

sponse to our tentative decision in the *Third NPRM* to grant CellularVision a Pioneer Preference, until the record is supplemented upon conclusion of a peer review process that we require in the Order.

## II. Summary of Issues Raised by Public Comments In Response to Initial Regulatory Flexibility Analysis

### A. IRFA Issues

We received one comment in direct response to the IRFA in the *Fourth NPRM* based on our request for comment on our proposal to designate, on a primary protected basis, the 31.0-31.3 GHz (31 GHz) band to LMDS. SBA opposes our proposed designation because it contends that the *Fourth NPRM* fails to consider the impact on existing users of the spectrum, which it argues are largely small governmental entities and small businesses. SBA contends that, in Section IV of the IRFA, the description and estimate of the number of small entities to which the proposed rule will apply misconstrues and underestimates the small entities that are incumbent licensees. It asserts that rather than 25 or 26 licensees, as we estimated, the comments of Sunnyvale indicate there are more than 40 incumbent local governments holding licenses. SBA contends that Sierra asserts there are as many as 100 incumbent licensees and there are over a dozen marketers or resellers of its equipment that are small businesses. We consider in the Order the comments of SBA and other commenters on the number of licensees in the 31 GHz service, as discussed fully in paragraphs 44-51 of the Order, and later in this FRFA.

SBA further argues that, in Section VI of the IRFA, we failed to consider significant alternatives to redesignating the entire 31 GHz band to LMDS that might minimize the impact on the incumbent licensees that are small entities. It argues that the only alternative to the proposed 31 GHz designation that we considered in the IRFA involved alternative spectrum bands for LMDS to use, rather than any alternatives for the incumbent licensees.

We consider in the Order the comments of SBA and other commenters on numerous alternatives to accommodate existing licensees in the 31 GHz services, as discussed fully in paragraphs 69-103 of the Order, and later in this FRFA. The IRFA itself did not identify any alternatives to our proposed designation of 31 GHz for LMDS in order to reduce the impact on incumbent licensees. However, the text of the *Fourth NPRM*, in paragraphs 100-104, specifically identified several alternative methods by which incumbent operations could be accommodated if LMDS were authorized on a primary protected basis in the 31 GHz band. We requested comments on those alternatives and any other options we should consider that would not impose undue economic burdens on the new LMDS operations. We modify our proposal and adopt a band-sharing plan that provides non-LTTS incumbent li-

censees with protection from LMDS on a portion of the 31 GHz band, while designating the entire band for LMDS.

### B. Other Service Issues

We also consider significant issues raised in comments to our proposals in the *First NPRM*, *Third NPRM*, and *Fourth NPRM* that may have a significant economic impact on a substantial number of small entities. In response to the *Fourth NPRM*, several comments were filed in response to our proposal to designate, on a primary protected basis, the 31 GHz band for LMDS and our request for comments on various alternatives for accommodating the incumbent 31 GHz licensees. Several comments were received from proponents of LMDS, including CellularVision, in favor of designating 31 GHz for LMDS, while several comments were received from proponents of the existing 31 GHz services that oppose changes to the services and their being relegated to secondary status to LMDS.

We received several comments in response to the accommodation proposals. All of the comments opposing our proposal, including IMSA and ITE on behalf of their members, argue that permitting LMDS to operate in the entire 300 megahertz on a primary basis essentially would eliminate their operations and that co-existence under these circumstances would not be possible. Palm Springs argues that it would be forced to disband its 31 GHz traffic communication system, creating undue hardship. On the other hand, CellularVision and Endgate assert that, as LMDS licensees, they would offer leasing options to incumbents, if available. Several comments argue against our suggestion that current 31 GHz services could move to another frequency band where protection for such operations is provided under our rules, such as 23 GHz. Sierra, as the primary manufacturer of the 31 GHz equipment, asserts that the cost of modifying equipment for other bands would be more than replacement costs and also would require the development of new equipment. Topeka argues that moving to the 21 GHz band would cause financial hardship that would require allocating funds through local tax dollars and it seeks to avoid the costs of converting or replacing equipment that may be required by a move.

In response to our request for cooperation among the LMDS providers and existing licensees to explore methods for allowing the services to coexist, CellularVision and Sierra submit two different band-sharing plans. In CellularVision's plan for 25 megahertz at each end of band for incumbent services, Sierra argues that the equipment for 31 GHz would not function in the narrow bandwidth and important traffic signal services could not be provided. It argues that the 75 megahertz at each end that it proposes in its plan would not require expensive modifications and would accommodate existing services. Sierra argues that its plan is supported by current 31 GHz licensees. SBA and USDOT, as Federal Government entities, support the Sierra plan and argue that incumbent services should be maintained to assist in meeting national goals of reducing traffic congestion and air pollution.

The governmental entities, manufacturers, and organizations in support of incumbent services argue that we should accept new applications, modifications, and renewal applications in the band for traffic control systems. For example, Palm Springs asserts that it plans to build out its 31 GHz microwave system from the current 35 signals to a total of 70 signals over the next three years. It requests that we maintain their ability to use the band for their systems. Topeka argues that, if we adopt our proposal, we at least grandfather existing licensees in the LMDS rules to permit renewals and modifications and to ensure their protection from LMDS interference.

Of the remaining issues, some commenters oppose our proposal in the *Fourth NPRM* that both the 28 GHz band and the 31 GHz band be assigned as a single block in an LMDS license. For example, the Ad Hoc RTC and others request that the 31 GHz block be licensed as a separate unit in each LMDS service area. Emc<sup>3</sup> argues that as little as 150 megahertz of spectrum could be used to provide a viable service using digital technology. WCA argues for three licenses per geographic area, the smallest being 150 megahertz. These commenters argue that additional licenses of smaller bandwidth would provide for smaller operators, encourage the development of niche markets, and promote economical services similar to those in narrower bandwidth licenses, particularly in rural areas.

Some commenters, including M3ITC, oppose our proposal in the *Third NPRM* to license LMDS on broad geographic areas based on the Rand McNally Commercial and Marketing Guide Basic Trading Areas (BTAs). They argue that use of the smaller designations of Metropolitan Statistical Areas (MSAs) and Rural Service Areas (RSAs) would provide more manageable territories within which to initiate service and be more affordable for entrepreneurs.

CellularVision and other commenters support our proposal to permit the disaggregation of spectrum by LMDS licensees and to permit the geographic partitioning of any part of an LMDS license.

Many comments support our request for comments in the *Fourth NPRM* on whether to temporarily restrict eligibility of incumbent LECs and cable companies that seek to obtain LMDS licenses in their geographic service areas. CVTT and SkyOptics argue that LECs and cable companies should be permanently ineligible in order to ensure that smaller companies enter the new market. Other comments, including WebCel, advocate restrictions limited to those areas in which LECs and cable companies currently operate. Other parties, including CellularVision, argue that we should impose restrictions on the largest LECs and cable companies or allow incumbents to hold only one LMDS license. Some parties oppose our proposal to define in-region incumbent LECs or cable companies based on a 20 percent population threshold and to define an attributable interest to be an ownership interest of 10 percent. Some parties, including RioVision and other small entities, agree that the restric-

tions could end when competition is sufficient, either after a five-year period or under a test established by the Commission.

Virtually all the comments support our proposal in the *First NPRM* to designate a new LMDS service from the existing point-to-point microwave common carrier service to a local multipoint distribution service that allows non-common carrier service as well as common carrier service. CellularVision, M3ITC, and other small entities seek a broad service definition that allows the LMDS provider to choose any common or non-common carrier service within the technical rules. CellularVision and other commenters oppose our proposal to apply a presumption that a service is common carriage. They argue that the licensing framework should be sufficiently open and flexible to allow the business judgments of licensees to shape the nature of the services to be offered.

Some comments, including M3ITC, oppose our proposal in the *Third NPRM* to impose construction requirements on licensees and require service to be available to a minimum of one-third of the population of their geographic areas within five years from the date of license grant, and to two-thirds of the population within ten years from the date of the grant of the license. M3ITC alternatively argues that a time limit such as eight years would be sufficient to claim a service area, after which unserved areas should be opened for licensing. ComTech, on the other hand, supports the requirements and requests that we impose a faster requirement for companies that acquire a license adjacent to their existing service area to ensure against anti-competitive behavior.

With respect to the technical rules proposed in the *Third NPRM*, CellularVision, Endgate, and other commenters oppose an alternative proposal to establish a power flux density (PFD) rather than require applicants to coordinate frequencies among themselves at their service area boundaries. They argue that LMDS development is in its infancy and it would be difficult to determine a PFD standard to be protective of all LMDS system designs. CellularVision opposes requiring LMDS operators to use active power control and interlock techniques in their systems, which it contends are unnecessary, expensive, and will complicate designs. Next, Endgate opposes our proposal to restrict the use of various signal polarizations and require orthogonally-polarized signals as unnecessary. Further, Endgate opposes our proposal to restrict the maximum equivalent isotropically radiated power (EIRP) at which LMDS systems operate in the 28 GHz band to a -52 dBW/Hz. It opposes any limit less than -18 dBW/Hz and contends that the proposed limit will not provide coverage to justify an LMDS systems economically. CellularVision offers a compromise maximum limit of -35 dBW/Hz, which it argues is sufficient to meet the needs of LMDS subscribers and is conducive to frequency coordination. CellularVision and ComTech also argue that our proposal to adopt a frequency tolerance standard for subscriber transceiver equipment would be too costly.

### C. Competitive Bidding Issues

With respect to competitive bidding (para. 303 of the Order), most commenters supported the Commission's proposal to auction LMDS spectrum. M3ITC, however, disagreed and proposed the use of lotteries, expressing a concern that small businesses may lack the financial ability to participate in the auction, particularly in the major markets. It suggested the imposition of a royalty or other fee on lottery winners to generate revenue in lieu of auctions.

The Commission's proposal to require participants in LMDS auctions to tender to the Commission a substantial upfront payment was generally supported (paras. 328-330 of the Order), but CellularVision and ComTech objected to establishing an upfront payment of \$0.02 per MHz-pop for the largest combination of MHz-pops a bidder anticipates being active on in any single round of bidding, as this would yield an upfront payment of approximately \$20 million for a BTA with one million pops and an upfront payment of approximately \$5 billion for the whole Nation.

The Commission proposed adoption of the transfer disclosure requirements contained in 47 CFR § 1.2111(a) for all LMDS licenses obtained through the competitive bidding process. CellularVision agreed with the Commission's proposal not to limit transfers and assignments of LMDS licenses.

The Commission sought comment on the best way to promote opportunities for businesses owned by minorities and women in light of the Supreme Court's decision in *Adarand Constructors v. Peña*, which held that federal race-based programs are subject to strict scrutiny. Commenters were also asked to document discrimination against such businesses. RioVision argued that the Commission should develop special provisions to provide designated entities with realistic opportunities to participate in the auction process, but RioVision and other commenters failed to supply evidence of discrimination against such businesses (paras. 340-342 of the Order).

The Commission's proposal to establish a small business definition for LMDS and adopt installment payments for small businesses bidding for LMDS licenses met with general approval from commenters. However, CellularVision recommended that the Commission establish a higher limit on average annual gross revenues in its definition of small business, arguing that the proposed limit of \$40 million in average annual gross revenues was too low to help small businesses. The Commission's request for comment on the related issue of reduced upfront payments for small businesses yielded comments from CellularVision and Emc<sup>3</sup> in favor of reduced upfront payments for these entities (paras. 344-346 of the Order).

The Commission's proposal to make the unjust enrichment provisions adopted in the Competitive Bidding Second Report and Order<sup>3</sup> applicable to installment payments by small business applicants (paras. 344-345 of the Order) received general support, although CellularVision argued against restrictions after the seventh year of the license term. ComTech urged the Commission to adopt transfer rules which would relieve the transferor of any regulatory or other burdens associated with the newly created license. The Commission's proposal to make available a bidding credit of 25 percent for small businesses and the corresponding imposition of a payment requirement on transfers of such licenses to entities that are not small businesses was supported by commenters M3ITC, Emc<sup>3</sup>, and CellularVision, the latter encouraging the Commission to consider other regulatory measures, including a small business bidding credit higher than 25 percent. (para. 355 of the Order).

### III. Description and Estimate of Small Entities Subject to Rules

The service regulations we adopt to implement LMDS would apply to all entities seeking an LMDS license, including small entities. In addition, the in-region, temporary eligibility restrictions we adopt would apply to qualifying LECs and cable companies. Finally, the rules we adopt to designate additional spectrum for LMDS in the 31.0-31.3 GHz band would apply to all entities providing incumbent services under existing rules for 31 GHz services. We consider these three groups of affected entities separately below.

#### A. Estimates of Potential Applicants of LMDS

SBA has developed definitions applicable to radiotelephone companies and to pay television services. We are using these definitions that SBA has developed because these categories approximate most closely the services that may be provided by LMDS licensees. The definition of radiotelephone companies provides that a small entity is a radiotelephone company employing fewer than 1,500 persons.<sup>4</sup> The definition of a pay television service is one which has annual receipts of \$11 million or less.<sup>5</sup>

The size data provided by SBA do not enable us to make an accurate estimate of the number of telecommunications providers which are small entities because it combines all

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<sup>3</sup> 9 FCC Rcd 2348 (1994).

<sup>4</sup> 13 CFR § 121.201, Standard Industrial Classification (SIC) 4812.

<sup>5</sup> *Id.*, SIC 4841.

radiotelephone companies with 500 or more employees.<sup>6</sup> We therefore use the 1992 Census of Transportation, Communications, and Utilities, conducted by the Bureau of the Census, which is the most recent information available. This document shows that only 12 radiotelephone firms out of a total of 1,178 such firms which operated during 1992 had 1,000 or more employees.<sup>7</sup> Likewise, the size data provided by SBA do not enable us to make a meaningful estimate of the number of cable and pay television providers which are small entities because it combines all such providers with revenues of \$11 million or less.<sup>8</sup> We therefore use the 1992 Census of Transportation, Communications, and Utilities (Table 2D), conducted by the Bureau of the Census, which is the most recent information available. This document shows that only 36 of 1,788 firms providing cable and pay television service have a revenue of greater than \$10 million. Therefore, the majority of LMDS entities to provide video distribution and telecommunications services may be small businesses under SBA's definition.

The Commission has not developed a definition of small entities applicable to LMDS licensees, which is a new service being licensed in the Order. The RFA amendments were not in effect until shortly before the *Fourth NPRM* was released, and no data has been received establishing the number of small businesses associated with LMDS. However, in the *Third NPRM* we proposed to auction the spectrum for assignment and requested information regarding the potential number of small businesses interested in obtaining LMDS spectrum, in order to determine their eligibility for special provisions such as bidding credits and installment payments to facilitate participation of small entities in the auction process. In the Order we adopt criteria for defining small businesses for purposes of determining such eligibility. We will use this definition for estimating the potential number of entities applying for auctionable spectrum that are small businesses.

As discussed in Section II.D.2.e. of the Order, we adopt criteria for defining small businesses and other eligible entities for purposes of defining eligibility for bidding credits and installment payments. We define a small business as an entity that, together with affiliates and controlling principals, has average gross revenues not exceeding \$40 million for the three preceding years (paras. 345 and 348 of the Order). Additionally, bidding credits

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<sup>6</sup> U.S. Small Business Administration 1992 Economic Census Employment Report, Bureau of the Census, U.S. Department of Commerce, Table 3, SIC 4812 (radiotelephone communications industry data adopted by the SBA Office of Advocacy).

<sup>7</sup> U.S. Bureau of the Census, U.S. Department of Commerce, 1992 Census of Transportation, Communications, and Utilities, UC92-S-1, Subject Series, Establishment and Firm Size, Table 5, Employment Size of Firms: 1992, SIC 4812 (issued May 1995).

<sup>8</sup> *Id.*, SIC 4841.

and installment payments are available to applicants that, together with affiliates and controlling principals, have average gross revenues for the three preceding years of more than \$40 million but not more than \$75 million (paras. 349 and 358 of the Order).

SBREFA was not in effect until the record in the *Third NPRM* closed, and we did not seek comment on the potential number of prospective applicants for LMDS that might qualify as small businesses. Therefore, we are unable to predict accurately the number of applicants for LMDS that would fit the definition of a small business for competitive bidding purposes. However, using the definition of small business we adopted for auction eligibility, we can estimate the number of applicants that are small businesses by examining the number of applicants in similar services that qualified as small businesses. For example, MDS authorizes non-common carrier services similar to what may be developed through LMDS. The MDS rules provide a similar definition of a small business as an entity that, together with its affiliates, has annual gross revenues for the three preceding years not in excess of \$40 million.<sup>9</sup> A total of 154 applications were received in the MDS auction, of which 141, or 92 percent, qualified as small businesses.

We plan to issue 2 licenses for each of the 492 BTAs, excluding New York, that are the geographic basis for licensing LMDS. Thus, 984 licenses will be made available for authorization in the LMDS auction. Inasmuch as 92 percent of the applications were received in the MDS auction were from entities qualifying as small businesses, we anticipate receiving at least the same from LMDS applicants interested in providing non-common carrier services.

There is only one company, CellularVision, that is currently providing LMDS video services. Although the Commission does not collect data on annual receipts, we assume that CellularVision is a small business under both the SBA definition and our proposed auction rules.

## **B. Estimates of LECs and Cable Companies Ineligible Under the Temporary, In-Region Eligibility Restriction**

### **1. Local Exchange Carriers**

Neither the Commission nor the SBA has developed a definition for small providers of local exchange services (LECs). The closest applicable definition under the SBA rules is

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<sup>9</sup> Amendment to Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service, MM Docket No. 94-131, and Implementation of section 309(j) of the Communications Act - Competitive Bidding, PP Docket No. 93-253, Report and Order, 10 FCC Rcd 9589 (1995).

for telephone communications companies other than radiotelephone (wireless) companies.<sup>10</sup> The most reliable source of information regarding the number of LECs nationwide of which we are aware appears to be the data that we collect annually in connection with the *TRS Worksheet*. According to our most recent data, 1,347 companies reported that they were engaged in the provision of local exchange services.<sup>11</sup> Although it seems certain that some of these carriers are not independently owned and operated, or have more than 1,500 employees, we are unable at this time to estimate with greater precision the number of LECs that would qualify as small business concerns under SBA's definition. Consequently, we estimate that there are fewer than 1,347 small incumbent LECs.

Because the small incumbent LECs subject to these rules are either dominant in their field of operations or are not independently owned and operated, consistent with our prior practice, they are excluded from the definition of "small entity" and "small business concerns."<sup>12</sup> Accordingly, our use of the terms "small entities" and "small businesses" does not encompass small incumbent LECs.<sup>13</sup> Out of an abundance of caution, however, for regulatory flexibility analysis purposes, we will consider small incumbent LECs within this analysis and use the term "small incumbent LECs" to refer to any incumbent LECs that arguably might be defined by SBA as "small business concerns."

## 2. Cable Services or Systems

The SBA has developed a definition of small entities for cable and other pay television services, which includes all such companies generating \$11 million or less in revenue annually.<sup>14</sup> This definition includes cable systems operators, closed circuit television services, direct broadcast satellite services, multipoint distribution systems, satellite master antenna systems and subscription television services. According to the Census Bureau, there were

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<sup>10</sup> 13 CFR § 121.201, SIC 4813.

<sup>11</sup> Federal Communications Commission, Common Carrier Bureau, Industry Analysis Division, *Telecommunications Industry Revenue: TRS Fund Worksheet Data*, Tbl. 1 (Average Total Telecommunications Revenue Reported by Class of Carrier) (Dec. 1996) (*TRS Worksheet*).

<sup>12</sup> See Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, 11 FCC Rcd 15499 (1996), *motion for stay pending judicial review denied*, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Order, 11 FCC Rcd 11754 (1996), *partial stay granted*, Iowa Utilities Board v. F.C.C., No. 96-3321, 1996 WL 589204 (8th Cir. 1996), paras. 1328-1330, 1342.

<sup>13</sup> See *id.* at para. 1342.

<sup>14</sup> 13 CFR § 121.201, SIC 4841.

1,788 total cable and other pay television services and 1,423 have \$11 million or less in revenue.<sup>15</sup>

The Commission has developed its own definition of a small cable system operator for the purposes of rate regulation. Under the Commission's Rules, a "small cable company," is one serving fewer than 400,000 subscribers nationwide.<sup>16</sup> Based on our most recent information, we estimate that there were 1,439 cable operators that qualified as small cable system operators at the end of 1995.<sup>17</sup> Since then, some of those companies may have grown to serve over 400,000 subscribers, and others may have been involved in transactions that caused them to be combined with other cable operators. Consequently, we estimate that there are fewer than 1,439 small entity cable system operators.

The Communications Act also contains a definition of a small cable system operator, which is "a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1 percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000."<sup>18</sup> The Commission has determined that there are 61,700,000 subscribers in the United States. Therefore, we found that an operator serving fewer than 617,000 subscribers shall be deemed a small operator, if its annual revenues, when combined with the total annual revenues of all of its affiliates, do not exceed \$250 million in the aggregate.<sup>19</sup> Based on available data, we find that the number of cable operators serving 617,000 subscribers or less totals 1,450.<sup>20</sup> We do not request nor do we collect information concerning whether cable system operators are affiliated with entities whose gross annual revenues exceed \$250,000,000,<sup>21</sup> and thus are

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<sup>15</sup> 1992 Economic Census Industry and Enterprise Receipts Size Report, Table 2D, SIC 4841 (U.S. Bureau of the Census data under contract to the Office of Advocacy of the U.S. Small Business Administration).

<sup>16</sup> 47 CFR § 76.901(e). The Commission developed this definition based on its determination that a small cable system operator is one with annual revenues of \$100 million or less. Implementation of Sections of the 1992 Cable Act: Rate Regulation, Sixth Report and Order and Eleventh Order on Reconsideration, 10 FCC Rcd 7393 (1995).

<sup>17</sup> Paul Kagan Associates, Inc., *Cable TV Investor*, Feb. 29, 1996 (based on figures for December 30, 1995).

<sup>18</sup> 47 U.S.C. § 543(m)(2).

<sup>19</sup> 47 CFR § 76.1403(b).

<sup>20</sup> Paul Kagan Associates, Inc., *Cable TV Investor*, Feb. 29, 1996 (based on figures for December 30, 1995).

<sup>21</sup> We do receive such information on a case-by-case basis only if a cable operator appeals a local franchise authority's finding that the operator does not qualify as a small cable operator pursuant to Section 76.1403(b) of the Commission's Rules. See 47 CFR § 76.1403(d).

unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

We find that the definition of small entities developed by SBA includes categories of services that are not included in LMDS, such as satellite master antenna systems. Thus, the estimated figure that 1,423 cable systems are small businesses that would be affected by our rule would be an overstatement. There is no other definition for us to use, since none has been developed for cable systems limited to LMDS-type services. Moreover, there is no harm in relying on the SBA number, which overestimates rather than underestimates potential cable systems that might be affected.

### C. Estimates of Incumbent Services in 31 GHz Band

We proposed in the *Fourth NPRM* to designate the 31 GHz band for LMDS, on a primary protected basis, and requested comment on how to accommodate incumbent licensees, which are not protected from harmful interference under their licenses. In the IRFA, we estimated the number of small entities to which the proposed rule would apply based on the number of incumbent licensees in the 31 GHz band that are governmental entities. We stated there are 27 incumbent licensees and that a total of 25 or 26 are small entities. Our adjustment was based on the requirement that we estimate the number of governmental entities with populations of less than 50,000 that would be affected by our new rules.<sup>22</sup> We then applied the Census Bureau ratio that 96 percent of all counties, cities, and towns in the Nation have populations of fewer than 50,000.<sup>23</sup> We requested comment in the IRFA on the number of small entities significantly impacted by our proposed designation of 31 GHz for LMDS.

We address SBA's comments in paras. 44-46 of the Order, where we agree that we did not reflect the correct number of total licensees in the 31 GHz band. We consider the lists of licensees and users submitted by Sunnyvale and Sierra, which we find include duplicates and several users that are not licensed. Based on a review of our database, we found there are a total of 86 licensees for 31 GHz services under the current rules. We found that licensees fall into three categories of services, as follows: (1) governmental entities using the band primarily for traffic control systems; (2) cellular and other communications companies providing LTTS; and (3) private business users.

Of the total licensees, 59 licensees are LTTS licensees, 8 are private business users, and 19 are governmental entities. Of the 19 governmental entities, 14 are municipalities and

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<sup>22</sup> See 5 U.S.C. § 601(5).

<sup>23</sup> See 1992 Census of Governments, Bureau of the Census, U.S. Department of Commerce.

the remainder are counties or states. The cities appear small in size, except for the Cities of Charlotte, San Diego, and Topeka. Thus, the correct number of small governmental entities that are licensees in the 31 GHz services should be 11 or less, rather than the 26 or 27 we stated in the IRFA. As for the entire number of licensees that qualify as small entities, we cannot determine from the remaining 59 LTTS licensees or 8 private business licensees which are small. Many of the LTTS licensees are not small, such as MCI or Bell Atlantic New Jersey, Inc. Nevertheless, to ensure that no small interests are overlooked, we will assume that most of these are small licensees and, together with the 11 small governmental entities, will consider at least 50 of all 86 licensees to be small entities.

#### **IV. Summary of Projected Reporting, Recordkeeping, and Other Compliance Requirements**

The Order adopts a number of rules that will entail reporting, recordkeeping, and third party consultation. We find that these requirements are the minimum needed to ensure the integrity and efficiency of LMDS licensing and serve the public interest, as reflected in this record.

In designating the 31 GHz band for LMDS, we adopt in the Order a band-sharing plan that designates the two outer 75 megahertz segments for non-LTTS incumbent licensees to be protected from harmful interference from LMDS. We adopt technical rules that require LMDS licensees to coordinate frequencies with incumbent licensees. We adopt a procedure to allow non-LTTS incumbent licensees in the middle 150 megahertz segment that is not protected to relocate to the outer segments within 15 days after the effective date of the Order and to file an application to modify their licenses to reflect the new frequencies (paras. 91-92 of the Order). Relocation and protection are accorded to all incumbents except LTTS, which are temporary services that operate on a secondary basis and in any band, so that the protections would not benefit them. Many of the non-LTTS incumbent licensees are small entities. We find that the relocation and coordination process we have established does not impose undue cost burdens and we believe it is administratively manageable. Moreover, we have found that while relocation of such incumbents to adjacent bands will involve some costs for adjusting equipment, we do not expect at this time that such costs will impose an undue burden on small incumbents.

We limit the eligibility of incumbent LECs and cable companies to hold the larger license of 1,150 megahertz in each BTA for LMDS. They are barred (for a period of three years from the effective date of LMDS rules) from holding an attributable interest in such a license in the service area in which they operate. We adopt rules similar to the CMRS spectrum cap that defines in-region if 10 percent or more of the population of the BTA is within the applicant's service area. We adopt attribution rules that apply when an ownership interest is at least 20 percent. However, we permit incumbent LECs and cable companies to

participate fully in the auction of any in-region license, so long as they come into compliance after conclusion of the auction. We require such LMDS licensees to divest overlapping ownership interests by selling their existing system or by partitioning within 90 days after the grant of their license. We find that these requirements should not affect many small entities, which are not likely to be incumbents LECs or cable companies. These requirements may also create opportunities for small businesses who wish to bid for LMDS licenses and compete in the LMDS market.

We adopt a number of service rules to initiate LMDS under procedures for licensing and filing applications, conducting operations, and establishing technical parameters. Applicants are required to submit a completed FCC Form 175. Auction winners are required to file a completed FCC Form 600. All applications are submitted for 30-day public notice and applicants are required to keep FCC Form 600 up-to-date concerning all of the foreign ownership information requested on the form. Licensees may change status between common carriage and non-common carriage or add an additional status to conduct both operations upon notification to the Commission that does not require prior approval. However, common carriers discontinuing or reducing operations must adhere to statutory notification requirements imposed in Part 63 of the Commission's Rules.

We adopt limited technical regulations. We impose a coordination process on each LMDS licensee prior to initiating service in the 27.5-28.35 GHz band in which each adjacent LMDS licensee and each potentially-affected, adjacent-channel FSS licensee must provide values for the appropriate operational parameters. Coordinating parties must supply information related to their channelization and frequency plan, receiver parameters, and system geometry. Coordination between adjacent LMDS systems need only encompass hubs located within 20 kilometers of BTA boundaries. We would resolve any conflicts between licensees. LMDS licensees in the two outer segments of the 31 GHz band also must coordinate with non-LTTS incumbent licensees to protect those licensees from harmful interference. In some cases, the services of persons with technical or engineering expertise may be required to assist with the coordination information.

We are directed by Section 309(j)(4)(E) of the Communications Act to "require such transfer disclosures and anti-trafficking restrictions and payment schedules as may be necessary to prevent unjust enrichment as a result of the methods employed to issue licenses and permits."<sup>24</sup> The Commission adopted safeguards designed to ensure that the requirements of this section are satisfied, including a transfer disclosure requirements for licenses obtained through the competitive bidding process for LMDS. An applicant seeking approval for a transfer of control or assignment of a license within three years of receiving a new license

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<sup>24</sup> 47 U.S.C. § 309(j)(4)(E).

through competitive bidding procedures must, together with its application for transfer of control or assignment, file with the Commission a statement indicating that its license was obtained through competitive bidding. Such applicant must also file with the Commission the associated contracts for sale, option agreements, management agreements, or other documents disclosing the total consideration that the applicant would receive in return for the transfer or assignment of its license.

With respect to small businesses, we have adopted unjust enrichment provisions to deter speculation and participation in the licensing process by those who do not intend to offer service to the public, or who intend to use the competitive bidding process to obtain a license at a lower cost than they would otherwise have to pay and to later sell it at a profit, and to ensure that large businesses do not become the unintended beneficiaries of measures meant to help small firms. Small business licensees seeking to transfer their licenses to entities which do not qualify as small businesses, or entities with more than \$40 million but not more than \$75 million in average gross revenues for the three preceding years that seek to transfer their licenses to larger entities, as a condition of approval of the transfer, must remit to the government a payment equal to a portion of the total value of the benefit conferred by the government.

#### **V. Significant Alternatives to Proposed Rules Which Minimize Significant Economic Impact on Small Entities and Accomplish Stated Objectives**

We modify a number of our proposals in the *Third NPRM* and *Fourth NPRM* to minimize any significant economic impact on small entities consistent with the objectives of the Order based on the comments we have received in this proceeding.

##### **A. Alternatives To Minimize Impact of Redesignation of 31 GHz for LMDS**

Specifically, we decided that LMDS needed the additional 300 megahertz of spectrum at 31 GHz in order to obtain the 1 gigahertz of unencumbered spectrum for broadband services and sufficient spectrum to experiment with services and technology that competes with telephone and cable operators. We deny requests from CellularVision and other commenters to consider an alternative allocation to spectrum below 27.5 GHz or the request from ICE-G to consider allocation to the 40 GHz band. We considered these matters in the *First Report and Order* and their availability has not changed since then.

Among the alternatives, we decide that co-existence of incumbent 31 GHz licensees with LMDS would not be possible because incumbents would be reduced to a secondary status if LMDS were accorded primary protected status and the interference from LMDS

would render such services useless. We agree with CellularVision that incumbents could lease or otherwise arrange to continue to use redesignated spectrum, but find that incumbents cannot rely on these arrangements as a reasonable alternative to minimize the impact. We also decide that movement to another band such as 23 GHz that provides protection for incumbent services is not feasible because of the major costs to incumbents to modify or replace equipment.

We decide that the plans submitted by CellularVision and Sierra to share the 31 GHz band establish a framework for us to reach a compromise based on the needs of both LMDS and 31 GHz proponents and adopt an outcome that is more equitable and balanced. We decide to segment the 300 megahertz for establishing protections based on the enumerations used by Sierra. Under this plan, the middle 150 megahertz is designated for LMDS on a primary protected basis and incumbent licensees are not granted protection from harmful interference. At each end of the band, a segment of 75 megahertz each is designated for protection of non-LTTS incumbent licensees from LMDS to enable them to continue existing operations. We decide that the plan of CellularVision to increase the middle segment to 250 megahertz on a primary protected basis and leave incumbents protected in only 25 megahertz at each end would not accommodate traffic signal technology at intersections and would be too costly. We decide that LMDS requires no more than 150 megahertz of unencumbered spectrum in the middle.

We do not adopt Sierra's limitations on LMDS use or access of the entire 31 GHz band. We agree with CellularVision and other comments that the benefits to according LMDS access to the entire band and to allowing the full array of LMDS services can be achieved while according the protections that non-LTTS incumbent licensees need to continue their operations. Thus, we accord LMDS a protected status throughout the band, but require LMDS in return to protect non-LTTS existing services in the outer segments. We do not agree with CellularVision that incumbents should be excluded altogether from the middle segment, inasmuch as LMDS has primary status there and is protected from harmful interference there.

To accommodate incumbents, we permit them to relocate to the outer segments and adopt a procedure that requires them to file an application to modify their licenses within 15 days after the rules adopted in the Order take effect, if they choose to relocate. Under our current rules, any 31 GHz licensee filing a modification application in accordance with the Order will be able to implement license changes any time during the 18-month period after the Commission grants the modification.<sup>25</sup> Moreover, because the incumbents are not authorized to provide service on a common carriage basis, their modification applications are not

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<sup>25</sup> See Section 101.63(a) of the Commission's Rules, 47 CFR § 101.63(a).

subject to the public notice and petition to deny requirements of Section 101.37 of the Commission's Rules. Thus, applications for modification of an incumbent's license under the relocation procedure would be expedited.

We find that relocation within the band gives existing 31 GHz licensees a reasonable opportunity to continue their operations with a minimum of expense and disruption. We decide not to include LTTS licensees for protection in the outer segments nor permit them to relocate, but to leave their status unchanged because of the nature of their services. These decisions are discussed more fully at paras. 85-93 of the Order.

We decide to limit the band-sharing plan to achieve protections for existing 31 GHz non-LTTS licensees in order to minimize the impact of our objective of implementing LMDS in 31 GHz on existing traffic control systems provided by small municipalities and other governmental entities. Commenters, including Palm Springs, demonstrate that public funds have been expended that would be wasted if incumbents were not protected and that these systems help control traffic and air pollution in furtherance of Federal goals. However, we decide not to allow future licensing under the existing rules and to limit incumbent licensees to their existing operations. We carefully consider the advantages and disadvantages of future growth under such rules, and conclude that it would be inconsistent with our objective to permit the licensing of LMDS on 31 GHz in order to meet the consumer demand for those telecommunications and video services it will provide.

We decide to permit incumbent licensees to renew and to modify their licenses to the extent they are not expanding service. As a result, the plans of Palm Springs and other licensees to expand existing operations under current rules cannot be achieved. The impact on small entities would not be extensive, inasmuch as we have shown that all incumbents are few in number and engaged in short-range services, as compared with the potential harm to LMDS development if the entire 31 GHz spectrum were not available and was encumbered by changing, incompatible, localized services.

Because we do not permit the licensing of new 31 GHz services, we find the dismissal of all pending applications to be consistent with our objectives. As we noted in para. 100 of the Order, we have concluded that it is in the public interest to dismiss the pending applications. Moreover, a review of our database indicates that all pending applications were filed after the release date of the *Fourth NPRM* and by new applicants not currently licensed. Thus, these applicants were on notice that we were considering a change in our rules for the 31 GHz band. To the extent any of these applicants are small entities, the impact would not be considerable because they have not invested fully in such new systems and alternative spectrum or options to gain access to 31 GHz is available, such as leasing from LMDS licensees.

## B. Alternatives To Minimize Impact of LMDS Service Rules

To accommodate concerns expressed by Ad Hoc RTG and others about our proposal to license LMDS as a single block of the 28 GHz and 31 GHz spectrum, we decided to auction two licensees of different sizes for each BTA. We considered the band-segmentation plan we adopted for protecting non-LTTS incumbent licensees in 31 GHz and the comments of LMDS proponents that 150 megahertz is viable for certain LMDS services. We decide to issue one license for 1,150 megahertz, consisting of 1,000 megahertz located in the 28 GHz band and 150 megahertz in the middle of the 300 megahertz located in the 31 GHz band. We also will issue a smaller license for 150 megahertz consisting of the two 75 megahertz segments located at each end of the 300 megahertz block in 31 GHz. The small license can be acquired by LMDS to achieve the objectives of the broadest spectrum for its experimentation, or may be used by incumbent licensees to accommodate their needs to continue using the 31 GHz band on a protected basis or by small entities such as rural interests to develop niche markets or provide more economical narrower bandwidth services. We have decided to establish a 1,150 megahertz license because we believe that a large block of unencumbered spectrum will provide LMDS providers with an opportunity to compete with broadband services and develop two-way services.

We decide that our proposal to license LMDS based on BTA geographic service areas is the most logical area for LMDS. We decline to use the smaller MSAs and RSAs requested by M3ITC and other commenters because their areas are smaller than existing video programming and telephony service areas and their use might result in unnecessary fragmentation of natural markets. BTAs ensure that the wide array of LMDS services can be provided, afford greater economies of scale, and vary in size to afford building blocks for establishing an LMDS system. We do not restrict the number of BTAs a licensee may acquire at auction, but also point out that the varying sizes provide more opportunities for smaller businesses to enter the market.

We decide that our proposal for disaggregating spectrum and allowing the geographic partitioning of an LMDS licensed area would benefit small business and allow some areas, such as rural areas, to be served more readily (para. 145 of the Order).

We agree with WebCel and other small entities to adopt our proposal to restrict eligibility of incumbent LECs and cable companies and decide that they may not acquire the larger LMDS license of 1,150 megahertz in their geographic service areas for three years. We find that such firms would not need the small license for unencumbered service and thus would not have the incentive to hobble competition. We do not adopt the request of SkyOptics and CVTT for permanent ineligibility to protect smaller entities, because they can bid for the smaller license and the 3-year period may be sufficient to allow new entrants to become established. We do not agree with commenters from the rural telephone community

that argue against any restrictions on LEC ownership of LMDS licenses. We find our restrictions should not hinder LMDS in rural areas, because they do not have the overlap that triggers our restriction and they can acquire spectrum from an LMDS licensee through contract or partitioning and disaggregation. We modify our proposal to define in-region incumbent LECs or cable companies to reflect the same provisions in the CMRS spectrum cap. This ensures consistency in our rules for wireless services for ease of compliance and efficiency.

In adopting application procedures for LMDS, we agree with CellularVision and other small entities to adopt a broad service definition that allows the LMDS provider to provide any fixed microwave service, whether common or non-common carrier. We expand our proposal to allow an applicant or licensee to apply for both common and non-common authorization in the same license, depending on the services it seeks to provide. We clarify the effect of the Telecommunications Act of 1996 on the nature of the video programming and telecommunications services that we originally identified as potential services in LMDS to assist applicants and licensees in determining the regulatory status to govern their operations. We agree with commenters to not apply the presumption we proposed to treat LMDS as common carriage.

By authorizing both common and non-common carrier service in a single license, we eliminate the burden in our proposed procedures that would require a licensee to submit an application whenever it sought to change its services between common and non-common carrier services. We decide this achieves economies in the licensing process, ensures the flexibility licensees need to provide the full array of LMDS offerings, and promotes the development of the services that may compete with existing telecommunications and video programming services. To ensure that applicants or licensees are in compliance with the statutory requirements imposed on common carriers and reflected in the Part 101 rules that govern LMDS, we decide to subject all LMDS applications to the 30-day public notice provisions and require all applicants to submit information in response to all the alien ownership eligibility restrictions. Consequently, we can rely on a simplified procedure for licensees to notify us of any change in their regulatory status, either by changing or adding common carrier or non-common carrier status, through notification by application after the change is implemented, unless the change results in the impairment of a common carrier service that requires prior approval under the discontinuance rules. These procedures are adopted to ensure implementation of LMDS under a simplified format.

For the technical rules, we agree with commenters to use the prior frequency coordination procedures rather than a service area boundary PFD limit, which could stifle technology and inhibit flexibility in system design. We decide to adopt uniform polarization to achieve greater system efficiency. We disagree with CellularVision and ComTech that

adopting a frequency stability standard would be costly, but find that it aids in coordinating usage to assist the rapid development of service.

### C. Alternatives To Minimize Impact of LMDS Auction Rules

We decline to adopt the use of lotteries in lieu of auctions. We conclude that auctioning LMDS licenses would further the Communications Act's objectives: first, by speeding the development and deployment of this new technology, products and services to the public with minimal administrative or judicial delay, and encouraging efficient use of the spectrum; second, by fostering economic opportunity and the distribution of licenses among a wide variety of applicants, including small businesses; and, third, by enabling the public to recover a portion of the value of the public spectrum. Concerns regarding small businesses having the financial ability to participate in LMDS auctions are addressed by the special provisions adopted for small businesses. We also decline to adopt Public Television's suggestion of a set-aside of spectrum for educational purposes.

We adopt a uniform upfront payment for all applicants for LMDS auctions, and decide not to adopt a reduced down payment for small businesses, because we believe that this action is consistent with our reason for requiring upfront payments, *i.e.*, to deter insincere and speculative bidding and to ensure that bidders have the financial capacity to build out their system. We delegate authority to the Wireless Telecommunications Bureau to determine an appropriate calculation for the upfront payment, which the Bureau will announce by Public Notice. The Bureau will take into consideration CellularVision's and ComTech's objection to the proposed formula of \$0.02 per MHz-pop for the largest combination of MHz-pops a bidder anticipates being active on in any single round of bidding.

Because we believe the record with regard to past discrimination, continuing discrimination, and other significant barriers experienced by minorities and women is insufficient to support race- and gender-based competitive bidding provisions under the standards of judicial review applicable to such provisions, we do not adopt such provisions. Instead, we adopt race- and gender-neutral provisions such as installment payments and bidding credits for small businesses in order to provide small businesses with an opportunity to obtain LMDS licenses. Many minority- and women-owned entities are small businesses and will therefore qualify for these same special provisions.

CellularVision recommended a definition of small business with a ceiling of \$100 million in annual gross revenues. We choose, for the purposes of LMDS auctions, to define a small business as an entity that, together with affiliates and controlling principals, has average gross revenues not exceeding \$40 million for the three preceding years. To address CellularVision's concerns, we also adopt bidding credits and installment payments for LMDS applicants that, together with affiliates and controlling principals, have average gross

revenues for the three preceding years of more than \$40 million but not more than \$75 million, as elaborated in paras. 346-348 of the Order.

Emc<sup>3</sup> and CellularVision proposed a small business bidding credit of 25 percent or more. The rules adopted in the Order provide a 25 percent bidding credit for small business applicants in the LMDS auctions, and a 15 percent bidding credit for entities with average gross revenues of more than \$40 million but not exceeding \$75 million. Commenters who advocated higher credits offered no data upon which to base such credits. We also decline to offer a bidding credit to commercial entities that set aside part of their capacity for educational institutions at preferential rates. We do not believe that we have an adequate record regarding the legal and policy implications of such credits.

#### **VI. Report to Congress**

We will submit a copy of this Final Regulatory Flexibility Analysis, along with the Order, in a report to Congress pursuant to 5 U.S.C. § 801(a)(1)(A). A copy of this FRFA will also be published in the Federal Register.

## APPENDIX E

## List of Pleadings

**First Notice of Proposed Rulemaking****Comments**

Acor, Everett T., Jr.  
Alex, Brown & Sons  
Alpha Industries, Inc.  
Amby, Faith C.  
America's Public Television Stations, Public Broadcasting Service, Organization of State  
Broadcasting Executives and Southern Educational Communications Association  
Ameritech  
Anchorage Telephone Utility  
Baderwood International, Inc.  
Bell Atlantic Corporation, *et al.* (Bell Atlantic)  
BellSouth Corporation, *et al.* (BellSouth)  
Box Springs Educators  
Calling Communications Corporation  
Cardiff Broadcasting Company  
Caribbean Communications Corporation d/b/a St. Thomas-St. John Cable TV  
Carney, Joseph D. & Associates  
Catel Telecommunications  
Cellular Television Associates, Inc.  
Coalition for Wireless Cable  
Cole, Raywid & Braverman  
Competitive Cable Association  
Cyrus Partnership  
Dataflow Systems  
Digital Microwave Corporation (DMC)  
Eagle Engineering & Communications Group, Inc.  
Educational Parties (filing jointly): American Council on Education, Board on Distance  
Education and Telecommunications of the National Association of State Universities and  
Land Grant Colleges, Instructional Telecommunications Consortium of the American As-  
sociation of Community Colleges, Western Cooperative for Educational  
Telecommunications, Arizona Board of Regents for the Benefit of the University of Arizo-  
na, California State University, Alliance for Higher Education, Iowa Public Broadcasting  
Board, University of Maine at Augusta, University of Washington, University of Wiscon-  
sin System, Washington State University, South Carolina Educational Television Commis-  
sion and Ana G. Mendez Educational Foundation  
EMI Communications Corporation

Foresight Communications  
GHz Equipment Company, Inc. (GEC)  
Gilio, Robin V.  
GTE Service Corporation (GTE)  
Guy, Frederick R.  
Haddon, Perry W.  
Hornby, Harold  
Hughes Space and Communications Co. and Hughes Network Systems, Inc.  
Joplin Beepers, Inc.  
King Broadcasting Associates  
Kingswood Associates  
Linz, Robert M., P.E.  
Levin, Michael H.  
Loral/Qualcomm Partnership, L.P. (Loral/Qualcomm)  
M3 Illinois Telecommunications Corporation (M3ITC)  
M/A-Com, Inc. (M/A-Com)  
Metrocom Telecasting  
Mettler Communications, Inc.  
Milani, Patricia B.  
Motorola, Inc.  
Motorola Satellite Communications, Inc. and Iridium, Inc. (Motorola)  
Multi-Micro, Inc.  
National Aeronautic and Space Administration (NASA)  
National Association for the Advancement of Colored People  
National Captioning Institute  
New York Department of Public Service  
Norris Satellite Communications, Inc.  
NYNEX Mobile Communications Company  
Pacific Telesis Group, Pacific Bell and Nevada Bell  
RioVision of Texas, Inc. (RioVision)  
Rochester Telephone Corporation  
Rock Hill Telephone Company, Fort Mill Telephone Company and Lancaster  
Telephone Company  
RSW Communications, Ltd.  
Rumore, Victor  
Seiter, Steven P.  
Senvista General Partnership  
Sprint Corporation on behalf of Sprint Communications Company, L.P. and the United and  
Central Companies (Sprint)  
Stephenson, Todd  
Subscriber TV Partners

Suite 12 Group  
Technology Engineering Company  
Telephone and Data Systems, Inc. (TDS)  
Total TV, Inc.  
United States Telephone Association (USTA)  
University of California  
University of Colorado  
University of Texas System  
US West, Inc. (US West)  
Utilities Telecommunications Council  
Video/Multipoint, Inc.  
Video/Phone Systems, Inc. (Video/Phone)  
Virginia Communications, Inc.  
Western Sierra Bancorp  
Wireless Cable Association International, Inc. (WCA)  
Wireless Cable, Ltd.

#### Reply Comments

Anchorage Telephone Utility  
Bell Atlantic  
Calling Communications Corporation  
Coalition for Wireless Cable  
Cole, Raywid & Braverman  
Comcast Corporation, Jones Intercable, Inc. and Cablevision Industries Corporation  
DMC  
Eagle Engineering & Communications Group, Inc.  
GEC  
GTE  
Hughes Space and Communications Co.  
Leaco Rural Telephone Company  
M3ITC  
Motorola, Inc.  
Motorola  
NASA  
National Association of Regulatory Utility Commissioners (NARUC)  
National Council of LaRaza  
New York Department of Public Service  
Public Broadcasting Service  
RioVision  
Rumore, Victor

Seiter, Steven P.  
Senvista General Partnership  
Sprint  
Suite 12 Group  
TDS  
Thomas & Associates  
Video/Phone  
USTA  
WCA

### **Third Notice of Proposed Rulemaking**

#### **Comments**

Airtouch Communications, Inc. (Airtouch)  
Alcatel Network Systems, Inc. (Alcatel)  
Ameritech  
Andrew Corporation (Andrew Corp.)  
Association of America's Public Television Stations and Public Broadcasting Service (PTV)  
Bell Atlantic  
BellSouth  
Boeing  
CellularVision USA, Inc. (CellularVision)  
ComTech Associates, Inc. (ComTech)  
Constellation Communications, Inc. (Constellation)  
Cox Enterprises Inc., *et al.* (Cox)  
DMC  
Duncan Weinberg Miller & Pembroke, P.C. (Duncan)  
Endgate  
Entertainment Made Convenient International, Inc. (Emc<sup>3</sup>)  
GE American Communications, Inc. (GE)  
GEC  
GTE  
Harris Corporation-Farion Division (Harris)  
Hewlett-Packard Company (HP)  
Hughes Communications Galaxy, Inc. (Hughes)  
Lockheed Martin Corporation (LMC)  
Loral Aerospace Holdings, Inc. (Loral)  
Loral/Qualcomm  
M3ITC  
Motorola

NASA  
National Cable Television Association (NCTA)  
Northern Telecom, Inc. (Nortel)  
NYNEX Corporation (NYNEX)  
Orion Network Systems, Inc. (Orion)  
Pacific Telesis Wireless Broadband Services (PTWBS)  
Panamsat Corporation (Panamsat)  
RioVision  
Satellite Industry Association (SIA)  
Summit Communications, Inc. (SCI)  
Telecommunications Industry Association (TIA)  
Teledesic Corporation (Teledesic)  
TDS  
Texas Instruments, Inc. (TI)  
Titan Information Systems Corporation (Titan)  
TRW, Inc. (TRW)  
WCA

**Reply Comments**

Bell Atlantic  
BellSouth  
CellularVision  
ComTech  
Emc<sup>3</sup>  
GE  
GEC  
Hon. Mark Hatfield  
Hughes  
Loral  
Loral/Qualcomm  
Motorola  
NetSat 28 Company, L.L.C. (NetSat)  
NYNEX  
Orion  
PTWBS  
SCI  
TIA  
Teledesic  
TI  
TRW