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KELLOGG, HUBER, HANSEN, TODD & EVANS, P.L.L.C.

SUMNER SQUARE
1615 M STREET, N.W.
SUITE 400
WASHINGTON, D.C. 20036-3209

(202) 326-7900
FACSIMILE:
(202) 326-7999

MICHAEL K. KELLOGG
PETER W. HUBER
MARK C. HANSEN
K. CHRIS TODD
MARK L. EVANS
STEVEN F. BENZ
NEIL M. GORSUCH
GEOFFREY M. KLINEBERG
REID M. FIGEL
HENK BRANDS

SEAN A. LEV
EVAN T. LEO
ANTONIA M. APPS
MICHAEL J. GUZMAN
AARON M. PANNER
DAVID E. ROSS
SILVIJA A. STRIKIS
WILLIAM J. CONYNGHAM
RICHARD H. STERN, OF COUNSEL
SHANLON WU, OF COUNSEL

August 23, 2001

VIA HAND DELIVERY **EX PARTE**

RECEIVED
AUG 23 2001
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Ex Parte Communication in ET Docket No. 98-206; RM-9147; RM-9245; Applications of Broadwave USA et al., PDC Broadband Corporation, and Satellite Receivers, Ltd., to provide a fixed service in the 12.2-12.7 GHz Band; Requests of Broadwave USA et al. (DA 99-494), PDC Broadband Corporation (DA 00-1841), and Satellite Receivers, Ltd. (DA 00-2134) for Waiver of Part 101 Rules.

Dear Ms. Salas:

On August 22, 2001, Sophia Collier of Northpoint Technology, Ltd. ("Northpoint"), Peter Huber of this firm, and Thomas Hazlett of the American Enterprise Institute met with David Sappington and Jonathan Levy of the Commission's Office of Plans and Policy ("OPP").

The purpose of the meeting was to discuss the processing of Northpoint's pending applications to provide terrestrial service in the12.2-12.7 GHz band. Northpoint argued that it would be inappropriate to auction the licenses, in view of several factors, including the following: Without Northpoint, there would be no terrestrial service in the 12.2-12.7 GHz band, because Northpoint invented the only technology capable of ubiquitously sharing of the band with existing DBS and planned NGSO satellite users.. Equally important, Northpoint is the only applicant qualified for a license because only Northpoint has proven its ability to share with DBS operations in independent tests required by statute and carried out earlier this year by the MITRE Corporation on behalf of the Commission. Northpoint urged that the Commission should promptly grant its pending license applications so that Northpoint can begin providing service that will bring real competition to the markets for MVPD and broadband Internet access. The enclosed materials served as a basis for discussion at the meeting.

No. of Copies rec'd 0+18

Eighteen copies of this letter and its attachments are enclosed – two for inclusion in each of the above-referenced files. Please contact me if you have any questions.

Yours sincerely,

J. C. Rozendaal

Counsel for Northpoint Technology, Ltd.

enclosures

cc: meeting participants

Northpoint Technology Has Created the Bandwidth It Seeks to Use

- Northpoint technology allows terrestrial services to operate on the same frequencies in the same geographic area as satellite transmissions.
  - Northpoint is first system ever presented to the FCC that allowed ubiquitous satellite terrestrial sharing.
  - Previous efforts at sharing required "band segmentation" (using different frequencies) or geographic separation.
  - Northpoint holds broad fundamental patents on its system of satellite terrestrial sharing, directional broadcasting and power control.
  - The entire FCC record that supports the decision to authorize terrestrial service in the 12 GHz band is based on Northpoint technology.

Business Plan

- Use Northpoint technology to create new nationwide network offering consumer services to compete with franchise cable & DBS.
  - Product offering – multi-channel video programming, local signals and high speed internet, new technologies
  - Price competition
- Keys to competitive success
  - Low cost infrastructure – enables price competition, broad deployment including rural areas
  - Ability to use existing consumer equipment
  - National brand
    - Scale (purchasing, marketing & programming)
    - Retail access

Timeline

- Northpoint's inventors first presented its technology to the FCC in 1994
  - Operated under experimental licenses (applied for in 1995, 97 & 99)
  - Filed Petition for Rulemaking in 1998
  - Applied for operating licenses in January 1999 with NGSO applicants

Northpoint Seeks Parity With Other Applicants

Northpoint has demonstrated that it can share spectrum with the two DBS carriers as well as with eight satellite applicants that applied on the same day for the same spectrum. These satellite applicants – which include DirecTV's parent, Hughes, and other industry giants, Boeing and Alcatel – will not be subject to an auction.

FCC Has Statutory Duty to Avoid Mutual Exclusivity

- The auction statute permits the FCC to conduct auctions only if it accepts "mutually exclusive applications," and it explicitly directs the FCC to pursue "engineering solutions" and "other means in order to avoid mutual exclusivity in application and licensing proceedings." (See 47 U.S.C. 309(j)(1) and (6))

Northpoint is Only Terrestrial System to Pass Congressionally-Mandated Independent Test

- Northpoint is the only qualified applicant because it alone submitted its technology for the congressionally-mandated independent demonstration of spectrum sharing capability with DBS satellites. (See Sec. 1012, FY 2001 CJS Appropriations, PL 106-553) MITRE concluded that satellite-terrestrial spectrum sharing is feasible and specifically demonstrated Northpoint's technology can eliminate interference to satellite reception.

Consumer Groups and Broadcasters Oppose Auction in FCC Comments

- Consumer groups say Northpoint "will bring instant competition and rapid deployment of broadband services to the entire country," and caution, "auctions would delay and possibly undermine the expansion of competition to incumbent cable and satellite companies."

- The NAB and well over 100 individual station owners similarly oppose an auction and endorse Northpoint for the competition it would bring to the marketplace and for its carriage of all local television stations.

An Auction Would Delay Service, Penalize Northpoint, and Stifle Future Innovation

- If the FCC were to pursue an auction, it would delay introduction of this new service for perhaps years and inevitably increase the cost to consumers. Moreover, auctions have never facilitated the deployment of service for rural areas.

- An auction would force a start-up to compete for the product of its own patented innovation against deep-pocketed companies, and rises to an unconstitutional taking.

- The FCC should do all it can to encourage innovation that expands the productive use of spectrum. Subjecting Northpoint to an auction -- the very party whose technology made this spectrum available for terrestrial use – would send precisely the wrong message to future innovators.

3

Became Public Law No. 106-553
December 21, 2000

106TH CONGRESS, 2d Session | HOUSE OF REPRESENTATIVES | REPORT 106–1005

MAKING APPROPRIATIONS FOR THE GOVERNMENT OF THE DISTRICT OF COLUMBIA AND OTHER ACTIVITIES CHARGEABLE IN WHOLE OR IN PART AGAINST REVENUES OF SAID DISTRICT FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 2001, AND FOR OTHER PURPOSES

OCTOBER 26 (legislative day, OCTOBER 25), 2000.—Ordered to be printed

Mr. ISTOOK, from the committee of conference, submitted the following

CONFERENCE REPORT

[To accompany H.R. 4942]

The committee of conference on the disagreeing votes of the two Houses on the amendment of the Senate to the bill (H.R. 4942) "making appropriations for the government of the District of Columbia and other activities chargeable in whole or in part against revenues of said District for the fiscal year ending September 30, 2001, and for other purposes", having met, after full and free conference, have agreed to recommend and do recommend to their respective Houses as follows:

That the House recede from its disagreement to the amendment of the Senate, and agree to the same with an amendment, as follows:

In lieu of the matter stricken and inserted by said amendment, insert:

Section 1. (a) The provisions of the following bills of the 106th Congress are hereby enacted into law:

(1) H.R. 5547, as introduced on October 25, 2000.

(2) H.R. 5548, as introduced on October 25, 2000.

(b) In publishing this Act in slip form and in the United States Statutes at Large pursuant to section 112 of title 1, United States Code, the Archivist of the United States shall include after the date of approval at the end appendixes setting forth the texts of the bills referred to in subsection (a) of this section.

67–407

Communications Act of 1934 (47 U.S.C. 151 et seq.) has the meaning given that term in the Communications Act of 1934.

SEC. 1011. AUTHORIZATIONS OF APPROPRIATIONS.

(a) COST OF LOAN GUARANTEES.—For the cost of the loans guaranteed under this Act, including the cost of modifying the loans, as defined in section 502 of the Congressional Budget Act of 1974 (2 U.S.C. 661(a)), there are authorized to be appropriated for fiscal years 2001 through 2006, such amounts as may be necessary.

(b) COST OF ADMINISTRATION.—There is hereby authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act, other than to cover costs under subsection (a).

(c) AVAILABILITY.—Any amounts appropriated pursuant to the authorizations of appropriations in subsections (a) and (b) shall remain available until expended.

SEC. 1012. PREVENTION OF INTERFERENCE TO DIRECT BROADCAST SATELLITE SERVICES.

(a) TESTING FOR HARMFUL INTERFERENCE.—The Federal Communications Commission shall provide for an independent technical demonstration of any terrestrial service technology proposed by any entity that has filed an application to provide terrestrial service in the direct broadcast satellite frequency band to determine whether the terrestrial service technology proposed to be provided by that entity will cause harmful interference to any direct broadcast satellite service.

(b) TECHNICAL DEMONSTRATION.—In order to satisfy the requirement of subsection (a) for any pending application, the Commission shall select an engineering firm or other qualified entity independent of any interested party based on a recommendation made by the Institute of Electrical and Electronics Engineers (IEEE), or a similar independent professional organization, to perform the technical demonstration or analysis. The demonstration shall be concluded within 60 days after the date of enactment of this Act and shall be subject to public notice and comment for not more than 30 days thereafter.

(c) DEFINITIONS.—As used in this section:

(1) DIRECT BROADCAST SATELLITE FREQUENCY BAND.—The term "direct broadcast satellite frequency band" means the band of frequencies at 12.2 to 12.7 gigahertz.

(2) DIRECT BROADCAST SATELLITE SERVICE.—The term "direct broadcast satellite service" means any direct broadcast satellite system operating in the direct broadcast satellite frequency band.

TITLE XI—ENCOURAGING IMMIGRANT FAMILY REUNIFICATION

SEC. 1101. SHORT TITLE.

This title may be cited as—

(1) the "Legal Immigration Family Equity Act"; or

(2) the "LIFE Act".

FEDERAL COMMUNICATIONS COMMISSION

SALARIES AND EXPENSES

The conference agreement includes a total of $230,000,000 for the salaries and expenses of the Federal Communications Commission (FCC), instead of $207,909,000 as provided in the House bill, and $237,188,000 as proposed in the Senate-reported amendment. Of the amounts provided, $200,146,000 is to be derived from offsetting fee collections, as provided in both the House bill and the Senate-reported amendment, resulting in a net direct appropriation of $29,854,000, instead of $7,763,000 included in the House bill, and $37,042,000 included in the Senate-reported amendment. Receipts in excess of $200,146,000 shall remain available until expended but shall not be available for obligation until October 1, 2001.

The conference agreement directs the Commission to submit, no later than December 15, 2000, a financial plan proposing a distribution of all the funds in this account, subject to the reprogramming requirements under section 605 of this Act.

From within the funds provided, the FCC is urged to support public safety, emergency preparedness and telecommunications functions of the 2002 Olympic Winter Games.

The Senate report included language on public broadcasting stations' access to spectrum. The House included no similar language. The FCC is examining this issue, which is also pending in the Court of Appeals. The conference agreement reflects the belief that this issue can be resolved through the administrative or judicial process, so no legislative action is required at this time. The Chairman of the FCC should report to the House and Senate Committees on Appropriations on any action the Commission takes on this issue by April 1, 2001.

The FCC shall take all actions necessary to complete the processing of applications for licenses or other authorizations for facilities that would provide services covered by the Satellite Home Viewers Improvement Act (Public Law 106–113, 113 Stat. 1501), specifically to deliver multi-channel video services including all local broadcast television station signals and broadband services in unserved and underserved local television markets by November 29, 2000, as required by Public Law 106–113, 113 Stat. 1501.

The Senate report language with respect to a broadcast industry code of conduct for the content of programming is incorporated by reference.

FEDERAL MARITIME COMMISSION

SALARIES AND EXPENSES

The conference agreement includes $15,500,000 for the salaries and expenses of the Federal Maritime Commission, instead of $14,097,000 as proposed in the House bill and $16,222,000 as proposed in the Senate-reported amendment.

S.376

ORBIT Act (Enrolled Bill (Sent to President))

`SEC. 647 . SATELLITE AUCTIONS.

`Notwithstanding any other provision of law, the Commission shall not have the authority to assign by competitive bidding orbital locations or spectrum used for the provision of international or global satellite communications services. The President shall oppose in the International Telecommunication Union and in other bilateral and multilateral fora any assignment by competitive bidding of orbital locations or spectrum used for the provision of such services.

`SEC. 648. EXCLUSIVITY ARRANGEMENTS.

`(a) IN GENERAL- No satellite operator shall acquire or enjoy the exclusive right of handling telecommunications to or from the United States, its territories or possessions, and any other country or territory by reason of any concession, contract, understanding, or working arrangement to which the satellite operator or any persons or companies controlling or controlled by the operator are parties.

`(b) EXCEPTION- In enforcing the provisions of this section, the Commission--

`(1) shall not require the termination of existing satellite telecommunications services under contract with, or tariff commitment to, such satellite operator; but

`(2) may require the termination of new services only to the country that has provided the exclusive right to handle telecommunications, if the Commission determines the public interest, convenience, and necessity so requires.

`Subtitle D--Negotiations To Pursue Privatization

`SEC. 661. METHODS TO PURSUE PRIVATIZATION.

`The President shall secure the pro-competitive privatizations required by this title in a manner that meets the criteria in subtitle B.

`Subtitle E--Definitions

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

In the Matter of Applications of Northpoint USA, PDC Broadband Corporation, and Satellite Receivers, Ltd. to Provide a Fixed Service in the 12.2-12.7 GHz Band	ET Docket No. 98-206 RM-9147 RM-9245

DECLARATION OF THOMAS W. HAZLETT, PH.D.

1. My name is Thomas W. Hazlett. I am a Resident Scholar at the American Enterprise Institute for Public Policy Research in Washington, D.C., and a former Chief Economist of the Federal Communications Commission. I have written extensively on the topic of auctions, licensing, and spectrum allocation policy at the FCC.[1] A brief bio is included as Attachment A.

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[1] My research articles include: *The Rationality of U.S. Regulation of the Broadcast Spectrum*, 33 J.L. & Econ. 133 (1990); *The Cost of Rent-Seeking: Evidence from Cellular Telephone License Lotteries*, 59 So. Econ. J. 425 (1993) (co-authored with Robert J. Michaels); *Physical Scarcity, Rent-Seeking and the First Amendment*, 97 Colum. L. Rev. 905 (1997); *Assigning Property Rights to Radio Spectrum Users: Why Did FCC License Auctions Take 67 Years?*, 41 J.L. & Econ. 529 (1998); *The Wireless Craze, the Unlimited Bandwidth Myth, the Spectrum Auctions Faux Pas, and the Punchline to Ronald Coase's 'Big Joke': An Essay on Airwave Allocation Policy*, 15 Harv. J.L. & Tech. (forthcoming Spring 2001, working paper *available at* http://www.aei.brookings.org/publications/abstract.asp?pID=117). I have long been a proponent of both FCC auctions and efficient spectrum use. *See Making Money Out of the Air*, N.Y. Times, Dec. 2, 1987, at A35; *Dial 'G' for Giveaway*, Barron's, June 4, 1990; *Spectrum Auctions - Only a First Step*, Wall St. J., Dec. 20, 1994, at A14.

SUMMARY

2. At the request of Northpoint Technology and its Broadwave USA affiliates (collectively "Northpoint"), I have examined the Commission's policies in the above-captioned matter. My analysis focuses on the consumer welfare aspects of the Commission's response to Northpoint's application for licenses to provide nationwide terrestrial video and data services in the 12.2-12.7 GHz frequency band. Although it has approved Northpoint's proposed service in principle, the Commission has not licensed Northpoint to provide that service, but has instead created a "new terrestrial fixed Multichannel Video Distribution and Data Service ('MVDDS')," and commenced a rulemaking proceeding to determine how best to license the service. This new rulemaking will, at a minimum, delay introduction of Northpoint's innovative spectrum re-use system, most likely for several years. This delay will produce substantial social losses. Households will be deprived of an array of competitive television and broadband access services. Even using a conservative estimate, the prompt establishment of competition for these services could save consumers over $1 billion annually. Businesses, too, will lose productivity-enhancing choices as Northpoint's broadly applicable techniques for enhancing spectrum capacity are blocked from market adaptation. The experience, innovations, and upgrades that would naturally flow from deployment of these technological advances could deliver further benefits throughout the wireless sector. Even over the short run, then, the social losses associated with delay are likely to outweigh any revenues or efficiency gains associated with auctions.

3. Yet, perhaps more destructive of consumer welfare is the long-run effect of a Commission decision to auction rights to deploy Northpoint's technology.

Northpoint's considerable investment in research and development discovered a way to deliver valuable telecommunications services via airwaves already thought fully allocated. Northpoint made substantial investments applying for a change in Commission rules and in documenting the precise nature of the new service. In the absence of these investments, this opportunity would not be known to the FCC. Were the producer-side gains accruing to Northpoint's risk-taking to be appropriated by a government auction, the policy would impose a potentially confiscatory tax on the most vulnerable and yet most valuable asset in the spectrum allocation process – the entrepreneur. Such an action would clearly have a deleterious effect on future risk-taking to discover and implement efficiencies in the use of radio spectrum.

4. The Commission's expeditious grant of Northpoint's request – issuing licenses for fixed service with such waivers of the Commission's Part 101 rules as are necessary to provide point-to-multipoint video broadcasts and one-way data transmission – will maximize consumer welfare. The efficiencies would be far-reaching, and include the following.

- *Driving wireless innovation to remedy the "spectrum drought."* Each successful entrepreneur attracts rivals. Northpoint's successful innovation will signal inventors, venture capitalists, and investors that barriers to entry are substantially lower than if the Commission were to delay the launch of service and appropriate returns to innovation by auctioning Northpoint's right to compete.
- *Encouraging spectrum re-use.* The implementation of Northpoint's advances in spectrum engineering will offer guidance for adaptation in other bands.

Deployment will speed new applications and promote a wide variety of advanced wireless communications.

- *Enhancing cable TV competition.* Conservatively assuming a 5% price reduction in the price of cable television services would create approximately $2 billion in annual consumer benefits. Each year of delay sacrifices such gains, which cannot be recouped.
- *Promoting Internet access competition.* Northpoint's entry into local markets introduces a third major competitor in the broadband access race. This would yield substantial social gains in lowering the price and improving the quality of high-speed access service, promoting broadband network development.
- *Enabling a low-cost distribution mechanism for local TV channels.* Traditional broadcast TV signals are relatively expensive for satellite broadcasters to retransmit, but relatively inexpensive for Northpoint's hybrid satellite/terrestrial service. This allows the Commission to introduce a market solution to the carriage of local signals to TV viewers, mitigating the costs associated with must-carry and the digital television transition.

ENCOURAGING ENTREPRENEURSHIP IN WIRELESS TECHNOLOGY

5. Competitive bidding for FCC licenses was a major policy advance. The principle benefit of auctions is in assigning rights relatively quickly to parties most likely to provide good service to the public. They are particularly effective tools when the Commission has created a new service and it is difficult to determine *ex ante* which

applicants will be the most efficient operators. Competitive bidding allows the Commission to let the market select. Firms willing and able to bid the most are likely to be the most efficient service providers.

6. In the Northpoint application, however, the competitive process has already determined the firm willing to invest the most to provide service. It is Northpoint, the firm that invested substantial sums to create the possibility of additional service in the 12 GHz band. The application the firm has filed requests permission to commence service long after the firm discovered the means for creating new service, negotiated complicated bandwidth sharing arrangements with other users of the 12 GHz band, and funded extensive experiments documenting the viability of the negotiated interference standards.

7. Auctions can efficiently eliminate excess demand for a right. Yet the situation that obtains here features only one firm undertaking to create the opportunity for sharing 12.2 GHz to 12.7 GHz. No firm offered to defray Northpoint's expenses in creating additional service. No firm simultaneously developed a competing system for spectrum re-use in the 12 GHz band. No firm contested Northpoint's status as the sole applicant to provide service under FCC rules in response to a formal public invitation to do so issued November 2, 1998. Upon the cut-off date for applications, January 8, 1999, Northpoint stood alone in applying for the right to provide multi-channel video service via spectrum re-use in 12 GHz.[2]

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[2] First Report and Order and Further Notice of Proposed Rule Making, *Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, ET Docket No. 98-206, FCC 00-418, ¶¶ 262-263 (rel. Dec. 8, 2000) ("*First Report and Order and FNPRM*").

8. Not only is Northpoint the unrivaled creator of the service in question, it seeks only to share bandwidth already allocated to other services. It does not seek exclusive use of this band. It does not oppose further sharing in this band. Future applicants may also be licensed to offer service in this band on a non-interfering basis. Additional users are not precluded by the timely granting of Northpoint's request; in fact, they are encouraged by rules yielding incentives for innovative wireless system design.

9. It is true that, due to Northpoint's investment in developing and demonstrating the superior quality of its technology, demand for licenses is building. Firms are attracted to an opportunity to free ride on Northpoint's investment in creating a business opportunity. The Commission should not, however, delay service to artificially create excess demand. Delays directly harm consumers, and the appropriation of entrepreneurial risk capital deadens the dynamic economic process.[3]

10. The Commission finds that "incumbent cable companies possess very large market shares and would find it rational to foreclose or at least delay the emergence of new firms that might drive prices down or otherwise increase MVPD competition."[4] By imposing multiple administrative proceedings delaying the entry of Northpoint for "years,"[5] the Commission would harm consumers with anti-competitive actions – a course it condemns when undertaken by market actors.

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[3] Auction bids can be an efficient way for government to finance expenditures, precisely because up-front bids do not distort marginal incentives. Sales and income taxes, on the other hand, change trade-offs for decision makers, leading to inefficiencies. To delay or restrict licensing to extract extra auction revenues, however, typically distorts economic activity more profoundly than do income taxes. Hence, the rationale for auctions as a revenue-raising device disappears once policy makers attempt to drive up auction receipts through anti-consumer allocation policies.

[4] *First Report and Order and FNPRM* ¶ 298.

[5] *Id.* at 190 (statement of Commissioner Furchtgott-Roth).

11. The FCC has placed its auction authority into proper context. For instance, in its 1997 Report to Congress on Spectrum Auctions, the Commission wrote: "[T]he Commission's statutory authority continues to instruct that the agency not base spectrum allocation decisions 'solely or predominantly' on the expectation of revenues that auctions may generate. The Commission's primary mission in conducting auctions is promoting competition by awarding licenses rapidly to those who value them most highly."[6] The Commission observed "the inherent tension between use of the spectrum auction as a revenue-raising measure and its use as an efficient means of assigning licenses."[7] When Wireless Communications Services licenses attracted low bids, the Commission noted that promptly assigning licenses trumped the extraction of revenues: "WCS spectrum can be used for many promising applications (*e.g.*, Internet access, wireless cable, low power telephony). As a result, consumers will soon benefit from the deployment of this new service – regardless of the amount of revenue raised by auction. In fact, winning bidders from WCS licenses are already investing in the development of new technologies and formulating ideas for the efficient use of this spectrum band."[8]

12. Pushing efficient solutions to market creates consumer gains that dominate the extraction of potential profits through license auctions. For instance, Jerry Hausman estimates that the gain in consumer surplus from the introduction of cellular telephones amounted to $24 billion to $50 billion annually. Gregory L. Rosston estimated that, if auctioned by the FCC in 1982, cellular licenses might have brought as much as $30

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[6] Report, *FCC Report to Congress on Spectrum Auctions*, WT Docket No. 97-150, FCC 97-353, at 33 (rel. Oct. 9, 1997) (footnote omitted).
[7] *Id.* at 35.
[8] *Id.*

billion in aggregate.[9] Hence, using conservative projections either way, the total discounted present value of producers' surplus is about equivalent to the *annual* gains seen by consumers. This implies that, using a real social discount rate of 5%, the consumer benefits swamp auction receipts by *twenty to one*.

13. Besides the high costs of delay, there is a more general manner in which auctioning Northpoint's rights to supply service will undermine consumer welfare. It involves the tension between license auctions and a liberal spectrum allocation system, where innovations are readily introduced to the marketplace. I write about this in my paper, *The Wireless Craze* (*see supra* note 1). The way that the spectrum allocation system has developed under the Radio Act of 1927 and the Communications Act of 1934 prevents new wireless services or technologies from being adopted until an entrepreneur successfully petitions the FCC to gain the rules necessary to commence service. The Commission relies on private parties to discover new wireless applications, bring them to the attention of regulators, file substantial applications, and – in many cases – negotiate interference contours with technical experts, regulators and other operators.

14. Suppose a private party does discover, develop, and demonstrate an innovative wireless technology, and then goes on to surmount a difficult and costly regulatory process to obtain a rule making approving the new service. Traditionally, the Commission has observed an informal queue, and parties petitioning the Commission for

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[9] Jerry Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications* 22-23, *in Brookings Papers on Economic Activity – Microeconomics* (Martin Baily et al. eds., 1997). This was the estimate of consumer gains from the introduction of cellular. Had there been an auction to assign cellular licenses in 1982, likely receipts were estimated by Gregory L. Rosston, An Economic Analysis of the Effects of FCC Regulation on Land Mobile Radio 145 (1994) (unpublished Ph.D. dissertation, Stanford University).

rule makings stand at the head of the line to receive licenses. Where the Commission assigns licenses by auction, however, the value of new technology may be appropriated from innovators. Forced to bid against firms that invested nothing to create the business opportunity being licensed, the entrepreneur will logically see its rivals – as well as the auction authority – as free riders.

15. It is a genuine problem, and not one of simple equity. When entrepreneurs foresee the prospect of appropriation, they are less likely to invest scarce resources in discovering new wireless applications, technologies, or efficiencies. Once discovered, they are less likely to invest considerable sums to bring them to the attention of the FCC, or to spend years pursuing formal inquiries, rule makings, negotiations, field trials, and documentation. Consumers lose as the pace of technological advance in spectrum-based services declines due to a peculiar form of over-taxation.

16. Northpoint has patented its technology and has licensed its technology to the individual Broadwave USA affiliates that have sought FCC licenses in the current proceeding. Northpoint's patent rights mean that it may be in a position to capture some share of the revenue stream its investment makes possible even if operating licenses are assigned by competitive bidding. It is likely that one of two scenarios would obtain: (1) although Northpoint has stated that it would not participate in an FCC license auction, Northpoint could, in principle, bid and win a license at auction. (2) A firm other than Northpoint could win the auction, and then negotiate a partnership, licensing, or joint venture agreement to use Northpoint technology in exchange for a share of revenues or

profits.[10] While Northpoint's innovative technology will be used regardless of the license assignment method, efficiency will still be affected.

17. First, when ultimate resource use is not in doubt, delays associated with license auctions are not offset by market selection benefits accruing from competitive bidding. Second, auctioning license rights introduces additional bargaining. If a firm other than Northpoint wins the auction, for instance, the strategic interests of the licensee (or the need to adjudicate the licensee's rights to use Northpoint's technology) may preclude rapid provision of service. Finally, assuming that the auction proceeds without cost and without surprise – and Northpoint emerges victorious with a bid of $X – the outcome tends to depress the incentive for investments in new wireless technology. The payment of $X represents double billing to Northpoint's providers of risk capital. Having advanced substantial sums to create a technology and to then gain FCC rules permitting an opportunity for a new business to operate, Northpoint must then outbid other firms for the right to profit from this opportunity. That other firms would have to share their profits with Northpoint to use its innovative technology does not eliminate the tax on Northpoint's investment. It is as if, having demonstrated a successful business model with initial rounds of funding from venture capitalists, a start-up (and its equity owners) are forced to bid for ownership of the business model. What motivates the firm's founders to discover such entrepreneurial opportunities is the right to capture what it creates, a right to *not* bid against other firms. That is true even where the start-up owns key patents that would allow it to capture some of the profits generated.

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[10] This assumes that neither cable nor DBS operators would win the licenses, eliminating competitive issues from this discussion. It also assumes that the FCC's

18. Other investors and entrepreneurs are watching what happens here. If the Commission elects to appropriate the investment Northpoint has made in creating the very service it now seeks to provide over airwaves thought by the FCC to be fully utilized and capable of no further public benefit, then it establishes incentives for all spectrum innovators to cease and desist. Even the bravest among them will have access to substantially reduced funding for the inputs used to produce advances.

19. FCC policy respects this tension and seeks to mitigate it in some respects. One is the Commission policy with respect to renewal of licenses. Even licenses that are assigned by competitive bidding are renewed without auctions. To subject licenses to re-auction at renewal might capture additional revenues for the Treasury.[11] Yet, "[w]ithout confidence in their long-term rights, licensees would tend to underinvest in license-specific assets."[12] Similarly, when an existing wireless service provider is granted a waiver enhancing the scope of its license, the Commission does not auction the new right. Examples include the decision to liberalize cellular rules by granting operators the right to offer digital service,[13] reforms allowing two-way data to be offered by "wireless cable" operators wanting to migrate to fixed broadband access service,[14] and changes permitting

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licensing process does not lead to a patent infringement dispute, which could delay the introduction of terrestrial services in the 12 GHz band indefinitely.

[11] Of course, initial bids would be adjusted downward to reflect subsequent auctions. But net receipts could unambiguously be generated by auctioning licenses awarded by lottery or comparative hearings at renewal – which the Commission does not do.

[12] Gregory L. Rosston & Jeffrey S. Steinberg, *Using Market-Based Spectrum Policy to Promote the Public Interest*, 50 Fed. Comm. L.J. 87, 111 (1997).

[13] Report and Order, *Amendment of Parts 2 and 22 of the Commission's Rules to Permit Liberalization of Technology and Auxiliary Service Offerings in the Domestic Public Cellular Radio Telecommunications Services*, 3 FCC Rcd 7033 (1988).

[14] *See* Report and Order, *Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions*, 13 FCC Rcd 19112 (1998); Report and Order on

mobile wireless providers to offer fixed wireless.[15] In each instance, the new rights were granted to existing licensees without comparative hearings, lotteries, or competitive bidding. This practice has been recognized as a progressive, pro-consumer policy step in promoting competition and service to the public. "Maximum service flexibility will enable spectrum users quickly and efficiently to modify their offerings to provide the services that consumers demand and that technology makes possible."[16]

20. The Commission would discriminate against Northpoint relative to incumbent licensees were it to issue its requested waiver by auction. For the reasons that incumbents should be encouraged to work with the Commission to create new technologies, so too *de novo* entrants. Were incumbent licensees in the 12 GHz band to have developed Northpoint's spectrum re-use technology and applied for permission to deploy it, the Commission would not – as precedents show – be auctioning new licenses. The expansion of rights would represent greater licensee flexibility, a policy seen (correctly) by the Commission as pro-consumer. It would not make sense to tax this innovation by auctioning new rights. Similarly, the Commission now has an opportunity to license Northpoint's technology, thus living up to its policy statements favoring

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Reconsideration, *Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions*, 14 FCC Rcd 12764 (1999).

[15] First Report and Order and Further Notice of Proposed Rule Making, *Amendment of the Commission's Rules to Permit Flexible Service Offerings in the Commercial Mobile Radio Services*, 11 FCC Rcd 8965 (1996).

[16] Rosston & Steinberg, *supra* note 12, at 100.

flexibility and innovation in radio-based technologies.[17] Offering such incentives to incumbents but discriminating against entrants cannot be explained as good policy.

21. Licensing policy can be generalized in the following, two-pronged approach. The first prong establishes a two-part threshold test for excess demand for licenses. First, where applications are mutually compatible, no excess demand exists and all applicants should be authorized to offer service to the public.[18] Second, should excess demand for a given number of licenses exist, it should be remedied – wherever possible – by the creation of new licenses. If licenses to eliminate excess demand can be readily created, all applicants can and should be satisfied with licenses issued rapidly.

22. The second prong kicks in when excess demand is not so easily remedied. A three-part test is recommended as a framework for deciding when to issue licenses with or without competitive bidding. Where the answer is affirmative to the following questions, it suggests that competitive bidding is not necessary for efficient license allocation:

a. Was the rule making largely dependent on innovative technology brought to the Commission by the applicant(s)?[19]
b. Is technology deployment likely to come more rapidly through licensing the identifiable applicant(s) as compared to competitive bidding?
c. Are other wireless technology creators likely to be encouraged to bring innovations to the Commission as a result of licensing identifiable applicant(s)?

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[17] *See, e.g.*, Policy Statement, *Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium*, 14 FCC Rcd 19868 (1999).

[18] "[A]uctions are not necessary in the absence of mutually exclusive applications because, if there is only one applicant, then there are no opportunity costs associated with granting a license to the sole applicant." Rosston & Steinberg, *supra* note 12, at 108.

[19] Alternatively, would the Rule Making have been substantially the same in the absence of the identified applicant?

23. Northpoint argues that there exists no cognizable excess demand for licenses, ending the auction inquiry with the first prong. Yet, even if excess demand for licenses does obtain, moving the analysis to the second prong's three-part test, the case for licensing Northpoint without competitive bidding is strong. It is clear that Northpoint created the very service the FCC now seeks to license, initiating the Rule Making and developing the technology that now makes spectrum re-use in this band possible. No other firm or individual has any competing claim. Northpoint's investment in documenting the compatibility of the new technology with existing band users is substantial, and the product of this effort has been extremely valuable to the Commission in crafting the new service. Indeed, Northpoint's negotiation with other parties was vital to establishing sharing arrangements. Licensing Northpoint would speed services to market, whereas auctioning licenses would delay service for a substantial period of time. Licensing Northpoint would encourage other parties to offer similar innovations and work through the regulatory process to promote new technologies. In sum, all three parts of the test are satisfied, leading to the conclusion that quickly licensing Northpoint is the efficient solution.

ENCOURAGING SPECTRUM RE-USE IN OTHER BANDS

24. Northpoint's innovative approach to spectrum re-use has been found effective by the FCC. But until it is established in the marketplace, independent technology suppliers and equipment manufacturers face muted incentives to invent system improvements, to adapt the technology for other wireless services, or to develop applications yielding greater functionality.

25. Introduction of Northpoint's system will attract research and development investment in advanced applications, additional 12 GHz systems, and in adaptation of the spectrum re-use system to other bands. This will help remedy the "spectrum drought" plaguing the development of communications networks, and decried by former FCC Chairman William E. Kennard.[20] It will create spectrum out of thin air, allowing bands that appear crowded today to yield a considerably richer harvest of consumer services. In this, it will prove crucial to the progress of America's information age economy – a goal specifically advanced as central to the FCC's mission by Chairman Michael Powell.[21]

ENHANCING CABLE TELEVISION COMPETITION

26. The FCC has long noted the problem of market power in cable television service. Since at least 1987, when the Video Dialtone proceeding commenced,[22] up through annual reports on the status of cable competition required by the 1992 Cable

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[20] FCC Chairman William E. Kennard, Wire Less Is More, Address Before the Cellular Telecommunications Industry Association, New Orleans, Louisiana (Feb. 28, 2000). *See also* Jennifer Jones, *FCC Chief Prods Internet Industry on Wireless Spectrum*, InfoWorld.com (May 31, 2000), *at* http://www.infoworld.com/articles/hn/xml/00/05/31/000531hnspectrum.xml.

[21] "Powell said there's 'critical need' for spectrum .... The FCC must try to recoup as much spectrum as it can, he said, but incumbents also have rights. It will be a 'big challenge,' Powell said." *Powell Seeks to Harmonize Intercarrier Compensation, Develop Coherent Approach to Spectrum*, Wash. Telecom Newswire (Feb. 9, 2001). "I strongly encourage the prompt completion of any allocation and licensing proceedings ... so that carriers in the U.S. may offer our citizens such advanced, whiz-bang services very soon." Report and Order, *1998 Biennial Regulatory Review — Spectrum Aggregation Limits for Wireless Telecommunications Carriers*, 15 FCC Rcd 9219, 9297 (1999) (separate statement of Commissioner Powell).

[22] Notice of Inquiry, *Telephone Company-Cable Television Cross-Ownership Rules, Sections 63.54-63.58*, 2 FCC Rcd 5092 (1987).

Act,[23] the Commission has confronted the anti-consumer consequences of local monopoly provision of multi-channel video service.[24] In the extant proceeding, the Commission returns to this long-running theme in expressing concern over the fact that, "[r]oughly 82% of MVPD households are served by cable companies."[25] The *First Report and Order and FNPRM* goes on to note that "incumbent cable companies in most markets will have an incentive to acquire the in-region MVDDS license in order to prevent a fourth significant provider from emerging."[26] This conclusion springs from the Commission's finding that cable operators possess market power, and that such market power would diminish upon initiation of service by Northpoint.

27. Introducing competition to challenge cable operators in video and high-speed access markets is the priority concern of pro-consumer public policy. Regulatory proceedings that delay such competition substantially damage consumers. To gain an appreciation for the magnitude of the market power problem in local cable television markets, we may examine the price effect seen in overbuilt cable television markets. Today, a small if growing proportion of local markets witness head-to-head cable television competition of the sort that Northpoint will be able to deliver nationwide.[27]

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[23] Seventh Annual Report, *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, CS Docket No. 00-132, FCC 01-1 (rel. Jan. 8, 2001).

[24] Cable's market power is also analyzed in Thomas W. Hazlett & Matthew L. Spitzer, *Public Policy Toward Cable Television*, ch. 3 (1997).

[25] *First Report and Order and FNPRM* ¶ 298.

[26] *Id.*

[27] While direct broadcast satellite providers compete against cable television providers and will compete against Northpoint, the latter offers a closer substitute to cable television. That is because it offers local service, including the delivery of all TV stations broadcast in the market. Northpoint would also deliver high-speed network access resembling cable modem service, avoiding latency problems associated with satellite-to-earth interactivity.

The introduction of such direct rivalry lowers per-channel rates for customers by 14% in recent Commission surveys,[28] and by as much as 32% in other estimates.[29] Northpoint plans to deliver 96 channels of video programming, including all local broadcast signals, for fees that are 10%-15% below existing cable television rates.[30] If we assume that Northpoint's entry succeeds in pushing cable rates down 5% nationally, the annual savings for U.S. households exceeds $2 billion.[31] This abstracts from predictable quality gains. For instance, cable systems facing overbuild competition provide an average of 60 channels of programming on basic tiers, nearly ten percent more than systems not facing such rivalry.[32] Competitive pressure from a new entrant offering a 96-channel package would likely result in further increases.

28. Delaying the entry of Northpoint will cost consumers such benefits. If Northpoint's license takes three years to assign, over $5 billion in consumer benefits would be sacrificed. These enormous losses would never be recouped.

29. The Commission's FNPRM states, "Based on Northpoint's request for 500 megahertz of spectrum nationwide, grant of its request would mean that it would be the

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[28] Overbuilt competitors charge an average of 57 cents per basic channel, while systems not facing direct rivals charge an average of 66 cents. Report on Cable Industry Prices, *Implementation of Section 3 of the Cable Television Consumer Protection and Competition Act of 1992; Statistical Report on Average Rates for Basic Service, Cable Programming Service, and Equipment*, MM Docket No. 92-266, FCC 01-49, ¶¶ 8, 24 (rel. Feb. 14, 2001) ("*FCC Cable Rate Report*").

[29] This estimates the price reduction from an overbuild extending throughout the local market. T. Randolph Beard & George S. Ford, Fragmented Duopoly: A Conceptual and Empirical Investigation 19 (Mar. 2, 2001) (unpublished manuscript).

[30] *See* Northpoint, *Broadwave*, *at* http://www.northpointtechnology.com/html/broadwave.html.

[31] Cable industry video revenues in 2000 are estimated at approximately $41 billion. *The Cable TV Financial Factbook* 11 (Paul Kagan Associates 2000).

sole provider of terrestrial MVDDS in the 12.2-12.7 GHz band."[33] First, Northpoint is not requesting ownership or exclusive use of 500 MHz of spectrum nationwide. The firm simply requests access to radio spectrum in this band, in cooperation with others and respecting the clear reception of existing transmissions, in order to offer additional services to consumers. Second, Northpoint enters the multi-channel video market as the fourth provider (or fifth where a local overbuilder is present). This market definition is supported by the Commission's view that "the in-region MVDDS license" constitutes "a fourth significant provider."[34] Third, Northpoint would be the "sole provider" of an arbitrarily designated MVDDS service only if the Commission were to exclude others. Northpoint has not requested exclusive use of the 12.2-12.7 GHz band; indeed, its entire system is based on shared use. The technology Northpoint has pioneered accommodates additional providers in this – and other – bands. Fourth, the implication of inquiring about Northpoint's potential status as "sole provider of MVDDS" is that market power would be created, harming consumers. Precisely the reverse would obtain. Entry by Northpoint would create at least a fourth competitor in local cable television markets. Due to the local transmission advantages of Northpoint's terrestrial distribution, this new rival promises to be particularly effective in remedying the market power of cable monopolies. To inquire about "sole provider" status in a market that does not yet exist, would only be created by artificial administrative designation, and that is subsumed as an economic matter in the market defined by the Commission as multi-channel video

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[32] "The competitive [cable] group averaged 59.9 channels and the noncompetitive [cable] group averaged 54.8 channels as of July 1, 2000 . . . ." *FCC Cable Rate Report* ¶ 8 & Attach. B-5.

[33] *First Report and Order and FNPRM* ¶ 325.

[34] *Id.* ¶ 298.

delivery service, is to invert the competitive analysis. Licensing Northpoint *eliminates* the "sole provider" status cable television systems currently enjoy.

PROMOTING HIGH SPEED INTERNET ACCESS

30. Rapid licensing of Northpoint would also produce immediate competitive benefits in promoting high-speed Internet access. Today, most consumers have no more than two choices for high-speed service: cable modems and digital subscriber lines (DSL). Indeed, a substantial fraction of U.S. households cannot subscribe to cable modem service because their local cable provider has not upgraded its system to deliver two-way data service, or cannot receive DSL because they are located too far from the local exchange's central office. Additional choices are very valuable to consumers.

31. Entry by Northpoint could considerably speed the "race for bandwidth." In creating a first, second or third broadband high-speed access option for residential customers, millions of additional Internet users could avail themselves of broadband services. This would stimulate network development, giving content and infrastructure providers a far larger market to serve. It would also put pressure on existing access suppliers to improve service and lower prices.

32. Northpoint and its 68 local affiliates plan to provide high-speed access bringing competition to these sub-markets, as well as additional competitive pressure where cable modems and DSL are currently operational. As a first approximation, one can conservatively assume that the emergence of this third major national platform will

lower high-speed access charges by an average of 10% nationwide.[35] Given current residential subscribership of about 5 million and average monthly fees of $40,[36] this would produce yearly customer savings of about $250 million. Of course, high-speed access service is growing at nearly 100% per year. Savings from enhanced competition grow commensurately. Were a three-year delay imposed on Northpoint's entry into the market, nearly $1.2 billion in losses would accrue from the above estimate compounded at 50% over three years. Again, these losses would not be recouped by consumers upon Northpoint's (delayed) entry. They are lost forever.

PROMOTING EFFICIENT DISTRIBUTION OF BROADCAST TV SIGNALS

33. DBS providers face a high cost in carrying broadcast TV signals, as channel capacity is exceeded by the number of local stations. The Commission correctly notes the advantages of terrestrial transmission, as devised by Northpoint, in creating local capacity.[37]

34. Not only are cable and satellite operators mandated to provide local television signals under various must-carry statutes, additional policies rely on the carriage of local signals to customers. Most pressing today is the transition to digital television. Due to capacity limitations of both existing multi-channel distribution media (cable and satellite), an entrant attempting to differentiate its product by specializing in

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[35] On its website, Northpoint states that it contemplates offering residential subscribers a package of 64 video channels plus 100 hours of high-speed Internet access for just $39 per month. This would imply savings off existing cable packages of about 50%.

[36] *Precursor Watch: Broadband Deployment Outlook* (Feb. 22, 2001).

[37] "[E]ach terrestrial licensee in the 211 markets will have the capacity to provide all local television channels, whereas a DBS satellite system with one Continental United

local content would appear to fulfill announced public interest goals of the Commission. Clearly, Northpoint's distribution system enjoys efficiencies in providing local broadcast signals to multi-channel video subscribers.

CONCLUSION

35. To best serve consumers, innovative technologies and applications need be continually discovered and deployed. Multi-year regulatory lags and extraction of gains created by entrepreneurial activity reduce the flow of innovation. Competitive bidding to assign new rights is appropriate in some instances, but not in others. This is recognized in FCC policy. For license renewals, or expanded use of frequencies allocated licenses, the Commission practice is to assign rights to existing licensees without competitive bidding. To assign such rights by auction would clearly discourage important investments in infrastructure, including those to discover new wireless services. By granting innovators a reward for invention, as well as for gaining agency authorization, incentives are created to drive new services and technologies into the marketplace.

36. Were the Commission to create a new MVDSS allocation, it would substantially delay service to the public. A one-year delay – assuming lightning fast allocation rules and auction implementation – could (conservatively estimated) result in $2 billion in lost consumer surplus in cable television service, and another $250 million lost in reduced competition for high-speed Internet access. A three-year lag would likely exceed $6 billion in lost (aggregate) consumer surplus. As Commission policy analysts

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States footprint, does not have the capacity to retransmit all of the local channels nationwide." *First Report and Order and FNPRM* ¶ 290.

have recognized, "authorizations to use spectrum should be assigned in a manner that minimizes delay and inefficiency."[38]

37. Were licenses to be assigned by competitive bidding, much of the profit opportunity created by Northpoint's inventive solution would be appropriated from its creators. While this might appear a budgetary victory, that view is short-sighted and, ultimately, illusory. Northpoint's substantial investments enabled it to discover the opportunity to provide more communications over an already allocated band of frequencies. Northpoint's perseverance in bringing this creative solution to the Commission's attention, in petitioning for permission to use this technology, in conducting rigorous experimentation and laboratory work, in filing voluminous (and expensive) documentation to meet the Commission's high threshold for approving waiver applications, is now to be rewarded or punished. If rewarded, by permission to promptly use the FCC's current rules to offer service as an NGSO FSS gateway service, then further entrepreneurship will be encouraged. If punished, by artificial delays during which other firms will be invited to submit competing applications, followed by auctions among these newly competitive bidders, future innovations will be more difficult to fund and less likely to succeed.

38. The short-run interest of consumers is to have service commence quickly. The long-run interest of consumers is to have entrepreneurship rewarded rather than taxed. From either perspective, the public's interest lies in having the FCC allow grant Northpoint's January 1999 request for permission to commence service without delay.

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[38] Rosston & Steinberg, *supra* note 12, at 107.

39. A two-pronged test suggests a framework for evaluating Northpoint's claim for a license. By utilizing such an approach, the Commission may employ auctions to promote efficiency in assigning licenses, yet also promote efficiencies in spectrum allocation. In a threshold test, it is determined whether excess demand for licenses exists. Northpoint's claim is that such excess demand does not exist, in that no eligible applicant filed for a competing license against Northpoint in a timely fashion. Even if this claim is rejected, and competing claims are found to be in evidence by the Commission, a three-part test under the second prong can be used to evaluate Northpoint's license application. The key considerations are these:

a. Northpoint is distinctly responsible for creating and developing the FCC's rules permitting spectrum re-use in the 12 GHz band, and Northpoint is in this position due to having invested substantial sums in proving its technology and negotiating spectrum sharing with other users.
b. It is likely that license auctions would delay service to customers, perhaps by several years.
c. Licensing Northpoint in the current proceeding would provide an incentive for other spectrum innovators to bring new wireless applications to the marketplace.

40. On all three pillars of the test, the circumstances of this situation suggest that licensing Northpoint without competitive bidding would result in efficient spectrum use and both short-term and long-term benefits to the consuming public.

I declare, under penalty of perjury, that the foregoing is true and correct to the best of my knowledge and belief.

Thomas W. Hazlett

Executed on: March 12, 2001

Tab 1A

Thomas W. Hazlett

Short Bio, September 2000

thazlett@aei.org

Thomas W. Hazlett is a Resident Scholar at the American Enterprise Institute for Public Policy Research in Washington, D.C. From 1984 through June 2000 he taught economics and finance at the University of California, Davis, where he last served as Professor of Agricultural & Resource Economics and Director of the Program on Telecommunications Policy. In 1990-91 he was a Visiting Scholar at the Columbia University Graduate School of Business, and in 1991-92 he served as Chief Economist of the Federal Communications Commission in Washington, D.C. He has served as Senior Adviser to Arthur Andersen, and a Consultant to Econ One, and is a columnist for *Forbes ASAP*.

Dr. Hazlett has written for such general interest periodicals as the *Wall Street Journal*, *New York Times*, *Newsday*, *Los Angeles Times*, *Chicago Tribune*, *Sacramento Bee*, *San Francisco Chronicle*, *The Economist*, *Reason*, *Reader's Digest*, *Barron's*, *Across the Board*, *Chief Executive*, *The American Enterprise*, *The Weekly Standard*, *Forbes*, the *National Post* (Toronto) and *The New Republic*. He wrote the "Selected Skirmishes" column in *Reason Magazine*, 1989-2000, and previously served as a contributing editor to *Harper's*. His academic research has been published in scholarly journals and law reviews, including the *Journal of Financial Economics*, *Journal of Law & Economics*, *Journal of Financial Economics*, *Economic Inquiry*, *Southern Economic Journal*, *Review of Industrial Organization*, *Journal of Legal Studies*, *Columbia Law Review*, *Journal of Regulatory Economics*, *Supreme Court Economic Review*, *Business & Politics*, *Hastings Law Journal*, *The Public Interest*, *International Journal of the Economics of Business*, *Public Choice*, *Regulation*, *Managerial & Decision Economics*, *Yale Journal on Regulation*, *Telecommunications Policy*, *Journal of Broadcasting & Electronic Media*, *Harvard Journal on Law & Public Policy*, *Connecticut Law Review*, *Michigan Telecommunications and Technology Law Review*, *Federal Communications Law Journal*, *Cornell Journal of Law & Public Policy*, and the *University of Pennsylvania Law Review*. He has provided expert testimony in federal and state courts, before the Department of Commerce, General Accounting Office, and the Federal Communications Commission, and before committees of Congress. In addition, he has served as a consultant to numerous private firms, the State of California, Congressional Budget Office, federal agencies, municipal governments and foreign governments.

Professor Hazlett is an internationally recognized expert on government regulation of business, specializing in the area of telecommunications policy. He received his doctorate in economics from UCLA in 1984, and is a member of the Mont Pelerin Society, a Senior Research Associate of the Columbia Institute for Tele-information, and a Senior Fellow of the Liberal Institute in Prague, Czech Republic. In 1990-91 he was awarded the Wriston Citicorp Fellowship, a prize awarded annually by the Manhattan Institute to a young scholar working in an important area of public policy. His book (with Matthew L. Spitzer), Public Policy Toward Cable Television, was published by the MIT Press in November 1997.

CERTIFICATE OF SERVICE

I, Shannon Thrash, hereby certify that on this 23rd day of August, 2001, copies of the foregoing were served by hand delivery* or first class United States mail, postage prepaid, on the following:

Magalie Roman Salas*
Secretary
Federal Communications Commission
445 12th Street, SW
Room TW-B204
Washington, D.C. 20554

David Sappington, Chief Economist
Jonathan Levy, Deputy Chief Economist
Office of Plans and Policy*
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Antoinette Cook Bush
Northpoint Technology, Ltd.
444 North Capitol Street, N.W.
Suite 645
Washington, D.C. 20001

Nathaniel J. Hardy
Irwin, Campbell & Tannenwald, P.C.
1730 Rhode Island Ave, NW
Suite 200
Washington, D.C. 20036-3101

David C. Oxenford
Shaw Pittman
2300 N. Street, NW
Washington, D.C. 20037

James H. Barker, III
Latham & Watkins
1001 Pennsylvania Ave., NW
Suite 1300
Washington, D.C. 20004-2505

Pantelis Michalopoulos
Steptoe & Johnson LLP
1330 Connecticut Avenue, NW
Washington, D.C. 20036

James W. Olson
Gregory F. Intoccia
Howrey Simon Arnold & White LLP
1299 Pennsylvania Ave., NW
Washington, D.C. 20004

Shannon Thrash