responsibility for specific identifiable innovations, as discussed above.

64. Bell Atlantic also disagrees with our tentative approval of Omnipoint's request, stating that Omnipoint's system is based on well-known spread spectrum techniques that have been used in both military and commercial equipment for over twenty years.[74] Therefore, Bell Atlantic argues, neither the concept nor the demonstration of operation at 2 GHz by Omnipoint is innovative. Bell Atlantic adds that SCSM, Digital Spread Spectrum Technologies, Inc. (DSST), and Qualcomm also manufacture 2 GHz CDMA equipment. Bell Atlantic also argues that European companies have designed TDMA PCS systems in the 2 GHz range, and further claims that Omnipoint's TDD/CDMA/FDD is a compilation of existing technologies. Finally, Bell Atlantic asserts that Omnipoint's request lacks substantial field or experimental data to demonstrate operational multicell feasibility.

65. Regarding Bell Atlantic's comments that Omnipoint's equipment is based on well-known spread spectrum techniques, Omnipoint asserts that the spread spectrum technologies and military projects to which Bell Atlantic refers are completely different from its technology. Omnipoint states that its engineers worked on each of the military projects mentioned by Bell Atlantic and that this did provide experience with spread spectrum technology, but that none of these military projects form the basis for a PCS system.[75] Omnipoint asserts that some of the differences are that the military equipment is much heavier than PCS equipment, is not duplex, uses frequency hopping rather than direct sequence techniques, and is high power. Omnipoint also asserts that Bell Atlantic glosses over the significant differences between its system and those of SCSM, Qualcomm, and DSST. Omnipoint claims that it was the first to miniaturize its phone and that it is responsible for integrating TDD with CDMA.

66. Concerning Bell Atlantic's assertion that Omnipoint has not demonstrated an operational system, Omnipoint asserts that several other parties in this proceeding use Omnipoint's equipment and that this demonstrates its technical feasibility. Further, Omnipoint maintains that it has fully demonstrated the systems's operation itself.[76]

67. Based on the record, we conclude that Omnipoint's equipment is innovative and substantially different from that of SCSM, DSST, Qualcomm, and the various military projects for which

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[74] See Bell Atlantic at 13 (January 29, 1993).

[75] Id. at 21.

[76] Id. at 23.

Omnipoint also developed equipment. We are not aware of any other entity proposing or building 2 GHz PCS equipment that allows for both transmit and receive on the same frequency channel (TDD) and multiple users on the same frequency channel (TDMA) while also providing for multiple cells on the same frequency channel by using spread spectrum and associated CDMA technology or by using different frequency channels (FDMA) with CDMA. This combination of FDMA and CDMA is used to provide diversity from one channel to the next. We are not convinced that developments in any of the mentioned military projects are capable of being used for pocket phone PCS. Additionally, we believe that not only has Omnipoint demonstrated the feasibility of multicell operations, but that other entities have used Omnipoint's equipment in various configurations that support our finding of feasibility.

68. Pacific Bell concedes that Omnipoint has made significant contributions to PCS, but argues that Omnipoint's proposed system is inferior to that developed by Pacific Bell.[77] Pacific Bell contends that Bell Atlantic tested both Omnipoint's and Pacific Bell's equipment and the results indicated that Pacific Bell has more sensitive receivers and that its TDMA technology has twice the coverage area and could operate at lower transmitter power.

69. In response to Pacific Bell, Omnipoint states that Pacific Bell's own data do not support its claims when subjected to the same analysis as Omnipoint's system. Additionally, Omnipoint asserts that the test upon which Pacific Bell relies was but one of many at this site, that the site was chosen because of its unusual propagation properties, and further, that Omnipoint's equipment used for the particular test in question contained experimental aspects not part of its current design.[78] We conclude that the record does not support Pacific Bell's claim.

70. Qualcomm claims that Omnipoint has not filed the results of an experiment or tests that validate the performance of its system.[79] Qualcomm also claims that Omnipoint failed to provide a detailed description of its system. It further argues that Omnipoint's interference to microwave facilities analysis is flawed and that a proper analysis would show that there is no significant difference in exclusion zone radius between Omnipoint's system and a narrowband system. Qualcomm states that Omnipoint erred by using average, rather than peak, powers in its calculations of interference to microwave operations, and argues

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[77] See Pacific Bell at 12 (January 29, 1993).

[78] Id. at Appendix 1.

[79] See Qualcomm at 19 (January 29, 1993).

that if Omnipoint's system transmitted the same number of speech bits over the same channel using the same antenna as a CT-2 system, its average power would be comparable to that of the CT-2 system.

71. Qualcomm also asserts that many technical details were omitted from Omnipoint's material, but that given the parameters provided, it appears that Omnipoint's system can provide only eight calls in each cell, using 10 megahertz of spectrum. Qualcomm further maintains that Omnipoint has not developed a working system and therefore would have to use a third party's equipment in order to capitalize on its pioneer's preference.[80]

72. Omnipoint responds that it has demonstrated a functional system, and provides statements from Ameritech, American Portable Telecommunications, Inc. (APT), Cox, SBPC, and Time Warner that each have tested Omnipoint's system. With respect to Qualcomm's assertion that Omnipoint's system cannot coexist with microwave operations, Omnipoint replies that experiments with SBPC disprove this claim.[81] Further, Omnipoint maintains that Qualcomm's assertion that Omnipoint uses average power in its interference analysis is incorrect. Omnipoint states that peak power is used in all of the calculations and coexistence tests.

73. We find no basis to question Omnipoint's interference analysis. Additionally, Omnipoint has demonstrated the technical feasibility of its system. Finally, we do not agree with Qualcomm's assertion that a preference applicant must use only its own equipment for a complete system.

74. Accordingly, we conclude that Omnipoint meets the standard specified in our rules for grant of a pioneer's preference. Omnipoint has demonstrated its role in developing PCS by designing and manufacturing innovative spread spectrum/ time division equipment. Omnipoint's handsets also have enabled other entities to develop PCS experimental systems, thereby facilitating experimentation and establishment of this new service. Omnipoint also has proposed a viable service with the flexibility to be implemented in a variety of environments and with capabilities useful to subscribers. Two of these capabilities are the flexibility in assigning time slots to mobile units so that long data messages can be transmitted in a short time, and the ability to switch from licensed PCS frequencies to unlicensed frequencies, thereby permitting subscribers to use the handsets in residential or office environments in a manner similar to that of a cordless telephone. Finally, the rules we are adopting are a reasonable outgrowth of

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[80] Id. at 24.

[81] Id. at 26.

Omnipoint's proposal and reflect Omnipoint's development of equipment in the 1850-1990 MHz band. The technical standards adopted in the PCS Second Report and Order are consistent with experiments performed by Omnipoint and those of several other parties using Omnipoint's equipment. Accordingly, we award Omnipoint a pioneer's preference.

License Block

75. In the Second Report and Order the Commission allocated seven blocks of spectrum for licensed PCS encompassing 120 megahertz at 1850-1890, 1930-1970, 2130-2150, and 2180-2200 MHz.[82] We also adopted regional and local PCS service areas based upon MTAs and Basic Trading Areas (BTAs).

76. APC, Cox, and Omnipoint argue that a 30 megahertz MTA grant is necessary to permit their implementation of the systems they have proposed.[83] APC states that the 10 megahertz BTA blocks at 2130-2200 MHz are too small, expensive, and time-consuming to clear, and require equipment that is costly and not yet available. APC explains that equipment to operate in the 2130-2200 MHz band will not be available until 1997. APC further contends that the crowded nature of the 2130-2200 MHz band precludes the use of some technologies, including CDMA. APC also argues that the 20 megahertz BTA block at 1880-1890/1960-1970 MHz is inadequate in many cities because of congestion. Finally, without regard to the amount of spectrum, APC argues that the economic integrity of the Washington/Baltimore market for which it has applied for a preference would be impaired by granting it any of the BTA blocks because Washington and Baltimore are in different BTAs. According to APC, using current technology, a 20 megahertz BTA block could not be combined with a 10 megahertz block in the 2130-2200 MHz band. APC concludes that grant of only a single 10 or 20 megahertz BTA block would prevent it from implementing the service it pioneered and would be inconsistent with its preference request.

77. Cox contends that preferences should not be awarded in the 2130-2200 MHz band because those specific frequencies have not been the subject of any preference applicant's tests; and that a 20 megahertz BTA grant would preclude fully developing its service in the 1850-1990 MHz band. Cox states that it performed studies of microwave congestion in the 1850-1990 MHz band and contends that from these studies it determined that 40 megahertz

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[82] See Second Report and Order, supra note 10.

[83] See APC letter of September 27, 1993 to Chairman Quello and Commissioners Barrett and Duggan; Cox letter of September 28, 1993 to Chairman Quello and Commissioners Barrett and Duggan; and Omnipoint letter of September 29, 1993 to Acting FCC Secretary William F. Caton.

is the minimum necessary to bring a fully functional range of PCS to the public.[84] Further, Cox maintains that given the nature of the mobile communications market, wide service areas such as MTAs will best serve customers. Finally, Cox states that Commission award of a preference other than a 30 megahertz MTA would not ensure enough spectrum for an innovator to provide service.

78. Omnipoint asserts that the 2130-2200 MHz band is virtually unusable with its system design; and that its system is optimized for use at 1850-1990 MHz with a total of 30 megahertz or more per operator. Omnipoint states that in its June 25, 1992 filing with the Commission it specified that it required such a spectrum assignment. It maintains that its system has been designed to co-exist with 5 and 10 megahertz microwave links at 1850-1990 MHz, rather than 800 and 1600 kilohertz links at 2130-2200 MHz; and argues that all of the key RF components in its equipment would have to be different to operate at 2130-2200 MHz. Omnipoint states that while its system can operate in the 2400-2483 MHz Part 15 unlicensed band, as well as in the 1850-1990 MHz PCS band, it is not designed to operate between 1990-2400 MHz. Further, it states that its system is designed to be used in a three frequency reuse pattern to obtain the economic benefits of its innovations, and that such a reuse pattern requires at least 30 megahertz.

79. Cablevision, Southwestern Bell Corporation (SBC), and Fidelity Investments and Cylink Corporation (Fidelity/Cylink) disagree that a 30 megahertz MTA license should be awarded pioneers.[85] Cablevision contends that the Commission's challenge is to fit pioneer's preference awards into the PCS structure, rather than accommodating the desires and expectations of the preference grantees. According to Cablevision, this can best be accomplished by awarding pioneers the 20 megahertz BTA block at 1880-1890/1960-1970 MHz. Cablevision maintains that a 10 megahertz block at 2130-2200 MHz would unfairly marginalize the contribution made by the grantees at 1850-1990 MHz, but that a 20 megahertz BTA block would permit the grantees to use the band in which they have conducted experiments, while not

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[84] Cox notes that 2 GHz PCS licensees may aggregate spectrum up to 40 megahertz in a geographic area; see Second Report and Order, supra note 10, 8 FCC Rcd at 7813.

[85] See Cablevision letter of October 5, 1993 to Chairman Quello and Commissioners Barrett and Duggan; SBC letter of October 14, 1993 to Chairman Quello and Commissioners Barrett and Duggan; and Fidelity/Cylink letter of October 8, 1993 to Acting FCC Secretary William F. Caton. Cablevision filed a pioneer's preference request in this proceeding, see PP-10, and subsidiaries of SBC and Fidelity/Cylink also filed pioneer's preference requests, see, respectively, PP-17 and PP-42.

conveying a windfall 30 megahertz MTA block that could have a preclusive effect on other licensees. SBC concurs, stating that a 20 megahertz BTA block would be enough spectrum to provide adequate PCS service.[86]

80. We find the arguments of APC, Cox, and Omnipoint persuasive. Each applicant conducted experiments in the 1850-1990 MHz band, not in the 2130-2200 MHz band. An award in the lower band is appropriate and will ensure that the grantees can implement the services they have proposed. While we continue to believe that the upper band has the potential to provide a variety of important PCS services, APC, Cox, and Omnipoint have designed their systems and conducted their experiments in the 1850-1990 MHz band. Further, we are not convinced that a 20 megahertz BTA grant would be adequate, given the nature of the systems proposed.[87] Accordingly, we are awarding each pioneer a 30 megahertz MTA block in the area each requested. If otherwise qualified, APC will be licensed to use Channel Block A in the MTA that includes Washington, D.C. and Baltimore, Maryland; Cox will be licensed to use Channel Block A in the MTA that includes San Diego, California; and Omnipoint will be

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[86] Fidelity/Cylink argue that a 10 megahertz BTA block at 2130-2200 MHz would be adequate because such a block would enable the provision of full-featured PCS, as well as many specialized PCS services. Fidelity/Cylink contend that the paramount technical challenge in the design of PCS spread spectrum radios is the development of the digital baseband, and not the design of the radio frequency segment, and accordingly use of the 2130-2200 MHz band is not a substantial limiting factor. Fidelity/Cylink state that while design of a common antenna to serve both the 1850-1990 MHz and 2130-2200 MHz bands would require significant technical effort, this effort is not insurmountable. Further, according to Fidelity/Cylink, a common antenna is not necessary to realize the benefits of an allocation at 2130-2200 MHz. Fidelity/Cylink assert that a 10 megahertz block in this band can, with the use of emerging technologies such as Synchronous CDMA/FDMA/TDD, achieve greater system capacity than an existing 25 megahertz cellular radio block.

[87] Additionally, we note that in our Notice of Proposed Rulemaking on competitive bidding we proposed to set aside the 20 megahertz BTA block for small businesses, rural telephone companies, and businesses owned by minorities and women. See Implementation of Section 309(j) of the Communications Act Competitive Bidding, PP Docket No. 93-253, Notice of Proposed Rule Making, 8 FCC Rcd 7635 at 7655 (1993).

licensed to use Channel Block A in the MTA that includes northern New Jersey.[88]

Pioneer's Preferences Denied

81. American Portable Telecommunications, Inc. (PP-7). APT requests a pioneer's preference for having integrated traditional paging service with a proposed PCS service providing CT-2 type voice communications with one-way alpha-numeric messaging. APT names its service Enhanced Personal Message Service (EPMS). APT states that EPMS is designed to provide: 1) improved control by users over incoming and outgoing messages; 2) enhanced functions, including call forwarding and redirecting of calls; 3) improved spectrum efficiency over existing and proposed PCS systems; and 4) cost savings over existing and proposed PCS systems. APT also states that its system will take advantage of digital compressed voice in combination with EPMS to provide additional services.

82. In APT's proposed system the customer would receive a paging message on a 900 MHz paging channel. The customer could acknowledge the page by making a connection over a PCS channel, or have the EPMS redirect the call. APT maintains that its proposal constitutes a new service because it combines digital communications using PCS with a two-way messaging or acknowledgement capability. APT calls this its "message back" feature.[89] APT claims that its proposal is innovative because its enhanced messaging service would permit users to exercise control over incoming and outgoing message traffic.

83. In comments on APT's pioneer's preference request, GTE states that the request should be denied because it is grounded in outdated CT-2 technology. GTE states that APT's proposed PCS system will be capable only of providing two-way voice communications near microcell base stations. As such, according

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[88] To provide certainty to other parties that may be preparing analyses for 30 megahertz MTA channel blocks we are designating the specific spectrum and geographic areas for the pioneers. Each grantee, if otherwise qualified, will be licensed for Channel Block A, 1850-1865 and 1930-1945 MHz, in the MTAs noted supra. The existing pioneer's preference rules will apply to these license grants, see note 2 supra. The existing pioneer's preference rules do not contemplate payment for the value of the spectrum awarded, see 47 CFR § 1.402; First Report and Order, ET Docket No. 93-266, supra note 2, at note 23. Therefore APC, Cox, and Omnipoint will not be required to pay any spectrum-based charge for the grants.

[89] APT defines "message back" technology as that which provides a two-way acknowledgement of a page and its "meet me" concept as that which allows immediate connection between the person initiating the page and the user.

to GTE, the paging device is a necessary component because it is the only device which is powerful enough to reach the subscriber and make the initial contact.[90]

84. In reply, APT contends that GTE did not offer any justification for arguing for denial, given that APT is continuing to conduct its experimental program.[91] APT requests that the Commission hold open the record until its tests are completed.

85. In our Tentative Decision we proposed to deny APT's request because APT had not demonstrated the feasibility of its technology or that it had developed the capabilities or possibilities of a specific identifiable PCS technology or service or had brought it to a more advanced or effective state.[92]

86. In its comments APT argues that it has demonstrated its key role in developing its proposed EPMS, which it argues is significantly innovative compared to existing and proposed PCS services in that EPMS gives control of the call to the subscriber and is spectrum efficient in its use of paging channels for the initial contact.[93] APT states that it originated and developed its proposed service that integrates PCS voice communications with two-way messaging capability. According to APT, its proposed service puts control of the incoming call in the hands of individual wireless service customers through its handheld unit and provides the ability of redirecting an incoming call in many ways not currently available in the wireline service. APT asserts that these new capabilities allow the subscriber to screen and control the call, include taking a message and forwarding or redirecting it to another location. APT also maintains that using a paging frequency for the incoming contact results in significant efficiencies in spectrum use and that this translates to a reduction in user costs.[94]

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[90] See GTE at 10 (January 24, 1992).

[91] See APT Reply at 7 (February 18, 1992).

[92] Our pioneer's preference rules require that an applicant demonstrate the technical feasibility of its system either through a technical showing or by results from experiments. See Pioneer's Preference Report and Order and Pioneer's Preference Recon. Order, supra note 2, 6 FCC Rcd at 3493 and 7 FCC Rcd at 1809, respectively.

[93] See APT at 2 (January 29, 1993).

[94] Id.

87. In addition, APT asserts that it first proposed its service concept in July 1991, long before any other participant in this proceeding. It contends that this timing confirms its responsibility for development and demonstration of its proposed new service. Also, APT claims that market projections and user surveys indicate public demand for its proposed service. Finally, APT argues that the Commission should consider service innovation aspects of its proposal, not just the technology, and that in the Tentative Decision the Commission ignored proposals that enhance services.

88. We find that integrating two-way voice service with a paging service is not innovative and that APT also has not demonstrated innovation in developing new communications technology. APT's proposed system relies on older technology to provide a service that is not a significant enhancement of existing services. While APT states that its system will use digital compressed voice, it does not define this term nor indicate what role APT played in the development of this technology. Accordingly, we deny APT's pioneer's preference request.[95]

89. Associated PCN Corporation (PP-8). Associated requests a pioneer's preference for its proposal to provide a PCS service that would provide voice and data mobile services and share the 1850-1990 MHz band by avoiding interference with incumbent fixed microwave operations through what Associated contends is an innovative use of technology.[96] This technology would combine frequency hopping and direct sequence CDMA spread spectrum, and would be capable of providing "spot capacity" on demand by hopping over 13 different 5 megahertz CDMA channels in each direction (transmit and receive), thus requiring a total of 130 megahertz (5 megahertz times 13 channels in each direction). Associated states that the key advantage of its proposed system is its ability to be implemented immediately without displacing existing 2 GHz users. This capability would be achieved by mapping existing channel usage and by using extensive software to select channels that are not in use. Thus, Associated argues its system can be overlayed on an existing service without affecting that service. The service would provide both digital voice and data messaging channels on demand. Associated claims it deserves a pioneer's preference because it was the first entity to combine

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[95] Although we tentatively denied APT's pioneer's preference request for failing to demonstrate technical feasibility, after a complete review of the record, we conclude that APT fails the test of not demonstrating a new or innovative contribution to communications technology.

[96] See Associated's pioneer's preference request at 4-2 (August 13, 1991).

direct sequence spread spectrum, frequency hopping, and frequency management concepts into a PCS system.

90. Associated states that its system would feature small microcells of between .5 to 5 miles in radius; small base stations that are inexpensive and can be mounted in various locations including on poles or buildings; careful frequency planning and sophisticated software in the portable units to allow intelligent spectrum sharing with other systems; the capability to accurately locate each mobile; and multi-channel usage that allows additional service and lower rates.

91. Associated contends that its proposal is innovative because: 1) it was the first to combine direct sequence spread spectrum, frequency hopping, and frequency management into one system for interference avoidance; 2) it uses microcell technology employing cells of .5-5 miles in radius resulting in 10 times the number of voice channels as traditional cellular radio systems; and 3) it features a frequency sharing concept developed prior to that of APC.[97]

92. In comments to Associated's pioneer's preference request, APC maintains that Associated's attempt to develop a cellular-type PCS that uses frequency hopping is not innovative and does not warrant a pioneer's preference.[98] APC asserts that Associated's system does not provide interference avoidance as does the APC system and also contends that Associated has never tested a complete PCS system nor demonstrated the technical feasibility of its approach. PacTel also argues that Associated has not demonstrated the feasibility of its proposed system.[99] Finally, Rockwell International Corporation (Rockwell) maintains that Associated's proposed system may cause interference to existing microwave systems.[100] Rockwell states that narrowband systems such as that of Associated, when used in tall buildings, cannot prevent interference to microwave systems unless global planning is done, resulting in reduction of the capacity of the system. Further, Rockwell states that narrowband systems can be potentially more complex due to the fact that the narrowband interference has higher power and less white RF noise (random noise) than wideband systems and will affect more distant microwave users.

93. In the Tentative Decision, we found that the pioneer's preference request filed by Associated constituted a compilation

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[97] Id. at 2-4 through 4-2.

[98] See APC reply, appendix at 11 (February 18, 1993).

[99] See PacTel at 9 (January 24, 1992).

[100] See Rockwell at 2 (June 24, 1992).

or aggregation of existing communications technologies or systems or did not constitute a unique or innovative technology or service. Therefore, we tentatively denied Associated's request.

94. In comments filed in response to the Tentative Decision, Associated contends that the Commission proposed to award APC a pioneer's preference rather than Associated because we concluded that APC had commenced activities prior to Associated. Associated asserts that such a basis for award of a pioneer's preference is illegitimate, but that in any event, it preceded APC both with respect to the proposal of a frequency agile spectrum sharing technology and the field testing of this technology. Additionally, Associated maintains that its system is superior to that of APC, which it maintains uses mostly CT-2 technology and off-the-shelf hardware. Associated contends that it has developed a true PCS system that utilizes custom equipment including sophisticated frequency mapping software.

95. In reply comments to the Tentative Decision, APC argues that the entire scope of Associated's developmental activity lies in its attempt to develop a cellular-style hand-off technique for PCS using frequency hopping, as opposed to APC's frequency management system.[101] Further, APC maintains that Associated has not deployed a working PCS system to demonstrate its approach.

96. Associated's proposed system would require each licensee to be assigned 130 megahertz of spectrum and therefore is incompatible with the rules we adopted in the PCS Second Report and Order.[102] Further, Associated has not demonstrated that its system will avoid interference to existing fixed microwave licensees. Finally, Associated's approach is a frequency overlay scheme, and as such, is not new and innovative technology. Accordingly, we deny Associated's request for a pioneer's preference.[103]

97. Atlantic Cellular Company, L.P. (Atlantic) (PP-9). Atlantic filed a pioneer's preference request seeking to use microwave facilities to be integrated with currently existing PBX and cellular technology to provide a low cost PCS network that would allow switching from the handset between the microwave and

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[101] See APC reply at 11 (March 1, 1993).

[102] We are not permitting PCS licensees to have an ownership interest in more than 40 megahertz in a geographic area; see Second Report and Order, supra note 10, 8 FCC Rcd at 7813.

[103] As discussed in para. 30, supra, since there are substantive differences between the pioneer's preference requests of Associated and APC, there is no need to consider their filing timetables.

cellular system at the discretion of the user. However, Atlantic does not provide technical design details of its system.

98. In comments on Atlantic's proposal, PacTel states that insufficient detail is provided by Atlantic to demonstrate the feasibility of its system.[104] In its comments, GTE argues that Atlantic's band switching technique has been in practice for years and is deployed in Japan and Europe and as such does not warrant a preference.[105]

99. In our Tentative Decision we proposed to deny Atlantic's pioneer's preference request for failure to submit either the preliminary results from an experiment or a sufficient showing of technical feasibility. Atlantic did not respond to the Tentative Decision. Accordingly, we deny Atlantic's pioneer's preference request.

100. Cablevision Systems Corporation (PP-10). Cablevision proposes to provide a range of PCS services including voice and interactive data and video by using cable television facilities to interconnect microcells. It requests a preference for its proposal to use Cable Television Relay Service (CARS) frequencies on a secondary basis for the provision of mobile to base PCS communications. Cablevision claims that it was the first to outline in detail the possibilities of utilizing cable television facilities for PCS. It states that it plans to use CDMA modulation techniques and that subscriber units will include dynamic power control circuitry. It proposes to use a distributed antenna system that uses remote antenna drivers connected to microcells to form a seamless coverage area. Cablevision contends that its "star architecture" enables efficient spectrum reuse by utilizing multiple trunk outputs emanating from the cable headend. Cablevision also claims to use centralized intelligence to achieve call handoff between microcells in a cost effective manner, and states that it has demonstrated handoff at vehicular speeds in its PCS experiments.

101. In comments to Cablevision's pioneer's preference request, GTE asserts that Cablevision did not demonstrate the feasibility of its technology.[106] PacTel concurs, contending that Cablevision's request is "speculative and premature," and that Cablevision's concepts are vague and the information supplied is insufficient to enable the Commission to judge the merits of the proposal.[107] However, Associated disagrees,

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[104] See PacTel at 14 (January 24, 1992).

[105] See GTE at 7 (January 24, 1992).

[106] See GTE at 16 (January 24, 1992).

[107] See PacTel at 15 (January 24, 1992).

stating that Cablevision has met most of the requirements for a preference and that its technical discussion appears complete.[108]

102. In reply comments, Cablevision asserts that GTE and PacTel ignored the unique applications that could stem from using cable television facilities to carry PCS.[109] Cablevision states that it has made major progress towards demonstrating the feasibility of its proposal in its pioneer's preference request and quarterly reports, and that GTE's and PacTel's analysis ignore its accomplishments.

103. Cablevision's request was tentatively denied in the Tentative Decision for failure to develop and demonstrate its proposed PCS technology and also for failure to demonstrate its specific contributions to the technology and equipment used in its experiments. We further stated that Cox had preceded Cablevision and other cable entities in its cable/PCS development. In comments to the Tentative Decision, Cablevision replies that it filed its experimental PCS application in September 1990, prior to initiation of Canadian trials and efforts to develop cable-based CT-2 equipment, and that this application contained critical concepts absent from Cox's experimental application.[110] Cablevision acknowledges that the Nexus Engineering Corp. (Nexus) developed RAD technology for CT-2 implementation, but maintains that it and Nexus worked together to convert this technology to provide PCS to subscribers at vehicular speeds. Cablevision claims that prior to this enhancement, a subscriber could not move from one RAD area to another. Cablevision asserts that no other party has made comparable contributions to enhancement of cable-based RAD or distributed antenna technology. Cablevision also asserts that its experiment demonstrated the feasibility of its star architecture.

104. We note that several entities have proposed cable-based PCS systems in this proceeding. We believe that Cablevision has established itself as a contributor to cable-based PCS, but we believe that it has failed to meet the threshold of innovativeness necessary to qualify for a pioneer's preference. Specifically, the developments that Cablevision appears to be responsible for are: 1) the use of CARS frequencies for PCS service, 2) the establishment of PCS in a star architecture, and 3) the enhancement work with Nexus to permit its RAD to handoff at vehicular speeds. Regarding the first development, we cannot give a preference for the proposal to use

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[108] See Associated at 7, 10, 12, 15 (January 24, 1992).

[109] See Cablevision Reply at 8-10 (February 18, 1992).

[110] See Cablevision at 6 (January 29, 1993).

CARS frequencies for PCS because we did not adopt this proposal in the Second Report and Order. Regarding the second development, other entities have also proposed the use of a star architecture for their cable plant. This architecture may enhance PCS operation over that of a tree/branch architecture,[111] but it is a component of the cable television network and not a development created for the implementation of PCS on the network. Therefore it does not qualify as a PCS innovation. Hence, the single contribution for which Cablevision appears to be partially responsible is its work with Nexus' RAD technology to permit handoff at vehicular speeds. However, Cablevision has not clearly defined its own specific role in developing this technology. Also, we note that at lower frequencies vehicular handoff was achieved many years ago by cellular radio providers. Accordingly, we deny Cablevision's pioneer's preference request.

105. Linkatel Communications, Inc. (LCI) (PP-12). LCI requests a pioneer's preference to provide PCS service using a fiber optic ring network that would carry digital voice and data signals to various locations in a ring configuration and hand-off individual voice signals to any point in the ring. LCI states that it plans to use direct sequence spread spectrum CDMA for providing high quality PCS but does not specify the bandwidth or other technical specifications of its spread spectrum design.

106. PacTel and GTE comment that the LCI proposal is quite vague and does not appear to be innovative because many parties began work on use of CDMA for spectrum sharing before LCI.[112] In the Tentative Decision, we proposed to deny LCI's request for failure to demonstrate the technical feasibility of its proposal. LCI did not respond to the Tentative Decision. Accordingly, we deny LCI's pioneer's preference request.

107. LiTel Telecommunications Corporation (LiTel) (PP-13). LiTel requests a pioneer's preference for its proposal to use point-to-point Part 15 spread spectrum communications links to provide backbone or infrastructure support for PCS.[113] LiTel maintains that it is a leader in the development of PCS and the

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[111] The tree/branch architecture consists of a main trunk that distributes the signal from the headend to an area and branches off the main trunk that distribute the signal to individual subscribers. This distribution architecture requires multiple amplifiers in series to transmit a signal from the headend to the end of a branch.

[112] See PacTel at 16 and GTE at 8 (January 24, 1992).

[113] See Pioneer's Preference Request at 2 (October 10, 1991) and experimental license application, 1947-EX-PL-91, exhibit 2 (April 25, 1991).

first to seek authority to test a Part 15 spread spectrum system in the 2.4-2.4835 and 5.725-5.85 GHz (2.4 and 5.8 GHz) bands. LiTel asserts that this infrastructure could be used as part of the infrastructure of a PCS network. It states that it plans to test spread spectrum transmission in the 2.4 and 5.8 GHz bands for point-to-point applications.[114]

108. In comments on LiTel's request, PacTel states that deficiencies in the request should lead to its denial.[115] PacTel maintains that LiTel's request is vague and lacks details of its proposed service and innovation. GTE also argues that the Commission should deny the LiTel request because, GTE asserts, it is focused on planned research, devoid of actual development, and fails to demonstrate the technical feasibility of its proposed system. Associated also questions whether LiTel's proposal warrants a preference.

109. In reply comments, LiTel counters that it has brought PCS technology to a more advanced and effective state by its testing of Part 15 point-to-point spread spectrum devices at the 2.4 and 5.8 GHz ranges to supplement PCS systems.[116] According to LiTel, its development of these devices will reduce the spectrum needed for PCS.

110. In our Tentative Decision we proposed to deny LiTel's request for a preference because LiTel had not demonstrated the feasibility of its proposed technology or that it had developed the capabilities or possibilities of a specific identifiable PCS technology or service or had brought it to a more advanced or effective state.

111. LiTel responds that its three years of developmental testing demonstrate the technical feasibility of Part 15 point-to-point spread spectrum systems that can be used to support PCS systems. Further, LiTel states that it has demonstrated technical feasibility by successfully testing equipment. Specifically, it states that it has successfully transmitted voice over a 3-mile link and transmitted composite data over back-to-back links of one and 8.6 miles. Further, LiTel asserts that it brought out the capabilities of a specific PCS technology by developing a family of mobile radio communications services that could provide services to individuals and businesses and be

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[114] These bands already are designated for use under Part 15, which allows point-to-point spread spectrum operations.

[115] See PacTel at 16 (January 24, 1992).

[116] See LiTel Reply at 2 (February 14, 1992).

integrated with a variety of competing networks using Part 15 equipment that would not interfere with existing users.[117]

112. LiTel maintains that its technology will support PCS by connecting base stations using Part 15 point-to-point wireless links rather than cable or licensed microwave links, and will permit operators to construct mobile networks quickly and inexpensively. It argues that its proposed system would permit economical and rapid deployment of PCS services and substitution of existing infrastructure for spectrum.

113. LiTel's pioneer's preference request is based upon its claimed innovation in developing spread spectrum point-to-point communications in the unlicensed Part 15 bands at 2.4 and 5.8 GHz for use as backbone for a dedicated PCS system. LiTel's technology and backbone service already is authorized at these frequencies by our rules. Insofar as LiTel argues that its fixed technology may be used to support PCS, it has developed but one of a number of methods available to support the service. LiTel has not demonstrated that its fixed technology is an integral part of a specific PCS system or PCS systems in general. With regard to the family of PCS services that LiTel argues it has developed, it has not specified what these services are or what its role has been in their development. Thus, LiTel has not demonstrated by way of a technical showing or through experimental test results a specific contribution to 2 GHz PCS. Accordingly, we deny Litel's pioneer's preference request.

114. PCN America, Inc. (PP-15). PCNA requests a pioneer's preference for its proposal to implement PCS in the 2 GHz fixed microwave bands using microcells that it claims can co-exist with the current fixed users through the use of broadband CDMA spread spectrum at 1850-1990 MHz. Its request is based upon small, inexpensive, pocket-sized handsets that communicate with cells that are considerably smaller than those used in the cellular industry today. PCNA states that in November 1989 it was first to propose rules to authorize a personal communications network; originate a cellular concept that could co-exist with current users of the 2 GHz band; conduct extensive tests using spread spectrum techniques that demonstrate the spectrum sharing capabilities of its system; demonstrate public demand for PCS through a nationwide survey; and coordinate industry-wide PCS initiatives involving other PCS experimental licensees, including making its technology available to others.[118]

115. Specifically, PCNA proposes to use direct sequence spread spectrum and spread the signal over 48 megahertz for

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[117] See LiTel at 4 (January 29, 1993).

[118] See PCNA Reply at 2 (February 18, 1992).

transmitting between handsets and microcells.[119] The base stations would automatically adjust the power of each handset so that the power received by the base station from each handset is the minimum required to complete the transmission without interference.

116. In comments to the PCNA pioneer's preference request, PacTel states that PCNA has demonstrated substantial developmental work in the area of 2 GHz PCS but has not submitted sufficient information to warrant a preference.[120] Both PacTel and PCNS-NY assert that PCNA has not demonstrated the technical feasibility of its system.[121] GTE concedes that PCNA has presented a colorable claim for a preference, but argues that the request should be denied because it is based solely on an assertion that PCNA was the originator of the PCS spectrum sharing concept.[122] GTE also maintains that PCNA's experimental data lacks the information necessary to support its claim that spectrum sharing is feasible.

117. In the Tentative Decision we found that although PCNA had devoted substantial effort and resources in developing and demonstrating a broadband spread spectrum proposal, its system did not comply with the Commission's channelization proposal for the 2 GHz band as outlined in the Notice of Proposed Rule Making (Notice) in this proceeding.[123] We also concluded that PCNA had not demonstrated that broadband spread spectrum operations could be used successfully to avoid interference to existing fixed users. Accordingly, we proposed to deny PCNA's request.

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[119] See PCNA at 16 (August 7, 1991). However, later PCNA proposed testing a system that spread over 40 megahertz of contiguous spectrum using TDD for transmission of the spread spectrum signal in both the transmit and receive mode in the same 40 megahertz. See PCNA letter to Chief Engineer, Federal Communications Commission, File No. 1343-EX-PL-90, at 3 (May 20, 1992). Based on the comments received in this proceeding regarding the likelihood of interference to fixed microwave users from a broadband spread spectrum system, the Commission did not approve the experimental testing of the 40 megahertz TDD system proposed by PCNA and concluded that broadband overlay type spread spectrum systems were not viable for avoiding interference to the 2 GHz fixed microwave users.

[120] See PacTel at 10 (January 24, 1992).

[121] Id. See also PCNS-NY Reply at 10 (February 18, 1992).

[122] See GTE at 17 (January 24, 1992).

[123] See Notice of Proposed Rule Making and Tentative Decision, GEN Docket No. 90-314 and ET Docket No. 92-100, 7 FCC Rcd 5676 (1992).

118. In comments responding to the tentative denial, PCNA contends that it merits a preference because it is responsible for the fundamental concepts that underlie the Commission's vision of PCS. It maintains that it was tentatively denied a preference because of a single element of its proposal that was not adopted by the Commission[124], the use of two 48 megahertz channels for broadband spread spectrum. It asserts that it outlined the initial idea and substantially the entire regulatory scheme for PCS to the Commission. It further argues that its November 1989 petition for rule making first recommended locating PCS in the 2 GHz band and that it was the first to propose sharing this band with incumbent microwave users on a co-primary basis. Finally, PCNA maintains that it conducted the first significant demand study of PCS, as well as propagation and interference tests in the 2 GHz band.[125] While it expresses support for the grants of pioneer's preference awards to APC, Cox, and Omnipoint, it argues that it first advanced many of the concepts credited to these companies.

119. In reply comments to the Tentative Decision, PCNA contends that no company in the proceeding contributed to PCS as much as it did. It reiterates that it was first to: 1) petition for a rule making to allocate PCS spectrum; 2) focus attention on the need for spectrum at 1850-1990 MHz; 3) propose sharing the band with the incumbent microwave users and to perform extensive interference testing; 4) demonstrate that fixed microwave use was light in the band; 5) demonstrate the demand for PCS; and 6) propose the advantages of CDMA for microcell mobile communications.[126]

120. Although we recognize that PCNA filed the petition that contributed to initiating our PCS proceeding and made a substantial effort to develop technology to facilitate the service, PCNA does not meet the pioneer's preference criteria set forth in our rules. After PCNA's petition, the concepts and proposed services envisioned for PCS have expanded substantially and there have been a large number of other entrepreneurs that, like PCNA, obtained experimental licenses and performed extensive experiments. In adopting the pioneer's preference rules the Commission observed that an otherwise qualified innovating party would risk that the Commission might not accept its proposal.[127] The PCS Second Report and Order adopted rules

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[124] See PCNA at 5-6 (January 28, 1993).

[125] See PCNA at 2 (January 28, 1993) and Reply at 10 (March 1, 1993).

[126] See PCNA Reply at 3-6 (March 1, 1993).

[127] See Pioneer's Preference Report and Order, supra note 2, 6 FCC Rcd at 3492.

that provide for the implementation of PCS based upon an entirely different technological concept than proposed by PCNA, and to which it devoted its technical development efforts. Our rules provide maximum spectrum assignments of 40 megahertz per licensee (20 megahertz paired with a second non-contiguous 20 megahertz). This spectrum plan precludes use of PCNA's system without regard to whether using PCNA's system would cause interference to existing microwave systems. Most importantly, PCNA's broadband spread spectrum system requires a total of 40 to 100 megahertz of contiguous spectrum. Accordingly, we deny PCNA's request for a pioneer's preference.

121. Personal Communications Network Services of New York, Inc. (PP-16). PCNS-NY requests a pioneer's preference for developing a microcell broadband CDMA system capable of sharing spectrum with fixed microwave services, proposing the use of Digital Termination Service (DTS) for PCS backbone communications, proposing a plan for migrating existing microwave operations to other frequencies, and developing its service to operate in what it asserts is the unique and harsh radio environment of New York City. It proposes to provide a service that entails delivering voice, data, and image transmission services to users in high density environments, such as multi-story buildings, between such buildings, and from public access locations. It proposes broadband CDMA microcells sharing spectrum with existing microwave operations and using DTS frequencies at 10 and 18 GHz to provide backbone communications between microcells.[128]

122. PCNS-NY asserts that it is the sole party to propose and develop an innovative plan for migrating existing microwave users in the 1850-1990 MHz band to higher frequencies and to propose that this relocation be accomplished through use of voluntarily negotiated agreements. It also claims that it is unique in proposing that existing users be relocated to higher frequencies at no cost to existing users and in a manner that minimizes the potential for disruption to the operations of the existing users.

123. In comments to PCNS-NY's pioneer's preference request, Cox asserts that PCNS-NY should not receive a preference because "the mere tendering of an experimental license application and the claim that the results will somehow assist the Commission is an insufficient basis for an award."[129] Similarly, PacTel claims that PCNS-NY's only innovation is the idea to use DTS

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[128] PCNS-NY initially tested SCSM's broadband CDMA equipment, but stated in a 1992 experimental report that it would use Qualcomm's narrowband CDMA equipment. See PCNS-NY Report at 1 (September 30, 1992).

[129] See Cox at 2-3 (January 24, 1992).

frequencies to connect base stations, and that this is insufficient for a preference award.[130] PacTel also asserts that technical feasibility has been shown only in a controlled environment and that a more realistic showing of feasibility is needed. GTE maintains that use of DTS frequencies is not innovative and that until verifiable data on PCNS-NY's sharing technology can be reviewed, no demonstration of feasibility can be claimed.[131]

124. In reply, PCNS-NY asserts that opposing comments reflect flawed analysis of its preference request.[132] It argues that comments stating that it has not demonstrated technical feasibility are unsupported and that, in any event, the Commission's rules do not require such demonstration if the applicant has commenced an experiment. It claims that Cox ignored the substantial testing and extensive progress reports that it provided to the Commission.

125. In the Tentative Decision we found that PCNS-NY's proposal appeared to be a compilation or aggregation of existing communications technologies or systems. Additionally, we tentatively found that PCNS-NY failed to demonstrate that its proposal constitutes a unique or innovative technology or service proposal. Therefore we proposed to deny PCNS-NY's request.

126. In comments filed in response to the Tentative Decision, PCNS-NY states that the Commission failed to apply the pioneer's preference rules in a reasonable manner by singling out the innovations of only three applicants when the Notice contains aspects that also are the reasonable outgrowth of proposals developed and demonstrated by PCNS-NY and other applicants.[133] Specifically, PCNS-NY argues that the Commission failed to account or credit it for proposing relocation of the existing microwave users through negotiations. Further, PCNS-NY asserts that the Commission failed to provide a case-by-case analysis of the preference requests it tentatively denied and failed to provide an adequate basis for distinguishing the tentative grants from the tentative denials. It also states that not sufficiently articulating specific reasons for the tentative denials prevents parties from making meaningful comments and leads to speculation as to the reason for denial.

127. PCNS-NY further maintains that the Commission erred in denying its request and incorrectly credits APC with its

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[130] See PacTel at 17 (January 24, 1992).

[131] See GTE at 17 (January 24, 1992).

[132] See PCNS-NY Reply at 8 (February 18, 1992).

[133] See PCNS-NY at 8-9 (January 29, 1993).

innovation. PCNS-NY claims that it, and not APC, is the pioneer of procedures to negotiate voluntary agreements with microwave users to relocate to higher frequencies on terms favorable to the microwave users. PCNS-NY claims that it was the first to demonstrate the widespread acceptance of its relocation procedure through its experimental efforts and that this innovation contributed to the Commission's establishment of PCS and its proposed rules. It asserts that the Commission has recognized the spectrum sharing innovations of Omnipoint and APC, but has not credited PCNS-NY for its negotiations proposal, which it claims is a spectrum management tool that remains a fundamental aspect of providing spectrum for PCS. PCNS-NY claims that its migration proposals preceded all other such proposals; therefore, its request cannot be denied as constituting a compilation or aggregation of existing communications technologies or systems.

128. APC responds that its proposal of "(i) sharing spectrum with microwave users and (ii) relocating some microwave users--with full cost reimbursement, and only to reliable alternative frequencies--formed the basis for the Commission's decision in ET Docket 92-9."[134] It states that it proposed this general approach as early as October 1, 1990 and that PCNS-NY's plan from the outset was not spectrum sharing, but rather band clearing.

129. We disagree with PCNS-NY's argument that it deserves a pioneer's preference for proposing a migration of 2 GHz fixed operations based upon negotiations, and that the adopted relocation scheme is an outgrowth of its proposal. The rules adopted in ET Docket No. 92-9 providing for fixed microwave migration from the 2 GHz band are the result of a rule making proceeding in which numerous comments were filed and considered and of which the results are not totally consistent with PCNS-NY's proposal; e.g., we did not propose to relocate all microwave operations or to restrict microwave relocation to existing common carrier microwave bands, as recommended by PCNS-NY, but instead provided for sharing of the 2 GHz band and implemented a plan that provides for a variety of relocation alternatives, including non-radio media, private microwave bands, and common carrier microwave bands. Moreover, PCNS-NY's negotiation proposal is relevant to PCS only in the broadest sense; it is a spectrum planning design, not a "technology" or "service" contemplated by the pioneer's preference rules.

130. We also disagree that the Commission failed to provide a case-by-case analysis of each request or an adequate basis for distinguishing the tentative grants from the tentative denials. The Commission analyzed each application on a case-by-case basis and articulated the criteria necessary to be granted a tentative preference. While many tentative denials were grouped together,

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[134] See APC Reply at 15 (March 1, 1993).

this is appropriate because they had similar deficiencies. After the additional opportunity provided the applicants and the public to comment upon our tentative conclusions, we now address each application individually. We note that our Tentative Decision clearly spelled out the attributes that are necessary to be granted a preference.[135]

131. We also conclude that PCNS-NY's proposal to use 10 and 18 GHz DTS frequencies for PCS backbone communications is not innovative. There are a number of bands that may be used for such communications, and our recent decision in the emerging technologies proceeding has reallocated the 10 GHz band from DTS to point-to-point microwave use.[136] Further, merely identifying bands that may be used to support PCS is not innovative in the sense intended to be recognized by the pioneer's preference rules.

132. Finally, PCNS-NY's proposal for the development of a service to operate in the New York metropolitan radio environment does not qualify as an innovation warranting a pioneer's preference.[137] PCNS-NY contracted with SCS Mobilecom to test SCSM's CDMA mobile equipment, but it is unclear what innovation PCNS-NY contributed to this test. PCNS-NY also fails to specify any innovations for which it is responsible that would differentiate the tests done for it by SCSM from the tests that SCSM performed for other preference applicants. Accordingly, we deny PCNS-NY's pioneer's preference request.

133. Southwestern Bell Personal Communications, Inc. (PP-17). SBPC requests a pioneer's preference based upon its proposal to utilize spectrum between existing microwave systems for PCS made possible by its Intelligent Multiple Access Spectrum Sharing approach. SBPC's IMASS approach consists of microwave signal level monitoring, data base look-up of microwave systems, information processing, and PCS channel assignment. The microwave signal levels are periodically measured across the

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[135] See Tentative Decision, supra note 8, 7 FCC Rcd at 7795-96.

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

[137] We note that initially PCNS-NY requested a preference for its implementation of broadband CDMA equipment in New York City. However, the rules adopted in the PCS Second Report and Order do not permit using broadband CDMA. PCNS-NY's broadband technology proposals therefore are inconsistent with our PCS rules. More recently, PCNS-NY proposed to test Qualcomm's CDMA equipment in New York City. Although Qualcomm's equipment could be used consistent with our rules, proposing use of this equipment is not an innovation attributable to PCNS-NY.

frequency band in a given area. A database search then identifies the microwave frequencies being used and calculates the potential interference from a PCS base station or portable to the microwave receiver. This information provides a list of available frequencies within that specific measurement area.[138] In addition, SBPC proposed to demonstrate the use of intelligent networking to provide features such as personal number service, call alerting by pager, inter-network call routing, and call screening.[139] These features would be delivered across multiple networks, including the PSTN and cellular, paging, and portable communications networks in a seamless fashion by experimenting with alternative interfaces between the network switch, PCS switch, and applications processor.

134. In comments on SBPC's proposal, GTE states that the proposal is not innovative insofar as it offers intelligent network features such as Caller ID and Selective Call Screening that are already available. Further, GTE states it is premature to award SBPC a pioneer's preference until SBPC demonstrates the proposal's technical feasibility.[140] Similarly, PacTel argues that SBPC's proposal is speculative and premature, and that its technical feasibility has not been demonstrated. PacTel also states that others tested similar concepts prior to SBPC.[141] Associated maintains that SBPC does not specify exactly what aspect of its proposal is original or innovative.[142]

135. SBPC replies that GTE fails to identify the experiments or vendors that are proposing to offer the same capabilities.[143] Additionally, SBPC claims that no other experimenter has proposed as detailed or as broad a program of experimentation combining new network services and innovative radio technology. SBPC also maintains that it demonstrated technical feasibility in its experimental application and that while field results may be desirable, they are not a prerequisite for a pioneer's preference. In response to Associated, SBPC states that the originality of its proposal has been demonstrated

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[138] See SBPC Quarterly Progress Report Number One at 3-9 (June 17, 1992).

[139] See SBPC request for Pioneer's Preference at 3-4 (October 22, 1991).

[140] See GTE at 18 (January 24, 1992).

[141] See PacTel at 18 (January 24, 1992).

[142] See Associated at 8 (January 24, 1992).

[143] SBPC Reply at 2 (February 18, 1992).

and Associated has chosen to ignore the showings that SBPC has filed.[144]

136. In the Tentative Decision we proposed to deny SBPC a preference because its proposal constitutes a compilation or aggregation of existing communications technologies or systems or otherwise does not constitute a unique or innovative technology or service proposal. SBPC responds that it was the first to develop and define an active interference avoidance approach to spectrum sharing and that the IMASS system is not a compilation or aggregation of existing communications technologies or systems. According to SBPC, the IMASS algorithm that is the heart of its proposal required development of a new communications system by a third party vendor.[145]

137. In reply to SBPC's comments, APC states that SBPC has not quantified spectrum availability in the 2 GHz band using its IMASS approach in any market or proven that IMASS receivers can improve PCS spectrum availability. APC raises further questions concerning the number of receivers necessary to cover a wide area and states that SBPC has not proven that the IMASS receivers are practical and cost effective.[146]

138. SBPC bases its preference request upon the IMASS system for spectrum sharing and its proposed delivery of advanced calling features by interconnecting various networks. Experimental work by SBPC includes fixed microwave signal measurements in the Houston area, development of a prototype IMASS system that is still being refined, a test of the IMASS algorithm, and deployment of two PCS service trials in medical environments. However, SBPC has not demonstrated the technical feasibility of using the IMASS system to share spectrum with existing fixed microwave systems, nor that its system can be used to deploy PCS in a real world environment. Additionally, SBPC's proposal to offer advanced calling features by interconnecting existing networks does not justify a preference because similar calling features already are offered the public. Accordingly, we deny SBPC's pioneer's preference request.

139. Tel/Logic, Inc. (Tel/Logic) (PP-18). Tel/Logic requests a pioneer's preference based on its overall contributions to PCS system design and service concepts that focus on providing PCS to the medical community. Tel/Logic states that its innovations include specifying key functionality requirements and operating characteristics, identifying a mechanism for the coordination and control of multiple micro-

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[144] Id. at 8.

[145] See SBPC at 4-6 (January 29, 1993).

[146] See Attachment A of APC Reply at 47-48 (March 1, 1993).

cells, developing an intelligent feature set needed to ensure full user functionality, and setting user and alternative mobile service integration and inter-operability design objectives. Tel/Logic states that it plans to test a distributed and hierarchical control system that permits local control and interconnection; a distributed antenna system to provide effective, widespread radio propagation within buildings; and an intelligent signalling interface to provide flexible, useful, and non-intrusive call control to mobile users. Tel/Logic states that in designing its PCS service it will use equipment and technology developed by others.

140. GTE opposes Tel/Logic's request for a pioneer's preference, stating that its proposal is no more than a concept or design and thus is not innovative. GTE also argues that Tel/Logic is not making a serious development effort.[147]

141. In reply, Tel/Logic asserts that its status as an innovator is evidenced by the press attention it has received for its approach to medically-based PCS.[148] Tel/Logic asserts that its developmental efforts have been serious, although limited by lack of resources. It suggests that the Commission reiterate the philosophy incorporated in the pioneer's preference rulemaking, which requires neither actual testing of all experimental aspects of an applicant's proposal, nor demonstrations of immediate financial capacity. Tel/Logic also suggests that the Commission recognize the decentralized nature of PCS development, and for smaller companies in particular, assess the contribution, not necessarily the completeness, of each pioneer's effort in relationship to its resources.

142. In the Tentative Decision we proposed to deny Tel/Logic a preference for failure to submit either the preliminary results from an experiment or a sufficient showing of technical feasibility. Tel/Logic responds that the technical feasibility of its proposal was adequately demonstrated in its original preference request, which it maintains clearly demonstrated the analogous use of related technologies in other communications applications.[149] It also maintains that its subsequent developmental work provides more than sufficient support for a claim of the significant innovation and technical feasibility of its system requirements as initially proposed. Tel/Logic concludes that its subsequent experimental efforts are fully documented in its quarterly progress reports, and that no arguments were received questioning the feasibility of its technical innovations.

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[147] See GTE at 8 (January 24, 1992).

[148] See Tel/Logic Reply at 8 (February 7, 1992).

[149] See Tel/Logic Reply at 5 (January 29, 1993).