a large reuse distance, while in systems with smaller cells, frequencies may be reused at shorter distances. (*See* figure).

Where large-cell and small-cell systems are adjacent, channel selection methods that work well for coordination between comparable-power systems are far from satisfactory because of the different interference ranges of the small and large-cell systems. Moreover, even after coordination is completed, the signal from the high-power system will diminish the effective coverage of low-power cells, and customers of the low-power system may be captured by the high-power system even while in the low-power system's coverage area. In such a system, the standards used for determining the "reliable service area" of a cell do not give a realistic picture of actual reliable service.

Without low power limits for PCS, the Commission will inevitably be presented with numerous interference complaints if licensees attempt to operate low-power systems near high-power systems. If all systems were low-powered, the interference range of cells would be sufficiently limited to minimize the interference between adjacent systems. Thus, the Commission must plan to assign more staff resources to the task of resolving interference complaints if the new PCS service involves both high-power and low-power licensees.

Furthermore, for the reasons discussed in Section 2.b. above, the use of high power by PCS licensees may result in considerable interference complaints by microwave licensees in nearby or even relatively distant market areas. Resolution of such complaints will very likely consume considerable FCC staff time, if parties are unable to resolve their differences. The use of low power for PCS will eliminate many opportunities for complaints and thereby result in lower Commission resource requirements.

Finally, high-power systems are likely to require higher antennas than low-power systems. The localized coverage of microcells does not typically require tall antenna structures because great transmitting range is not needed. This means that low-power service would be unlikely to require

substantial Commission resources for tower clearance, coordination with the FAA, and establishing marking and lighting requirements. High-power systems will, on the other hand, be similar to today's cellular systems in their antenna structure processing requirements.

B. Number of Licenses and Size of Frequency Blocks: Five 20 MHz Licenses for Broadband, One 10 MHz License for Local Loop Applications, 20 MHz for Unlicensed Services, and 3 MHz for Narrowband In Each Market

A policy of licensing five PCS providers in each market, with a block of 20 MHz of spectrum assigned to each licensee, will, as BellSouth explains below, best achieve the core goal of this proceeding. In addition, a single license for a block of 10 MHz for local loop applications should be made available in each market with a local loop reserve of 10 MHz, and the Commission should also allocate 20 MHz of spectrum at 2 GHz for unlicensed forms of PCS and 3 MHz of spectrum at 900 MHz for Narrowband PCS. Specifically, BellSouth proposes the following allocation of spectrum for PCS, subject to the outcome of the *Emerging Technologies* docket:[44]

1. There Should Be Five 20 MHz PCS Licensees

BellSouth submits that an allocation for five 20 MHz licensees is the optimal way, on balance, to accomplish the core goal. First, consistent with Telocator's analysis,[45] BellSouth believes that 20

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[44] In order to facilitate two-way communications applications using technologies that require a frequency separation between the forward and return channels and at the same time maximize interoperability, BellSouth suggests that each licensee be assigned a pair of 10 MHz blocks of spectrum with each pair having the same frequency separation. BellSouth concurs with the Commission's suggestion *(NPRM*, 7 FCC Rcd. at 5692) that it would be desirable to utilize an 80 MHz separation criterion, consistent with the separation currently used in the 1850-1990 MHz private Operational Fixed Service ("OFS") band. The Commission found that this separation was achievable if there are five 20 MHz licensees. *See id.*

Moreover, the proposed allocation scheme has the advantage of permitting the alignment of the PCS frequency blocks with the frequency blocks most commonly used for private fixed microwave. This will eliminate the need, in most cases, for partial overlap between OFS channels and PCS blocks. The one-to-one correspondence with the 10 MHz OFS channels would facilitate uniformity of coordination. Microwave licensees would be better protected, because they would only have to coordinate with a single group of co-channel PCS licensees. If the PCS frequency blocks overlapped with the OFS channels, each OFS licensee would have to guard against interference by two sets of PCS licensees.

[45] *See* Telocator, Spectrum Estimates for PCS Report, TE/92-5-28/076 at Scenario "C" (May 28, 1992).

20 paired 50 kHz channels for Narrowband PCS:	901-902/940-941 MHz
20 unpaired 50 kHz channels for Narrowband PCS:	930-931 MHz
Wideband PCS Channel Block A:	1850-1860/1930-1940 MHz
Wideband PCS Channel Block B:	1860-1870/1940-1950 MHz
Wideband PCS Channel Block C:	1870-1880/1950-1960 MHz
Wideband PCS Channel Block D:	1880-1890/1960-1970 MHz
Wideband PCS Channel Block E:	1890-1900/1970-1980 MHz
Local Loop Application Channel Block:	1900-1905/1980-1985 MHz
Unlicensed PCS Channel Block:	1910-1930 MHz
Local Loop Application Reserve:	1905-1910/1985-1990 MHz

MHz will be needed for each provider. BellSouth bases its estimate of the required spectrum per licensee on the types of PCS service that will be provided by low-powered PCS systems, on the Telocator projections of demand for these services, and on estimates of the likely traffic load that PCS facilities will carry. For purposes of this determination, BellSouth has assumed that the PCS facilities will be used to provide voice grade service (*i.e.*, voice and voice band data) using low-power handsets at the subscriber end, low-power base stations with low antenna heights, and base station spacing of 50-1000 meters.[46]

Authorizing five competing providers of regular low-power PCS service may be opposed by some commenters as creating an environment that is too competitive and risky for investment in the extensive networks that will be needed. Such an environment is only likely if the licensees expect to provide the same type of service.

[46] A 20 MHz assignment of spectrum can handle the expected demand through the year 2002, ultimately using a 16 kb/s voice coding technology, an equivalent duplex channel bandwidth of 50 kHz, and a frequency reuse factor of 12. Lower initial demand may be served by using a less-demanding 32 kb/s voice coding technology, with greater bandwidth; future growth in demand can be accommodated by continued technological evolution and cell splitting.

Under BellSouth's proposal, diversity of service will result. For example, if BellSouth became a licensee, it might invest in a wide-scale network of low-power facilities offering wireless services at low cost to the mass market. Some other licensees would do the same, while others might develop more specialized services. Thus, the five licensees could develop a variety of low-power microcell networks oriented to many different consumer needs. Some licensees might concentrate their efforts, at least initially, in certain geographic areas within the market, but the licensees would not necessarily choose the same areas. With five licensees, each licensee would have an incentive to distinguish its service from the service provided by the others; financial success would force them to innovate and differentiate their services.

If there were fewer licensees, this diversity of approaches could well be diminished, with a lowered likelihood that licensees would attempt to serve specialized, "niche" markets, either in the type of service offered or in the geographic regions served. Thus, a system of five licensees would likely lead to greater universality of service, as well as greater diversity of service, than would be the case with a smaller number of licensees.

Speed of deployment would be accelerated by having five licensees, rather than a smaller number. This is true because in a potentially highly competitive marketplace each competitor has a great incentive to make a name for itself, distinguish its service, and build a customer base without delay, because any delay may work to the advantage of its competitors. This is particularly true when the licensees have paid market value for their licenses through the auction procedure advocated by BellSouth, which will virtually eliminate the incentive to warehouse spectrum for speculative purposes.

Furthermore, a spectrum allotment of 20 MHz for each of five providers is more spectrally efficient than an allocation of significantly larger blocks of spectrum, such as four 30 MHz blocks or three 40 MHz blocks. The intensive frequency reuse resulting from low-power microcell deployment

will provide sufficient capacity for a very large number of users even with 20 MHz. Giving each provider a larger block of spectrum would reduce each provider's net spectrum efficiency.

For all of these reasons, BellSouth submits that an allocation that provides for five PCS licensees, each with 20 MHz of spectrum, would best accomplish the core goal.

2. There Should Also Be One 10 MHz Provider Authorized for Wireless Local Loop Applications

BellSouth also endorses the allocation of 10 MHz and an additional reserve of 10 MHz for a specialized form of PCS: local loop applications. This allocation would allow advanced radio technology to be used by a provider of local telecommunications service, such as an LEC or a competitive access provider, in order to connect end users to the provider's network by wireless, instead of wired, means. A separate allocation would serve the public interest by ensuring that spectrum will be available for this particular purpose, whether or not the five other PCS providers wish to provide services designed for local loop applications. The spectrum for this use of wireless technology will only support one provider per license area. Any provider of local loop service, such as LECs, competitive access providers, or cable television companies, should be eligible to apply for that license in order to integrate advanced radio technology into local loops.

Wireless local loop applications may be served with a 10 MHz allocation, but the cost of providing such services will be higher than if 15 or 20 MHz is made available.[47] A better approach would be to make 10 MHz initially available, and make available 5 or 10 MHz of additional spectrum from a reserve when the need warrants it. The additional spectrum could then be incorporated into the local loop applications at minimal incremental cost. However, equipment and network costs

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[47] Operation of even a specialized PCS network with only 10 MHz of spectrum will entail higher costs than if additional spectrum is available. Air interface standards could be chosen to minimize this disadvantage. However, performance and cost tradeoffs would likely increase the cost and complexity of the system and require additional synchronization capabilities. The added complexity would increase weight and power consumption. A cost increase of 25-50% for the radio equipment and an increased network cost of a few hundred dollars per radio port for synchronization could be expected.

would be lower with a larger initial allocation; thus, the optimum benefit obtained through initial assignment of 20 MHz would allow more universal deployment of this technology and eliminate a technical disadvantage.[48]

3. The Five Licensees Should Be Independently Owned

BellSouth submits that each of the five 20 MHz PCS licensees in each market should be independently owned, in order to promote diversity of service offerings, foster competitive delivery of service, and prevent anticompetitive abuses. To this end, no single entity or group of affiliated (or commonly owned) entities should be permitted to control or own a significant interest in more than one of the five 20 MHz licensees in each market. Since this issue has recently been addressed in the cellular area, the Commission may wish to consider adopting a policy regarding interests in competing PCS licensees in a market similar to that applied in the cellular radio service.[49]

There should be no restriction on the ownership of the single 10 MHz local loop application license by any of the five regular PCS licensees. The 10 MHz allocation is dedicated to a single, specific purpose and may not be used to provide the wide variety of services that the 20 MHz licensees are authorized to provide. Accordingly, there is no justification for excluding the regular PCS licensees from holding the 10 MHz local loop application license.

4. Allocation of 20 MHz for Unlicensed PCS

BellSouth supports the allocation of 20 MHz for unlicensed low-power PCS usage. This will make a wide variety of products and services universally available in an unrestricted competitive market, with little or no restriction on speed of deployment. In order to give developers and vendors the greatest freedom to utilize this spectrum in designing products and services that meet consumer

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[48] If the additional 10 MHz is merely kept in reserve and not reserved specifically for local loop applications, equipment could not be type-accepted and marketed that can use the additional 10 MHz.

[49] *See Cellular Unserved Areas*, CC Docket 90-6, *First Report and Order*, 6 FCC Rcd. 6185, 6212-14 (1991), *recon. in part*, FCC 92-472 (released Nov. 4, 1992).

needs, the Commission should not impose any channelization on the 20 MHz block or restrict the types of modulation that may be used.

The existing licensees in this band must be relocated to other spectrum as a condition precedent to unlicensed use of this spectrum because, as a practical matter, unlicensed PCS use is incompatible with existing fixed microwave use. As noted above, how and when such relocation can be effectuated, and at whose expense, are policy questions that must be resolved in the *Emerging Technologies* docket before a reasoned allocation decision can be made in this proceeding.

The Commission cannot reasonably decide to allocate 20 MHz of spectrum for an unlicensed, end-user-oriented service if the spectrum will not be usable for the new unlicensed service because of interference that will be encountered from existing microwave licensees; nor can it make the allocation without determining whether massive use of this spectrum by unlicensed consumers will result in interference to microwave licensees. Much of the unlicensed equipment can be expected to be purchased and used by consumers; there will be no system operator who can coordinate use of the spectrum. Once in the hands of the consumer, the location of customer equipment will be unrestricted and unknown. This will make spectrum usage by existing microwave licensees very difficult, because there will be no way to track competing usage, no party with whom to coordinate, and no way to enforce the right of interference protection to which their primary status entitles them. Relocation will avoid these problems.

Unlicensed PCS will need a "protected" sharing environment among all unlicensed PCS users. This "protected" environment must be guaranteed through jointly agreed upon standards of operation of equipment that address common air interfaces, embedded sharing mechanisms, and a "spectrum sharing etiquette." The coordination mechanism and "spectrum sharing etiquette" must be an automatic and autonomous function of the equipment, and incorporated into its design. These must evolve into FCC equipment authorization rules. As part of the equipment authorization process,

applicants requesting equipment authorization of a system under the Unlicensed PCS, must demonstrate capability of the system to coexist in an Unlicensed PCS operating environment, as defined by jointly agreed upon standardized test scenarios incorporated in the equipment authorization criteria. In this context, FCC equipment authorization may include Type Acceptance, Certification, Registration, or the like. The following Telocator documents: *Telocator Position Regarding PCS Spectrum Sharing/Coordination Issues*, TR45.JEM.92.11.09.225 and *Non-Licensed Sharing Etiquette (Unlicensed Part 15)*, TR 45.JEM.92.11.09.229 discuss this issue. BellSouth supports these Telocator positions.

5. Allocation of 3 MHz for Narrowband PCS

BellSouth supports the Commission's proposal to allocate 3 MHz of spectrum at 900 MHz for "narrowband PCS," also known as "advanced messaging services." Specifically, the Commission should adopt its first alternative frequency plan which would provide 20 pairs of 50 kHz channels and 20 unpaired channels.[50]

This plan will yield the maximum number of channels that can be licensed, leading to the greatest number of opportunities for competition, and serve the goal of diversity. It will also give all competitors a considerable likelihood of obtaining spectrum at an early date, leading to speedy deployment of service. Service will be more universally available under this scheme, also, because in any single area there will be less likelihood that all blocks will be in use in nearby areas, given the larger number of channels. Each licensee will have the same amount of spectrum, initially, and the competitors will therefore be on a level playing field. Furthermore, the use of narrower channel width will likely lead to greater spectral efficiency in use.

In order to avoid precluding the offering of services requiring more than a 50 kHz channel, BellSouth proposes that the Commission allow a licensee to acquire additional channels after initial

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[50] *NPRM*, 7 FCC Rcd. at 5697.

licensing, either from other licensees or from the pool of channels remaining available, if any. A licensee should be permitted to utilize alternative channelization and modulation schemes within its authorized block of spectrum, in order to gain the maximum utility from the use of spectrum in providing innovative services.[51]

6. Encouragement of Industry-Developed Standards

If PCS service offerings are to be widely available at low cost, licensing and implementation will depend on the development of standards for many different aspects of the systems to be constructed. The success of U.S. cellular service can be attributed, in part, to the standards established for this service in the early 1980s. The failure of Telepoint CT-2 service in the U.K. is due, in part, to the lack of a common air interface standard from the outset.[52] Similarly, stereophonic AM broadcasting has failed to gain acceptance because of the lack of a commonly agreed-upon standard.

The telecommunications industry generally agrees that voluntary standards greatly enhance the overall market and customer acceptability of equipment and services. Users, service providers, and manufacturers all benefit from development of, and adherence to, standards. Users benefit from lower costs and compatibility. Providers benefit from the reduction of capital and operating expenses resulting from the availability of competitively priced, high quality equipment, and vertical services provided through open interfaces.

Standards are needed for interoperability between different manufacturers' radio equipment and to avoid the establishment of proprietary standards by vendors. Proprietary standards would keep prices artificially high, but even more importantly they would slow deployment and eliminate

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[51] A higher power level will be needed to better balance the forward and reverse links, even though they are still highly unbalanced. Since the messaging will consist of short burst transmissions, the biological (heating) effect is minimized due to the shorter, and probably less frequent, transmissions.

[52] *See* Doyle Study at 8.

universality as a PCS trait. Common air interfaces are needed for radio systems using similar technology for a similar purpose, so that, for example, all TDMA-based PCS microcell systems can be accessed by handsets from any manufacturer. Interoperability is not needed among all forms of PCS, but a high level of interoperability is a clearly desirable goal within a specific class of PCS in a multiple-vendor environment.

Standards are needed to ensure co-existence among the unlicensed PCS users and provide a "protected" operating environment to avoid chaos in the deployment of unlicensed devices. A "spectrum sharing etiquette" will provide a "protected" sharing environment among all users. It is essential that such a spectrum etiquette be adopted by either the FCC and/or accredited standards-setting bodies.

The definition of Unlicensed PCS implies numerous providers on common shared frequencies operating in an autonomous manner. Interference of uncoordinated Unlicensed PCS operations to other Unlicensed PCS operations without a proven "spectrum sharing etiquette" can be expected to be severe and disruptive as evidenced by BellSouth technical tests and by actual BellSouth deployments of existing Part 15 equipment in close proximity environments (*e.g.*, trade shows, deployments in Atlanta in the 1100 Peachtree Street building).

Standards must also be developed for the non-radio side of PCS operation — specifically, standards for interconnection of PCS networks with other networks, including the public switched telephone network ("PSTN"). Standards are needed both for the interconnection of the communications path between the caller and the called party and for the internal links connecting the various components of a PCS network — the microcell sites, switches, controllers, computers,

databases, and such. Efforts to define these interfaces and standardize them have been undertaken by Bell Communications Research, Inc. ("Bellcore").[53]

The Commission should rely upon industry-negotiated standards. FCC oversight of such standards efforts would ensure that its speed-of-deployment and universality goals will be honored. The Commission should encourage prompt private development of standards because, in the absence of open, respected standards, the PCS allocation will not be utilized for the maximum benefit of the public.

Standards development can be completed by consensus of the industry only if the Commission establishes basic ground rules, in the form of precise technical rules. Without such rules, those in the industry may diverge sufficiently to prevent agreement on standards. For example, the technical standards needed for high-power, large-cell systems would be very different than those needed for low-power microcell systems.[54] The industry cannot be expected to reach agreement on standards until the FCC has established the basic parameters of the new service.

A number of critical standards are currently under development by a wide variety of private standards-making organizations, including the Telecommunications Industry Association's ("TIA") TR45 committee and the T1 Committee of the Exchange Carriers Standards Association ("ECSA"), which has been accredited by the American National Standards Institute ("ANSI"). Industry groups such as Telocator have been diligently working toward a consensus on a variety of technical standards issues, as well. Their efforts would converge toward adoption of industry standards most rapidly if

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[53] *See Personal Communications Services (PCS) Network Access Services to PCS Providers*, Bellcore document SR-TSV-002459, Issue 1 (October 1992), which documents these interfaces and the functions performed at each interface.

[54] Standards for large-cell systems might require extensive signal processing and transmissions at low bit-rates, while standards for microcell systems might eliminate the signal processing and use high bit-rates; standards for a large-cell system might call for radio channel selection to be centrally controlled at the switch, while the standards for a small-cell system might call for an automatic frequency coordination procedure to be implemented at each base station.

the FCC adopts technical parameters for PCS that provide meaningful guidance for the standards-makers.

C. MSAs and RSAs Should Be the Basis for Licensing PCS

The Metropolitan Statistical Areas ("MSAs") and Rural Service Areas ("RSAs") that the Commission has used for licensing in cellular and other radio services are the best model for geographic area licensing to date and are clearly preferable to other alternatives suggested by the Commission[55] for the following reasons:

- MSA/RSA licensing would serve the public interest by using license areas that are designed specifically for licensing and are well understood; provide opportunities for licensing small businesses; promote the important value of localism; and speed the delivery of service.
- Larger areas would result in arbitrary exclusions from eligibility if cellular licensees are ineligible in all market areas where they provide service.
- Nationwide licensing, in particular, would disserve the public interest.

1. MSA/RSA Licensing Would Best Accomplish the Core Goal

The MSA and RSA definitions are time-tested licensing area definitions specifically developed for area-wide radio licensing.[56] They have been found well-suited for defining areas to be used for

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[55] The options set forth in paragraph 60 of the *NPRM* were: (1) the 487 Rand McNally "Basic Trading Areas", (2) 49 regions comprising the 47 Rand McNally "Major Trading Areas" plus Alaska and Hawaii, (3) the 194 Local Access and Transportation Areas used in the telephone industry, and (4) a single nationwide licensing area. *NPRM*, 7 FCC Rcd. at 5700-01. The four options set forth by the Commission appear to exclude a number of territories, possessions, and commonwealths subject to FCC regulatory jurisdiction (*i.e.*, Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, the Northern Mariana Islands, and others) that were included in the MSAs or RSAs defined for cellular service.

[56] The MSAs used for cellular and other radio licensing by the FCC are not identical to the MSAs used for general economic and statistical reporting. The FCC's MSAs were based on the 1980 Census Bureau Standardized Metropolitan Statistical Areas and New England County Metropolitan Areas, but the Commission combined some MSAs that had been separately defined and modified others based on changes that had occurred since 1980. *See Cellular Communications Systems*, CC Docket 79-318, *Report and Order*, 86 FCC 2d 469 (1981), *recon. in part*, 89 FCC 2d 58 (1982), *further recon.*, 90 FCC 2d 571 (1982), *appeal dismissed sub nom. United States v. FCC*, No. 82-1526 (D.C. Cir. 1983). The RSAs were developed specifically for licensing cellular systems in areas outside the MSAs based on extensive public input, in a rulemaking begun in late 1985 and completed, including numerous changes on reconsideration, in 1988. *See Rural Cellular*
(continued...)

licensing, and are well-understood by the FCC, the cellular industry, and the financial community.[57] The Commission has used the MSAs and RSAs not only for cellular licensing but for area-wide licensing of interactive television service,[58] and it is relying on the MSA/RSA model for providing cellular service to areas unserved by existing cellular systems.[59] The Commission has also published a comprehensive list defining these MSA and RSA market areas.[60]

As the Commission recognized in the *NPRM*, the use of smaller service areas has many potential benefits:

> [S]maller service areas may permit a broader participation by firms of all sizes in the PCS market. Some potential PCS licensees may be interested in serving only their local areas, including smaller areas that are less economic to serve. This approach may minimize certain transaction costs associated with having larger areas . . . . Broader participation also may produce a greater diversity and degree of technical and service innovation than would be expected from a few large firms. Diversity may be an important benefit during the initial implementation of PCS when the market is still being defined.[61]

BellSouth submits that the use of smaller service areas will produce the greatest number of opportunities for licensing of small and medium-sized businesses, including minority-owned businesses.

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[56](...continued)
Service, CC Docket 85-388, *Notice of Proposed Rulemaking*, FCC 85-646 (1985); *Report and Order*, 60 RR 2d 1029 (1986); *recon. denied*, 2 FCC Rcd. 733, *recon. in part*, 2 FCC Rcd. 3366, *erratum*, 2 FCC Rcd. 4008 (1987), *further recon. in part*, 4 FCC Rcd. 5272, *recon. in part*, 3 FCC Rcd. 4403 (1988).

[57] *See* Gantt Report (Appendix III).

[58] *Interactive Video and Data Service*, 7 FCC Rcd. 1630, *recon. in part*, 7 FCC Rcd. 4923 (1992), *pet. for recon. pending.*

[59] *Cellular Unserved Areas*, CC Docket 90-6, *First Report and Order*, *supra*; *Second Report and Order*, 7 FCC Rcd. 2449 (1992), *recon. in part*, FCC 92-472 (released Nov. 4, 1992).

[60] *Common Carrier Public Mobile Services Information: Cellular MSA/RSA Markets and Counties*, 7 FCC Rcd. 742 (1992) (incorporating Reports No. CL-92-40, 92-40A, and 92-42B).

[61] *NPRM*, 7 FCC Rcd. at 5700.

It will also foster the provision of service to more diverse areas of the country on a more expeditious basis, as well as serve the important value of localism.[62]

The costs involved in acquiring, constructing, and operating a widespread PCS network will depend on the size of the licensing area. The capital requirements for large service areas may exclude smaller firms from participation, due to their lack of access to the capital markets. Many smaller and minority firms might be able to obtain financing for an MSA or RSA system, resulting in considerable diversity of ownership, while only a handful of very large firms might be able to finance a system covering the larger areas the Commission is considering. Financial institutions today would be much more hesitant to provide funding for large-area PCS projects than for projects scaled to the size of an MSA or RSA.[63]

MSA/RSA licensing would also speed delivery of service. The greatest delays in cellular processing resulted not from use of the MSAs and RSAs but from the use of comparative hearings and from the rulemaking process. Once the RSAs were defined and procedures established, the FCC received license applications for all 428 RSAs in just a six-month period and licensing was completed for the RSAs, except for the markets involving complex legal issues, less than three years later. The use of any new geographic model would undoubtedly result in delays before applications can be filed and licenses awarded.

The MSA/RSA service area definitions reflect hundreds of changes made in response to industry comments.[64] If the Commission adopted any of the geographic regional models it proposed,

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[62] Gantt Report at 2-3.

[63] The capital markets are still recovering from a poor economic environment. Banks and other lenders are reluctant to make sizeable loans in general because of past problem loans and regulatory restrictions. They are particularly reluctant to make loans to borrowers in the technology sector. Given these facts, banks are more likely to make a number of smaller loans for MSA or RSA PCS networks than the large loans needed for a Major Trading Area or nationwide PCS network. *See* Gantt Report at 3-5.

[64] *See* note 55, *supra*.

it would no doubt have to engage in the same sort of time-consuming process before applications can be tendered. This process of "reinventing the wheel" would appear to be entirely unnecessary and will result in lengthy delays in the delivery of service.

The use of smaller areas, such as MSAs and RSAs, will serve the important public interest goal of localism.[65] As Commissioner Duggan said before voting to adopt the *NPRM*, the FCC has a "statutory, . . . moral, and political obligation to encourage localism."[66] MSA/RSA licensing will allow the licensees to tailor their services to better suit the needs of local business and residential areas in their markets. Smaller initial licensing areas will therefore likely result in systems that are more responsive to local needs.[67]

Any geographic licensing area adopted by the FCC will to some degree vary from the "natural" area that would be formed by the interplay of market forces. The FCC-defined licensing areas are but the first stage in the establishment of PCS service areas, and there will inevitably be a second stage of post-licensing reconfiguration to meet the demands of the marketplace. The use of small

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[65] *See* 47 U.S.C. § 307(b). While the Commission has found that this section of the Act is inapplicable in awarding common carrier licenses via comparative hearings, *e.g.*, *Cellular Radio Lotteries*, 98 FCC 2d 175, 180 n.16 (1984), it is, nevertheless, relevant in allocating spectrum. For instance, the Commission took into account "localism" concerns and the "fair, efficient, and equitable distribution of radio service" among the "several States and communities" in designing the RSAs. *See Rural Cellular Service* decisions, cited in note 55, *supra*. Moreover, in initiating the rulemaking that led to the adoption of cellular licensing rules and policies, the Commission explicitly invoked Section 307 as one source of its authority. *Cellular Communications Systems*, CC Docket 79-318, *Notice of Inquiry and Notice of Proposed Rulemaking*, 78 FCC 2d 984, 1007 (1980). The plain text of this section of the Act does not limit it to any one service. In fact, a 1936 legislative change removed language limiting the section to broadcasting. *See* Pub. L. No. 652, 48 Stat. 1475 (1936).

[66] Remarks of Commissioner Duggan at a July 16, 1992 meeting, *as reported in* Telecommunications Reports 6, 8 (July 20, 1992).

[67] *See* Gantt Report at 2-3.

areas for initial licensing, with relatively free transferability of licenses, will interject the least amount of government interference into the development of naturally consolidated markets.[68]

If larger areas are licensed simply to keep down the number of applications or licensing cases, for the administrative convenience of the Commission, the subsequent reconfiguration of market boundaries in the marketplace is likely to take longer, and involve more transactional costs, than if smaller areas are used for initial licensing. The reconfiguration of large areas will require both subdivision into smaller components and then reassembly of those components into service areas that are more naturally suited to PCS. Smaller areas, by contrast, can be accumulated and assembled in "building block" fashion, requiring less subdivision.[69]

The use of MSAs and RSAs for licensing may facilitate the application and licensing process, particularly if auctions are used, because bidders will be able to evaluate the potential value of licenses more accurately under this scenario. Participants in the telecommunications industry are quite familiar with the valuation of cellular properties on an MSA/RSA basis. Furthermore, the type and quality of cellular service available in a market may have some bearing on the value of a PCS license in the same area. If substantially different areas are used for cellular and PCS licensing, it will be more difficult to assess this factor.[70]

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[68] A number of RSAs and at least one MSA have been partitioned. The "natural" market areas may thus be even smaller than RSAs and MSAs. *See* NERA Study at 21, 33-34. It is true that cellular systems have, in some instances, outgrown the MSA and RSA boundaries established by the Commission as systems have come under common ownership or management and become "supersystems" or "clusters." *See NPRM,* 7 FCC Rcd. at 5699-70. This has occurred as the natural result of a variety of forces that may or may not have applicability to PCS. It certainly is not any reason to reject the MSA and RSA licensing model, as the Commission has tentatively done. The Commission did not cite any study of how cellular system clustering has developed. *See NPRM,* 7 FCC Rcd. at 5699. Cellular system clustering has been anything but uniform and has typically developed differently on the two frequency blocks.

[69] *See NERA* Study at 21; Gantt Report at 3.

[70] *See* Gantt Report at 4.

The Commission tentatively concluded that larger service areas should be used for PCS because the economies of scale and scope that have caused geographic consolidation or clustering of cellular systems "may exist in PCS."[71] BellSouth respectfully disagrees. Whether the same forces that have caused the conglomeration of some cellular systems into regional networks will apply to PCS is highly doubtful. Cellular systems designed to serve vehicles moving at high speeds along interstate highways may logically evolve to include interstate highway corridors, while such corridors would appear to be largely irrelevant to microcell PCS systems. The "natural geographic dimensions" of PCS market areas[72] may in fact be *smaller*, not *larger*, than the natural dimensions of cellular systems. Given the smaller cell size in PCS systems, it is extremely unlikely that "natural" PCS market areas would be substantially larger than cellular market areas.

In light of its apparent dissatisfaction with the fact that there are a large number of MSAs and RSAs, the Commission has proposed consideration of four options involving the licensing of market areas that are, on average, larger than the MSAs and RSAs. The Commission has arbitrarily selected four sets of predefined areas that have no appreciable relationship to the forces affecting consolidation or clustering of cellular systems and were not, in any event, designed for licensing of PCS or any other radio service. The Commission's regional area proposals are depicted, together with the MSAs and RSAs, on the maps on the following pages.

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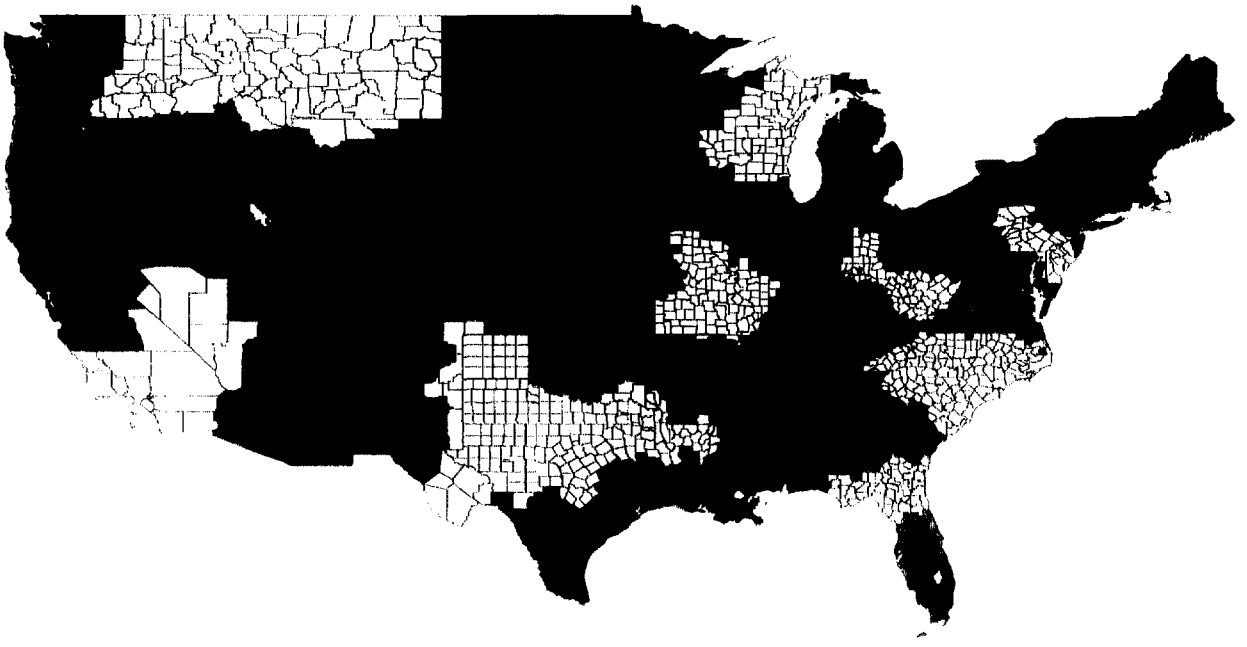
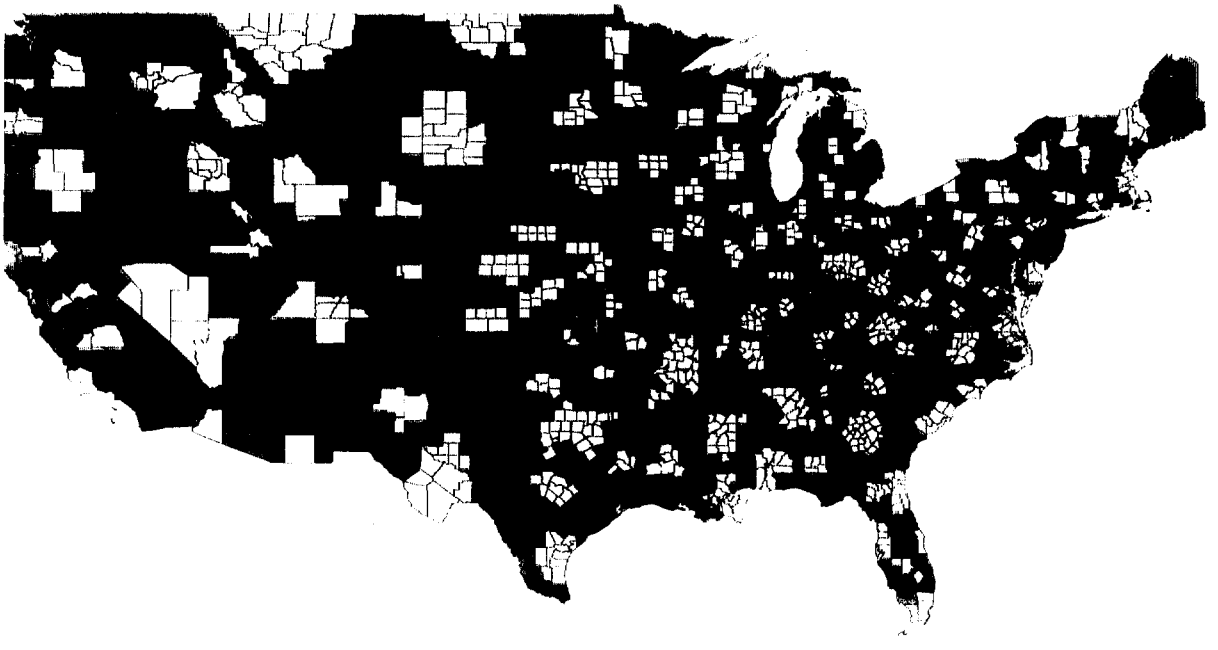
71 *NPRM*, 7 FCC Rcd. at 5700.

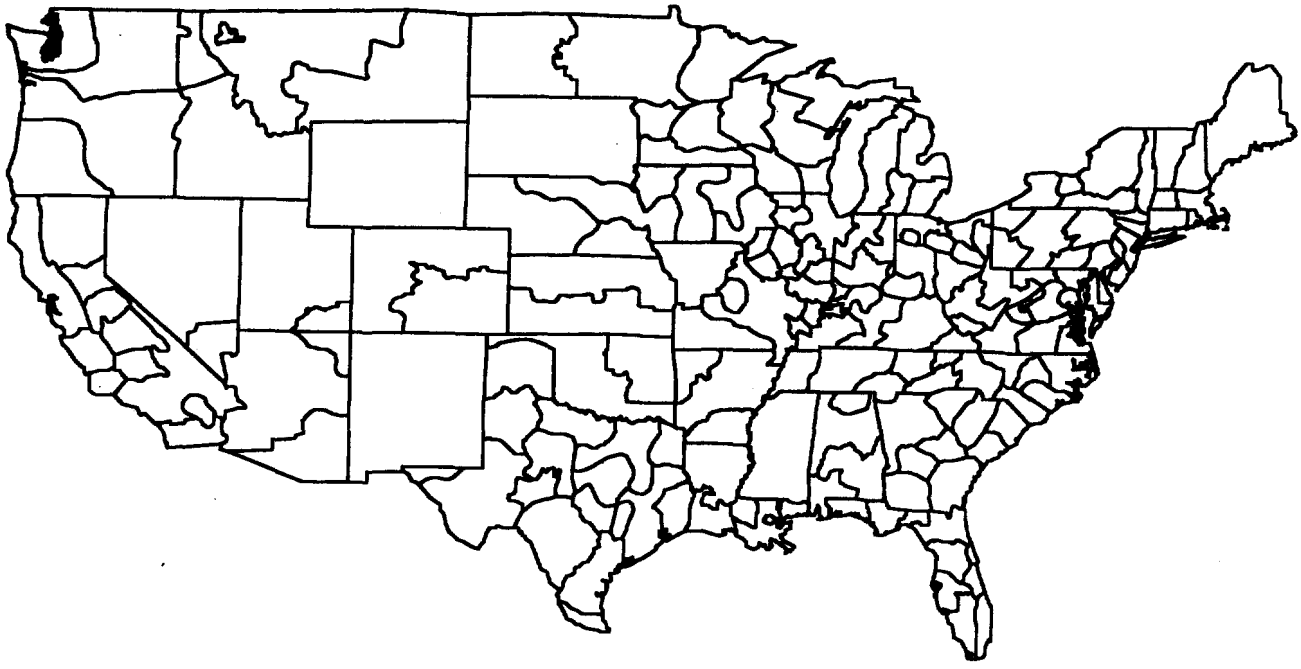
72 *Id.*



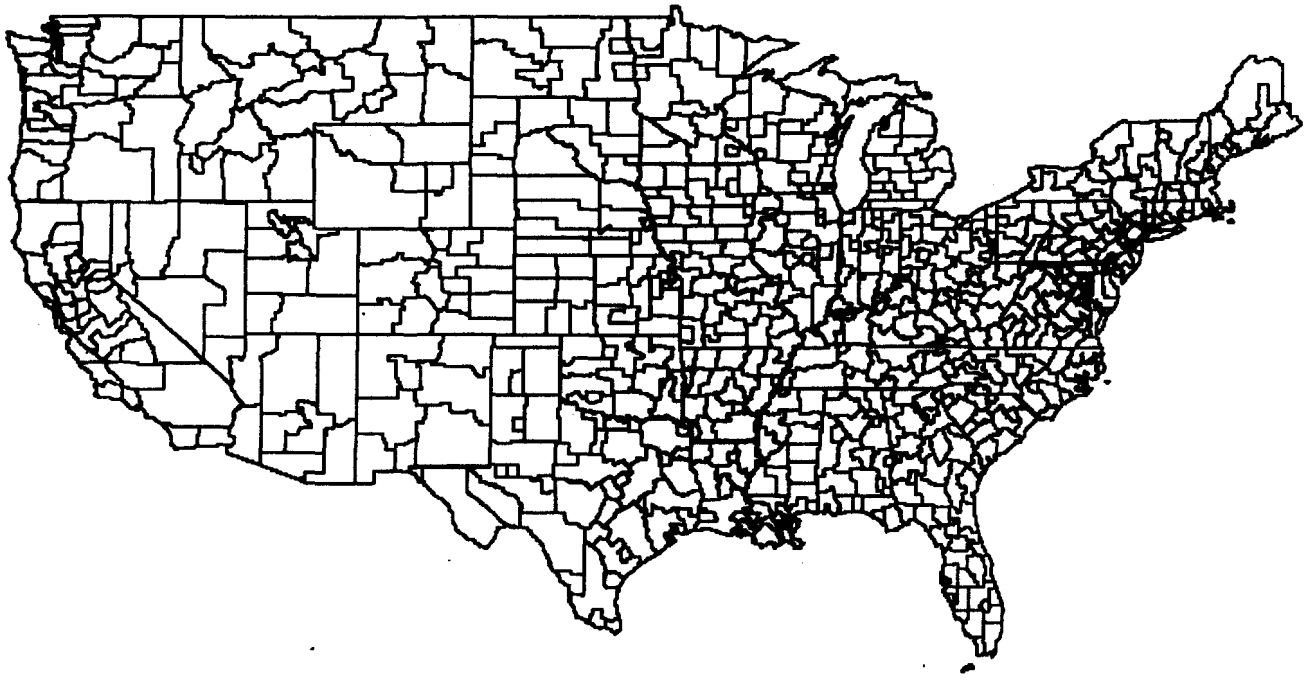
MAP 1. MAJOR TRADING AREAS



MAP 2. BASIC TRADING AREAS



MAP 3. LATA BOUNDARIES



MAP 4. MSA & RSA BOUNDARIES

2. The Use of Areas Larger Than MSAs and RSAs Would be Arbitrary and Capricious if Eligibility Restrictions Are Adopted or If High-Powered Large-Cell Systems Are Permitted

The Commission is considering a policy of excluding cellular licensees and affiliated telephone companies from being eligible for PCS license awards and acquisitions in market areas where they currently provide service. The boundaries of licensing areas such as Basic Trading Areas and Major Trading Areas ("MTAs") do not follow the MSA or RSA boundaries used for cellular licensing, so a single MSA or RSA may in fact overlap with several PCS licensing areas. This would result in a cellular licensee or telephone company being excluded entirely from PCS in a one or more large regions merely because of its provision of cellular service in some portion of the PCS licensing region.

Moreover, many cellular licensees are partnerships or corporations and nearly all LECs are corporations or cooperatives with multiple owners. A cellular or telephone company/PCS cross-ownership ban would thus have to take into account not only the effect of partial overlap in coverage but also partial ownership of PCS applications, cellular licenses, and LECs. The complexities of such issues are entirely beyond the scope of this proceeding because they cannot be meaningfully addressed in comments in the absence of both a specific PCS licensing area definition and proposed cross-ownership rules, including reasons for any such rules.

The results of such an exclusion would preclude a cellular carrier from PCS eligibility in wide-ranging areas totally unrelated to the area of cellular service. For example, RSA 402, Illinois 9 - Clay, has a population of 150,000, and a cellular licensee in this RSA would be excluded from four MTAs (Chicago, Louisville, St. Louis, and Indianapolis) with a population totaling 23,365,800, covering 348 counties in seven states. Such a result could hardly be considered rational.

BellSouth would be excluded from many market areas where it hardly has any presence. Two examples will suffice. BellSouth owns a cellular system in RSA 450, Kentucky 8 - Mason, three of

whose ten counties, with a population of 37,400, fall in the Cincinnati MTA. Although these counties account for only 0.8% of the MTA's population of 4,716,800, BellSouth would be excluded from the entire MTA. BellSouth also has a 9% interest in five Louisiana cellular systems that overlap with the Dallas MTA. The portions of the five Louisiana market areas falling in the Dallas MTA have a population totaling 75,300. Although this represents only 0.8% of the MTA's population of 9,788,300, BellSouth would be excluded from the entire MTA.[73]

3. Nationwide Licensing Would Undermine the Core Goal

Nationwide licensing of PCS providers would magnify the disadvantages of large-area licensing and reduced diversity. All but the very largest companies would be excluded.

If the Commission is intent on nationwide licensing, it must be very careful to structure the rules in a manner which overcomes the following significant problems. Nationwide licensing would be in tension with the statutory mandate of Section 7 of the Communications Act. It would minimize the number of U.S. companies involved in PCS development, which would adversely affect the ability of the United States to take a leadership role in PCS internationally. It is even possible that foreign manufacturers might take advantage of the opportunity to become nationwide PCS licensees in the United States,[74] which would significantly diminish the opportunities for increased U.S. competitiveness overseas in the PCS arena. As we discuss further below, policies that would involve many companies in PCS development and operation would, by contrast, allow the United States to develop a large pool of manufacturers and operators with PCS expertise and enhance the ability of American companies to compete in the international PCS market.

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[73] In fact, forty-nine entities would be excluded from eligibility in the Dallas MTA, including three Regional Bell Operating Companies, GTE, Centel, Alltel, and dozens of small telephone companies, in addition to non-wireline cellular carriers such as McCaw, Radiofone, General Cellular, and numerous others.

[74] There are no restrictions on alien ownership of private radio licenses. If PCS were licensed nationwide on a private carrier basis, there would be no legal obstacle to Asian or European equipment manufacturers obtaining nationwide PCS licenses for the United States.

Nationwide licensing would result in a lack of responsiveness to local needs and thus reduce diversity of services.[75] A nationwide licensee would have little familiarity with the particular communications needs of the innumerable residential and business communities across the nation. The licensee would have no incentive to tailor its services to local needs and, in any event, the magnitude of the task would preclude its effective accomplishment in any event. Furthermore, the licensee would naturally focus its efforts predominantly on the most populated areas of the nation, to the virtual exclusion of less-populated areas. If regulations were adopted to force nationwide licensees to cover less-populated areas, the financial requirements would be magnified, deployment would be delayed, and there would be an increased risk that one or more national systems would not survive.[76]

The Commission suggested in the *NPRM* that the licensee for a large area might subcontract with other companies to provide service in smaller areas and communities.[77] The Commission felt this idea might alleviate some concerns about a nationwide licensee's ability to serve to less-populated areas. The Commission notes, however, that such subcontracting might involve substantial transaction costs.[78]

A far more fundamental problem exists. Subcontracting would be contrary to the public interest and would violate the express terms and the regulatory scheme of the Communications Act.[79] A licensee may not delegate its responsibility to a third party; the licensee must be fully

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[75] *See* Gantt Report at 2-3.

[76] *See* Doyle Study at 9-14, 17-19.

[77] *NPRM*, 7 FCC Rcd. at 5700.

[78] *Id.*

[79] The subcontracting envisioned by the *NPRM* appears to be different from a partial assignment of license or the use of a management contractor. A nationwide licensee could lawfully assign its license rights to another party, pursuant to Commission consent. A licensee could also engage a management company to (continued...)

responsible to the Commission for ensuring that it provides service in the public interest and in compliance with FCC rules, policies, and regulations. The licensee must retain control of its facilities, subject to the ultimate control of the United States over the use of radio in the national interest.[80] Granting a blanket license to a private party to provide service when and where it chooses to do so would constitute an abandonment of the Commission's statutory responsibility and an unlawful delegation of authority.

Accordingly, the Commission may not, consistent with the Communications Act, delegate its responsibility and authority to a private party, who would then effectively grant licenses for local service to "subcontractors." The fact that the Commission even raised this issue emphasizes how poorly suited large-area licenses would be for the provision of PCS, a highly localized service. Since PCS by its very nature must be local, it would be irrational, as well as an abrogation of the Commission's responsibilities, to license the service on a nationwide basis.

D. All Technically and Financially Capable Parties Should Be Permitted to Hold and Acquire Licenses

The Commission should not impose artificial limitations on eligibility to hold PCS licenses or to acquire licenses by assignment or transfer. Unrestricted eligibility of financially and technically qualified entities to participate in the provision of PCS will yield very substantial benefits.

1. Open Eligibility Will Serve the Public Interest

In order to maximize the diversity of services provided through a PCS allocation, the Commission should adopt policies that encourage the participation of companies with a wide range of perspectives. The incentives of existing businesses to offer a new product or service will differ,

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[79](...continued)
oversee local operations, under the licensee's active supervision and control, instead of utilizing its own employees.

[80] *See* 47 U.S.C. §§ 301, 304, 307, 308, 309, 310(d), 312.

as will their approach to the new offerings. Some will approach the new product as a complement or extension to their current product line; others will approach the new product as a way of taking advantage of their existing plant or expertise; some will offer a new niche product; and others will approach the new opportunity as a way to compete to some degree with existing companies in existing markets. The actual products that these companies introduce will be affected by their existing businesses and their own perceptions of the marketplace.

If companies from diverse backgrounds are permitted to compete, a wider variety of products are likely to be introduced. In a free market, without eligibility restrictions, the public benefits from particular companies' interest in offering a wide range of related products or services, other companies' potential economies of scale or of scope in offering new products or services, and other companies' interest in providing new or hybrid products as new entrants.[81] If there are artificial restrictions on entry, however, the diversity of offerings will be lessened.

For example, the diversity of participants in the cellular industry has undoubtedly been partly responsible for the wealth of new service developments and experiments, as well as the unprecedented growth of this industry. If the Commission had excluded cable television companies, publishers, paging companies, or LECs from cellular ownership ten years ago, the cellular industry would look

[81] A somewhat simplified example of these different approaches, under open eligibility, might be the introduction of laundry products by various competitors. A soap company might attempt to broaden its laundry product lines by introducing rinse-cycle fabric softener; a paper company might enter the laundry market for the first time by introducing softener-impregnated paper sheets for the dryer; an entrepreneur might introduce an organic enzyme-based detergent; and a chemical company might market a baking-soda laundry additive.

very different today.[82] Participants from each of these industries have made their own unique contributions to the development of cellular service.

Open eligibility for licenses to provide PCS will, therefore, result in the widest possible array of new and hybrid services, including services that broaden the offerings of those already providing forms of Existing-PCS, services that take advantage of fixed networks and service organizations in place, low-priced services that compete to some degree with Existing-PCS, and truly unique new services. Any restriction on eligibility for PCS licenses, however, will tend to reduce the variety of PCS services that will be made available. This may reduce the overall utility of PCS to the public because, without a wealth of service offerings at different prices to choose from, some members of the public may have communications needs that will not be met at an appropriate price from among the limited set of services offered by a less-diverse group of providers.

It is noteworthy that the Commission has, when adopting rules for major new services in the past, recognized the importance of allowing existing service providers to take advantage of new technologies and participate in providing the new, related services. For example, it has provided television broadcasters with an exclusive initial opportunity to hold a high definition television license, rather than excluding them,[83] and it has repeatedly allowed existing broadcasters at least as good

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[82] At one time the FCC intended cellular to be the sole domain of telephone companies, while at another time it considered whether to exclude them. *Compare Land Mobile Radio Service*, Docket 18262, *Second Report and Order*, 46 FCC 2d 752, 760 (1974) (eligibility restricted to wireline telephone companies), *recon.*, 51 FCC 2d 945, *clarified*, 55 FCC 2d 771 (1975), *aff'd sub nom. NARUC v. FCC*, 525 F.2d 630 (D.C. Cir.), *cert. denied*, 425 U.S. 992 (1976), *with Cellular Communications Systems*, CC Docket 79-318, *Notice of Inquiry and Notice of Proposed Rulemaking*, 78 FCC 2d 984, 988-95 (1980) (calling for comment on whether to exclude wireline telephone companies).

[83] *Advanced Television Systems*, MM Docket 87-268, *Second Report and Order/Further Notice of Proposed Rulemaking*, 7 FCC Rcd. 3340 (1992), *recon. in part on other grounds*, FCC 92-438, *Memorandum Opinion and Order/Third Report and Order/Third Further Notice of Proposed Rulemaking* (adopted September 17, 1992).