to raise questions for the carriers themselves. It is absolutely not a call for comprehensive regulation or nationalization of the wireless industry. The perspective is that regulation, if necessary, should be a last resort.

2. Competition Model

The American wireless industry is a classic example of an information platform economy.

Figure 1. The Wireless Industry and Associated Industries⁹



Today, most discussion of the wireless industry is focused on the degree of competition between carriers—the horizontal competition within the carrier market, represented as the “Network” layer in Figure 1 above. The FCC has done important work in this area since the 1990s. The rise of spectrum auctions, the initial imposition of spectrum caps (since repealed), and the number portability rules are important landmarks that have intensified intra-industry competition.¹⁰

Much less attention has been paid to a different issue: the impact of carrier practices on the vertical markets touched by the wireless industry and its spectrum-based oligopoly—in other words, the effects of the wireless oligopoly on the equipment and application markets, and consequently on consumers.

Part II: Carrier Practices

For various reasons, discussed in Part IV, the oligopoly of carriers, using their power over the public spectrum, are disabling features or paths of development that might be attractive to consumers. We now turn to a more detailed look at carrier practices. We examine four areas: (1) network attachments, (2) product design and feature crippling, (3) data-service discrimination, and (4) application development.

1. The Right to Attach – *Carterfone* Principles

In early 2007, Apple launched the iPhone—its first foray into the world of wireless voice. The iPhone (Figure 2) is beautiful and innovative in design. But it also came with many surprising limitations. Most importantly, to the surprise of many, the iPhone only works on the network of a single carrier, AT&T Wireless. The hundreds of millions of consumers who are not AT&T Wireless customers cannot make use of the iPhone unless they become AT&T Wireless customers. The question is, why? Why can't you just buy a cell phone and use it on any network, like a normal phone?



Fig.2
Apple's iPhone

The main reason is the lack, in the wireless world, of basic network attachment rules. Thanks to FCC rules dating from the 1960s and 1970s, usually referred to as *Carterfone* rules, when it comes to wireline telephones, consumers have the right to attach whichever devices they want to their phone lines. That right is made possible by the standard “telephone jack.” If Apple wanted to build a wireline telephone, it would simply build one that could plug into the standard household phone jack. It could sell the device directly to consumers—and it would work whether they bought their phone service from AT&T, Verizon or any of hundreds of smaller telcos.

The standardized telephone jack has proved essential to competition in the wireline space. To understand its importance, we must examine where it came from. For much of the 20th century until the 1970s, the AT&T monopoly barred consumers from attaching anything but a Bell telephone to their network. AT&T had a rule (a tariff*), which stated,

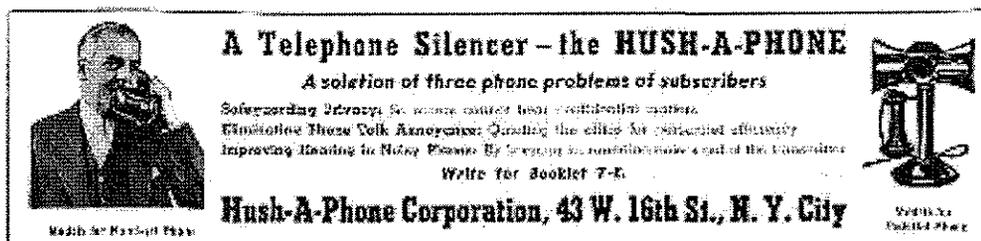
No equipment, apparatus, circuit, or device not furnished by the telephone company shall be attached to or connected with the facilities

* Pursuant to §203(a) of the 1934 Telecommunications Act, AT&T had the right to file tariffs showing charges for its phone service, and also “classifications, practices, and regulations affecting” its phone service.

furnished by the telephone company, physically, by induction or otherwise.¹¹

That rule, unsurprisingly, suppressed all competition and most innovation in the making of telephones. A slow change began in 1948, when a company named “Hush-a-Phone” challenged AT&T’s rule. AT&T had banned the use of a small device (shown in Figure 3 below) designed to keep phone calls quiet and private. Hush-a-Phone challenged the tariff at the FCC as “unreasonable.”

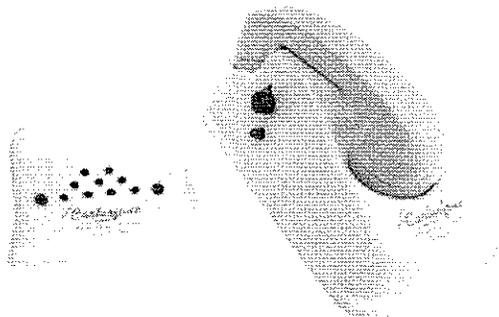
Figure 3. Hush-a-Phone Advertisement



In litigation, AT&T argued that

It would be extremely difficult to furnish ‘good’ telephone service if telephone users were free to attach to the equipment, or use with it, all of the numerous kinds of foreign attachments which are marketed by persons who have no responsibility for the quality of telephone service but are primarily interested in exploiting their products.¹²

After eight years of litigation, the D.C. Circuit Court of Appeals ordered AT&T to allow consumers to attach the Hush-A-Phone to their handsets. The court said that the subscriber has the “right reasonably to use his telephone in ways which are privately beneficial without being publicly detrimental.”¹³ Subsequent to this ruling, through the 1960s and 1970s, the FCC progressively deregulated network attachments—ordering the local phone companies to allow users to connect any devices that complied with a set of basic rules. These principles are often referred to as the *Carterfone* principles, after the 1968 case by that name.



In the *Carterfone* case, AT&T wanted to prohibit the use of the “Carterfone,” a device that facilitated communication between a mobile radio and a telephone. AT&T again argued that control over all equipment on the network was necessary for the

telephone system to function properly. As AT&T described in an advertisement, "It takes a totally unified system to make it all work. One system. AT&T."

Despite these arguments, the FCC in *Carterfone* struck down AT&T's rule as "unduly discriminatory." Importantly, the FCC rejected arguments made by AT&T that suggested control over all equipment on the network was necessary for the telephone system to function properly.¹⁴ Full realization of the modularity rule implicit in *Carterfone* took until the late-1970s, but few doubt the historic importance of the decision.¹⁵

The 1968 *Carterfone* right to attach devices to home networks is perhaps the fundamental consumer right in telecom, and indeed its consequences have been historic. The attachment right is broadly celebrated by policy analysts of every ideological persuasion, who recognize the *Carterfone* principle as a central tenet of a competitive telecommunications policy. However, as described below, AT&T's wireless descendants have shown an interest in resurrecting, one way or another, the pre-*Carterfone* rule.

The *Carterfone* principle has had enormous consequences not only in telecommunications policy, but for the economic prosperity of the United States. The ability to build a device to a standardized network interface (the phone plug, known as an RJ-11) gave birth to a new market in home and business telecommunications equipment. That led, predictably, to competition in the phone market. But it also led, unpredictably, to other innovations. Those have included mass consumer versions of the fax machine, the answering machine, and, perhaps most importantly, the modem. Arguably, the FCC's rules on network attachments—now known as the Part 68 rules—have been the most successful in its history. The freedom to buy and attach a modem became the anchor of the mass popularization of the Internet in the 1990s. As one observer put it, without *Carterfone*, "the development and broad popularization of the Internet also would not have occurred as it did. The key point of *Carterfone* is that it eliminated an innovation bottleneck in the form of the phone company."¹⁶

Carterfone is an important innovation policy. It drives decentralized innovation: any company or even individual can build to the standardized telephone jack, without gaining the permission of the phone company.¹⁷ *Carterfone* freed innovators to invent the personal modem, and then ever-faster versions of the personal modem, without seeking approval from the owners of the telephone lines. In the wireless world, the *Carterfone* rule does not exist. Instead, like in the pre-*Carterfone* world, innovative companies must seek the permission and cooperation of the carrier oligopoly.

Consequently, the market for consumer devices is unusual and distorted. As one developer put it, "You just can't sell in this market like you do in others. The carriers have ultimate control over what products reach the market. If they don't like what you're doing, that's too bad."[†]

Current Barriers to Attachment and Marketing

American equipment manufacturers are used to Internet connections and telephone lines that are "plug and play." A firm can design equipment, create whatever features it thinks best, and sell to consumers directly.

In contrast, today, it is *de facto* necessary to obtain the permission of the carrier to market a wireless device in the United States. That fact creates an important bottleneck on innovation and product diversity. To make it to market, any device must "fit" with the business plans of the major carriers.

That has two main consequences. First, the cellular phones widely available in the United States are just a small fraction of the phones available in the world. As Marguerite Reardon of C-Net points out, "even though Nokia introduced roughly 50 new products into the market last year, only a handful were offered by operators in the U.S."¹⁸

Second, as discussed in subsequent sections, control over attachments has given carriers enormous power over equipment design and over application markets. First, we examine how the carriers control network attachment in the first place.

Retail Barriers

The major carriers have a near-lock on the retailing of mobile wireless devices in the United States. According to analyst estimates, between 90 percent and 95 percent of cell phones in the United States are sold by the carriers. That is nearly the opposite of other markets: in some markets in Asia, for example, about 80 percent of cell phones are sold independently of a carrier.¹⁹

The primary reason is very well known, and even beloved by consumers: the practice of subsidizing equipment purchases with subscription fees. As Elliot Drucker writes in *Wireless Week*, "by far the biggest impediment to commercialization of innovative wireless data products and services lies in the way mobile handsets are distributed in the U.S. market."²⁰

[†] Many of the application and equipment developers interviewed for this report requested anonymity, for fear of retaliation. For that reason, some of the sources relied upon cannot be disclosed.

As the main carriers collect a monthly fee from consumers, they are in a unique position to collect the price of the telephone or smartphone over a long period. In effect, they can sell telephones on a “buy-now-pay-later” basis, like an installment plan, as opposed to a lump sum purchase. Typically, a provider like T-Mobile or AT&T will advertise and sell a phone for \$99-\$199 that retails without subsidies for \$300-\$600. They consequently collect the full cost of the telephone through higher monthly billing, spread over their entire customer base. The higher fees charged to recover the price of the telephone subsidy program are not indicated on phone bills. Since many consumers spend over \$1,000 a year for mobile service, collecting the wholesale price of the telephones through subscription fees is practical.

As many sources we interviewed suggest, the subsidy makes trying to sell phones through non-affiliated retailers a losing proposition. As one equipment developer explained, “we always hated it, but if you want to move the needle, you have one choice, and that’s selling through the carriers.” It is possible to buy handsets from unaffiliated vendors in the United States, but they cost far more because of the lack of the subsidy.

Whether the phone subsidies and other barriers to network attachments are ultimately a pro- or anti-consumer practice we do not address in this paper.[‡] However, their effect on innovation, equipment markets and application markets is undeniable. As the only significant channel for the purchase of mobile devices, the carriers can and do reserve the power to decide what devices will operate on their network.

Technical Barriers

In the United States, carriers rely on two distinct main standards—GSM and CDMA.[§] The CDMA carriers (Verizon and Sprint) have different means of restricting network attachments than the GSM carriers (T-Mobile and AT&T). We shall examine each briefly.

Approved Phones Only. “We only allow devices on our network that have been approved,” said Jeffrey Nelson, a spokesman for Verizon Wireless.²¹ As Nelson confirms, for Verizon Wireless, the largest CDMA carrier in the United States, only devices specifically approved by the company work on its networks. Technically, how is this accomplished? For CDMA carriers, every

[‡] Notably, if the current low upfront prices made possible by subsidies are important to ensure the affordability of phones for consumers, telephones could be sold on an installment plan, with repayment processed automatically through billing.

[§] GSM stands for the Global System for Mobile Communications and is the world’s most popular standard. CDMA stands for Code Division Multiple Access and is used mainly in the United States, South America and Korea.

device that connects to the network must have an approved ID number—an ESN (electronic serial number) or, more recently, an MEID (mobile equipment ID). The practice of Verizon Wireless is to block telephones that are not sold by Verizon itself.²² As one Verizon customer representative put it, “all the phones that work are already in our system.”

The method of exclusion is a “whitelist” of Verizon phones which, by implication, prevents others from working. Without an approved ID number, telephones not sold by Verizon will not be recognized and cannot be used on the network. This effectively makes Verizon Wireless the gatekeeper of market entry for telephones on their network, like the AT&T of old.

The whitelist is not a matter of technological necessity. Sprint is also a CDMA carrier and its practice is slightly different. Sprint keeps a list of customer ESNs and bars the use of existing ESNs—which can be evidence of a “cloned” or stolen telephone. While Sprint “discourages” the use of non-Sprint phones on its network, and will not offer technical support for such phones, it does not block the use of phones on its network as Verizon does. In other words, a consumer who owns his own phone can call Sprint customer service and have his phone activated on the network.

Phone Locks. The GSM wireless providers (AT&T and T-Mobile) limit network attachments using a different means: “locking” cell phones, or making them incapable of operating on any network other than theirs. It would be strange to have a car that worked on some roads but not others. However, much of the mobile wireless equipment sold in the United States today, unless modified, will only work on one network, for reasons unrelated to technological necessity.

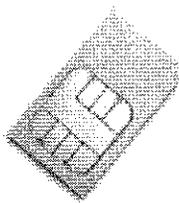


Figure 5. A SIM Card

Locking works as follows. The GSM standard envisions a standardized interface between the phone and wireless service. For that reason, GSM phones carry a Subscriber Identity Module, or SIM card, designed to make it easy for one phone to be used on various networks simply by plugging in new SIM cards. In addition, the SIM system allows consumers to easily switch telephones by moving the SIM card from one phone to another.

The mobile device itself, however, can be designed to recognize and reject certain types of SIM cards based on information carried on the SIM, creating a “lock.” There are several varieties of lock: a “service provider lock” simply prevents the phone from being used on anything but the SIM cards of one service provider. A “full lock” prevents the phone from being used with any other SIM card, period. Most, if not all, of the American GSM phones sold by carriers are locked, disabling the utility of the SIM system.

Just as it is possible to lock phones, it is possible to unlock them. Typically, unlocking a phone requires entering a series of codes, and there are companies that specialize in unlocking telephones and reselling them. The U.S. Copyright Office announced in 2006 that telephones may be unlocked without violating the anti-circumvention provisions of the copyright laws, though of course the rule does not prevent carriers from locking phones to begin with.²³ The GSM carriers, T-Mobile and AT&T, have been careful not to go too far in absolutely preventing the unlocking of phones, perhaps for fear of regulation. Both firms appear to have a policy of agreeing to unlock telephones, on request, so long as the phone has been owned for three months.

What is important, however, is the status quo. Most consumers have no idea what a phone lock is, let alone know how to unlock a phone themselves. New products, like the Apple iPhone, are sent to consumers locked to one network (AT&T, in Apple's case). Consequently, unlike in most of the rest of the world, American devices are usually locked absent user expertise or knowledge.

* * *

Two sets of consequences flow from the control that carriers exert on the marketing and attaching of mobile devices in the United States. One is a loss of *product diversity*. Of the many mobile devices sold even by major providers like Nokia and Motorola, only a fraction effectively make it to the U.S. market. The bottleneck also deters other potential market entrants.

The second set of consequences of the carrier bottleneck on the device market is in product design, an issue to which we now turn.

2. Coercive Product Design and Crippled Phones

As a condition of network access, American wireless carriers are wielding a heavy hand in the design of mobile devices. "We were used to selling PDAs (personal digital assistants). But the wireless market was like night and day. Basically, the carriers have all the power," said the former wireless marketing director of a PDA manufacturer. While they accept that some level of cooperation is necessary, equipment developers complain about two problems: (1) being forced to disable services or features that might be useful to consumers, and (2) being forced to add elements to telephones that the designers do not think are what consumers want.

Call Timers. Developers report that carriers have often forced them to remove or limit "call timers" from their phones. Call timers can keep track of the length of individual phone calls, and can also keep track by month, year, or in total. The carriers, reportedly, are concerned that consumers might

easily develop an independent and possibly different record of their mobile phone usage. While it is clear that destroying an independent record simplifies billing practices for carriers, it is less clear how that serves the interests of consumers.

Photo Sharing. As one developer said, “The first thing you want to do with a photo is get it off your phone [and] email it, right? But the carriers wouldn’t let us make it that easy.” In the early 2000s, when camera capabilities began appearing in telephones, equipment developers and carriers came into conflict.

Developers wanted to make it relatively easy to send a photo to an existing email account, as a product feature. Carriers, conversely, wanted to channel consumers to paid “photo sharing” sites where, for a monthly fee, consumers could upload their photos and then download them to their computers. While results now depend on the device and carrier, many carriers successfully forced equipment developers to make photo-sharing services the only way to get photos off of a camera-equipped phone.

For example, Sprint’s “Picture Mail,” Verizon’s “Pix Place” and AT&T’s MediaNet/MMS services, for prices typically ranging from \$60-\$240 per year, allow consumers to get photos off of their phones and onto a Web “album.” An AT&T customer, for example, who wants to get photos off of her phone must sign up for three packages: “MediaNet,” “Text Messaging” and “Multi-Media Messaging,” each of which has affiliated charges. On many phones, the carriers have made it difficult (or sometimes near-impossible) to get the pictures off of the phones otherwise. That has prompted numerous consumer complaints. As one consumer wrote about Sprint’s offering:

so.. wtf i pay \$5/month just for the service
and i also the .2/.3 cents/kb for a data transfer?? for every single
picture??
wtf kind of bull**** is this?²⁴

Consumers also report that Verizon has placed limits on the maximum size of photos that can be uploaded from its phones (300 KB), for reasons that are not always clear. In the words of a Verizon customer:

Verizon's greed hurts its customers...One phone call to Motorola's dedicated V3C support line (800-657-8909, for those who want that number) verified that the problem was Verizon's own limit of 300 Kb on MMS and email attachments — and led to the Motorola tech expressing extreme exasperation that his company was willing to put its products in the hands of customers via a middleman (Verizon) who crippled those products before passing them on...²⁵

Whatever the benefits of a photo-sharing service may be generally, it seems hard to see how consumer interests are served by making it harder for consumers to send photos to themselves.

Web Access. During the early development of wireless-capable PDAs, also known as smartphones, the potential use of phones to access the Web became obvious. However, various carriers strongly opposed the availability of “full” Internet browsers on the devices. Instead, the carriers pushed the development of an alternative to the standard Internet through the “Wireless Application Protocol,” or WAP.

There are two ways to approach the challenge of providing access to the Web using a cell phone. The first is to provide access to the existing Internet and simplify sites to reflect the limits of the mobile platform. That was, for example, the approach of the “Blazer” browser developed by Palm systems. The Blazer worked by simplifying normal Web pages to make them appear on a phone, consequently allowing consumers to reach a full, albeit simplified, range of Web content.

The carriers, however, supported a different approach, embodied in the WAP protocol. As opposed to adapting the Internet to the technical constraints of mobile phones, WAP created an entirely new set of protocols, and contemplated, in essence, the creation of an alternative, cell-phone only Web. The carriers pressured manufacturers to offer WAP-compatible browsers only, and then, at least initially, a “walled garden” of WAP-compatible sites. As one developer said, “we thought Blazer was pretty good, while we knew WAP was terrible. But the carriers had to have WAP.”

As one critic wrote of WAP:

They [the WAP Forum] have developed an entire stack of network protocols analogous to, but largely incompatible with, the existing Internet architecture. Not only has this approach required an enormous engineering effort on the part of the protocol designers and implementers, it has also given rise to a number of fundamental design errors. The deficiencies in the WAP specification are glaring, obvious, and readily apparent to any competent data communications professional.²⁶

Eventually the carriers relented, demanding only that their site be the first site available on any browser. Ultimately, WAP proved a commercial failure and has been abandoned in the United States.

Bluetooth. The disabling of Bluetooth functionality has been a major sticking point for many consumers and has even prompted a lawsuit. Bluetooth is a protocol designed for very short-range personal communications—to allow communications between devices such as PCs, printers, wireless headsets, etc.** Obvious uses of the technology might include transferring photos off of camera-phones, printing information from a telephone, or backing up address books.

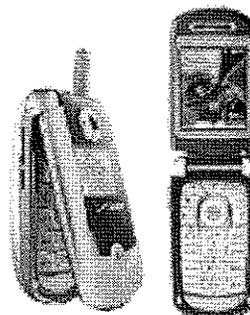


Figure 6. Verizon's modified Motorola V710

In 2004, Verizon Wireless released the Motorola V710 cell phone, advertising “full” Bluetooth capabilities. However, most of the Bluetooth capabilities were, in fact, disabled. The phone was capable only of recognizing headsets and cooperating with a modem to make dialup calls. In statements and interviews, Verizon Wireless stated that the crippling was necessary for “security” reasons.²⁷ It later defended the crippling as necessitated by its contracts with various content partners. In response, in 2005, subscribers filed a class action lawsuit in California. Verizon Wireless eventually settled the lawsuit.²⁸

Since then, while it hasn't stopped crippling Bluetooth, Verizon and Motorola more clearly indicate the limits of the Bluetooth features on phones. For example, Motorola's “Phone Tools” website states:

if you are a Verizon customer, all multimedia and internet connection features in this software will be disabled due to carrier request. Please contact your service provider for further information.²⁹

In addition to Verizon's practices, which are notable, Sprint and AT&T have also, at various times, disabled various Bluetooth capabilities—particularly on smartphones like the *Treo* line.

It is important to understand the consequences of Bluetooth crippling. Generally speaking, the treatment of Bluetooth features by carriers is inconsistent and mixed, uncertainty which makes it difficult or impossible for developers to create secondary markets based on full Bluetooth capabilities. For example, it would be easy for mobile phones to communicate better with printers so that users can print phone numbers, addresses or photos. However, the unpredictability of Bluetooth capabilities has inhibited the growth of that or similar markets.

** Bluetooth is specified in the IEEE 802.15.1 Personal Area Network Standard.

Wi-Fi. Technologically, cellular phones can incorporate Wi-Fi (802.11b) capabilities for a range of potential uses, from email, to web access, to VoIP, to communicating directly with other devices. However, over the last five years, American wireless carriers have strongly resisted and blocked the installation of Wi-Fi capabilities in cellular phones. In some cases, they have forced equipment manufacturers to manufacture specialized American versions of telephones with all Wi-Fi capabilities crippled.

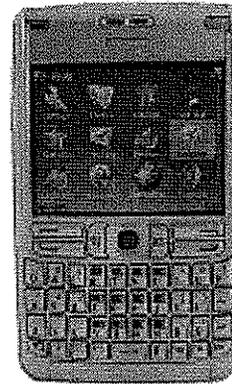


Figure 7. Nokia U.S. e62 (e61 sans Wi-Fi)

The Nokia e62/e61 is one example. The Nokia e61 phone is the company's flagship "smartphone"—widely known as its "Blackberry killer." It was released in Europe in the summer of 2006 to enthusiastic reviews. However, in the United States, AT&T is the exclusive vendor of the e62—a crippled version of the e61 that has Wi-Fi and other features removed. In the words of MSN columnist Gary Krakow: "What some carriers fear most is the e61's ability to handle VoIP calls when you're near a friendly wireless network. That's why we won't see Wi-Fi on the e62."³⁰

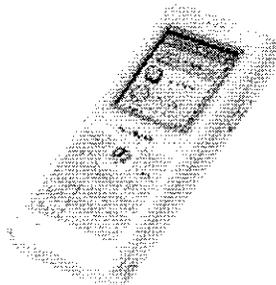


Figure 8. Netgear SPH101

As of 2006, there are "pure" Wi-Fi phones being sold in the United States, such as the Netgear SPH101. But these phones do not work on the cellular networks operated by the commercial wireless carriers. They are Wi-Fi phones only—typically only allowing a user to make phone calls using Skype or other VoIP providers within range of a local area or public Wi-Fi network.

In the United States, with a few notable exceptions, it is difficult today to find a Wi-Fi capable cell phone.^{††} It is difficult to see how the practice of blocking Wi-Fi in mobile devices is helpful to the American consumer.

3. Discrimination in 3G Broadband Services

Under the general banner of 3G ("Third Generation") services, wireless carriers have begun offering various types of broadband data services using their wireless spectrum. These data services are designed to be used both for

^{††} AT&T will soon offer the Apple iPhone, which has Wi-Fi capabilities. Also, since October 2006, T-Mobile has offered a plan in the city of Seattle whereby consumers can use a hybrid telephone, sold by T-Mobile, in T-Mobile's "hotspots," although this feature also entails an extra monthly fee. In addition, also in October 2006, T-Mobile began to make available the "Dash" smartphone with Wi-Fi capabilities. Users can also buy Wi-Fi phones in Europe or Asia and import them.

smart telephones and personal computers (presumably laptops) through a data-card (typically a modem card with an embedded antenna that plugs into the computer). GSM and CDMA telephones use different protocols for these data services (such as EVDO and HSDPA). While there are important technical differences, we shall refer to all as 3G wireless broadband services.

Verizon, Sprint-Nextel, AT&T and T-Mobile now all offer wireless broadband services of various kinds. These data services, based on licensed spectrum, compete with commercial and public Wi-Fi providers, who offer services for free or for a fee in cafes, airports, and other public facilities, at designated hot spots or hot zones, and in some cases throughout cities.³¹

Wi-Fi is faster than 3G. Under current technologies, Wi-Fi has a capacity between 11 Mbps to 54 Mbps, which means that Wi-Fi usually operates at the maximum speed of the underlying Internet connection (often a home DSL or cable connection), minus whatever is lost through interference or sharing. As for 3G, Verizon and Sprint have claimed average downstream speeds between 500-600 kbps, though some in the industry contest these claims. One independent test of AT&T's broadband network found downstream speeds between 100-300 kbps, and upstream speeds under 100 kbps.³²

The major advantage of 3G broadband data services over Wi-Fi is not speed but coverage—Wi-Fi networks tend to be offered sporadically, by various providers (or neighbors), while cellular data services are available anywhere that the carrier's network reaches.

In a manner similar to early broadband services, Verizon and AT&T have offered their services pursuant to discriminatory conditions of various kinds.

Blocks and Bans



Figure 9. Verizon EVDO Advertisement

The practices of Verizon & AT&T with respect to their data services are most notable. Verizon widely advertises an “unlimited broadband access” offering (see Figure 9 below).³³

However, in practice, Verizon imposes limits on its “unlimited service”—namely by restricting bandwidth and designating certain applications as “forbidden.”. AT&T and Verizon have virtually identical Terms of Service contracts.

They ban their users from using their broadband connections for any purpose other than:

1. Internet browsing;
2. E-mail; and
3. Corporate intranet access (including access to corporate email, customer relationship management, sales force automation, and field service automation applications).

Verizon limits its “unlimited” brand service as follows:

Unlimited NationalAccess/BroadbandAccess services cannot be used (1) for uploading, downloading or streaming of movies, music or games, (2) with server devices or with host computer applications, including, but not limited to, Web camera posts or broadcasts, automatic data feeds, Voice over IP (VoIP), automated machine-to-machine connections, or peer-to-peer (P2P) file sharing, or (3) as a substitute or backup for private lines or dedicated data connections.³⁴

AT&T takes its restrictions even further:

Prohibited uses include, but are not limited to, using Services: (i) with server devices or with host computer applications, including, without limitation, Web camera posts or broadcasts, continuous jpeg file transfers, automatic data feeds, telemetry applications, automated functions or any other machine-to-machine applications; (ii) as substitute or backup for private lines or dedicated data connections; (iii) for Voice over IP; (iv) in conjunction with WWAN or other applications or devices which aggregate usage from multiple sources prior to transmission; ... except for CONTENT formatted in accordance with AT&T's CONTENT standards, Unlimited plans cannot be used for uploading, downloading or streaming of video content (e.g. movies, TV), music or games. Furthermore, unlimited plans (except for DataConnect and Blackberry Tethered) cannot be used for any applications that tether the device (through use of, including without limitation, connection kits, other phone/PDA-to-computer accessories, Bluetooth® or any other wireless technology) to laptops, PCs, or other equipment for any purpose.³⁵

Under these contracts, a computer user who subscribes to Verizon's “unlimited broadband access” is contractually barred from many of the most popular uses of the Internet. The provisions ban, for example, a computer user from downloading episodes of the television show *Lost*, or even music, from Apple iTunes. They also bar downloading user-created content on YouTube, or using VoIP providers like Skype or Vonage.

How are these rules enforced? First, while this is not possible to verify, Verizon or AT&T may be blocking or degrading applications that fall outside

its list of “permitted” uses. The limits of this study preclude monitoring any active blocking or degrading.

Second, over the last two years, Verizon has shut down the accounts of people who use banned applications or too much bandwidth. Numerous people have complained about being shut down by Verizon for such reasons.³⁶ Victims identify two patterns of termination. In the first, users are notified through a letter that they are using too much bandwidth and asked to call a number. When they call, they are asked whether they are downloading games or songs. If the answer is “yes,” the user is terminated, and charged a \$175 termination fee. In a second reported pattern, the appeal stage is skipped: customers who, according to Verizon, use too much bandwidth, are terminated and charged the termination fee.

An excerpt from a termination letter is below:

As you know, the terms and conditions that govern your NationalAccess and/or BroadbandAccess account, which were provided to you at the time of service activation and which are posted on VerizonWireless.com, only permit Internet browsing, email and intranet access. All other activities, such as streaming and/or downloading movies and video, are expressly prohibited by the terms and conditions. A copy of the terms and conditions is enclosed.

We recently reviewed your Verizon Wireless NationalAccess and/or Broadband Access account and found that your usage over the past 30 days exceeded 10 Gigabytes. Your usage was more than 40 times that of a typical user. This level of usage is so extraordinarily high that it could only have been attained by activities, such as streaming and/or downloading movies and video, prohibited by the terms and conditions. Based on these facts, your extraordinarily high levels of usage conclusively demonstrate a violation of the terms and conditions, and your account will be terminated on 9/20/2006.³⁷

One anonymous user who was terminated documented his complaint as follows:

I would not object to being billed monthly per gigabyte, or even to being billed at a usurious rate for usage over a prespecified threshold. But in their advertising, ‘unlimited’ is the big selling point. Nowhere do they reveal the daily usage quota—which with great difficulty I finally discovered to be 166M [Megabits] per day—or any limit of any kind. They kick anyone off who uses more than that and pretend it's because they caught you streaming kiddie porn or something.³⁸

In the summer of 2006, the group Consumer Affairs ran tests of the 3G limits and were terminated for using too much bandwidth, despite the fact that they did not violate any contractual limitations.³⁹ When contacted by Consumer Affairs, a Verizon spokesman, Jeffrey Nelson, maintained that advertising the service as “unlimited” is not misleading to consumers. “[The limits are] very clear,” he insisted, “in all the legal materials we put out.”⁴⁰

4. Application Stall

In the words of Michael Mace, an observer of the mobile application world:

There's a collision coming between the wireless world and the Web, and I think it won't be pretty... The river is the torrent of innovation happening in Web apps right now. The dam is the carriers who won't allow that innovation to run freely on their networks. They haven't figured out how to set up spillways and generators, let alone operate them, so the pressure of the water keeps growing as Web innovation gets further and further in front of what you can do on the wireless networks.⁴¹

In the words of another commentator:

Developing any kind of mobile application is a tarpit. A tarpit of misery, pain and destruction.⁴²

As these comments suggest, all is not well in the world of mobile software development.

Software Development on the Web and PC

The hallmarks of the software development environment for personal computers and Web applications are (1) permissionless market entry, (2) relatively low costs of market entry, and (3) open development standards that make it possible to write to many platforms. It is important to examine how these features work together. Today, a Web or PC developer can develop a new application without seeking the permission of any carrier, the World Wide Web, or any operating system owner. A new Web-based firm can be launched without “clearance” from anyone. Similarly, applications for the major operating systems—Linux, Apple, UNIX and Microsoft Windows—can be written without the permissions of the companies or authors of those systems.

The costs of developing software for these markets, while not zero, have been relatively low. Obviously, a developer needs a degree of computer expertise and computer equipment to write a new application. However, that has not prevented hobbies from becoming multi-national corporations. eBay, for example, was run as a hobby site before becoming a multi-billion dollar

concern. The amount of start-up capital required was sufficiently low that the business could be launched as a part-time job. eBay is an extreme example, but the history of the personal computer and the Internet is full of examples of low-cost market entry. Microsoft was a tiny concern when it began to market MS-DOS. Yahoo! was a graduate-student project. Similar examples are legion.

The importance of these facts for software development cannot be overstated. They allow developers to discover, or try to discover, entirely new markets at very low cost, and they give consumers more choice and value. Few in the 1980s would have ever predicted the existence of large markets for search engines, auction goods, online media, and other markets that have been discovered in the software/Web development environment. Not every market that people thought might exist has worked out—consider, for example, the “push” application craze of the mid-1990s. But through trial and error, many new markets have been discovered. In addition, cheap entry for developers creates iterative product development—rapid advances and improvements on products, based on what works and what does not. As it becomes more expensive to roll out a software product, the rate of improvement slows.

Difficulties for Developers

Many application developers believe that the mobile applications market is stalled, or much less active than it might be. Developers describe many reasons, though three are dominant: (1) access to phone capabilities, (2) extensive qualification and approval procedures, and (3) pervasive lack of standards in many areas.

Access to Phone Capabilities. Says one developer, “the bleeding from the neck problem is this: you cannot do anything if you cannot access the power of the hardware. Right now, you just can’t get at the phone’s capabilities, so you really can’t do much.” Today, in the mobile device world, there are two dominant development platforms: Java and BREW. Both create a virtual machine that runs on top of the telephone’s capabilities. Neither offers application developers full access to the technological capabilities of the telephone.

Developers complain that carriers and even equipment makers do not make available many of the most useful application programming interfaces (APIs), or reserve them for some developers over others. In the words of one developer, “If you are a J2ME [Java] developer you’d be shocked at the number of capabilities that get locked down for no fucking reason. Serial port access, Bluetooth access, location, Internet access with encryption, the list goes on...”

Simple evidence of this problem can be clearly verified by anyone who owns a cell phone. Available applications, if they need processing power, tend to perform very badly. On the Motorola Razr, even simple computer games run at a snail's pace, and can take a long time simply to render graphics on the screen.†† As one developer explained, "the guys who work at Verizon or Motorola aren't software developers, so they're just struggling to make things work. And thanks to lack of access for everyone else, the applications on phones are mostly a joke."

Screening Developers. A second problem is the carriers' qualification and approval requirements. Each of the carriers has extensive qualification procedures to become a developer for their cell phone platforms. Becoming a registered developer is expensive, which can obviously impede development by very small or hobbyist developers. While hobbyist developers may not sound important, the history of the computer industry shows how important small developers can be. The work of economists like MIT's Eric von Hippel show how important user-driven innovation can be in fields as diverse as software through surfing. Qualification procedures that make user-driven improvements impossible sacrifice that potential.⁴³

For example, most of Verizon Wireless's telephones run the BREW development environment, one of two used commonly for mobile telephones. BREW, as implemented, requires an extensive and expensive three-stage process to develop applications. It requires (1) pre-qualification of individual developers, (2) a rigorous process of testing for all applications, and (3) individual submission of each application to Verizon for approval and a potential contract. In taking this approach, BREW is notable for its apparent rejection of the value of an open development environment. As BREW's promotional materials, directed to carriers, state:

BREW equals REVENUE... With BREW, your needs come first: You own the relationship with your subscribers, you decide which apps to offer, and you determine the level of interaction you want with publishers and developers.⁴⁴

The consequence of this level of control is much less development of applications for BREW telephones. As David Passmore writes, "software can't be installed in Verizon BREW phones without permission of the operator, who gets to determine whether the resulting services are compatible with its walled garden business model, and then insist on collecting a percentage of the revenues."⁴⁵

†† For example, Iomo's "Gold Club" title takes between 20-22 seconds to render a screen on a Motorola Razr mobile phone.

Lack of Standards. A third major problem is the costs created by the sheer number of mobile platforms—the variety of cell phones, each with varying operating systems and different implementations of Java and BREW, the main development environments. The lack of standards raises development costs, as developers need to spend considerable resources making sure that even a simple wireless application works on a reasonable portion of the cell phone platforms.

The following diagram (Figure 10), based on the work of Henry Holtzman of the MIT Media Lab, highlights some of the differences between the PC and mobile phone environment:

Figure 10. Differences Between PC and Mobile Phone Development Environments

	PC	Mobile Phone
Service	Google, Yahoo, AOL, Windows Live, YouTube	
Apps	Web browser. All kinds of vertical niche applications.	
GUI	Common “desktop” paradigm	
Input	Generic: usually keyboard, mouse, and monitor	Specialized: keypad, buttons, and inconsistent (and often limited) screen space
HW	x86 (Intel, AMD, VIA)	Lots of different platforms

As this diagram shows, while developers would like to write software for phones and smartphones, both the variety of standards in some cases, and the lack of a standard in other cases, can be a major impediment.^{§§} Some large developers overcome these difficulties, but not without cost. As one developer commented, “yes you can download Google Maps for your Blackberry. But that’s because at Google they have a huge team who spends all their time just trying to get a weak version of Google Maps working on all those different platforms. That’s about the best they can do, and that’s Google we’re talking about.”

^{§§} This is not to completely discount the existing efforts to provide a uniform development platform. Sun Microsystems’ Java Micro Edition is probably the best known effort to standardize development across mobile platforms, though developers report that it remains inconsistent across platforms and underpowered.

* * *

We now consider several specific areas that, despite great potential, have experienced delayed development, for some of the reasons discussed above.

SMS Crippling

SMS, or short message service, is available on most American mobile phones, and is usually used for sending messages between friends. However, developers point out that SMS could be adopted to a far broader range of innovative and interesting uses. For example, many firms have been interested in using SMS as a means of payment, or, for example, as a means for charities to raise funds. Unfortunately, the carriers have imposed complex controls on the usage of the SMS system that have all but crippled many uses other than the most basic ones.

The following anonymous testimony from a developer describes vividly the challenges in developing an SMS application:

Almost all cell phones sold in the developed world have the ability to send and receive SMS (short message service) text messages. SMS is gaining popularity in the US, but only as a way to send quick messages to friends. So why aren't there a wealth of amazing and interactive services available for mobile devices? Why is there no MySpace, Craigslist, Amazon, Flickr, or eBay accessible through this network? Why are cell phone payment systems and email systems nearly nonexistent? Why haven't charities raised money or awareness of their causes through this system?

It's simple. Because the cell phone carriers control what services are allowed to use their networks. There is no net neutrality on the cell phone network.

Imagine you want to create a user-moderated news service like digg.com that operates on SMS. On the neutral Internet, you rent a Web server (\$7-\$100 per month to start), register your name, and start programming. Total time required: less than two hours in most cases. But getting a service on the non-neutral US cell phone network would be a little different:

The first step would be to contact a company known as an aggregator. This company manages your relationships with the cell phone carriers -- and that's carriers, plural, because making an agreement with just one carrier ensures that your service will fail because it cannot effectively spread via word of mouth. The first requirement from an aggregator is a service charge, which starts at \$1,000 per month. Then,

you must buy a shortcode (which kind of serves as your Web site name) for an additional \$500-\$1,000 per month. But you're not done.

The next step is satisfying the requirements of the cell phone companies. Many of these steps, such as requiring affirmative opt-in before a subscription can start, are not burdensome, and serve to protect the carriers' customers. Others, however, border on ludicrous. Requirements vary by carrier, but some prohibit operators from offering games or sweepstakes, or require that subscription periods can only be monthly—not daily, weekly, or yearly. Others require that content, such as ringtones, be locked so users can't forward them from their phones to their friends' phones.

Other requirements are outright offensive: as of this writing, Cingular, Sprint/Nextel, T-Mobile and Verizon all prohibit charities from raising money through their Premium SMS services. Too bad for the United Way, Greenpeace, and the Red Cross.

Some carriers also have "decency" restrictions that are so silly and restrictive that they make the production code that governed movies between 1934 and 1967 seem quaint. Verizon is the worst offender in this case: It prohibits dating services, images that are suggestive (the same images would be acceptable if aired on prime-time network TV), and any use of "crude" words, including such shockers as "fornicate" and "genital."

After you make your application compliant to the carriers' requirements, you wait weeks or months for the carriers to approve it, and jump through more hoops if they reject your application, which they can do for any or no reason.

In practical terms, you'd never get approval for your brand new peer-mediated news service. Even if you were able to set up filters to block images and bad words, you'd still be sunk: Verizon prohibits "unmoderated chatting, flirting and/or peer-to-peer communication services."

Even if you could slip your service past the censors, you would already have been set back eight weeks and many thousands of dollars -- and this is just the beginning. Next, the carrier will charge you a fee (a few cents, typically) for every message you send to your users, and charge your users to receive your messages -- and charge them to send you messages. Just imagine where craigslist.org would be if it had to pay a few cents every time someone browsed an ad, and you had to pay as

well. It's no wonder SMS services are overpriced and haven't grown beyond a niche market for ringtones and horoscopes.⁴⁶

As the anecdote suggests, the challenges surrounding the development of an SMS-based application are formidable.

Geolocation & Mobile Social Software (MoSoSo)

Thanks to the government's "Enhanced 911" (e911) mandate, all American mobile phones are required to have basic geolocation capabilities, while some have more advanced, full GPS capabilities. This feature can be utilized along with tools like SMS, to create innovative location-based applications—from finding friends to locating lost items or restaurants. So far, such applications have not been developed, to any significant degree, in the U.S.

An example is the effort to develop "Mobile Social Software," or MoSoSo, modeled on successful social networking sites like Friendster and MySpace. The concept behind mobile social networking software is the ability to use your mobile device to find out where your friends are, and to tell them where you are. For example, you might use the software to figure out whether any of your friends are at the café or bar to which you are headed.

Unfortunately, despite the promise of MoSoSo, it has yet to become a widespread phenomenon. It may be that the services simply aren't popular, or haven't yet reached a critical mass of people. But the development challenges just described have certainly held things back. As commentator danah boyd explains:

The next step in social technologies is mobile... Yet, a set of factors have made innovation in this space near impossible. First, carriers want to control everything. They control what goes on a handset, how much you pay for it and who else you can communicate with. Next, you have hella diverse handsets. Even if you can put an application on a phone, there's no standard. Developers have to make a bazillion different versions of an app. To make matters worse, installing [outside applications] on a phone sucks and most users don't want to do it... All around, it's a terrible experience for innovators, designers and users.⁴⁷

Boyd's concerns reflect general problems in this area. Other developers discuss the difficulty of accessing the GPS capabilities of phones. It stands to reason that, without the power to harness the relevant hardware capabilities, the development of useful GPS applications will continue to be delayed.

The OpenMoko Model

One model for how to solve many of these application development problems is something called the "OpenMoko" model. The OpenMoko is a project,

backed by various firms and developers, to produce mobile platforms that are as open to development as the Web and major operating systems.

In early 2007, a Taiwanese firm, FIC, Inc., announced the release of a phone called the OpenMoko Neo1973. The phone works on GSM networks, and its distinctive feature is that it runs a standard operating system (Linux) and is completely open to installation of third-party applications. In other words, the OpenMoko telephone comes with basic voice services, and allows a user to install any application she is interested in, downloadable from the Internet.

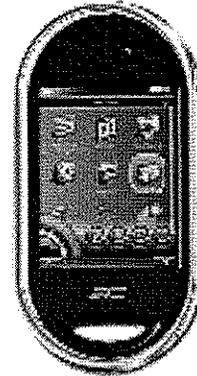


Figure 11.
FIC's
Neo1973

As Sean Moss-Pultz, who works for FIC, Inc. and is a leader of the OpenMoko project, explains, “we want to build the first product that actually gets better the longer you own it.”

According to Moss-Pultz, the essence of OpenMoko is giving developers full access to the capabilities of the telephone. “If you don’t have access to the hardware, you really can’t do anything.”

Whether the OpenMoko model will take off is far too soon to tell. The model depends both on the willingness of consumers to buy an unsubsidized phone and the willingness of third-party developers to write software for a telephone which will, at first, have a small user base. But what the OpenMoko model shows is that the current model of cell phone development is not the only way. Most industry observers bemoan the stagnant nature of mobile phone application development, but there are solutions.

* * *

It is interesting to contrast the present mobile development environment with that of early computer platforms, such as the Apple II. The Apple II of the late 1970s was, like today’s mobile phone, a platform with some serious technical limits. However, in many ways, the Apple was better for development than today’s mobile devices. It gave its users a native development environment (BASIC and Assembler) that had full access to the (albeit limited) power of the underlying hardware. The Apple II, furthermore, had no particular pre-qualification or approval rules for developers.

It seems strange that today’s mobile phones should be a more closed and limited development platform than a computer released in 1977. We might put things this way: if mobile devices are to become a major platform for software innovation, like the personal computer and web, they must become at least as hospitable to innovation as the humble Apple II.

Part III: Analysis & Recommendations

1. Rating the Carriers

Based on the investigation undertaken here, it is easy to rate the carriers on the degree to which they respect *Carterfone*, network neutrality, and open platform development principles. Broadly speaking, Verizon Wireless scores the most poorly across every category, while T-Mobile scores the best. AT&T and Sprint are in the middle.

Verizon Wireless

As documented, Verizon Wireless engages in the broadest range of discrimination and misrepresentational behavior. It violates *Carterfone* by blocking unaffiliated network equipment. It imposes what appears to be the most restrictive crippling of telephones in the industry, crippling Bluetooth and blocking Wi-Fi capable phones, practices for which it has been sued. Its preferred development environment, BREW, is strictly limited. Its wireless broadband services, advertised as “unlimited,” come with extensive and sometimes undisclosed usage limitations, violating both consumer protection norms and core network neutrality principles.

AT&T

AT&T is a GSM carrier, and locks its phones to the AT&T network. AT&T's broadband data service is provided with severe restrictions similar to those of Verizon. However, accounts of enforcement are not as common with AT&T as with Verizon. AT&T also cripples its products in various ways. It disables Bluetooth features on its Treo smartphones and, in the case of the Nokia E61, forced the manufacturer to remove Wi-Fi capabilities. On the Apple iPhone, while unconfirmed, many believe that AT&T's pressure led to the iPhone's inability to run third-party applications. It's also too early to tell if the iPhone will have true or crippled Wi-Fi capabilities.

Sprint

Sprint's wireless broadband data services are provided with fairly reasonable restrictions, similar to those historically imposed by dial-up ISP operators. Historically, Sprint has taken chances on new and innovative platforms, like the Handspring Treo. Sprint, however, has led efforts to cripple Bluetooth on various platforms, and has generally consented to the blocking of Wi-Fi.

T-Mobile

T-Mobile, the smallest U.S. carrier (other than regional carriers like AllTel), offers the least restrictions. It, like AT&T, locks its telephones. It will allow customers who are aware of what “locking” is to request unlocking after

owning their phones for three months. T-Mobile is not a major player in the broadband wireless market, so its practices in that area are not easy to assess. T-Mobile seems to offer the most open Bluetooth capabilities in the industry. Along with AT&T's Apple iPhone, T-Mobile is also the only known carrier, as of January 2007, to have publicly made available Wi-Fi-capable telephones, although (as noted above) this comes at an extra cost to the consumer.

2. RECOMMENDATIONS

Recommendation 1: *Cellular Carterfone*

As described above, *Carterfone* was and still is among the most fundamental rules in telecommunications policy—the *Magna Carta* of telecommunications competition. Of the various potential actions, adapting *Carterfone* to the mobile world is likely to have the greatest positive consequences and the minimum negative side-effects.

In light of existing practices, what *Carterfone* means for the mobile industry is fairly clear. It means, first, that two existing carrier practices must stop:

- on CDMA networks, blocking the registration of non-carrier-affiliated telephones; and
- on GSM networks, “locking” of equipment to single networks.

A second reform is more ambitious yet more important. The industry or the FCC should, as in the Part 68 rules, define a basic interface to which any equipment manufacturer could build a mobile device and sell to consumers. As Eli Noam put it, “while the carrier could still offer and market its preferred equipment, it could not exclude other equipment, as long as it conforms to certain technical specifications pertaining to the RF transceiving function and non-discriminatory industry specifications for air interfaces standards. These specifications could not close equipment third-party applications or access to other network protocols offered by other types of providers, as long as it conforms to the FCC’s software defined radio rules.”⁴⁸

Some may argue that a standard interface for mobile networks would be highly complex or impossible. This report, obviously, cannot address the full set of technical issues involved. However, there are reasons to think that impossibility is an over-statement. The wireless world already has standardized interfaces—for example, the GSM standard contains the standardized SIM card (though its function is usually crippled by U.S. carriers). A standardized interface would work like any other in the phone or electric industry. Spectrum bandwidth is a commodity, and the interface would provide the user with a fixed maximum bandwidth and, like an electric meter, bill the consumer for the amount of bandwidth actually used.

The ramifications of such a rule are extremely important. Today, the mobile world is fixated on telephones, and to a lesser extent, messaging. However, given a standard interface, and the ingenuity of the electronics industry, we might expect major leaps forward in:

* ***Mobile video.*** Right now, large-scale deployment of mobile TV or video services, especially independent of the cell phone model, is perpetually stalled in “carrier trials.” Companies in this sector are completely subject to the carrier’s plans for mobile TV. To take one example, Crown Castle International’s *Modeo* product has been thrown into jeopardy for want of carrier cooperation with its plans.⁴⁹ A consumer’s ability to buy a hybrid device, or even a “pure” IP device, that could simultaneously access other services on other frequencies could drive further innovation and development—and not just for video.

* ***Mobile geolocation tools.*** Presently, the technical possibilities of geolocation are highly underutilized. For example, an electronics company could sell a small device, using a tiny amount of wireless bandwidth, that could broadcast its location, making it possible and cheap to keep track of pets, vehicles and other highly mobile entities on a global scale. The limits on developing both devices and software that might inter-operate with wireless networks have so far made such products scarce in the market.

* ***Mobile functions built into more devices.*** There are telephones with cameras, yet it is hard to find a camera with mobile functions—that is, a camera that can download location-specific information, or upload photos it has taken. Cameras are one example, but given a standardized mobile interface, wireless communications might be built into cameras, refrigerators, e-Books, and other devices. In the 1990s, many spoke of the refrigerator that might call the grocery store to order more milk. Access to even tiny amounts of low-frequency wireless spectrum could make that a possibility, yet the ability of devices to inter-connect between these applications and commercial networks is a critical limiting factor.

* ***Phone variety.*** While the carriers do carry a wide variety of telephones, if phones were generally unlocked, we could expect see even greater product diversity. As detailed above, major companies introduce dozens of cell phones each year, only a handful of which are sold in U.S. markets. Devices like the Danger “Sidekick” barely made it to market under current conditions—and are sold by one carrier only (T-Mobile). We know that a better variety of phones is available outside of the United States. But we have no idea how many devices are dying on the drawing board for want of carrier approval in the United States.

The full implementation of *Carterfone*, would, over time, transform the wireless industry. Rule 68 is arguably the most successful rule created by the FCC. Its success should be exported, for it could create the same explosion of innovation that the wireline industries experienced in the 1970s and 1980s.

Recommendation 2: *Network Neutrality*

Wireless carriers should be subject to the same core network neutrality principles under which the cable and DSL industries currently operate.

In the early 2000s, the use of discriminatory terms of service and blocking of applications were strongly condemned by Chairman Michael Powell and the Federal Communications Commission. In a 2003 speech, Powell outlined the following “four network freedoms”:

1. ***Freedom to Access Content.*** First, consumers should have access to their choice of legal content.
2. ***Freedom to Use Applications.*** Second, consumers should be able to run applications of their choice.
3. ***Freedom to Attach Personal Devices.*** Third, consumers should be permitted to attach any devices they choose to the connection in their homes.
4. ***Freedom to Obtain Service Plan Information.*** Fourth, consumers should receive meaningful information regarding their service plans.⁵⁰

At a minimum, regulators should use the same basic general scrutiny for the broadband services of wireless carriers. At issue, in particular, are the contractual bans on the use of wireless connections for perfectly legitimate purposes, such as buying music from iTunes or downloading videos from YouTube. Such restrictions, even if enforced unevenly, risk warping application development by discouraging the use of some applications over others. If the carriers’ true goal is managing bandwidth, they should make that goal explicit. Metering of bandwidth is far more conducive to innovation, competition and consumer choice than is blocking.

Recommendation 3: *More Disclosure Rules*

Competition depends on information to work. Consumers cannot make wise decisions unless they know, for example, the daily or monthly bandwidth limits on wireless broadband services. Advertising “unlimited bandwidth” while maintaining secret limits is not acceptable. Consumers must receive truthful and meaningful information about their service plan.

Today, under agreements with states, the carriers have agreed to disclose information relevant to billing and coverage. However, much relevant information remains missing or buried. Wireless carriers should be required to disclose the following limits placed on devices and services:

- Locks placed on devices, and how to remove them, if possible;
- The disabling of standardized protocols, such as Bluetooth; and,
- If Internet access is provided, accurate and prominent information on bandwidth limits, if any; and prominent disclosure of any limits placed on Internet services.

Recommendation 4: *A Standardized Development Environment*

It is clear that the mobile application environment is not what it could be. Calling it “a tarpit of misery, pain and destruction” may be a little strong, but it captures the sentiments of many developers.

The problems include failure to give developers access to phone resources, over-demanding developer qualification requirements, too much inconsistency among platforms, inconsistent operating systems, and overly restrictive controls on developers. The combination of these factors has made what might be a flourishing jungle of mobile applications much more of a desert.

It is doubtful that government can play a useful role in this area. Instead, this report recommends that mobile carriers and equipment manufacturers should fundamentally rethink their approach to the development of software and applications for mobile platforms. Working with developers to liberate and standardize mobile application development may well yield great dividends for all parties involved, including both carriers and consumers.

In addition to the OpenMoko model already discussed, there are many existing models for better industry cooperation in this area. They include the Internet Engineering Task Force and IEEE for major Internet and communications protocols, and the CableLabs initiatives for cable Internet standardization. The emphasis must be on giving developers access to the power of mobile platforms in a standardized way. Given tools, the potential for new and innovative applications for mobile platforms is hard to estimate.

Part IV: Economic Analysis

This final section addresses several difficult economic questions that are implicated by this paper. First, given many instances of product crippling, we must ask what motivates such behavior and whether crippling products might, in fact, ultimately serve consumer interests. Second, many may argue

that the competitive nature of the wireless industry makes the scrutiny of the industry in this paper unnecessary. Third, some of the recommendations in this paper, particularly the *Carterfone* recommendation, will yield important objections based on scarcity and network security. We address each issue in turn.

1. Why Cripple Products?

Some of the behavior described in this report presents a paradox. Why would carriers disable functions, or block development, that might be useful for consumers? Does crippling ultimately serve consumer interests?

A familiar framework for understanding the behavior discussed in this paper is to view it as an *infrastructure* problem, or as a problem of *vertical integration*.⁵¹ The carrier oligopoly controls an important part of the national infrastructure, namely the public's licensed spectrum that carries digital wireless signals. The relevant question is how the spectrum caretakers interact with related vertical markets: namely, the equipment and application markets which depend on the wireless spectrum.

Given these premises, the wireless carriers have an obvious interest in exercising control over vertical markets: maximization of revenue. Usually, but not always, maximizing revenue is a useful motive, for it suggests making the wireless networks and wireless services as useful to consumers as possible. Vertical integration or controls placed on the equipment and applications markets may represent efforts to maximize the utility of the overall platform for consumers. For example, in some instances, careful "hand-in-glove" cooperation between the carrier and equipment may yield a better product or service. That's arguably the case, for example, for the voice services that are the carriers' main offering. Each carrier works carefully with handset manufacturers to make sure its voice service is carried efficiently on the spectrum it controls.

In other instances, however, what the carriers want can be at odds with what is good for consumers. As we have seen in this report, the carriers often control or cripple product features that might be useful for consumers. At various times, different carriers have, as detailed above, blocked, delayed or conditioned the following features on mobile platforms:

- Wi-Fi technology,
- Bluetooth technology,
- Call timers on telephones,
- Photo transfer capabilities,
- Sound transfer capabilities,
- Email clients, and
- Internet Browsers.

Why do so, if, for example, Wi-Fi capabilities might make a smartphone more useful? Logically, a more useful platform, if better for consumers and developers, should ultimately be good for the carrier too. Here we develop three explanations for this behavior—one that suggests that crippling serves consumer interests, and two suggesting it does not.

Price Discrimination. Crippled products can sometimes form part of a price discrimination (or market segmentation) strategy that in some instances can, on the whole, be socially beneficial. Companies will sometimes cripple a product so as to sell it at a lower price to those with less money. Industries routinely segment markets, by quality and by price, a practice that generally enhances overall consumer welfare. For example, the IBM Series E Laser Printer was a fast printer that was deliberately slowed down and sold for less to home users. Similarly, Microsoft in 2004 released a crippled version of Windows, named “Windows Starter XP,” that was substantially less capable than Windows XP—for example, capable of only running three applications at any time.⁵² The idea was to produce a weaker version of Windows to sell in developing countries and sell it for less, thereby serving consumers who cannot afford the full Windows XP.

Some of the behavior described in this paper looks like a partially-implemented price discrimination strategy. For example, if AT&T prevents Nokia from marketing the Wi-Fi capable e61 Smartphone in the United States, it may be crippling the product so as to be able to sell it cheaper.⁵³ Similarly, if 3G broadband services are limited to web browsing only, it may represent an effort to offer less capable products for poorer consumers.

Whether price discrimination in high-tech markets is on balance socially beneficial remains an open question. But the oddity of the facts discussed here is that while the crippled product is made available, no full-featured and higher priced version of the product is made available. Verizon will sell a Bluetooth-crippled phone, but not a Bluetooth-capable phone. Most carriers will not sell a Wi-Fi phone at any price. In other words, the other half of the price discrimination strategy is missing. Out of Superman is made Clark Kent, but without retaining Superman. That fact seems to raise doubts as to whether what the carriers are engaged in what can properly be called a price discrimination strategy.

Protecting Revenue Sources. A more plausible explanation for the behavior seen here is this: carriers believe it makes sense to block a feature to protect an existing revenue source, or to keep their own costs low, even if that behavior is bad for actors in the equipment and application markets and hurts innovation. For example, again, many carriers cripple Bluetooth’s media transfer capabilities. Bluetooth makes it easy to communicate between a computer and cell phone, so blocking helps preserve an existing

revenue source—the prices the companies can charge for songs, ringtones, wallpapers, and other content. In other words, with a more open system, a consumer could get what she wanted without passing the carrier’s “tollbooth.”

Unfortunately, protecting such tollbooths comes at a price. Crippling Bluetooth also retards any market for Bluetooth-compatible devices, and makes it much more difficult for users of cell phones to move data between their phones and computers. This kind of problem is a *spillover*, or *externality* problem. It may be that the money a carrier makes on ringtone downloads is more than it can expect to make from providing consumers with fully functioning Bluetooth. For that reason, it may narrowly make sense for a wireless carrier to block Bluetooth. But the carrier will not be taking into account the externalized costs of such action—the costs to consumers and equipment manufacturers who would like to make Bluetooth-compatible devices other than headsets.

Cultural Explanations—the Bell Model. A different explanation for the behavior seen here is that the carriers are simply acting to maximize their control and power over their networks. They have adopted a strategy that prevents the development of business models or revenue streams that depend on their network, yet over which they would lack significant control. We can call this the Bell model, after the same patterns of behavior exhibited by the pre-breakup Bell Company.⁵⁴

Interestingly, the strategy may be a mistake. The carriers may, in some cases, block the development of services that might make the cell phone platform more valuable, and therefore are ultimately good for the carrier. The industry sometimes appears to prefer that a new service or application not exist at all rather than develop into a lucrative industry whose pricing and conduct it might not be able to control.

The major example of this kind of behavior is the strategy adopted in the area of mobile software development. Given standardization and more openness, software developers might develop a range of applications at the rate seen in Web development. But the carriers seem hesitant to allow such development to occur, possibly out of the idea that if any new services come into existence, the services should be “theirs.” Analyst Andrei Jezierski describes the carriers’ behavior as follows: “It’s not clear if the carriers will make money from these value-added services. So if the economic model is still unclear, why give away more control earlier than you have to?”

While this strategy makes a certain amount of intuitive sense, it may be a mistake. The industry, or parts of it, appears obsessed with the fear of becoming “just a pipe” or selling “a commodity,” and thereby giving up control

over what happens on the pipe. But obsessions come at a cost, and may lead, in some instances, to outcomes contrary to the interests of the carrier.

2. Regulating Under Conditions of Oligopoly?

Some of the recommendations in this report, particularly the *Carterfone* recommendation, may lead to the response that the wireless industry is generally unsuited for *Carterfone*-style rules. There are two main reasons. The first is based on the argument that the wireless industry is highly competitive, unlike AT&T in the 1950s.

The AT&T monopoly in the 20th century was accepted and even maintained by government action. By contrast, it is often said that the wireless mobile market is “fiercely competitive,” as if a competitive cell phone company were as easy to start as a hot dog stand. That claim, oft repeated, does not stand up to closer examination.

Structurally, the mobile wireless industry has a natural and major barrier to entry—acquisition of sufficient spectrum. Under today’s conditions, that means spending hundred of millions at a minimum—and more likely billions or perhaps even tens of billions of dollars—to acquire sufficient spectrum to enter the market. For example, T-Mobile announced in 2006 that it would enter the 3G broadband wireless market. It also announced it would use \$4.2 billion of spectrum to do so. The oldest fact in broadcast, spectrum scarcity, is a physical fact that cannot help but affect the conditions of competition in the wireless world.

It is important to point out that, in one respect, the justifications for regulating AT&T were, to some degree, on weaker theoretical ground than in today’s wireless environment. The basis was a theory of natural monopoly in the local loop, which has subsequently undergone much criticism.⁵⁵ On the contrary, there is less doubt that, using today’s technologies and the federal government’s outdated spectrum allocation policies, spectrum suitable to support a wireless mobile phone company is scarce. That scarcity, in turn, has obvious market effects.

The future of the industry, of course, is hard to predict. There is a chance that ongoing spectrum auctions may lead to greater market entry. Smaller firms, like Clearwire Communications, which offers wireless broadband services in some markets, may attempt to provide services that compete with the major carriers. Yet the current trend is in the opposite direction. The industry is a textbook oligopoly—premised on a bottleneck resource—with four major players. While no one should discount the possibility of new entrants, we must also look at the facts as they are, not as how we might imagine them to be.

Whatever we might expect from oligopoly competition, there are also some reasons to believe that even competition between the carriers may not eliminate certain anticompetitive practices. Many of the practices described in this report are beneficial for an individual company to pursue, yet impose negative spillovers on adjacent markets or society at large.⁵⁶ Those practices will not necessarily be eliminated by oligopolistic competition.

That may particularly be the case where the feature in question is not well understood by consumers, and not often a relevant decisional factor. For example, say a wireless firm can narrowly make more profit by crippling Bluetooth and protecting some of its ringtone revenue. Unless consumers are aware of the crippling and its implications, it will be difficult for a firm to differentially compete by *not* crippling Bluetooth. It is relatively easy for consumers to compare firms by metrics like price and network coverage. But taking the time to do comparisons on the basis of whether the carrier cripples technological feature sets is something only a select group of consumers have the time or expertise to do.

That leads to a final reason that the existence of competition cannot be a reason not to examine carrier practices. As just described, for competition to work, consumers must know what is going on. To say that competition can then be a reason not to examine industry practices and mandate as much disclosure as possible is exactly backward. For it is such information that is necessary to make competition work in the first place.

3. Spectrum Scarcity, Network Security and Other Arguments

A different objection to *Carterfone* rules is the argument that the scarcity of wireless spectrum and network security make any such rules infeasible.

Spectrum Scarcity. While spectrum scarcity affects market structure, it also may affect the kind of rules that can be effectively maintained in the wireless space. To take *Carterfone*, for instance, how can carriers allow devices they have not approved on a network of scarce spectrum?

The problem with this argument is that scarcity is an economic feature of not just wireless networks, but wireline networks as well. Both wireless and the local loop are last-mile networks of limited available bandwidth, and, in fact, the bandwidth available on a copper local loop is considerably less than on some of today's wireless networks. For both products, it can be claimed that third parties cannot be trusted to make products that respect the shared needs of the network. In the *Hush-a-Phone* case, for example, AT&T claimed that third parties would bear "no responsibility for the quality of telephone service, but [be] primarily interested in exploiting their products." Similarly, local carriers for years complained that modems abused the scarce resources of the phone network (by maintaining long connections). But as Judge

Robert Bork argued in another context: "All economic goods are scarce... since scarcity is a universal fact, it can hardly explain regulation in one context and not another. The attempt to use a universal fact as a distinguishing principle necessarily leads to analytical confusion."⁵⁷

Does the fact that the local loop is reserved bandwidth (about 64 kbps), while wireless users share a far larger pool of bandwidth, make a difference? Yes, to a degree. You can leave your phone off the hook all day with little effect on the telephone network as a whole. However, a wireless connection left open would affect other customers.

The fact of shared bandwidth is important and true of wireless mobile networks. However, that is also true of most networks, including all Ethernet networks, the cable broadband networks, Wi-Fi networks, and other network designs. One advance over the last forty years of telecommunications technology and policy is a better understanding of what is possible using shared-bandwidth networks, and in fact many of the pieces of handling shared spectrum are already very well understood.

What is needed are private and sometimes government standards that allow a network to be shared. That's how, for example, Ethernet and DOCSIS cable networks work. That is also, crucially, how many of the cell phone networks *already* work, through the GSM and CDMA standards. These standards already control and standardize how individual devices make use of scarce spectrum—making strange the argument that scarcity is unmanageable as a technological issue. The second necessary element for addressing scarcity is pricing that reflects the scarcity of the resource, which is also already partially implemented by current cell phone pricing.

One thing should be clear from this. The answer to scarcity that has been rejected is the insistence that one party need to have total control over all aspects of the network to make possible usage of shared and scarce bandwidth. The issue of scarcity is not, by first principles, as completely different on wireless and wireline networks as is often maintained. For that reason, the thinking on network attachments from the wireline world is properly considered here.

Network Security. Customer representatives for the various companies defended practices as varied as phone locking, whitelisting, Bluetooth crippling, and other practices as necessitated by the demands of scarcity or to protect network security. For example, Verizon Wireless originally justified crippling Bluetooth on its telephones as a means of preventing "fraud" and virus infections. AT&T made similar claims in opposing the *Carterfone* principles.

There are valid and important security concerns on wireless networks.⁵⁸ The point here is similar to the point just made about bandwidth scarcity. The question that must be asked is whether the issues of network security on wireless networks are fundamentally different from similar concerns on other networks. Jonathan Zittrain's work is the starting place for the debate over network security and what it should and should not justify.⁵⁹ As he points out, any allowance of open entry and competition is likely to lead to greater abuses. Yet it is also essential to remember that the abuses are a cost that comes with a benefit: innovation, flexibility and diverse social function.

Spam, viruses, junk mail and telemarketing are different names for problems that every information network faces. What this suggests is that network security must be taken seriously, but also cannot become a blanket answer to any scrutiny of carrier practices.

All Regulation of Access is Doomed. A final argument is that any public effort and perhaps any private effort to promote greater access to wireless networks is a bad idea. Drawing a comparison with UNE-P line sharing, Scott Wallsten of the Progress and Freedom Foundation writes that "regulating how wireless carriers allow their networks to be used would represent another version of regulating network access, and the history of such regulation does not bode well for its impact."⁶⁰ Oddly, most believe that the *Carterfone* rules, which "regulate network access," are among the successful in the history the FCC. Before *Carterfone*, the interconnection requirements of the early 20th century, critical to the growth of a national phone network, were also the "regulation of network access." In fact, nearly all telecommunications regulation is some version of regulating network access. The important question is not whether access is regulated, but whether it is done well. The line-sharing rules were a failure, while *Carterfone* was a smashing success.

The comparison of the *Cellphone Carterfone* proposal with the line-sharing rules of the 1990s is the wrong one. The rules urged here are, as the name suggests, a version of *Carterfone* rules. They were never an effort to provide a price-fixed access to the Bells' phone lines. Instead, they center on a consumer's right to attach the devices of his choosing to the Bell network, and their time has come in the wireless world.

Conclusion

In many respects, the mobile market is and remains a wonder. But the infancy of the wireless market is now passing, making greater public scrutiny of industry practices more appropriate and important. In the words of analyst David Passmore, "At some point, I think Americans are going to put their foot down and say, 'We won't tolerate this anymore.'"

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EXHIBIT 3

**REMARKS OF MICHAEL J. COPPS
FEDERAL COMMUNICATIONS COMMISSIONER
"THE BEGINNING OF THE END OF THE INTERNET?
DISCRIMINATION, CLOSED NETWORKS, AND THE FUTURE OF
CYBERSPACE"
NEW AMERICA FOUNDATION
WASHINGTON, DC
OCTOBER 9, 2003**

Thank you, Michael, for that kind introduction. More than that, thank you for the creative thinking you and your colleagues here at New America always manage to impart to the great issues confronting communications. There are a lot of tangled issues to resolve as we work to bring the wonders of the digital revolution to each of our fellow citizens and you bring clarity and creativity to so many of them. So I appreciate being invited back to the Foundation. The last time we were together, on Capitol Hill, we were discussing the critically important issue of media concentration. At that time, we focused on action the Commission was taking against openness, access and competition in the media. Today, the New America Foundation, always on the cutting edge, has enlisted in the next great battle. The next great battle of the same continuing struggle.

The same forces are arrayed on this field as on the last one. Innovators, consumers and competitors once again face an entrenched axis with growing potential to stymie competition, deny consumers access and prevent innovations not under their control. But this time the battle is not over media consolidation. This battle is over the future of the Internet.

Americans take pride in their Internet. From right to left, Republicans and Democrats, rural and urban, we view the Internet as a place of freedom where new technologies and business innovation and competition flourish. For all our other differences, we point to the Internet as an example of how things ought to work. What made the Internet such fertile ground for this success? For openers: freedom, access, and wide dispersal of power. From its inception, the Internet was designed, as those present during the course of its creation will tell you, to prevent government or a corporation or anyone else from controlling it. It was designed to defeat discrimination against users, ideas and technologies.

This freedom has always been at the heart of what the Internet community and its creators celebrate. Anyone can access the Internet, with any kind of computer, for any type of application, and read or say pretty much what they want. No one can corner control of the Internet for their own limited purposes. It sounds good so far, right?

This Internet may be dying. It may be dying because entrenched interests are positioning themselves to control the Internet's choke-points and they are lobbying the FCC to aid and abet them. The founders' vision of the Internet is being exchanged for a constricted and distorted view of technology development, entrepreneurship and consumer preferences. For its part, the Commission has already made serious regulatory

miscalculations that could endanger the freedom and lifeblood of the Internet sooner rather than later. We seem to be buying into a warped vision that open networks should be replaced by closed networks and that traditional user accessibility can be superceded by a new power to discriminate. Let this vision prevail and the winners will be entrenched interests with far greater power than they have today to design and control the Internet of the future. I am not singling out one specific industry here. I am talking about any company that controls a choke-point. They may be doing what comes naturally and they may be doing what they think is right, but the result may well be contrary to the inherent dynamic of the Internet and to the needs of the American people. If these interests get their way, the losers will be innovators, technologists and business users, for opens and -- more importantly -- legions of consumers and citizens who make up the Internet community.

The life-threatening disease comes, strangely, in a prescription bottle. Many in industry and government prescribe closing off Internet openness a cure for telecom's ills. They claim that all they are doing is "letting the market reign supreme," and "deregulating," deploying the rhetoric of Libertarianism to serve their agenda. They are fond of railing against picking winners and losers when they are in fact picking winners and losers themselves. We've been in this same place in other major debates at the FCC over the past two years. The details may differ; the direction is the same. I believe that if the Commission's present mind-set is fully implemented, we will look back, shake our heads and wonder whatever happened to that open, dynamic and liberating Internet that once we knew. "What promise it held," we'll say. If that happens, history won't forgive us. Nor should it.

A funny thing happened as I was writing these remarks. The Ninth Circuit Court ruled in the *Brand X* case. And it vacated the Commission's troubling plan for cable broadband service. But even this important ruling has limited scope. It does not go, because it could not go, beyond cable to encompass DSL and any other technology that could act as a choke-point and give a few people too much control over the Internet. Some argue that because of the ruling the FCC will not rush forward in other areas until the issue is resolved in the courts. I have no such expectation.

Our ill-advised policy impacting the Internet is only one piece of a tectonic shift across the whole wide range of telecommunications and media issues at the FCC. From media to telecom to the Internet and beyond, we appear to be rushing toward breathtaking change in regulatory policy. The Commission strikes me as on course to replace open networks with closed systems. It is permitting, even encouraging, competition to wither in the face of centralization. And it is short-changing its responsibility to protect the public interest.

Not enough people outside Washington have paid attention to the momentous decisions already taken. With the exception of media concentration, wherein the brazenness of what the Commission decided and the stealth process it used to get there aroused the ire of millions of Americans, many of these other proceedings remain inside-

the-Beltway games even though they will cause gigantic seismic shocks all across the country. I don't want that to happen. I don't think most of you do, either.

Back to the battle at hand. Let me lay out the dangers I see in the Commission's proposals as they relate to the Internet and then offer some alternate thinking that I believe would better protect the vitality, freedom and original vision of the founders.

The Internet has already accomplished so much. It has become an engine of economic growth. A tool of education. A health provider. An entertainer. It will change the ways we govern ourselves and grow to be, I believe, a dynamic force against political oppression in regimes that are now closed. The power of the Internet resides, as its founders foresaw, in its decentralization. There is no central headquarters through which every communication is forced to pass. Millions of dialogues occur simultaneously. People share news, information and experiences from anywhere to anywhere because even if they aren't connected to each other, even if someone tries to interrupt a certain connection, they can route from open node to open node around the globe to find one another. It's more than just empowering. It may be the best and most democratic public forum that has ever existed.

What made it this way? What makes the Internet a place of freedom, technology development, competition and business innovation? What makes the Internet a place that Americans, conservatives and liberals alike, point to as an example of how things ought to work? What regulation, deregulation, unregulation, whatever, made it so that this dynamic and open platform developed as it did? And as the Internet enters its adolescence -- as it matures from the first hesitant steps of its dial-up infancy to the exuberance and freedom of broadband -- how do we keep it this way?

These questions should be our starting point. The Internet developed this way in large part because it was allowed to grow without either governments or monopolies stifling its openness and connectivity. To understand this fully, you need to start with some history. It wasn't that long ago that one network -- AT&T -- ran the whole show in the wireline world. AT&T had the power to decide how the network would be used. When innovators showed up at the door with ideas and new technologies, they were greeted with what I imagine was a courteous but quick "go away." For a long time, the FCC fully supported this type of network, and in fact served as its protector. It was thought that only through comprehensive control by a single company could the quality, safety and scale economies of the network be guaranteed. Bigger was better and uniformity and stability were thought to be worth the price of some lost opportunities for innovation and consumer benefits. This was government at its worst.

All of this began to change 35 years ago when an innovator called Carter Electronics Corporation developed a device that connected mobile radio-telephone systems to the wireline network. This device, called the Carterfone, had a cradle into which a regular handset was placed. It converted voice signals to radio signals without the need for a direct electrical connection. But the entrenched incumbent was convinced

that allowing this innovative and foreign attachment would bring down its entire system, because the incumbent did not build it, sell it and control it.

Despite AT&T's complaints, the Commission changed tack, stood up to the monopolist and did the right thing. It *required* the company to permit this new application that attached to the end of the existing network. Alarms went up that this decision meant the end of network quality and the end of reliable service as we knew it. Of course, the doomsday scenarios never came to pass. Just the opposite came to pass. The idea of having a network that couldn't discriminate against innovators who wanted to improve it started to break the choke-hold that monopoly had on the system.

In the years after the Carterfone decision, as we entered the Internet age, the Commission reaffirmed its policy of openness and competition by protecting freedom on two layers: the access layer and the architectural layer. In its Computer Inquiries, another Commission said that common carriers which own transmission pipes used to access the Internet must offer those pipes on non-discriminatory terms to independent ISPs, among others. With these decisions we preserved competition in the information services market by ensuring that customers could reach independent providers. Congress then moved to protect the architectural layer. In the 1996 Act, it said that local telephone companies with choke-point control of physical infrastructures would have to unbundle their transmission networks.

Now both of these policies – protections on the access layer *and* on the architectural layer – are under attack at the Commission.

Carterfone and its progeny tell a story of how companies that control choke-points on the network have a built-in incentive to restrict and control customer use of that network. But this is also a story about the positive role the FCC can play to ensure that networks are open for innovation -- when we do the right thing. This was government at its best -- limited, yes, but effective.

Through such decisions, the foundation for our early experience with the Internet was laid. We had an open environment where consumer freedom to use the network would be bounded only by the need to prevent harm to the network itself. So when dial-up technology came along, the Internet grew quickly. As dial-up kicked into high gear, e-mail exploded, research on every conceivable subject appeared with a click of the mouse, learning opportunities multiplied and streams of new services and products became available.

That was then. This is now. Today, as the Internet matures from dial-up to broadband, the FCC is positioning itself to change the rules, maybe even to call the game. Some important rules are already gone, others are on the block. If we continue down this path, we will end by undermining the basic end-to-end principle that made the Internet great. Control will have been wrested away from Internet users and given back to those interests that control the bottlenecks, just like AT&T controlled them not so long ago.

Broadband should be another step in the path of Internet growth. It may fall far short of its transformative potential.

All the signals of where this Commission is heading are there for the looking. It has already voted to place cable modem services into the unprotected and porous world of Title I. Then it turned right around and reached a similar, if tentative, conclusion for wireline DSL providers – an interim decision that was set to be made permanent, I believe, before the end of the year, until the Ninth Circuit intervened this week. I fervently hope that the Court's decision will put the wireline classification vote off until we have more clarity on the transmission issues, but I'm not taking that to the bank yet after reading the Chairman's quick response to the Ninth Circuit vote in which he strongly disagreed with the decision and vowed to appeal it. Remember also that the majority wrote into its cable modem order -- maybe they saw the hand-writing on the wall -- that should the courts overturn them, the Commission will simply forbear. How's that for *chutzpah*? The direction of the current Commission can also be seen in the broadband section of the recent Triennial Review Order where -- in a huge and hugely troubling decision -- fiber is declared the province of the incumbents rather than the playing field for competition and diversity.

Once again this Commission is out-driving its headlights. We are taking gigantic leaps down the road of removing core communications services from the framework that kept the Internet free, open, and non-discriminatory; substituting our own judgment for that of Congress; and playing a dangerous game of regulatory musical chairs by moving technologies and services from one statutory definition to another without having a clue about the consequences.

Before we move all these chairs, we had better understand the far-reaching implications of our actions, because I can tell you this: our actions will have many and serious consequences in addition to stifling Internet freedom and innovation. These involve such critical issues as universal service, competition, pricing, consumer protection, privacy, disability rights, and even homeland security. Here's one example: law enforcement tells us that this reclassification is raising concerns about its ability to protect the country from crime and terrorism. Here's another: the Joint Board on Universal Service recently reported to the Commission that reclassifying broadband transmission as a Title I service would mean that universal service could *never* support broadband deployment. Think about what that means for an Internet whose full realization depends upon accessibility to every home. It's a subject for another speech, but I do believe we need a national policy dedicated to high speed broadband deployment for every home and every citizen in this great nation. We're not on that track today.

Until now the big companies that control the bottlenecks have been unable to convert their reach into controlling power over the Internet. But now we face scenarios wherein those with bottleneck control may be able to discriminate against both users and content providers – users and content providers that they don't have commercial relationships with, don't share the same politics with, or just don't want to offer access to for any reason at all. From the not so distant shadows of the past, old attitudes favoring

industry consolidation and limited access are again seeking to reestablish themselves. Free from the dynamic of competition, a favored few interests may try to set up shop as gatekeepers of the Internet. The sign will be posted clearly: "Entrepreneurs Need Not Apply." With the on-ramps to the Internet under exclusive or at least limited control, we the citizenry could be left with an Internet of fenced gardens and walled prairies. Fences may make good neighbors; they do nothing to energize a dynamic Internet.

A *Washington Post* story got me thinking about this recently. Some of you may recall the scenario it depicted of someone trying to phone in an order for a down jacket from Land's End, only to be told by the phone company that the call was being re-directed to L. L. Bean, which had paid the phone company to be the exclusive purveyor of down jackets to its customers. It may sound far-fetched but discrimination in less dramatic guise could soon be legal. Think about what could happen if your broadband Internet provider could limit or retard your access to, say, certain news sources or political sites. Or what if your provider decided that you couldn't make use of new and improved filtering technology to prevent your children from cruising unprotected through the more obscene alleys of the Internet because it wasn't their filter? Or what if it prevented you from using some superior spam-jamming technology that could eliminate all that clutter from your in-box because it could block *their* spam? Or what if your broadband Internet provider decided that it wanted to impose usage restrictions to prevent the use of Virtual Private Networks by small businesses and telecommuters? Or streaming video? Guess what? Some of this is already happening. And I am told there is already a healthy market out there for so-called "policy-based routers" that allow providers to do all this. Is this how the end-to-end principle ends?

Let me try to put this issue into its broader context. The proposals related to the Internet are the third front on the battlefield for control of our communications future. Across almost the entire communications landscape, the Commission is allowing networks to be closed, competition to be undermined and innovation to be stifled. The other two fronts in this war, in addition to the Internet, are equally threatening.

On one of those fronts, the battle still rages over the Commission's decision to allow massive concentration in the media world. On June 2, we voted to walk away from many of our media concentration safeguards. At issue in that huge vote was how America's TV, radio, and newspapers are going to look for many years to come. Who is going to control the media? How many -- or, rather, how few -- companies? For what purposes? I think I exaggerate not at all to say that the issue is whether a few large conglomerates will be ceded content control over our music, entertainment and information; gatekeeper control over the civil dialogue of our country; and veto power over the majority of what we and our families watch, hear and read.

As the June 2 vote approached, I saw two divergent paths that the Commission could travel. Down one path was a reaffirmation of America's commitment to local control of our media, diversity in news and outlook, continuing opportunity for competitive entry, rededication to encouraging local creativity and genius through local media and independent programming, and understanding that access to the public's

airwaves is vital for our democratic future. This path beckoned us to update our rules to account for technological and marketplace changes, yes, but without abandoning core values going to the heart of what the media mean in our country.

Down the other path was evermore control over media choke-points by fewer corporate giants. Down this path we surrender awesome powers over our news, information and entertainment to a handful of large conglomerates, empowering the latter to tighten the circle of their control and to deny contrasting news, information and viewpoints the oxygen of distribution they need in order to breathe. Down this path we bid farewell to the days of innovative independent programming, farewell to diversity of viewpoint and outlets, and farewell to preserving time-honored values of localism, diversity and competition.

A majority at the Commission chose the wrong path. Where are localism, diversity and competition in a decision that allows Big Media companies to wield up to three TV stations, eight radio stations, the already monopolistic newspaper, and potentially the cable system and Internet access in the larger markets. *Localism? Try centralization? Diversity? Try uniformity. Competition? Try monopoly, oligopoly and denial of access.* And, shortly, we may bestow similar glad tidings onto Big Cable. Once upon a time, cable was going to save us from too much network control of the broadcast media. Today 90 percent of the Top 50 cable channels are controlled by the same corporations that own the TV networks and the huge cable systems. Then we were told not to worry because the Internet would be the ultimate protection. We looked at the top 20 news sites on the Internet. Guess who controls most of them? The same big companies that provide us with our TV and newspaper news. Some protection.

The third front is telecom. I see here much of the same mind-set that I have described regarding both our Internet and media concentration agenda. While many inside our Beltway world are focused on the outcome of the Triennial Review decision concerning voice competition in traditional telephony, the real story -- and infinitely more important long-term -- is how the majority closed up shop on broadband and data competition. After all, we're headed soon for a world where there is no exclusive voice service, where all services are data and voice is just one of many data functions. And we're arranging the field of play so that real competition won't have a fighting chance. This isn't about new rules for new wires. It's about no rules for old incumbents. It's about putting the fiber of the future under the ever-tighter control of a few major players. No, we won't say it that way, but try to find someone who can go out and raise capital and compete against those who the market will declare the victors in the great FCC policy debate. More germanely, try to find a critical mass of such potential competitors. I believe in my bones that re-monopolization or oligopolization or duopolization -- or whatever you want to call closing the circle of control and access -- are not the cures for telecom's problems.

I fail to see how innovation, technology development, new business models and consumer protections can survive, leave alone thrive, in a world wherein the circle keeps closing. I want to see real competition in broadband. I want to encourage everyone --

not just the big innovators, but entrepreneurs tinkering in their garages and small-business innovators with great ideas and new business models -- to come up with the best technology and the most consumer benefits that the genius of this country can create. I want to focus not just on the architecture of the Internet, but on the architectures of invention and innovation and creation and entrepreneurship and access that have fueled so much of this country's progress in the past and without which the dynamic and liberating potential of all these new technology tools will be denied the chance to do what they can do for America. Our broadband and Internet-centered future must be made to crackle with the myriad possibilities of digital communications. But first we must expand our vision and expand our thinking.

These two decisions on media and telecommunications cracked open the window for me so I could begin to grasp the meaning of this Commission's votes for closed systems, acceptance of discrimination and support of entrenched business models. Then I began to realize we were going down the same road for the Internet. The curtains flew open and light poured in, but the sunshine brought no happiness -- only despair. It's all part of the same phenomenon -- whether it is creative artists who are denied play time on the media, or competitors who are being phased out of phone company broadband, or bloggers who could be deprived of their customary freedom on the Internet.

So, yes, I am worried. I think we really are teetering on a precipice. We have already inflicted heavy damage on our media and telecom systems. And we could be on the cusp on inflicting terrible damage on the Internet. If we embrace closed networks, if we turn a blind eye to discrimination, if we abandon the end-to-end principle and decide to empower only a few, we will have inflicted upon one of history's most dynamic and potentially liberating technologies shackles that make a mockery of all the good things that might have been.

But the doom-sayer brings more heartening news, too. The good news is that this battle is not over. It's pretty far advanced, no doubt about that. But I do believe we can still correct our course. Good policy can yet prevail.

We have courts stepping into the fray, whether it's the Third Circuit staying the new media ownership rules or the Ninth Circuit correcting our rush to broadband transmission reclassification. Congress is actively involved. Just as encouraging, maybe more so, there are a few flickering signs that a deeper and better discussion may finally be starting. Its focus is on the principles of openness. And I can think of no better jumping-off point for an Internet dialogue than by restating our commitment to the original principle of openness that made the Internet great. We are fast moving to a world wherein so much of our lives will be organized through transactions that have to travel in one way or another along the digital highways of the Internet. To keep these roads trafficked with opportunity, innovation and investment, we need a new principle of nondiscrimination. Those with bottleneck control over the transmission facilities that are the on-ramps to the Internet should have to guarantee -- not a principle, not a best effort, but a *guarantee* -- that all comers will be treated equally and that they will not use their power over bottlenecks to discriminate between different content, users or usage. Recent

movement in the direction of openness by a few in the cable industry, especially, is good and welcome news; it is not a substitute for a policy that provides such openness for all to see and understand and possess. Until that happy day when we have a robust and competitive market for access and where there are no longer any dangerous bottleneck facilities on a network, the Commission should be on record that conduits must be accessible, neutral and open to all comers, just as they are in the dial-up world.

In the dial-up world, there is something akin to consumer sovereignty. The consumer has jurisdiction over the applications that prevail. And what power that is! No network owner telling you where to go and what to do. You run the show. This freedom – this openness – has always been at the heart of what the Internet community and its original innovators have celebrated. Anyone can access the Internet, with any kind of computer, for any type of application, and read or say what they want. No one can corner control of the Internet for their own purposes. Why shouldn't this principle be guaranteed in the broadband world? And if some tell us this is going to happen anyway, then why not join together and declare it a principle for all to understand?

Some would prefer to go down the road of open access. Others argue that the solution is net neutrality. Some want both. I'm not ready to endorse either as the exclusive solution. But let me offer a piece of friendly advice: the first need now is for unity in the face of a real threat to the Internet. Let's not be distracted or divided by the "how" until we get agreement on the basic principle. Internet openness and freedom are threatened whenever someone holds a choke-point that they have a legal right to squeeze. That choke-point can be too much power over the infrastructure needed to access the Internet. And it can also be the power to discriminate over what web sites people visit or what technologies they use. So we won't resolve the problem by focusing on one symptom alone and trying to make it go away. We need first to establish, for all to see and understand, that the goal of our policy must be to maintain and even enhance openness and freedom on the Internet and to fight discrimination over ideas, content and technologies. I like to call it "Clear Rules for Old Values," but whatever you call it, it should be Job One for all of us interested in the future of the Net.

So, to close, yes, I am worried that we could be witnessing the beginning of the end of the Internet as we know it. And that maybe we will never experience the Internet as it might one day be. "Over the top," some of you will say. But I worry that too often we just tell ourselves, "That can't happen," or "If anyone tries that, Congress will step in." All I know is that picking up the pieces after the fact is usually more difficult and certainly messier than solving problems before they reach critical mass. A lot of forces are converging out there, including not just new technologies that create opportunity but new technologies that facilitate closure and control. Economic policies that often seem to favor consolidation are converging with regulatory policies that eagerly pave the way. These are powerful currents. Our much vaunted digital migration could end far short of its destination. My concern is all the greater because I see the same policy approach informing so many of our decisions across the broad spectrum of telecommunications and media issues.

I don't come here this afternoon claiming to have all the answers – nor even to suggest that I have raised all the questions that need to be asked. I am here to share my concern that continuing the Commission's present course will bring a heavy cost that we should not pay, have no need to pay, and should be doing everything we can to avoid paying.

I am also here to say that we still have a chance to avoid all this. If we roll up our sleeves – if we work together now – all of us – businesses, innovators, technologists, content providers, regulators, legislators, consumers, citizens all – we can make sure that our Internet continues to foster freedom and innovation, and that the original vision that inspired this liberating technology lives for another day and for another generation. Time is not our friend. We are the underdogs and surely this will be a difficult battle to win. But it is a necessary battle to fight. And victory will reward us all with not only better communications, but a better America.

Thank you.

EXHIBIT 4



NEWS

News media information 202 / 418-0500
Fax-On-Demand 202 / 418-2830
TTY 202/418-2555
Internet: <http://www.fcc.gov>
<ftp.fcc.gov>

Federal Communications Commission
445 12th Street, S.W.
Washington, D. C. 20554

This is an unofficial announcement of Commission action. Release of the full text of a Commission order constitutes official action. See MCI v. FCC, 515 F 2d 385 (D.C. Cir. 1974).

FOR IMMEDIATE RELEASE
June 29, 2007

NEWS MEDIA CONTACT
Mary Diamond 202-418-2388

Press Statement by FCC Chairman Kevin J. Martin on Orders Resolving Various Set-Top Box Waiver Requests

Today the Media Bureau (Bureau) has resolved various set-top box waiver requests, furthering both pro-competition and pro-consumer policies. By these orders we are once again taking action to further Congress's goal of creating a competitive market for the set-top boxes that are used for watching cable television. In 1996, Congress explained: "Competition in the manufacturing and distribution of consumer devices has always led to innovation, lower prices and higher quality." I agree.

A previous Commission required cable operators to separate their security functions putting them into a CableCARD, which can be used in televisions and set-top boxes made by other manufacturers. By separating out security functions, the Commission hoped a viable market for truly cable ready televisions and set-top boxes could flourish. Back then, Congress and the Commission envisioned consumers being able to walk into their local retail store and buy televisions and set-top boxes from any manufacturer that would work on any cable system. This is a goal that I share and believe we are a big step closer to with today's rulings. In a new era with a competitive set-top box market, consumers will enjoy greater choice and reap the benefits of exciting and innovative features – such as the ability to watch Internet videos or view slideshows of family vacations on their tv sets.

The Bureau's actions today implement the statutory requirements to facilitate a competitive market for set-top boxes in a reasonable and consistent manner. Specifically, the Bureau granted a waiver of the integration ban for MVPDs that either are currently all digital or going all digital by February 17, 2009. In addition, the Bureau deferred enforcement of the July 1st deadline for one cable operator who demonstrated that it has placed orders for set-top boxes that comply but that its orders will not be fulfilled in time for it to comply with the deadline. The Bureau also denied the National Cable & Telecommunications Association's request for a waiver of the integration ban for all cable operators. Finally, the Bureau denied the broad waiver requests of several cable operators but provided several ways they could amend their requests.

The two-way rulemaking that the Commission began today will further spur the creation of a competitive set-top box market. I look forward to seeing greater progress between the cable industry and the consumer electronics industry on developing a two-way standard that would ensure that subscribers who do not wish to rely on set-top boxes provided by their cable operators can access two-way, as well as one-way, cable services.