development of the spectrum.[153] As Brenner and Woodbury point out, "it is not true that licenses awarded through an administrative process are unlikely to be placed in their highest-valued uses unless subject to detailed spectrum use requirements."[154] That view is misguided and runs counter to the Coase Theorem.[155] In any event,

---

[153] See NPRM at ¶ 28 ("[S]ome of the licensees in the 39 GHz band have offered to sell or lease their licenses to broadband PCS operators. These offers suggest that some of these licensees may not have ever intended to directly serve the public."); ¶ 106 (build out requirements are needed "to minimize speculation").

[154] Brenner and Woodbury at 68. See also Amendments of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *Notice of Proposed Rule Making*, ET Docket No. 94-124, 9 FCC Rcd 7078 at ¶ 25 (1994) (tentatively concluding that mandatory build out requirements reduce licensee flexibility and the ability of licensees to put spectrum to its highest valued uses).

[155] The Coase Theorem, formulated by Professor Ronald H. Coase has been hailed as "the single greatest intellectual event in the modern law and economics movement." See Hovenkamp, 75 Cornell L. Rev. at 783. It provides that the initial assignment of legal entitlements does not affect the efficiency of the resulting allocation of resources. In other words, the Coase Theorem posits that market forces will drive resources to their highest and best use regardless of their initial placement provided that government regulations do not hinder such movement by, for example, restricting transfer or use or imposing excessive costs. It should be noted that the Coase Theorem is especially applicable to the Commission since much of Professor Coase's work involved the allocation of radio licenses. See Ronald H. Coase, The Federal Communications Commission, 3 J.L. & Econ. 1, 27 (1959)(arguing in favor of market forces to allocate licenses); R.H. Coase, The Interdepartment Radio Advisory Committee, 5 J. Law & Econ. 40 (1962) (same).

The Coase Theorem assumes that bargaining costs are zero. See Ronald H. Coase, The Problem of Social Cost, 3 J.L. & Econ. (1960). However, economists elaborating upon it have concluded that the Coase Theorem holds true as long as the "costs of bargaining are less than the difference in value between the parties." See Herbert Hovenkamp, Marginal Utility and the Coase Theorem, 75 Cornell L. Rev. 783, 783 (1990). Consequently, absent government constraint, the public will still receive the welfare gains from efficient allocations and competition. For

(continued...)

WinStar and at least one other 39 GHz licensee purchased some of their licenses from original licensees. Hence, their behavior would mimic that of auction winners whom, the FCC believes, will make efficient use of their spectrum.[156] Consequently, there seems little justification for FCC-mandated build out requirements.

Nor would the build out requirements maximize the efficient use of the spectrum. Brenner and Woodbury explain that "[t]here is unlikely to be any unique set of profit-maximizing choices for all markets at all times."[157] For example, some end-users may be willing only to pay for a relatively low quality of service. Or, marketing strategies may dictate a slow pace of build out. Consequently, a mandated build out would restrict licensees' ability to build out their systems in response to market demands.[158] Rather than have the

---

[155] (...continued)
example, assume the most efficient allocation of licenses for airport landing rights is for passenger carriers to have 7 out of the 10 available licenses. Assume further that the government allocates the licenses by giving only 3 licenses to passenger carriers and the remaining 7 to cargo carriers. Assuming the elements of the Coase Theorem are satisfied (no restrictions on licenses, etc.), passenger carriers will eventually purchase another 4 licenses, thereby moving the licenses to their highest and best use. The inefficiencies from the initial allocation are readily apparent: too few passenger carriers to satisfy passenger demand and too many cargo carriers given the small demand.

[156] See NPRM at ¶ 28 ("An auction would place licenses in the hands of those who value this spectrum most highly . . . prevent the award of licenses to speculators and promote efficient use of this spectrum."); IVDS Report and Order, at ¶ 2 (use of auctions reduces incentives for speculation).

[157] Brenner and Woodbury at 67.

[158] Cf. CMRS Flexibility Order, at ¶ 13 (use restrictions could hinder licensees from meeting changing market demand).

market exhibit the "best way" to deploy spectrum, licensees would be forced to adhere to mandatory build out schedules. Such adherence would preclude licensees from trying different cost, demand, or marketing strategies and, in fact, may mandate inefficient use and inappropriate allocation of capital.[159] "As a result, the Commission will have foregone opportunities to advance the interests of consumers by enabling licensees to match spectrum use and transmission quality with what is likely to be a wide variety of end-user demands."[160]

Market forces, by contrast, will tend to ensure that incumbent licensees make efficient use of their spectrum.[161] As noted, the 37-40 GHz band is part of a larger competitive market: incumbent licensees do -- and will continue to -- face strong competition from other incumbents and new users in that band, other spectrum licensees, and with wireline competitors.[162] Successful licensees -- those who best satisfy end users -- will be more profitable than other licensees.[163] This "profit incentive" will guarantee that licensees utilize their spectrum in the most efficient manner, minimize costs,

---

[159] Brenner and Woodbury at 67. See also IVDS Report and Order at ¶ 6 (waiving build out requirements would "provide licensees with greater flexibility in selecting service options, obtaining financing, selecting equipment, and other considerations related to construction of their systems. Such action will, in turn, promote the development of the IVDS industry.").

[160] Id.

[161] Id. at 66 (market forces "ensure that licensees tend not to deploy the spectrum in inefficient ways.").

[162] See Sections VI.A.2 & A.3.

[163] Brenner and Woodbury at 65.

and seek new and innovative uses of the spectrum.[164] In order to compete in the market and earn profits, incumbents will, of necessity, be required to make efficient use of their spectrum.[165] Thus, a licensee that builds out too slowly or "packs" too little information into its spectrum would capture lower profits than it would otherwise.[166] In such situations, Brenner and Woodbury conclude that the "profit penalty" would spur licensees to hasten their build out or "pack" more information into the spectrum.[167] Were a licensee to refrain from such activities, another entity would -- as posited by the Coase Theorem -- observe the failure of the licensee to exploit its license and be willing to pay more for the license than it is worth to the incumbent licensee.[168]

As shown, mandatory build out requirements would ill serve the public interest. The Commission has tentatively reached that same conclusion with respect to other services: "mandatory build out requirements . . . would reduce licensee flexibility and reduce the ability of licensees to put [] spectrum to its highest valued use."[169]

---

[164] Id.

[165] Brenner and Woodbury point out that licensees' profit incentives benefit end users because it moves licensees to continually seek new and innovative uses of the spectrum as well as seeking new methods to reduce costs. Brenner and Woodbury at 66-68.

[166] Id. at 66.

[167] Id.

[168] This is the heart of the Coase Theorem.

[169] See Amendments of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New

(continued...)

More recently, the Commission has acknowledged that build out requirements may "skew[] the workings of the market" where, as here, a "wide array of potential services [may] be offered in [the] band."[170]

Finally, build out requirements constrain licensees' flexibility and reduce the maximum amount a bidder is willing to pay for the spectrum.[171]

b. The proposed build out plan is unreasonable

The proposed build out plan is unreasonably strict and costly and is predicated upon arbitrary assumptions about who is a "responsible licensee". It compels incumbent licensees to construct an average of "four permanently installed and operating links per hundred square kilometers" per channel block and to certify that the links can not be reaccommodated in another channel block.[172] Those actions would impose needless costs on incumbent licensees because they would have to install prematurely a significant number of links at a cost of

---

[169] (...continued)
Radio Applications, *Notice of Proposed Rule Making*, ET Docket No. 94-124, 9 FCC Rcd 7078 at ¶ 25 (1994) (licensed millimeter wave service). In waiving one year build out benchmarks for new IVDS (interactive video and data service) licensees -- and extending that waiver to 17 of 18 incumbent licensees -- the Commission agreed with commenters that "short-term deployment schedules should be based on market conditions." See IVDS Report and Order at ¶ 6.

[170] GWCS, 78 RR.2d at 1197 ¶ 116 (adopting 5 and 10 year build out requirements to prevent skewing of market or discouraging of innovation by licensees).

[171] Brenner and Woodbury at 67.

[172] NPRM at ¶¶ 105-108.

approximately $20,000 per link.[173] Given that incumbent licensees will use the spectrum as efficiently as those who purchase it at auction,[174] there is no public interest basis to impose such costs on incumbents.

Aside from the costs imposed on incumbents, the spectrum reclamation penalty places significant costs on consumers. In the short run, the harsh build out plan will discourage the growth of the 39-40 GHz spectrum.[175] Brenner and Woodbury explain that the prospect of reclamation may impact adversely on demand and increase licensees' borrowing and capital costs. They observe that the drop in demand, coupled with the increase in costs, will prevent prices to end users from dropping as far as they otherwise would.[176] In the longer run, the reclamation will reduce the incentives of both current and prospective licensees to develop new uses for the spectrum because licensees will be reluctant to invest time, effort, and funds into spectrum if there is a perception that they could subsequently lose those investments upon reclamation by the FCC.[177]

---

[173] In a study prepared for WinStar and submitted with its comments, technical consultants Dale N. Hatfield and Gene G. Ax estimate that the installed cost of a single link would be "approximately $20,000." See Technical and Economic Considerations in the Allocations of Radio Spectrum at 37-40 GHz: Lessons from the DEMS/DTS Technical Rules, at 6 n.11, March 4, 1996 ("Hatfield and Ax").

[174] See Section VII.B.5.a.

[175] Brenner and Woodbury at 76.

[176] Id.

[177] Id. at 77-79.

Moreover, the build out plan unnecessarily invites contentions over the scope of incumbent's rights in that the spectrum forfeiture and repacking schemes are counterproductive and unfair.[178] There is no basis for the Commission to identify "responsible" licensees -- those who may retain their spectrum -- by counting the number of operational links.[179] As Brenner and Woodbury explain, the "appropriate conceptual test would be evidence that the licensee has incurred 'significant' sunk costs in utilizing the spectrum."[180] The correlation between the number of operational links and sunk costs is likely to be so low that spectrum of truly "responsible" licensees could be reclaimed by the Commission.[181]

WinStar, for example, as the initial commercial developer of this spectrum, has invested considerable funds and "sweat equity" to determine whether various services could be offered commercially in the 37-40 GHz band. As part of its strategy, WinStar focused its resources on preparing a geographically wide-spread offering of its "Wireless Fiber" services. To this end, the Company has expended significant effort in hiring experienced personnel, disseminating information concerning commercial use of this spectrum throughout the industry, and soliciting and obtaining "blue-chip" customers such as

---

[178] Incumbents could, for example, bring takings claims against the government. See, Ruckelshaus v. Monsanto Co., 467 U.S. 986 (1984). Resolution of such claims could undermine the validity of the final rules adopted in this proceeding and bring the licensing process to a standstill.

[179] Brenner and Woodbury at 80.

[180] Id.

[181] Id.

MCI and Teleport. WinStar has also sunk considerable investment in obtaining state regulatory authority to offer service and ensuring the availability/quality of the necessary transmission equipment. Thus, the sunk costs incurred by WinStar in completing the regulatory and other requirements needed to market this spectrum will not have a high correlation with the number of operational links.[182] In fact, it would have been inefficient for the Company to install equipment at an early business stage -- as would be required by the Commission's proposed build out rules -- because the equipment would have remained idle while WinStar focused on completing the steps required for commercialization.[183] Consequently, if the agency intends to pursue its "reclamation plan," it should choose a characteristic that is more highly correlated with the expenditure of sunk costs than the number of operational links.[184] The FCC could, for example, accept other evidence of incumbent "responsibility," such as the number of full-time employees, leases for office space, arrangements for transmission equipment, and applications to provide service made to state PUCs.[185]

Finally, reclamation of the 39 GHz band would lower the amount bidders are willing to pay for spectrum to account for the risk that, having once "change[d] the 'rules of the game' after the game has started," the FCC may do so again.[186]

---

[182] Id. at 81.

[183] Id.

[184] Id. at 81-82.

[185] Id. at 82.

[186] Id. at 79.

c. The build out plan represents a deviation from the Commission's traditional treatment of incumbent licensees

As noted by then-Commissioner Duggan, "the Commission must always demonstrate maximum sensitivity to the needs of incumbent users [especially those that have] acted in good faith and abided by our rules."[187] As will be shown, the Commission's treatment of 39 GHz incumbents does not comport with its traditional treatment of incumbents.

Generally, the Commission does not single out incumbent licensees for treatment harsher than that given to new licensees. In IVDS, for example, the FCC treated incumbents much like new licensees as it waived the required one-year build out terms for 17 of 18 IVDS incumbents when waiving the requirements for new licensees.[188] Likewise, in allowing 220 MHz licensees to move base stations within their service area to unauthorized locations, the Commission stated that its plan "fairly balances the needs of existing licensees with the rights of future 220 MHz licensees by ensuring that both existing and future 220 MHz licensees will be able to provide service to the

---

[187] See In the Matter of Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, *Notice of Proposed Rule Making*, ET Docket No. 92-9, 7 FCC Rcd 1542, 1549 (1992) (statement of Commissioner Duggan).

[188] See In the Matter of Amendment of Part 95 of the Commission's Rules to Modify Construction for Interactive Video and Data Service (IVDS) Licenses, *Report and Order*, FCC 95-506 at n.6 (released Jan. 16, 1996).

public as expeditiously as possible."[189] Nor has the Commission "repacked" incumbents when establishing a mechanism for exclusive licensing of private carrier paging systems; instead, it "grandfathered" incumbents, enabling existing systems to continue operating without being forced to change channels or location.[190] More recently, the Commission tentatively concluded that in switching to geographic licensing of paging services, the public interest would be best served by allowing incumbent paging operators to choose to retain their site-specific licenses or to trade those licenses in for a system license demarcated by the aggregate of the service contours around the incumbent's site.[191] In light of the above, there is no basis for the FCC to impose build out requirements for incumbents that

---

[189] See Amendment of Part 90 of the Commission's Rules to Provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service, *Second Report and Order*, FCC 96-27, PR Docket No. 89-552, GEN Docket No. 93-253 at ¶ 10 (released Jan. 26, 1996).

[190] See Amendment of the Commission's Rules to Provide Channel Exclusivity to Qualified Private Paging Systems at 929-930 MHz, *Report and Order*, PR Docket No. 93-35, 8 FCC Rcd 8318, 8329 ¶ 31 (1993).

[191] See Part 22 Rewrite Order at ¶ 22 ("it is essential that the incumbent's rights to operate under its existing authorizations not be diminished").

A similar scheme was enacted for the benefit of incumbent licensees in the 900 MHz SMR service when the Commission adopted a geographic licensing plan. *See* Amendment of Parts 2 and 90 of the Commission's Rules to Provide for the Use of 200 Channels Outside the Designated Filing Areas in the 896-901 MHz and the 935-940 MHz Bands, *Second Report and Order and Second Further Notice of Rule Making*, PR Docket No. 89-553, 10 FCC Rcd 6884, 6901, ¶ 47 (1995).

are far stricter than those for new licensees.[192] Nor is there justification for repacking incumbents.[193] Both actions are contrary to the agency's decisions in the above cases and to the spirit of regulatory parity.[194]

d. If build out requirements are to be mandated, they should mirror those used for other services

As discussed above, WinStar believes that mandatory build out benchmarks are unnecessary. If, nevertheless, the Commission believes some type of build out requirement is necessary for existing licensees, the Commission should base its build out requirements on the size of the market (i.e., population) using the following plan: at the end of six months from the issuance of a final order in this proceeding, every channel in the top ten urban markets must have a minimum of five two-way links in service; markets 11-25 must have a minimum of two links with all other markets required to have one two-way link. Failure to meet those requirements would result in

---

[192] Compare NPRM at ¶¶ 105-109 (build out requirements for incumbent licensees) with NPRM at ¶ 98 (performance requirements for new licensees).

[193] See, e.g., CMRS Flexibility Order (statement of Commissioner Chong) "communications services provided in direct competition with one another should be subject to the same level of regulation").

[194] See In the Matter of Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier, FCC 95-427 (released Oct. 23, 1995) (statement of Commissioner Chong) ("I favor regulatory parity, and by this I mean that similarly situated competitors should be treated similarly under our rules; In my view, a vigorous competitive market requires . . . equally applicable rules."). See also Part 22 Rewrite NPRM at ¶ 74 (proposing to treat common carrier and private carrier paging comparably as they are substantially similar services).

forfeiture of the licensee's service area (although existing links would be grandfathered as long as they remained in service). WinStar believes this plan would balance the rights of incumbents while allowing them the ability to make the choices needed to maximize the use of its license. Regardless of what build out plan is adopted, the Commission should, at a minimum, consider waivers for licensees based on a demonstration that the spectrum is being used efficiently in accordance with market dictates and is not being warehoused. The Commission adopted such waiver rules with respect to build out requirements for other services.[195]

6. Technical requirements should be limited only to those necessary to minimize interference between licensees' systems

The NPRM proposes to set minimum standards of spectral efficiency as well as requirements for frequency tolerance, emission masks, adjacent channel interference and antenna characteristics.[196] Such restrictions are unnecessary in light of the agency's decision to give licensees the exclusive use of their spectrum within a defined geographic area. The restrictions also will impose needless costs and arbitrarily distort technology choices.

a. Exclusive use eliminates the need for regulating spectrum efficiencies

The NPRM proposes to grant licenses on the 37-40 GHz spectrum on an exclusive use basis. Consequently, there is no reason to impose spectral efficiency rules. As observed by telecommunications

---

[195] See GWCS, 78 RR.2d at 1173.

[196] NPRM at 54-58 ¶¶ 113-119.

consultants Dale N. Hatfield and Gene G. Ax, such rules are necessary only when the spectrum is shared.[197] In that circumstance, licensees have little incentive to make the most efficient use of their spectrum.[198] The Commission has recognized as much:

> The incentive for spectrum efficiency is not the same for licensees without exclusive use as for licensees with exclusive use of channels. On shared use channels, the advantage gained if one licensee is spectrum efficient is shared by all the channel's users. In some cases, such as use of lower ERP or slightly narrower bandwidth, none of the benefits of spectrum efficiency may accrue to the user of the spectrum efficient equipment.[199]

Accordingly, "adoption of a spectrum efficiency standard [is necessary to] provide incentives that are largely absent without exclusivity."[200]

Here, however, exclusivity has been proposed.[201] The Commission has found that exclusivity "will provide the proper incentives for users to efficiently use spectrum."[202] Hatfield and Ax explain that this is because exclusivity allows licensees to retain the benefits of

---

[197] See Hatfield and Ax at 3-4.

[198] Hatfield and Ax at 3.

[199] Spectrum Efficiency in the Private Land Mobile Radio Bands in use Prior to 1968, *Notice of Inquiry*, PR Docket No. 91-170, 6 FCC Rcd 4126 ¶ 51 (1991) (citations omitted) ("Spectrum Efficiency NOI").

[200] Spectrum Efficiency NOI, at ¶ 50.

[201] Sharing has been proposed with the Federal government. See NPRM at ¶ 14 and ¶ 120. As discussed in Section VII.B.6.b., WinStar believes sharing should not be adopted.

[202] See Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Service, *Report and Order and Further Notice of Proposed Rule Making*, PR Docket No. 92-235, 10 FCC Rcd 10076, 10129 ¶ 118 (1995).

efficiencies for themselves.[203] Consequently, "a licensee with exclusive use of one or more channels . . . will seek to maximize the value of [its] spectrum."[204] There can be little dispute over that point given the Commission's statement that "we view the probable application during the 1990's of second generation digital cellular and SMR technology as affirmation of the validity of this theory."[205] Exclusive use has therefore motivated licensees to upgrade their technology which, in turn, has allowed licensees to expand their capacity while simultaneously lowering their costs.[206] As shown, spectrum efficiency rules are not necessary where, as here, licensees have been granted exclusive use of their spectrum.[207]

---

[203] See Hatfield and Ax at 2-3. They note that exclusivity has led to the use of more advanced technologies and lower costs in various services including CMRS and SMR.

[204] See Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Service, *Report and Order and Further Notice of Proposed Rule Making*, PR Docket No. 92-235, 10 FCC Rcd 10076, 10129 ¶¶ 118-119 (1995) (citing Professor Coase); Spectrum Efficiency NOI, at ¶ 51.

[205] Spectrum Efficiency NOI, at ¶ 51. See also Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Service, *Report and Order and Further Notice of Proposed Rule Making*, PR Docket No 92-235 10 FCC Rcd 10076, 10129 ¶ 118 (1995) (exclusivity given to encourage spectrum efficient technologies such as trunking); Hatfield and Ax at 1-3 (providing examples of the benefits of exclusive use).

[206] Hatfield and Ax 3-4 (discussing benefits to CMRS licensees from use of more spectrally efficient technologies).

[207] See id. at 4 (granting of exclusive use licenses in the 37-40 GHz band precludes the need for spectral efficiency standards).

b. The proposed technical rules impose needless costs and arbitrarily distort technology choices

Hatfield and Ax note that unnecessary technical rules raise costs and distort technology choices.[208] As an example, they cite to the Digital Electronic Message Service ("DEMS") and point-to-point Digital Termination Service (DTS).[209] They believe that imposition of the proposed technical rules will have a similar effect upon the 37-40 GHz band.[210] Thus, they conclude that except to protect other licensees' services from harmful interference, "there is no need for the Commission to establish minimum standards of spectral efficiency or requirements for frequency tolerance, emission masks, adjacent channel interference, or antenna characteristics in the 37.0-40.0 GHz band."[211]

In 1981, the FCC allocated spectrum to DEMS and DTS and adopted technical rules for DEMS. By 1983, over 150 DEMS licenses had been awarded. However, by 1992, only 20 DEMS licenses were still in use.[212] According to Hatfield and Ax, a "major contributor" to the failure of DEMS service was high equipment costs caused by the FCC's technical specifications.[213] The agency does not disagree: "DEMS has

---

[208] Id. at 6-11.

[209] Id. at 7.

[210] Id. at 8-11.

[211] Id. at 13-14.

[212] Id. at 8 (citing 8 FCC Rcd 6495).

[213] Id.

higher equipment costs which, in turn, discourages the more efficient use of radio spectrum through frequency reuse."[218]

Imposition of an emission mask is similarly arbitrary and unnecessary. An emission mask is needed to minimize interference from a system operated by one licensee into a system operated by another licensee on an adjacent channel. An emission mask "was never intended for a service where a licensee employs subchannels and uses network design principles" to minimize interference from one subchannel to another.[219] In DEMS, emission masks were difficult to achieve and imposed cost penalties since more expensive equipment was needed to meet the mask requirements.[220] In later modifying the DEMS emission mask, the FCC stated that the modification would decrease equipment costs and allow some equipment to achieve greater path lengths.[221]

Moreover, the proposed emission mask need not apply to individual radios. According to Hatfield and Ax, "[s]ubchannel radios located near the channel edge could be allowed to operate at lower power levels as a way of avoiding interference into systems operated by other licensees on adjacent channels. This would be consistent with the [NPRM's] proposal for aggregating adjacent channels."[222] Thus,

---

[218] Id. at 9.

[219] Id. at 10. Examples of network design principles include lower power, polarization isolation, and antenna directivity.

[220] Id.

[221] Id.

[222] Id.

the emission mask should be eliminated for individual radios and the equipment type acceptance process modified accordingly.

Mandating Category A antennas is similarly ill-conceived. That requirement precludes point-to-multipoint operations from a single antenna.[223] Moreover, because licensees are permitted to subchannelize and reuse their frequencies, they may wish to install radios in a hub and spoke arrangement to achieve a configuration analogous to a wide beam model. To do so, contend Hatfield and Ax, could be "more expensive" than using wide beam antennas.[224] They note that in the DEMS service, the Commission ultimately relented and changed its antenna requirements for this very reason, i.e., lower cost antennas could be used.[225] Hence, the antenna beamwidth requirement did nothing more than unnecessarily raise costs.[226] Thus, Hatfield and Ax believe the DEMs experience supports their contention that unnecessary technical rules tend to raise costs and distort technology choices.

---

[223] Id. at 11.

[224] Id.

[225] Id.

[226] Should the FCC nonetheless adopt antenna requirements, WinStar believes that the same requirements should be adopted for both incumbents and new licensees. To do otherwise -- as proposed by the NPRM -- violates concepts of regulatory symmetry and handicaps incumbent licensees from making efficient use of the spectrum.

7. Licensees should not be required to share spectrum with the government

As discussed in Section VII.B.5, exclusivity provides licensees with incentives to make efficient use of their spectrum. Sharing, in contrast, provides no such incentives. In fact, as the Commission has recognized, licensing on a shared basis discourages optimally efficient use of spectrum.[227] Hatfield and Ax explain that with shared spectrum, a licensee will not capture the benefits from more efficient use of its spectrum. For example, if a licensee reduced its power at its base station in order to minimize interference with other co-channel licensees, the licensee would have reduced the performance of its system (less power) while conveying benefits to other users in the form of less interference to their systems.[228] Shared spectrum, therefore, gives little incentive to licensees to maximize the efficient use of their spectrum.

With respect to Federal government fixed operations, sharing undercuts the advantages from relying on market forces.[229] As Hatfield and Ax explain, sharing would: preclude certain types of

---

[227] See Amendment of the Commission's Rules to Provide Channel Exclusivity to Qualified Private Paging Systems at 929-930 MHz, *Report and Order*, PR Docket No. 93-35, 8 FCC Rcd 8318, 8319-20 ¶ 6 (1993) ("Private Paging Exclusivity") (licensing on a non-exclusive basis discourages investment); Private Paging Exclusivity, FCC 96-53, PR Docket No. 93-35, RM-7986, *Memorandum Opinion and Order*, (released Feb. 13, 1996).

[228] Hatfield and Ax at 2.

[229] WinStar does not object in principle to sharing the spectrum with government space research (space-to-Earth). However, further studies are needed to ensure that harmful interference does not occur.

operations; lead to inefficient use of the spectrum;[230] and require imposition of minimum requirements for frequency tolerance, emission masks, adjacent channel interference, and antenna characteristics.[231] Such requirements would be needed because interference would no longer be limited to intrasystem within the MTA.[232]

Sharing presents other problems as well. The database proposed by the Commission would be burdensome and would divulge sensitive marketplace information. Additionally, it would be hard for bidders to value the spectrum -- or make plans on its efficient use -- if they did not know when or how much spectrum they may have to share.[233] As shown, sharing with the Federal government should not be adopted.

Moreover, as Hatfield and Ax point out, sharing is unnecessary because Federal government communication needs can be met in ways that do not interfere with either market forces or efficient license utilization.[234] For example, the government could purchase needed services from licensees, much like it does in other areas.[235] Acquiring spectrum in this way would give the government "strong

---

[230] Federal government users would have little incentive to make efficient use of their spectrum as they are insulated from market forces.

[231] Hatfield and Ax at 8-12.

[232] Id.

[233] Id. at 12.

[234] Hatfield and Ax at 13-14.

[235] Id.

incentive" to use its spectrum efficiently.[236] Even if the Federal government has specialized communications needs that cannot be met by commercial service providers,[237] the FCC need not undermine its market-based approach to satisfy such needs. Rather, it could adopt rules that allow licensees to "sub-lease" spectrum to the government to meet its specialized needs. As Hatfield and Ax note, "[s]uch an approach would eliminate most, if not all, of the disadvantages associated with issuing separate frequency authorizations to government agencies."[238]

---

[236] Id.; see also R.H. Coase, The Interdepartment Radio Advisory Committee, 5 J. Law & Econ. 40 (1962) (arguing that government should pay for spectrum as that would help result in allocations which maximized the value of production).

[237] WinStar is not aware of such specialized government needs.

[238] Hatfield and Ax at 13-14.

VIII. CONCLUSION

For the foregoing reasons, WinStar respectfully urges the Commission to (1) allow market forces to allocate the 37-40 GHz band and (2) grant licensees' maximum flexibility in the use of their spectrum.

Respectfully submitted,

Philip L. Verveer
Michael F. Finn
WILLKIE FARR & GALLAGHER
Three Lafayette Centre
1155 21st Street, NW
Washington, DC 20036-3384

Attorneys for WinStar Communications, Inc.

Timothy R. Graham
Leo I. George
Joseph M. Sandri, Jr
WINSTAR COMMUNICATIONS, INC.
1146 19th Street, N.W.
Washington, D.C. 20036

March 4, 1996

been slow to develop partially because of the cost of DTS equipment."[214]

In this proceeding, the FCC has proposed a one bit per second per hertz spectral efficiency standard. A major problem with that restriction is that it does not take into account frequency reuse or coding improvements.[215] It therefore robs licensees of the ability to gain additional interference protection by moving to a less efficient but more robust modulation technique.[216] Hatfield and Ax point out that such additional interference protection would allow the channel to be reused at closer distances, giving the licensee the ability to transfer a much greater total amount of information per hertz in the geographic area.[217] Hatfield and Ax also note that the modulation standard is more difficult to achieve in narrower bandwidths because of additional filtering needed to meet the FCC's emission mask requirements. That additional filtering "translates directly into

---

[214] Id. (citing 2 FCC rcd 3164).

[215] Id. at 4.

[216] Hatfield and Ax cite as an example a system that operates at an acceptable bit error rate at a lower signal to interference ratio so that frequency reuse is improved. See id. at 4. They also note that a mandatory modulation efficiency requirement does not necessarily mean that more information can be transferred per hertz per square mile.

[217] For example, they note that going from 1 bps/Hz to .5 bps/Hz might (depending on other technical choices) cut the required frequency reuse distance in half thus quadrupling the amount of frequency reuse that could be obtained. Consequently, a mandatory 1 bps/Hz would cut spectral efficiency in half compared to what could be obtained with a .5 bps/Hz modulation or bandwidth efficiency

RECEIVED

MAR - 4 1996

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

COMPETITIVE MARKET CONSIDERATIONS IN THE LICENSING OF THE 37 TO 40 GHz BAND

Prepared for:

WINSTAR WIRELESS, INC.

Prepared by:

CHARLES RIVER ASSOCIATES

Steven R. Brenner
John R. Woodbury

March 4, 1996

I. EXECUTIVE SUMMARY i

I. INTRODUCTION AND SUMMARY OF CONCLUSIONS 1

II. SPECTRUM CAPS FOR THE 37 TO 40 GHZ BANDS: AN ANTITRUST ANALYSIS 6

A. THE ROLE OF COMPETITION 7

B. THE PRINCIPLES OF MARKET DEFINITION 11

1. Basic Principles *12*

2. Price Discrimination and Market Definition *15*

C. MARKET DEFINITION IN THE 37 TO 40 GHZ BAND 16

1. Services in the 37 to 40 GHz Band *18*

2. Spectrum Alternatives *20*

3. Non-Spectrum-Based Alternatives *28*

4. Summary - Product Market Definition *32*

5. Geographic Market *33*

D. ANTITRUST ANALYSIS OF THE NUMBER OF FIRMS, MARKET SHARES, AND CONCENTRATION 36

1. Merger Guidelines' Standards *37*

2. Application of Merger Guidelines' Standards to Spectrum Caps *42*

E. STRUCTURAL ANALYSIS OF THE MARKETS IN WHICH 37 TO 40 GHZ SERVICE WILL BE SUPPLIED 44

1. Capacity and Market Shares *44*

2. Market Structure and Concentration *47*

F. LIMITATIONS ON COLLUSIVE BEHAVIOR 52

1. Technological Development *53*

2. Regulatory Change *55*

3. The Structure of Costs *56*

4. Large Buyers and Individual Bidding *58*

G. IMPLICATIONS FOR A SPECTRUM CAP POLICY 59

III. MARKETS AND THE EFFICIENT USE OF SPECTRUM: AUCTIONS, SPECULATORS, AND RECLAMATION 62

A. MARKET FORCES AND THE EFFICIENT USE OF SPECTRUM: WITH OR WITHOUT AUCTIONS 63

1. Market Forces and the Efficient Use of Spectrum *64*

2. Are Rules For Buildout or Technical "Quality" Standards Needed? *66*

3. Is Spectrum Reclamation Needed to Ensure Efficient Use of Spectrum? *68*

4. The Role of Speculation *70*

5. Summary *71*

B. THE COSTS OF SPECTRUM RECLAMATION 73

1. A Stylized Version of the Entrepreneurial Process *73*

2. Short Run Effects on Consumers of Spectrum Reclamation *76*

3. Policy Implications I: The Net Benefits of Reclamation *79*

4. Policy Implications II: Identifying "Responsible Licensees" *79*

IV. SUMMARY OF CONCLUSIONS 82