Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FCC 94-144

In the Matter of	)	
	)	
Amendment of the Commission's Rules to Establish New Personal Communications Services	)	GEN Docket No. 90-314 ✓
	)	RM-7140, RM-7175, RM-7618
	)	

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MEMORANDUM OPINION AND ORDER

Adopted: June 9, 1994; Released: June 13, 1994

By the Commission: Commissioners Quello, Barrett, Ness, and Chong issuing separate statements.

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I. INTRODUCTION AND EXECUTIVE SUMMARY

1. By this action, we amend certain aspects of our rules governing broadband personal communications services (PCS). We take this action in response to 67 petitions for reconsideration or clarification of the rules and policies adopted in the Second Report and Order in this proceeding.[1]

2. PCS encompasses a broad range of new radio communications services that will free individuals from the limitations of the wireline public switched telephone network and will enable individuals to communicate when they are away from their home or office telephones. Broadband PCS devices are likely to be portable and have their own unique telephone numbers. A basic feature of PCS is expected to be the ability to communicate person-to-person, rather than station-to-station.

3. We take this action to foster rapid creation of a competitive market to deliver these new mobile digital voice and data services to the American public. Personal communications needs are changing rapidly as our society becomes more mobile and people demand rapid communications no matter where they are or what time it is. A competitive market is the best way to introduce broadband PCS to help meet these demands. We expect that PCS will provide a variety of mobile services competitive with existing cellular, paging and other land mobile services as well as new services offering communications capabilities not currently available. These services will be provided on an entire family of new communications devices that will include small, lightweight multi-function portable phones, portable facsimile and other imaging devices, new types of multi-channel cordless phones, and advanced paging devices with two-way data capabilities. We expect that these new services and devices will affect the future development and configuration of all telecommunications networks by significantly improving their flexibility and increasing the number of functions they can perform.

4. We are amending the broadband PCS spectrum allocation and regulatory structure to better achieve what have been and continue to be our four primary goals in this proceeding: competitive delivery, a diverse array of services, rapid deployment, and wide-area coverage.[2] Furthermore, our PCS rules as modified will partner with our competitive bidding procedures to meet Congressional objectives that include promoting economic growth and competition,

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[1] See Second Report and Order, GEN Docket No. 90-314, 8 FCC Rcd 7700 (1993) (Second Report and Order). This includes a petition filed by Apple on September 13, 1993, which was separately put on notice and comment separately received. Id. at ¶ 92.

[2] See Second Report and Order at ¶ 5.

enhancing widespread access to telecommunications service offerings, and ensuring that PCS licenses are disseminated to a wide variety of applicants.[3]

5. The actions we take are designed to enable PCS providers to compete effectively with each other and with other wireless providers so that the American public can enjoy the greatest benefit from the delivery of these new services. To promote competitive delivery, we have modified the band plan to ensure there is an opportunity for a sufficient number of competitors to offer PCS services. Further, providers will have the flexibility to determine the amount of spectrum needed for their particular service or services. However, we have also set limits on the total amount of spectrum that can be acquired by new entrants and by incumbent cellular providers. This ensures that there will be a significant number of competitors in each area.

6. We have purposely adopted a broad definition of PCS to encourage a variety of firms with their own visions of PCS to bid for various combinations of licenses and to provide a diverse array of new services. Firms will compete not only on price, but also on quality and the types of new products and services they offer. We have allocated spectrum both in different sized blocks and in different sized service areas because we want to encourage businesses to be able to acquire the spectrum and service areas that best suit their business plans. This additional flexibility will result in a greater diversity of products and services for consumers.

7. Rapid deployment is important so that consumers do not have to wait for the benefits of the new services. To ensure rapid deployment, we have allocated two different sized spectrum blocks, which can be aggregated to form other block sizes. We have also altered the allocation of some of the PCS spectrum to reduce the cost of moving microwave incumbents that must be relocated. Both of these decisions will allow more rapid introduction of service because of the reduced costs of microwave relocation.

8. The revised band plan also will reduce the cost of service and equipment to consumers. In addition, we have increased the power level available for PCS service. Together with our decisions to license some BTAs and 10 MHz blocks, these changes will make PCS service more viable in rural areas, help ensure wide-area coverage and increase access for all Americans.

9. Many of the actions we take today are directed toward ensuring that a wide variety of applicants have an opportunity to acquire PCS licenses. In addition to providing for different spectrum blocks and geographic areas, we are modifying our ownership rules to encourage participation in PCS by rural telephone companies, small businesses and businesses owned by minorities and women.

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[3] See 47 U.S.C. 309(j), as amended by Section 6002(a) of the Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, 107 Stat. 312 (1993).

10. The most significant of the changes that we adopt today involves modification of the band plan that was adopted in the Second Report and Order. In that Order, we allocated 120 MHz of spectrum to PCS, some of which was in the lower portion of the 2 GHz band allocated for emerging technologies and some of which was in the upper portion of that band. Under our revised plan, all of the 120 MHz of spectrum allocated to PCS is located in the lower band. The previous band plan would have required those who wished to operate in both the upper and lower bands to utilize more expensive dual mode handsets capable of operating on both bands. Providing PCS licenses in only the 1850-1990 MHz band will lower costs to consumers by permitting use of a single-band handset. Reducing the costs of equipment to consumers should also increase consumer demand and strengthen the economic viability of the PCS providers. Placing all the licensed and unlicensed spectrum in a single contiguous band also will decrease the cost of handsets that can operate in both licensed and unlicensed blocks. In addition, these changes will preserve spectrum in the upper band that is allocated internationally for the emerging Mobile Satellite Services (MSS) industry to provide worldwide service. Taken together, these changes will increase the competitiveness of PCS service providers in urban, suburban, and rural areas which should lower prices and stimulate demand, thereby increasing investment and economic growth. Lower prices will also enhance consumer access to PCS services.

11. Having all blocks in a single contiguous band also will increase the value of the 10 MHz blocks. These blocks would have been less desirable in the upper band because upper band equipment is expected to be available from manufacturers twelve or more months after lower band equipment. In addition, the upper band contains a higher concentration of microwave facilities that would have had to share spectrum with broadband PCS licensees or be relocated from the broadband PCS spectrum to avoid interference. Our action avoids the expense and potential delay associated with relocating the numerous microwave links currently operating in the upper band. The change we have made to the band plan also makes it more feasible to aggregate a 10 MHz block with a 30 MHz block for a total of 40 MHz. Taken together, these factors will reduce the time and the cost of PCS providers offering their services to the American public. The overall allocation of 120 MHz for broadband PCS remains unchanged.

12. In the Second Report and Order, we divided 120 MHz of spectrum into seven blocks: two 30 MHz blocks, one 20 MHz block, and four 10 MHz blocks. In this Order, we are amending our band plan to provide six blocks: three 30 MHz blocks and three 10 MHz blocks. We changed the 20 MHz block to a 30 MHz block and eliminated one 10 MHz block primarily because we were persuaded that a single 20 MHz block would not provide enough spectrum to support a viable competitor to the 30 MHz PCS MTA licensees, or to the two existing cellular licensees currently serving most areas. As a primary goal of our proceeding was to promote competitive delivery of PCS services, we believe that it is essential to make available an additional 30 MHz block. We anticipate that the three 10 MHz blocks will be used in a variety of ways that may include "niche services" and other functions, or as an enhancement for PCS or cellular providers that choose to purchase a 10 MHz block to complement a 30 MHz or 25 MHz block, respectively. Thus, our revised band plan provides

for an additional competitor to cellular service and to the other PCS providers, while also providing three 10 MHz blocks for multiple uses.

13. In addition to modifying our band plan, we also make significant amendments to the rules relating to participation in PCS by holders of cellular interests. In the Second Report and Order, we recognized that unfettered participation in PCS by cellular operators could lessen the potential competition that could develop between PCS and cellular systems. At the same time, we recognized that cellular licensees could foster rapid development of PCS for a variety of reasons, including their expertise with commercial mobile radio services. Promoting competition and providing for rapid deployment of PCS are both among the objectives that Congress instructed us to promote in Section 309(j) of the Communications Act, as amended by the Reconciliation Act. We have balanced those competing interests by allowing entities with a 20 or more percent investment interest in a cellular license to acquire a 10 MHz PCS license in the same area. We adhere to that decision. However, we have decided that as of January 1, 2000, we will afford cellular operators the same overall 40 MHz spectrum cap as other PCS operators, and allow them to acquire an additional 5 MHz for a total of 15 MHz of PCS spectrum in the same service areas as their cellular interests.

14. In Section 309(j), Congress also directed us to promote economic opportunity by disseminating licenses to a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women ("designated entities"). We are modifying our PCS cellular eligibility rules to promote that goal as well. Specifically, we are relaxing our cellular ownership attribution rules to allow designated entities with up to a 40 percent non-controlling interest in a cellular license to obtain a PCS license in the same area. One effect of this change will be to allow some rural telephone companies with non-controlling cellular interests, to provide PCS service in areas that might otherwise not be served in a timely manner.

15. We also are relaxing our cellular attribution rules to allow any entity with up to a 40 percent non-controlling ownership interest in a cellular license covering 10 percent or more of the population in a PCS service area to also attain a non-controlling, investment interest in a PCS license held by a business owned by minorities or women. While there is some risk that relaxing the cellular eligibility rule will limit the vigor of competition in some markets, we think that risk is sufficiently limited where the party holding interests in two licenses holds a minority interest in the cellular license and the PCS license is controlled by another entity. We have concluded that we should take that risk in order to advance the goal of promoting economic opportunity for these groups.

16. Our cellular eligibility rules balance the goals that Congress has established -- promoting competition, ensuring rapid deployment of PCS, and providing economic opportunity for designated entities. We have decided that limited participation by cellular providers will serve the public interest by promoting rapid deployment of PCS, participation by designated entities, and overall competition.

17. We have made a number of minor modifications to our rules. With these changes, we intend to proceed expeditiously toward licensing providers of broadband personal communications services. The following is a summary of all of the specific actions we take today to promote the goals outlined above:

a. Adopting a band plan that provides for three 30 MHz licenses (Blocks A, B, and C) and three 10 MHz licenses (Blocks D, E, and F), all of which are within the 1850-1990 MHz band;

b. Providing that the A and B Blocks be licensed within 51 service areas based on the Major Trading Areas (MTAs) and that the C, D, E, and F Blocks be licensed within 493 smaller service areas based on the Basic Trading Areas (BTAs) set forth in the Rand McNally Commercial Atlas & Marketing Guide (123rd ed. 1992);[4]

c. Maintaining the allocation of spectrum at 1910-1930 MHz for unlicensed PCS devices, and committing to initiate a proceeding in the near future to examine allocation of additional spectrum for unlicensed PCS operations. Within this band, we have adopted a 1.25 MHz channelization scheme for isochronous (voice) devices and eliminated channelization requirements for asynchronous (data) devices;

d. Continuing to permit all eligible entities to acquire spectrum up to a cap of 40 MHz;

e. Retaining our five percent equity attribution threshold for PCS licenses so that the same entity may not own more than five percent of PCS licenses constituting more than 40 MHz within the same area;

f. Retaining our cellular attribution threshold of 20 percent equity ownership of a cellular licensee and our service area overlap test of 10 percent of the population of the relevant PCS market, so that the same entity generally may not own more than 20 percent of the cellular license and more than 5 percent of PCS license(s) that would place the entity above the spectrum limit in an overlapping service area;

g. Relaxing the eligibility rules to permit entities with attributable interests in cellular companies whose combined cellular geographic service areas overlap between 10 and 20 percent of the PCS service area population to submit bids for more than 10 MHz of PCS spectrum provided that, prior to the auction, they commit to divest themselves of sufficient cellular interests to come into compliance with our eligibility rules within 90 days of license grant;

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[4] Our current rules provide 492 service areas based upon BTAs. In response to a request we are dividing the Puerto Rico service area into two areas, infra.

h. Providing that voting stock, general partnership interests, interlocking directorates and certain other controlling interests and relationships will be considered in determining attributable interests under our spectrum caps;

i. Raising from a 20 percent to a 40 percent non-controlling interest the threshold for determining attributable cellular equity ownership for rural telephone companies, small businesses and businesses owned by minorities and women which are collectively termed "designated entities" under 47 U.S.C. 309(j);

j. Increasing from a 20 percent to a 40 percent non-controlling interest the threshold for determining attributable cellular equity ownership to allow non-designated entities to make non-controlling investments in PCS licenses owned and controlled by minority- and women- owned businesses;

k. Permitting entities with attributable cellular interests covering 10 or more percent of the population in a PCS service area to acquire 10 MHz of PCS spectrum within the PCS service area and, after January 1, 2000, to acquire an additional 5 MHz for a total of 15 MHz of PCS spectrum in their cellular service areas;

l. Relaxing construction requirements to provide that (a) 30 MHz broadband PCS licensees must provide coverage to one-third of their service area population within five years of initial licensing and two-thirds within ten years and (b) 10 MHz licensees must provide coverage to twenty five percent of their service area population within five years of initial licensing or, submit a showing of equivalent or substantial service;

m. Increasing the maximum power level permitted for broadband PCS base stations to 1640 watts equivalent isotropically radiated power (e.i.r.p.), which is equivalent to 1000 watts effective radiated power (e.r.p.);

n. Retaining with minor amendment rules ensuring compliance with minimum standards for exposure to radio frequency (RF) energy emitted by PCS devices;

o. Committing to initiate a proceeding in the near future to allocate additional spectrum for mobile satellite services (MSS) and to work toward having additional spectrum allocated to MSS at the World Radio Conference to be held in 1995 (WRC-95); and

p. Pledging to examine management contracts and spectrum leases in the CMRS docket for the purpose of determining whether other interests in PCS licenses should be limited in order to foster vigorous competition.

II. BACKGROUND

18. The Commission began its investigation of broadband PCS in 1989.[5] Since then the Commission has addressed broadband PCS in this docket by issuing a Notice of Inquiry, holding an En Banc meeting, and adopting a Policy Statement and Order, a Notice of Proposed Rule Making and Tentative Decision, and a Second Report and Order;[6] and held a Public Forum on broadband PCS.[7] We have also allocated 220 MHz of spectrum between 1850 and 2200 MHz for emerging technologies that include PCS;[8] provided for band sharing or negotiated relocation of microwave facilities occupying 2 GHz PCS spectrum;[9] provided spectrum to accommodate the existing 2 GHz facilities that relocated;[10] and adopted technical, licensing and auction rules for narrowband PCS.[11] We also considered 50 pioneer's

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[5] Petitions for Rule Making requesting establishment of PCS were filed by Cellular 21, Inc., in September 1989, RM-7140; and PCN America, Inc. (PCN America), in November 1989, RM-7175. Subsequently, in February 1991, Apple, RM-7618, proposed that 40 MHz from the 1850-1990 MHz band be allocated for unlicensed high-speed local-area data communications services connecting personal computers.

[6] See Notice of Inquiry, GEN Docket No. 90-314, 5 FCC Rcd 3995 (1990); Policy Statement and Order, 6 FCC Rcd 6601 (1991); Notice of Proposed Rule Making and Tentative Decision, 7 FCC Rcd 5676 (1992); Erratum, 7 FCC Rcd 5779 (1992); and Second Report and Order.

[7] See FCC, Transcripts of PCS Public Forum, April 11-12, 1994 (Transcripts of the PCS Public Forum). The transcripts are available for public viewing at both the FCC Reference Center and the Library, 1919 M Street, N.W., Washington, DC. The transcripts also may be purchased from the Commission's duplication contractor.

[8] See First Report and Order and Third Notice of Proposed Rule Making, ET Docket No. 92-9, 7 FCC Rcd 6886 (1992).

[9] See First Report and Order and Third Notice of Proposed Rule Making, ET Docket No. 92-9, 7 FCC Rcd 6886 (1992); Second Report and Order, 8 FCC Rcd 6495 (1993); Third Report and Order and Memorandum Opinion and Order, 8 FCC Rcd 6589 (1993); Memorandum Opinion and Order, 9 FCC Rcd 1943 (1994), petition for further recon. pending.

[10] See Second Report and Order, ET Docket No. 92-9, 8 FCC Rcd 6495 (1993).

[11] See First Report and Order, GEN Docket No. 90-314 and ET Docket No. 92-100, 8 FCC Rcd 7162 (1993) (initial narrowband rules); Second Report and Order, ET Docket No. 92-9, 7 FCC Rcd 6886 (1992) (adopting minor administrative changes to the narrowband PCS rules); Memorandum Opinion and Order, 9 FCC Rcd 1309 (1994) (adopting certain narrowband PCS rule amendments on reconsideration); Third Report and Order, PP Docket No. 93-253, FCC 93-98, released May 10, 1994 (design of narrowband auctions).

preference requests related to broadband PCS.[12] Finally, the Commission made recommendations and participated in an international allocation conference at which decisions were made that recognize and permit use of 2 GHz spectrum for PCS.[13] Numerous telecommunications companies and associations have actively participated in our PCS proceedings, and over 100 companies have applied for and received more than 220 experimental licenses to develop and test PCS services and technologies.

19. On August 10, 1993, the President signed the Omnibus Budget Reconciliation Act of 1993 (Reconciliation Act),[14] which amended Sections 3(n), 309(j) and 332 of the Communications Act of 1934, as amended (Communications Act).[15] Section 309(j) for the first time authorized the Commission to select licensees by competitive bidding and establishes objectives for the bidding process, including rapid deployment of new technologies, promotion of economic opportunity, competition and public access, wide dissemination of licenses, and efficient use of the spectrum. The Reconciliation Act also amended Sections 3(n) and 332 to provide that PCS is a mobile service and to establish a new framework for regulatory treatment of mobile services.

20. On September 23, 1993, shortly after the Reconciliation Act was enacted, the Commission adopted the Second Report and Order establishing regulations and policies for broadband PCS that are under review here. In the Second Report and Order, the Commission enumerated goals of competitive delivery, diversity of services, speed of deployment, and wide-area service. The Commission took a number of actions to help meet these goals.

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[12] See Third Report and Order, 9 FCC Rcd 1337 (1994), recon. pending, appeal pending sub nom. Pacific Bell v. FCC, No. 94-1148 (D.C. Cir., filed March 1, 1994). We intend to address shortly the petitions for reconsideration of our pioneer's preference decisions.

[13] A worldwide allocation for PCS was discussed at the 1992 International Telecommunication Union (ITU) World Administrative Radio Conference (WARC-92) in Torremolinos, Spain. The conference decided to maintain primary fixed and mobile allocations at 2 GHz in Region II (which includes the United States), and to make additional primary mobile-satellite service allocations in the 1930-2010 and 2120-2200 MHz bands. It added a footnote stating that future public land mobile telecommunications systems, similar in concept to PCS, are expected to use the 1885-2025 MHz and 2110-2200 MHz bands on a worldwide basis. See Report, GEN Docket No. 89-554, 6 FCC Rcd 3900 (1991); ITU, Final Acts of the World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992).

[14] Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, Title VI, §§ 6002(b)(2)(A), (B), 107 Stat. 312, 392 (1993).

[15] 47 U.S.C. §§ 3(n), 309, 332.

Specifically, the Commission:

a. Defined PCS as "radio communications that encompass mobile and ancillary fixed communication that provide services to individuals and businesses and can be integrated with a variety of competing networks";[16]

b. Allocated spectrum at 2 GHz for PCS, including 120 MHz of spectrum for licensed broadband PCS and 40 MHz for unlicensed PCS devices;

c. Provided for two 30 MHz licenses and one 20 MHz license in the "lower" band of the emerging technologies spectrum, and four 10 MHz licenses in the "upper" band, in each geographic area;

d. Provided that the two 30 MHz licenses would be authorized within 51 service areas based on the Rand McNally Major Trading Areas (MTAs) and that the 20 MHz and 10 MHz licenses would be authorized within 492 service areas based on the Rand McNally Basic Trading Areas (BTAs);[17]

e. Established eligibility requirements that limit entities with certain cellular interests to 10 MHz of PCS spectrum where there is significant overlap between a PCS service area and the cellular service area (i.e., 10 percent or more of the PCS service area population);

f. Limited broadband PCS licensees to 40 MHz of spectrum, and established certain licensing and renewal mechanisms;

g. Established a maximum power level of 100 watts e.i.r.p. for PCS base stations, and adopted technical specifications to avoid harmful interference to other operations while leaving maximum technical flexibility to permit development of new technologies;

h. Adopted rules to minimize radio frequency (RF) exposure risk; and

i. Noted an intent to continue participating in international efforts to provide standards and consistent spectrum allocations for international deployment of worldwide terrestrial mobile and global satellite services.

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[16] Second Report and Order, ET Docket No. 92-9, 7 FCC Rcd 6886 (1992) at App. A, § 99.5.

[17] See Rand McNally, Inc., 1992 Commercial Atlas & Marketing Guide 38-39 (1992).

21. In related proceedings, the Commission provided a transition plan to govern PCS licensees sharing their authorized spectrum with existing 2 GHz fixed microwave facilities or relocating those facilities to other spectrum;[18] determined that broadband PCS presumptively will be classified as a commercial mobile radio service under Section 332 of the Communications Act as amended by the Reconciliation Act;[19] and found that broadband PCS is within the Commission's competitive bidding authority, when it adopted generic competitive bidding rules and procedures.[20] With regard to competitive bidding for broadband PCS licenses, the Commission proposed to set aside two blocks of spectrum -- the 20 MHz block (Block C) and a 10 MHz block (Block D) -- that would be reserved for bidding purposes to "designated entities", (small businesses, rural telephone companies and businesses owned by members of minority groups and women), and proposed other measures to ensure economic opportunity for designated entities.[21] These proposals remain pending. The proposed set-aside and other outstanding issues concerning broadband PCS auctions will be decided in a forthcoming Order (in PP Docket No. 93-253) addressing competitive bidding rules.

22. In response to the Second Report and Order, 67 parties filed petitions requesting reconsideration or clarification. Of the 67 petitions, 58 primarily address issues relating to licensed PCS services and 9 primarily address issues relating to unlicensed PCS operations. The petitioners collectively request reconsideration of the spectrum allocation and frequency block plan, eligibility and attribution matters, construction requirements, technical standards, microwave interference criteria, power limits, radio frequency (RF) hazard requirements, and matters related to unlicensed PCS devices. The Commission received comments addressing the petitions for reconsideration from 44 parties and replies from 54 parties.

23. On March 17, 1994, the Commission established an intra-agency task force to coordinate the reconsideration of PCS policies and rules. On April 11 and 12, 1994, the task force conducted a series of public panel discussions on PCS issues. The panelists included potential PCS service providers, technical experts, members of the financial community, economists and representatives of designated entities. The presentations of the panelists and transcripts of the panel discussions were placed in the record of this proceeding, and 30 interested parties filed statements in the record responding to the panel discussions.

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[18] See First Report and Order and Third Notice of Proposed Rule Making, ET Docket No. 92-9, 7 FCC Rcd 7997 (1992).

[19] Second Report and Order, GN Docket No. 93-252, 9 FCC Rcd 1411, 1423 (1994) (CMRS Second Report and Order), recon. pending.

[20] See Second Report and Order, PP Docket No. 93-253, FCC 94-61, released April 20, 1994. (competitive bidding rules).

[21] See Notice of Proposed Rule Making, PP Docket No. 93-253, 8 FCC Rcd 7635, 7655 (1993); Second Report and Order at n.61.

III. SPECTRUM ISSUES AND SERVICE AREAS

A. Allocation, Block Plan and Service Areas.

24. In the Second Report and Order, the Commission allocated 120 MHz for licensed PCS and 40 MHz for unlicensed PCS from the 220 MHz of emerging technologies spectrum.[22] Specifically, (lower band) 1850-1890 MHz and 1930-1970 MHz, and the (upper band) 2130-2150 MHz and 2180-2200 MHz, were allocated for licensed PCS; and the 1890-1930 MHz band was allocated for unlicensed PCS devices. In addition, 60 MHz remained in reserve for future allocations to emerging technologies such as MSS or other applications. The frequency plan for licensed PCS included two 30 MHz frequency blocks, one 20 MHz block, and four 10 MHz blocks. Service areas were defined based on Rand McNally's "Major Trading Areas" (MTAs) and "Basic Trading Areas" (BTAs).[23] The two 30 MHz blocks were in the lower band and licensed on an MTA basis; the 20 MHz block also was in the lower band, but licensed on a BTA basis; and the four 10 MHz blocks were in the upper band and licensed on a BTA basis.[24]

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[22] See "PCS Band Plan" chart attached as Appendix D.

[23] See Rand McNally, Inc., 1992 Commercial Atlas & Marketing Guide 38-39 (1992) ("BTA/MTA Map"). Rand McNally organizes the 50 states and the District of Columbia into 47 MTAs and 487 BTAs. The BTA/MTA Map is available for public inspection at the Office of Engineering and Technology's Technical Information Center, Room 7317, 2025 M Street, N.W., Washington, D.C. 20554. For PCS licensing purposes, the Commission adopted service areas that separated Alaska from the Seattle MTA and added five insular areas: Puerto Rico, U.S. Virgin Islands, Guam, Northern Mariana Islands, and American Samoa. In our rules, the insular areas are treated as five BTA service areas and three MTA service areas. See Section 24.102 of the Commission's Rules. Additionally, a listing of counties, parishes, and census divisions that constitute each BTA and MTA is available for inspection at the Technical Information Center. This is a listing of Rand McNally's 47 MTAs and 487 BTAs, and therefore, the census divisions of Alaska are listed within the Seattle MTA and the insular areas are not listed.

[24] Some parties opposed the use of the Rand McNally MTAs and BTAs for PCS service areas. AIDE Comments at 10-15; FCBA Replies at 1-6; GTE Comments at 13-14; Hill & Welch Comments at 4-8; Killen Petition at 1-3; NTCA Petition at 2-3; PacBell Comments at 6-8; Point Petition at 3; UTC Petition at 3, 6; and PCIA Petition at 16-18. The principal objection was the use of proprietary and copyrighted material to define service areas for PCS. On February 15, 1994, a blanket licensing agreement was reached between PCIA, on behalf of PCS entities, and Rand McNally. This agreement permits all interested persons to use Rand McNally's copyrighted material for purposes of PCS licensing, building, marketing and operating. As a result of this agreement, PCIA asked to delete from its Petition for Reconsideration all issues related to the use of Rand McNally's MTA/BTA service areas and the objections of the other parties appear to have been resolved by this agreement. We

25. Twenty-eight parties argue for reconsideration of various aspects of the allocation and frequency block plan adopted in the Second Report and Order.[25] In general, the petitioners address: 1) alternatives for the PCS frequency block plan, including the number of PCS providers, PCS service areas, and issues relating to the aggregation or subdivision of PCS spectrum; 2) whether spectrum should be designated for private PCS use; and 3) the impact of the PCS allocation on the international allocations for mobile satellite service (MSS).

26. We are revising the band plan to move the 10 MHz blocks from the upper band to the lower band, increase the size of the 20 MHz block to 30 MHz, and reduce the number of 10 MHz blocks from four to three. The revised band plan is depicted in Appendix D, "Broadband PCS Band Plan," and detailed in the following table.

Frequency Block	Amount of Spectrum	Geographic Scope	Frequency Range
A	30 MHz	MTA	1850-1865/1930-1945 MHz
B	30 MHz	MTA	1870-1885/1950-1965 MHz
C	30 MHz	BTA	1895-1910/1975-1990 MHz
D	10 MHz	BTA	1865-1870/1945-1950 MHz
E	10 MHz	BTA	1885-1890/1965-1970 MHz
F	10 MHz	BTA	1890-1895/1970-1975 MHz
Unlicensed	20 MHz	Nationwide	1910-1930 MHz

27. This plan provides for three large blocks and three small ones. This will allow potential licensees to aggregate varying amounts of spectrum in different geographic areas depending on their individual business plans. The three large 30 MHz blocks ensure that

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therefore consider the copyright issues related to using MTA/BTA service areas to be resolved.

[25] See Alliance Reply at 2-4; APCO Petition at 6; Bell Atlantic Petition at 3; BellSouth Petition at iii; Columbia Petition at 1-3; Comcast Petition at 15-16; Comsat Petition at 15-22; CTIA Petition at iii; DWMP Petition at 3; Florida Cellular Petition at 4; Killen Petition at 1-3; Murray Petition at 4-8; INS Petition at 6; McCaw Petition at 7; NTCA Petition at 2-3; Nextel Petition at 5; NYNEX Petition at 3, 6-11; PacBell Petition at 2; PCS Action Petition at 3, 9-10; Pegasus Petition at 1-2; PNSC Petition at 5; Point Petition at 1-2; RCA Petition at 2, 7-8; TDS Petition at 2; Time Warner Petition at 2-7; TRW Petition at 2; Intelco Petition at 3-6; and UTC Petition at 2-6.

these licensees have sufficient spectrum to begin service rapidly. The three small 10 MHz licenses will allow the provision of services that might not require a full 30 MHz, or for aggregation with a 30 MHz PCS license or an existing cellular license. As noted above, moving the 10 MHz blocks from the upper band to the lower band provides a number of important procompetitive benefits: consumer equipment costs will be significantly lower, costs of relocating incumbent fixed microwave links will be significantly reduced for new PCS entrants, the ability to aggregate spectrum will be increased, and valuable spectrum will be preserved that can be used to provide mobile satellite service on a worldwide basis. This revised plan reduces the amount of spectrum for unlicensed devices, but will increase the ability of new consumer equipment to work on both a licensed and unlicensed basis, increasing the utility of the devices for consumers. The improvement in this band plan will increase competition, lower equipment costs and provide other benefits. As a result, consumers will receive lower-cost and higher-quality service.[26]

1. Block Positioning

28. NYNEX proposes that the number of licenses and size of the frequency blocks be maintained, but that the 20 MHz block be switched to the upper band and that two of the 10 MHz blocks be switched to the lower band and located between the two 30 MHz blocks.[27] NYNEX states that this would facilitate aggregation of up to 40 MHz in the lower band because both 30 MHz MTA blocks would be adjacent to a 10 MHz BTA block. It states that this arrangement of the frequency blocks would be especially helpful to cellular licensees who are limited to 10 MHz in-market, but can aggregate up to 40 MHz out-of-market. NYNEX states that this approach would allow a cellular carrier to purchase licenses only in the lower PCS band so that its customers would not need handsets that operate in both the upper and

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[26] In the Second Report and Order, the Commission declined to allocate additional support spectrum to connect PCS cell sites. We found that fixed service spectrum already allocated in other bands is adequate to support such PCS backhaul operations. The Commission also noted that some of these support operations can be provided through facilities that do not require use of radio spectrum, such as fiber optic cable. APC, in its comments to the petitions for reconsideration, requests that we allocate at least a portion of the 38 GHz band specifically for PCS backhaul operation. See APC Comment at 23-24. We continue to believe that the spectrum already allocated for fixed microwave services is adequate to support PCS operations and will not allocate additional spectrum at this time. We do recognize, however, that it is important that PCS operations have access to adequate support spectrum. Accordingly, we will henceforth examine more closely requests for use of the 38 GHz band to ensure that such requests are justified and that the spectrum is used efficiently.

[27] Appendix B lists parties that filed petitions for reconsideration, oppositions or comments, and replies. Abbreviations for parties used throughout this Memorandum Opinion and Order are indicated in this appendix.

lower bands. NYNEX states that, while it is possible to design equipment that can work in both the lower and upper PCS bands and the cellular bands, such "interoperable" handsets would result in increased equipment cost, size, weight, and power consumption.[28]

29. INS proposes two 30 MHz and two 10 MHz blocks in the lower band and one 30 MHz and one 10 MHz block in the upper band. It states that this plan would increase the opportunity for designated entities to aggregate 40 MHz because the current frequency plan encourages designated entities to bid on three different blocks (one 20 MHz and two 10 MHz blocks). INS agrees with NYNEX that use of spectrum in both bands would result in higher per unit capital costs and indicates that this is of particular importance to small businesses.

30. Bell Atlantic states that six 20 MHz blocks would eliminate the need for costly and inefficient aggregation of licenses between the lower and upper frequency bands. CTIA states that the plan adopted in the Second Report and Order will force licensees in the lower band to aggregate with the 10 MHz frequency blocks in the upper band if their systems require more than 20 or 30 MHz and contends that this approach requires complex and expensive equipment capable of operating in both bands.[29]

31. MSS providers argue that the location of the PCS allocations located in the upper band spectrum nullifies the International Agreement on Global MSS allocations. They propose combining all 120 MHz of licensed PCS in a single block below 2 GHz.[30]

32. Motorola discussed a plan to move all of the PCS spectrum to the lower band in ex parte presentations. They note that their plan gives the Commission the flexibility to allocate three 30 MHz and three 10 MHz licenses in the lower band. Motorola argues that bidders would be able to aggregate licenses without the need for dual band equipment.

33. A number of parties filed comments and ex parte presentations which also discuss the benefits of placing all of the licensed PCS spectrum in a contiguous band. These benefits include lower equipment costs and lower microwave relocation costs. In addition, some stress the increased ability of a provider to have spectrum in the same band in different service areas to provide competitive service.[31] Other parties discuss the desirability of having 10 and 30 MHz blocks in the same band as the 30 MHz blocks to facilitate aggregation.[32]

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[28] See NYNEX Petition at 3.

[29] See CTIA Petition at iii, 3-5.

[30] See MSS Industry Spectrum Coalition Briefing for PCS Task Force at 1-5 (April 14, 1994).

[31] See e.g., MCI Comments at 5.

[32] See NYNEX Comments at 2.

34. Decision. We initially authorized 10 MHz blocks in the upper PCS band. Many parties, however, argue that the upper band blocks would be of little value in the near term because equipment would not be developed for this spectrum for a year or more.[33] In addition, handsets that can bridge the upper and lower bands are predicted to cost about 25 percent more and to be bulkier than handsets operating only on the lower frequencies.[34] In addition, dual mode handsets would be heavier and have shorter battery life. Several parties argued that dual band handsets were essential to the success of upper band service because PCS operators would be likely to aggregate upper and lower band spectrum and consumers would want to be able to receive service on both bands, both to permit roaming across geographic areas and to facilitate changing service providers.[35] These parties contended that the higher costs, delay, and other limitations associated with the upper band presented serious impediments to achieving our goals of fostering a competitive market, rapid deployment, opportunities for designated entities, and fostering a wide diversity of services. Upon reconsideration, we conclude that MSS and PCS services can both be accommodated by using only lower band spectrum for licensed and unlicensed PCS services.

35. Moving licensed PCS from the upper band to the lower band provides a number of procompetitive benefits. First, the cost of interoperability between licensed and unlicensed PCS will be reduced. As noted above, equipment costs to consumers are predicted to be reduced by 25 percent. Moreover, under the revised plan, manufacturers will concentrate on a single band with uniform frequency spacing, which should result in greater economies of scale in manufacturing that reduce consumer equipment prices. This additional cost for interoperability between bands was not evident to us when we made our earlier decision. Increased interoperability has the additional benefit of reducing lock-in costs for consumers, giving them greater ability to switch providers, and thereby resulting in a more competitive market. Because of the less expensive handsets and the ability to combine adjacent blocks, aggregation is much more desirable. This will benefit all new providers, including designated entities, because they will be able to reduce costs and compete more effectively. Furthermore, there appear to be a number of different potential uses for the 10 MHz blocks: innovative niche services that are unlikely to be provided initially on the 30 MHz blocks, aggregation with the 30 MHz blocks, aggregation with other 10 MHz blocks, service extensions for incumbent cellular providers, and opportunities for designated entities to provide service with lower capital cost. Moving the 10 MHz blocks from the upper band to the lower band will enhance the value of some, if not all, of these uses and allow licensees to decide the most valuable use for the spectrum.

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[33] See e.g., NYNEX Petition at 3.

[34] See Transcripts of the PCS Public Forum at 247-249 (April 12, 1994); Letter from Motorola to the FCC at 2 (May 25, 1994); Letter from Concord to the FCC at 1 (May 31, 1994); Letter from Northern Telecom to the FCC at 1 (June 1, 1994).

[35] See Murray Petition at 7-8; PCS Action Petition at 2.

36. Second, the cost and time required to relocate incumbent fixed microwave links should be significantly less in the lower band because the number of microwave links in the upper band is higher than the number in the lower band.[36] While the bandwidth used by the upper band microwave incumbents is much less, making it easier to find some clear spectrum immediately, the ultimate requirement to clear the spectrum would result in significantly higher costs for PCS licensees.

37. Third, equipment should be available for the lower band at an earlier date. Manufacturers have spent significant time and resources developing lower band equipment but the record indicates that they have not done much work on developing equipment for the upper band. As a result, some parties assert that the availability of upper band equipment trails the availability of lower band equipment by about one year.[37] Time to market is a critical factor in the rollout of PCS services that will compete against existing cellular and enhanced specialized mobile radio (ESMR) entities. Thus, earlier equipment availability is a significant factor in developing a competitive PCS service.

38. Fourth, many cellular companies have expressed a desire to operate PCS systems both outside and inside their current cellular service areas.[38] By moving the PCS spectrum to the lower band, PCS and cellular providers will have the ability to provide service over a large geographic area even though they desire (or are required) to have different amounts of PCS spectrum in different areas. This capability could lower costs to the benefit of consumers because cellular companies will be able to compete using PCS spectrum inside and outside of their service areas.

39. Finally, as we discuss infra, moving all the PCS spectrum to the lower band will better meet the needs of the emerging MSS industry. We also believe that this action will increase the value of the unlicensed spectrum because interoperability with licensed PCS will increase.

40. Accordingly, we find that moving all of the PCS spectrum to the lower band will increase competition, reduce both consumer equipment and system costs, and increase equipment functionality. This new band plan has significant industry support, as evidenced by numerous recent filings submitted in the record by a variety of interests supporting Motorola's proposal to move all of the PCS spectrum to the lower band.[39]

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[36] See Transcripts of the PCS Public Forum at 145 (April 12, 1994).

[37] See Letter from PCS Action to the FCC (March 23, 1994).

[38] See e.g., NYNEX Petition at 3.

[39] See Letter from Motorola to the FCC (May 25, 1994); Letter from MCI to the FCC (May 26, 1994); Letter from Northern Telecom to the FCC (June 1, 1994); Letter from MSS Spectrum Coalition to the FCC (May 27, 1994); Letter from U.S. West to the FCC (June 1,

2. Block Size

41. In developing our original plan, we concluded that 10 MHz blocks could support viable and competitive PCS services through the use of advanced digital techniques, such as Code Division Multiple Access (CDMA) and Time Division Multiple Access (TDMA), and microcellular technology. We also stated that some types of PCS operations would require more than 10 MHz of spectrum. In addition, we recognized that initially PCS is required to share spectrum with fixed microwave operations and therefore the full amount of spectrum will not be available initially in many locations. We concluded that 20 and 30 MHz frequency blocks were needed to support the rapid development and implementation of the fullest range of PCS services. We also permitted most licensees to aggregate up to 40 MHz of broadband PCS spectrum in each service area, except that cellular licensees were limited to 10 MHz where their cellular geographic service area (CGSA) overlapped with the PCS service area. For these reasons, we concluded that the combination of 10, 20, and 30 MHz licenses would allow users to acquire the amount of spectrum appropriate for their applications.

42. In its petition, Time Warner requests that we allocate 40 MHz per PCS license. Time Warner argues that 40 MHz blocks are needed to share the PCS frequencies with fixed users and that allowing aggregation does not adequately remedy the problems caused by licensing blocks smaller than 40 MHz. Time Warner states that under current PCS rules, the only way for a licensee to aggregate 40 MHz is to aggregate across the lower and upper bands, which would necessitate the use of subscriber equipment that is larger and more expensive.[40] Alternatively, INS proposes that we divide the PCS spectrum into three 30 MHz and three 10 MHz blocks, arguing that this facilitates aggregation of spectrum without crossing between the bands and will enable designated entities to obtain a 30 MHz block in the lower band.[41]

43. Several parties express support for alternative plans based on blocks of equal size.[42] Bell Atlantic, BellSouth, Florida Cellular, Point, and TDS urge that we allocate six 20 MHz blocks (four 20 MHz blocks in the lower band and two 20 MHz blocks in the upper

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1994); Letter from OPATSCO to the FCC (June 2, 1994); Letter from CTIA to the FCC (May 27, 1994); Letter from Concord to the FCC (May 31, 1994); Letter from Pacific Telesis to the FCC (May 27, 1994); Letter from APC to the FCC (June 2, 1994).

[40] See Time Warner Petition at 2.

[41] See INS Petition at 6.

[42] In his petition, Murray requested allocation of all broadband PCS spectrum in 10 MHz blocks and licensed in BTA license areas. In his comments, however, Murray indicates that although he still favors 10 MHz licenses, a move toward uniformity (in channel blocks of 20 MHz) would be a improvement over the plan adopted.

band).[43] Bell Atlantic states that the net efficiency and capacity gain in moving from four 10 MHz to four 20 MHz blocks greatly outweighs the slight efficiency loss from reducing the two 30 MHz allocations to 20 MHz. Florida Cellular states that equal-sized blocks would provide a "more equitable playing field" for small businesses. Other commenters, especially smaller companies and associations representing the interests of smaller groups, support the principle that competition will be increased if we allocate blocks of equal size.[44]

44. Point submits that a 20 MHz block is more than enough spectrum to create a viable PCS service, arguing that digital technology permits a provider with 20 MHz to serve the entire population in all but the very largest markets. It argues that in a marketplace comprised of two cellular carriers, one wide-area specialized mobile radio (SMR) carrier, and from two to six viable PCS carriers, no single carrier could expect to achieve more than a 30 percent market share. Point concludes that a 20 MHz block is more than sufficient to serve 30 percent of the total population even in the largest markets.[45]

45. CTIA and Nextel propose four 20 MHz blocks in the lower band and four 10 MHz blocks in the upper band. CTIA and Nextel argue that digital technology offers unprecedented customer capacity and that the record does not identify any PCS service requiring as much as a 30 MHz block. Nextel states that 10 and 20 MHz blocks are sufficient to permit engineering around unrelocated microwave systems while encouraging the use of spectrally-efficient technologies.[46] Additionally, CTIA states that 30 MHz blocks make coordination with microwave incumbents more difficult than the 20 MHz blocks because incumbent microwave users generally have 20 MHz channels.

46. PacBell urges that we reduce the number of blocks (and PCS licensees). In particular, PacBell argues that, given two established cellular providers and one SMR competitor, a maximum of three new PCS providers would be viable even in the largest metropolitan areas.[47]

47. AMT/DSST, in joint comments, submit that the adopted frequency plan should not be altered. AMT/DSST argue that the petitioners reflect no consensus on the appropriate direction to be taken by the Commission on reconsideration. They state that the 10 MHz licenses will facilitate the provision of specialized or "niche" applications and that such

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[43] See Bell Atlantic Petition at 3; BellSouth Petition at 17; Florida Cellular Petition at 4; Point Petition at 2; TDS Petition at 2.

[44] See Murray Petition at 4-8.

[45] See Point Petition at 2.

[46] See Nextel Petition at 5-8.

[47] See PacBell Petition at 2.

specialized applications and services will not be offered by PCS providers operating on the larger blocks and expecting to compete with incumbent cellular providers. AMT/DSST also state that the two 30 MHz blocks will foster the rapid introduction of PCS services with system capacities comparable to cellular system capacities. In the view of AMT/DSST, the current plan represents a "reasoned balancing of the regulatory, policy and technical considerations that have received a full airing in this Docket."[48]

48. GCI states that, while it would have preferred fewer blocks, each with a greater amount of spectrum, the current frequency plan should not be revised. It states that the diversity of arguments for different block sizes demonstrates that a diversity of services may result from the allocation of spectrum blocks of varying size. Further, GCI believes that cellular providers will combine 10 MHz of PCS spectrum with their existing allocation of 25 MHz. GCI therefore believes it important to provide PCS licensees with 30 MHz so that new entrants can compete with cellular providers.[49]

49. A number of responding parties argue strongly that the current plan should not be amended to eliminate 30 MHz blocks in favor of smaller blocks. For example, APC states that the 30 MHz blocks are necessary to permit licensees to share spectrum with microwave users, to enable PCS to compete with the wired local loop, and to facilitate the provision of high-speed data broadband and information services. APC believes that entities favoring smaller spectrum blocks hope to place PCS providers at a competitive disadvantage to cellular and wide-area SMR operations.[50] PCS Action similarly argues that large spectrum blocks and geographic areas will enable independent PCS operators to be competitive sooner with the existing mobile communications providers.[51] US West believes that 30 MHz is necessary to support new entrants.[52] MCI submits that smaller blocks would increase the costs and delays associated with the development of a broadband wide area PCS system. MCI believes that smaller blocks would be inefficient and would require new entrants to resort to the secondary market to obtain the spectrum necessary to compete with other mobile communications providers.[53]

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[48] See AMT/DSST Comments at 2-8.

[49] See GCI Comments at 3-5.

[50] See APC Comments at 13.

[51] See PCS Action Comments at 3-9.

[52] See US West Petition at 9-12.

[53] See MCI Comments at 2-3, 5.

50. Bell Atlantic, CTIA, Nextel, and Sprint oppose Time Warner's proposal for 40 MHz blocks, arguing that such a large amount of spectrum would permit too much concentration of control and discourage participation by designated entities, who will tend to be smaller than other PCS providers.[54]

51. At the PCS Public Forum held on April 11 and 12, 1994, and in comments filed in response to those discussions, many of the parties supported 30 MHz blocks. For example, Mark Roberts of Alex Brown & Co. stated that PCS entrants will need large blocks of spectrum to be able to compete efficiently and to operate with a cost structure similar to that of cellular providers that already have 25 MHz. He further argued that license sizes of less than 30 MHz would be likely to lock in premium returns for the cellular industry.[55] Paul Rissman of Alliance Capital stated that the financial community would be interested in PCS only if large spectrum blocks are created.[56] Daniel Kelley of Hatfield & Associates stated that, given the spectrum clearing problems, 30 MHz would be about the minimum amount of spectrum needed for a PCS provider to compete with incumbent cellular providers.[57] Other participants at the public meeting, including George Murray, Dr. Charles Jackson, and Dr. Jerry Hausman, expressed the view that 20 MHz blocks would be sufficient for the provision of PCS service and that by allocating 20 MHz blocks the Commission could facilitate aggregation to 40 MHz if some providers felt that was necessary.[58]

52. Decision. In the Second Report and Order, we allocated two 30 MHz blocks, one 20 MHz block and four 10 MHz blocks. Our intent was to encourage participation of as many viable new PCS entrants as possible while maintaining sufficient spectrum to ensure the viability of both MSS and unlicensed devices. Based on the reasoning presented below, and on information provided by the petitioners and other responding parties, including presentations made by industry experts at our panel discussions, we find that our goals will be better served by two modifications to the band plan: (a) an increase in the size of the 20 MHz block to 30 MHz; and (b) a reduction in the number of 10 MHz blocks from four to three. Overall, the total amount of spectrum allocated for licensed PCS remains unchanged.[59]

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[54] See Bell Atlantic Comments at 4-5; CTIA Comments at 12; Nextel Comments at 10-12; Sprint Comments at 4.

[55] See Transcripts of the PCS Public Forum at 439 (April 11, 1994).

[56] See Transcripts of the PCS Public Forum at 441-449 (April 11, 1994).

[57] See Transcripts of the PCS Public Forum at 251-252 (April 11, 1994).

[58] See PCS Public Forum transcript at 111 (April 12, 1994) (Murray), 28 (April 12, 1994) (Jackson), and 353 (April 11, 1994) (Hausman).

[59] See "PCS Band Plan" attached as Appendix D.

53. One of our goals in this proceeding is to stimulate competition in the wireless and wireline industries, thus reducing costs and improving quality for consumers. In so doing, we must balance two objectives. First, we want to maximize the number of opportunities for new viable competitors to emerge. We also want to allow market forces to guide how many competitors survive. We have endeavored to provide as many opportunities as possible to aggregate blocks into viable service offerings to ensure that several strong competitors emerge to provide service. Our desire to maximize competition must be tempered, however, because 1) spectrum is limited and 2) for new entrants to be viable we must provide sufficient spectrum to begin service quickly with reasonable upfront capital costs. We believe that the combination of microwave incumbents occupying part of this spectrum and economies of scale lead to the conclusion that the a set of three 30 MHz blocks will support the rapid introduction of competitive PCS services whereas 20 MHz blocks could lead to PCS service start-up delays or a reduction in the number of viable competitors.

54. We believe that our new band plan is superior to uniform 20 MHz blocks, as advocated by Bell Atlantic, BellSouth, Florida Cellular, Point and TDS.[60] The combination of three 30 MHz blocks and three 10 MHz blocks allows the aggregation of a variety of license sizes that could not occur with uniform 20 MHz blocks.[61] As a result, we find that the allocation of six 20 MHz blocks would not provide as many benefits as either the allocation adopted in the Second Report and Order on the modified plan we adopt in this order and it might lead to fewer new service providers with sufficient spectrum to provide service quickly. We also reject the plan of twelve 10 MHz blocks proposed by Murray, because such an arrangement might seriously delay the implementation of PCS, since the process of aggregating so many spectrum blocks could be time consuming and costly.[62] It also could dramatically increase complexity and transaction costs at and after the auction. Finally, we believe that dividing the spectrum into 40 MHz blocks as requested by Time Warner would be inefficient for many applications and would foreclose innovative niche services.

55. The record indicates significant concern that a 20 MHz block may not provide sufficient spectrum to enable a PCS provider to compete effectively with other PCS licensees operating on 30 MHz spectrum blocks or with other commercial mobile radio service providers. Some parties argue that 20 MHz will provide sufficient capacity in the long run.[63] However, APC argues that with only 20 MHz, there could be a significantly larger portion of

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[60] See Bell Atlantic Petition at 3; BellSouth Petition at 17; Florida Cellular Petition at 4; Point Petition at 2; TDS Petition at 2.

[61] We also believe that fewer new viable PCS competitors might emerge under the six blocks of 20 MHz plan, given a spectrum aggregation limit of 40 MHz and the head start of cellular incumbents.

[62] See Murray Petition at 4-8.

[63] See Point Petition at 2; Nextel Petition at 5-8.

each service area where the licensee has no usable spectrum due to the presence of microwave incumbents.[64] The presence of fixed microwave links requires that, on the average, a licensee with 20 MHz initially will have to relocate more microwave links than a 30 MHz license before PCS service can begin, which could significantly delay the commencement of service and increase the upfront cost of initiating service. In addition, APC states that the ability of a microwave incumbent to delay or extract a premium for relocating its link because its microwave path fully blocks service diminishes significantly with a 30 MHz spectrum block.[65] While incumbent microwave links are 20 MHz wide, we feel that the advantages of being able to work around specific links with a 30 MHz block outweigh the additional transaction costs which result from not matching the incumbent fixed microwave assignments identically.

56. Other parties support the notion that a 30 MHz block will help new PCS entrants compete more effectively with existing wireless and wireline providers.[66] We also believe that limiting one licensee to 20 MHz could be a disadvantage for future competition. The ability to provide a complete package of mobile voice and data services could become a significant competitive advantage in the future. Such a package of wireless services, however, may require more than 20 MHz of spectrum.[67] Other services may require less spectrum and are better suited to the 10 MHz blocks.

57. Due in large part to these concerns, the investment community has stated that financing would be much more difficult to obtain for the licensees on the 20 MHz block than on the other blocks.[68] These handicaps are of particular concern to us because the 20 MHz block was proposed to be reserved for designated entities.[69] The competitive handicaps of a 20 MHz block relative to 30 MHz blocks would not have served our goal of providing a viable competitive opportunity for designated entities.

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[64] See APC Comments at 11.

[65] See APC Comments at 10.

[66] See PCS Action Comments at 4; INS Petition at 6; Letter from PacBell to the FCC (April 28, 1994).

[67] See PCS Action Comments at 4.

[68] See Transcripts of the PCS Public Forum at 439-449 (April 11, 1994).

[69] In the Notice of Proposed Rule Making in the competitive bidding proceeding, PP Docket No. 93-253, 8 FCC Rcd 7635 (1993) (competitive bidding), the Commission indicated that it would consider setting aside Blocks C and D for small businesses, rural telephone companies, and businesses owned by minorities or women. Reconciliation Act § 6002(a), 107 Stat. at 389. See H.R. Rep. No. 103-213, 103d Cong., 1st Sess. at 482-484 (1993) (Conference Report); H.R. Rep. No. 103-111, 103d Cong., 1st Sess. at 255 (1993).

58. Increasing the third license from a 20 MHz block to a 30 MHz block appears to eliminate any competitive disadvantages stemming from the band plan. The A, B and C blocks each will have a roughly equivalent portion of its service area completely blocked by incumbent microwave users in any geographic area. As a result, the costs and delay due to incumbent relocation should be similar on each of the blocks. This change should also reduce the difficulty faced by the C block licensee in obtaining financing. We conclude, therefore, that three equal sized 30 MHz blocks will facilitate competition and the rapid development and implementation of the fullest range of PCS services and ensure that PCS is more fully competitive with other mobile radio services. Accordingly, we are changing the single 20 MHz license to a 30 MHz license.

59. Time Warner petitioned us to allocate 40 MHz blocks in order to promote rapid introduction of service and to enhance the ability a wide range of services in competition with existing wireless and wireline providers.[70] While we believe that some new entrants may need to acquire 40 MHz to fully realize their business plans, requiring all applicants to purchase 40 MHz in all areas would not serve our goal of giving potential licensees the ability to determine the amount of spectrum they need for particular services, nor would it maximize competition. Companies that desire to provide service using 40 MHz can do so through aggregation at the auction or afterwards. Providing a combination of 30 MHz and 10 licenses MHz provides the benefits of 40 MHz licenses, without restricting the options of firms nor affecting competition.

60. Consistent with our decision to formulate a flexible definition of PCS, we allocated four 10 MHz blocks in the Second Report and Order that could serve a variety of needs.[71] We continue to believe that 10 MHz blocks, both on their own and in combination with the 30 MHz blocks or with each other, are useful to support a variety of PCS services. Throughout this proceeding, several parties have indicated that 10 MHz blocks would be suitable for providing services ranging from specialized or "niche" applications to services comparable to those now provided by cellular systems.[72] In addition, the 10 MHz blocks will be beneficial both for cellular licensees, who have limited eligibility for PCS participation in region, and possibly also for augmenting SMR. Finally, commenters discussed the desire to aggregate the 10 MHz blocks with the larger blocks in order to increase capacity for PCS services in heavy demand areas.[73]

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[70] See Time Warner Petition at 2.

[71] See Second Report and Order at ¶ 24.

[72] AMT/DSST states that specialized services can meet unserved demand for PCS and that 10 MHz will be sufficient for some applications. See AMT/DSST Comments at 4. See also CTIA Comments at 10; Murray Comments at 3-4; and Nextel Reply at 4; Transcripts of the PCS Public Forum at 43 (April 11, 1994).

[73] See PCS Action Reply at 2; Time Warner Reply at 2-4.