

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

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In the Matter of
Third Report and Analysis of
Competitive Market Conditions with Respect
to Domestic and International Satellite
Communications Services
Report and Analysis of Competitive Market
Conditions with Respect to Domestic and
International Satellite Communications Services
IB Docket Nos. 09-16
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THIRD REPORT

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I. EXECUTIVE SUMMARY

1. This is the third report (*Third Report*) submitted by the Federal Communications Commission (Commission) to the United States Congress on the status of competition in domestic and international satellite communications services as required by Section 703 of the Communications Satellite Act of 1962, as amended (the *Act*).¹ In this *Third Report*, we focus on calendar years 2008, 2009, and 2010.

2. Here, as in previous Reports, we examine the organization of the satellite communications services industry. In addition, we describe wholesale and retail industry segments and discuss important inputs (*i.e.*, resources required to provide satellite services) to the communications satellite business, including spacecraft (satellites), earth stations and other kinds of terminal equipment, launch services, insurance and industry financing, and technical personnel. Further, we discuss the Commission's policies regarding foreign entry into the United States, as well as U.S. companies' access to markets in foreign nations.

3. This *Third Report*, examines three sectors of the satellite communications industry: (1) fixed satellite services (FSS); (2) mobile satellite services (MSS); and (3) satellite digital radio service (SDARS).² With respect to the FSS sector, we find that, in some respects, the record contains insufficient information to allow us to make anything more than limited competitive findings and conclusions with respect to such key factors as satellite transponder capacity. Also, because of the limitations of the record before us, and because the evidence that is available has mixed implications, we cannot make meaningful findings at this time regarding the allegations of anticompetitive conduct made by resellers/integrators against FSS operator Intelsat. Yet, the complaints do raise sufficient public interest concerns to warrant additional analysis in a formal proceeding. Thus, we will initiate a follow-up proceeding to develop an adequate record that will allow for a more complete exploration of the anticompetitive issues raised. With respect to the MSS sector, we do not make specific findings regarding competition given that the MSS industry currently is undergoing major technological and structural changes. With respect to SDARS, we

¹ Amendment to Communications Satellite Act, Pub. L. No. 109-34, 119 Stat. 377 (2005), *codified at* 47 U.S.C. § 703. Our previous Reports were *Annual Report and Analysis of Competitive Market Conditions with Respect to Domestic & International Satellite Communications Services*, IB Docket No. 06-67, First Report, 22 FCC Rcd 5954 (2007) ("*First Report*") and *Second Annual Report and Analysis of Competitive Market Conditions with Respect to Domestic & International Satellite Communications Services*, IB Docket No. 07-252, Second Report, 23 FCC Rcd 15170 (2008) ("*Second Report*").

² Because satellite-based multichannel video programming distributors (MVPDs) (*i.e.*, Direct-Broadcast Satellite (DBS) services) are discussed in another annual competition report to be issued by the Commission, *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Notice of Inquiry*, MB Docket No. 07-269, Notice of Inquiry, 24 FCC Rcd 750 (2009) (*Video Competition Report*), we do not address DBS in this Report; *see also* *Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Notice of Inquiry*, MB Docket No. 07-269, Supplemental Notice of Inquiry, 24 FCC Rcd 4401 (2009); *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Notice of Inquiry*, MB Docket No. 07-269, Further Notice of Inquiry, 26 FCC Rcd 14091 (2011).

note that several services are emerging as possible competitive alternatives.³ The record, however, is insufficient to support a finding with respect to the current state of competition involving these services and SDARS.

II. INTRODUCTION

4. Section 703(a) of the Act⁴ directs the Commission to “review competitive market conditions with respect to domestic and international satellite communications services,” and to provide Congress with reports analyzing these conditions on an annual basis.⁵ Section 703(b) states that the report shall include: (1) an identification of the number and market share of competitors in domestic and international satellite markets; (2) an analysis of whether there is effective competition in the market for domestic and international satellite services; and (3) a list of any foreign nations in which legal or regulatory practices restrict access to the market for satellite services in such nation in a manner that undermines competition or favors a particular competitor or set of competitors.⁶

A. Sources of Information

5. This *Third Report* is based in part on information submitted by interested parties in response to Public Notices issued by the International Bureau (Bureau).⁷ In addition to using these filings to reach our conclusions herein, we also relied upon a variety of 2008-2010 publicly-available sources of industry information and data including Securities and Exchange Commission filings; trade association and government data; securities analysts’ and other research companies and consultants; company news releases and websites; newspaper and periodical articles; and various public Commission filings, decisions, Reports, and databases.⁸

B. Overview of the Satellite Communications Industry

6. Figure II.1 lists major suppliers to the FSS, MSS, and SDARS operators in the far left-hand segment, and shows broad types of outputs produced by satellite operators in the far right-hand segment.

³ See *Applications for Consent to the Transfer of Control of Licenses XM Satellite Radio Holdings, Inc., Transferor, to Sirius Satellite Radio, Inc., Transferee*, MB Docket No. 07-57, Memorandum Opinion and Order, 26 FCC Rcd 10539 (Media Bur. 2011)(*XM Sirius Transfer Order*).

⁴ 47 U.S.C. § 703(a). The Communications Satellite Act is 47 U.S.C. §§ 701 *et seq.*

⁵ We have consolidated our annual analyses for 2008, 2009, and 2010 into this *Third Report*.

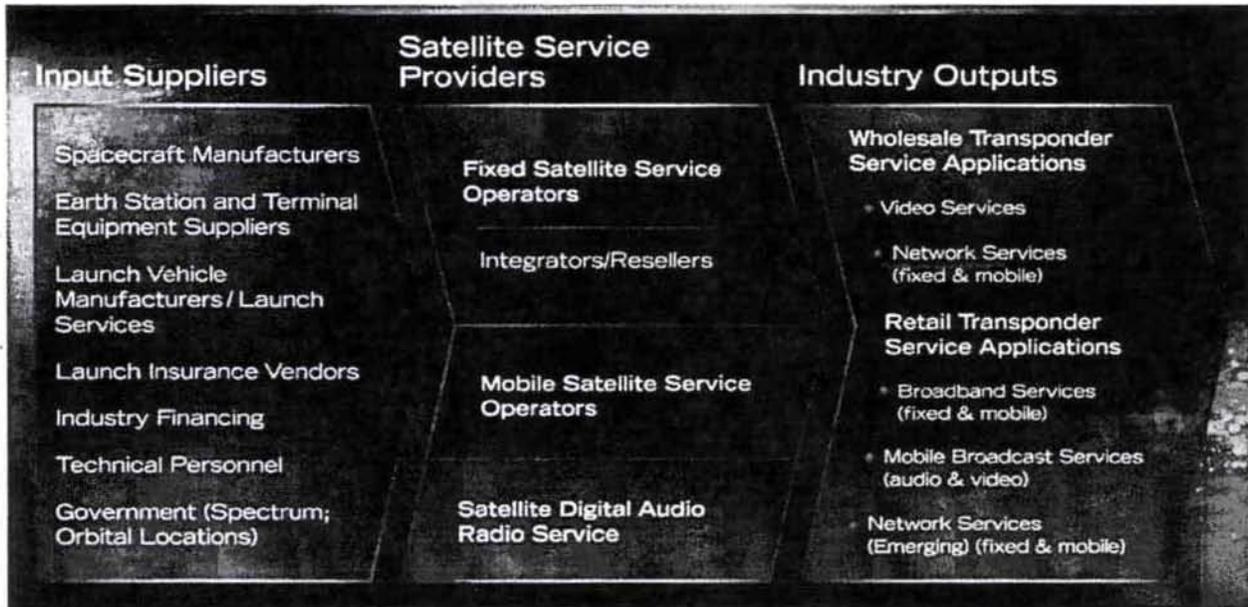
⁶ 47 U.S.C. § 703(b).

⁷ See, e.g., *International Bureau Invites Comment for Fourth Annual Report to Congress on Status of Competition in the Satellite Services Industry*, Public Notice, 25 FCC Rcd 10049 (Int’l. Bur. 2010) (*2009 Public Notice*). Although the *2009 Public Notice* states that it seeks information for the *Fourth Report*, this document will actually be the third Satellite Competition Report to be released by the Commission. Appendix A contains a list of commenters.

⁸ See, e.g., Annual Reports, 10-Ks, and Futron data for SES.

FIGURE II.1

Overview of Satellite Communications Industry



C. Technology and Sector Overview

7. For purposes of this *Third Report*, the satellite communications industry consists of those entities that supply communications services involving the use of satellite infrastructure, such as satellite space stations (space segment) and earth stations (ground segment). These entities, along with related industries such as satellite space and earth station manufacturing and the satellite launch industry, comprise the satellite communications industry and ultimately participate in the wholesale and retail industry segments defined below.

8. The primary providers of the space segment portion of satellite communications are FSS and MSS operators. FSS operators provide much of their service from satellites located in geostationary orbits.⁹ In the United States today, SES Global (through its subsidiary SES World Skies) and Intelsat (the privatized successor to the intergovernmental organization INTELSAT) are the two principal FSS operators. FSS is also provided by a number of smaller operators, such as EchoStar, Eutelsat, Satmex, and Telesat. MSS operators provide service via geostationary and non-geostationary satellites, but the communication is with mobile, as opposed to fixed, earth stations. In the United States during the period covered by this *Third Report*, the primary MSS operators were Globalstar, DBSD (formerly ICO Global Communications), Inmarsat, Iridium Satellite, LLC (Iridium), TerreStar Corporation (TerreStar), ORBCOMM, and SkyTerra (now LightSquared).

⁹ Satellites in geostationary orbit (GSO) operate approximately 22,300 miles above the equator, and appear to be fixed above a particular point on the Earth. Satellites operating in non-geostationary orbit (NGSO) appear to come and go over the horizon. Both GSO and NGSO satellites can provide FSS to fixed earth stations and MSS to earth stations in motion, such as earth stations mounted on vehicles.

9. The ground segment of satellite communications consists of earth stations that communicate with space stations and the companies that operate those earth stations. These companies include, among others, teleport operators (which often operate numerous fixed earth stations) and network service integrators (which often obtain blanket authorizations for Very Small Aperture Terminal earth stations (VSATs) to be integrated into larger communications networks).¹⁰ Heavy users of satellite communications services such as media companies, oilfield companies, and nationwide retailers sometimes provide their own ground segment.

10. Table II.1 provides an overview of world revenues for communications satellite services from 2005 through 2010,¹¹ and shows that world revenues for fixed-satellite services have grown steadily since 2005.¹² In particular, revenues increased by 12.9 percent between 2005 and 2006; by 14.0 percent between 2006 and 2007; 11.5 percent between 2007 and 2008; 13.1 percent between 2008 and 2009; and 4.3 percent between 2009 and 2010. World revenues for MSS are comparatively small and growing at a modest rate. MSS revenues increased by 17.6 percent between 2005 and 2006; 5 percent between 2006 and 2007; 4.8 percent between 2007 and 2008; remained steady between 2008 and 2009; and increased by 4.5 percent between 2009 and 2010.

11. Beyond FSS and MSS, revenues for nascent services such as end-user fixed-satellite broadband services remain comparatively small, although those revenues increased by 25 percent between 2008 and 2009 and 10 percent between 2009 and 2010. Similarly, satellite radio or audio, described below,¹³ showed substantial growth in recent years: 100 percent increase between 2005 and 2006; 31 percent between 2006 and 2007; 19 percent between 2007 and 2008; remained steady between 2008 and 2009; and increased 12 percent between 2009 and 2010. Such revenue growth rates are not unusual for new services where subscribership may grow rapidly from a small base in the early years following launch.

¹⁰ VSATs are earth-based terminals for transmissions to and from satellites. VSAT earth station antennas are smaller than 3 meters in diameter. Most VSAT earth stations range from 0.75 meters to 1.2 meters in diameter, and their data rates typically range from 56 kilobits per second (kbps) to 4 Megabits per second (Mbps). VSATs are most commonly used to transmit narrowband data (such as for credit card transactions), broadband data (for Internet access), or, in the receive mode, for video.

¹¹ The data reported in Table II.1 are taken from "State of the Satellite Industry Report," page 13, dated June, 2011 (*2011 SIA Report*), prepared by the Futron Corporation for the Satellite Industry Association. This Report is available at www.sia.org/IndustryReport.htm.

World revenues for satellite video services (DBS and direct-to-home (DTH) satellite antenna service), although not included within the scope of this *Report*, are reported in Table II.1 for purposes of comparison to the world revenues for FSS and MSS. Some historical data in Table II.1 have been revised and may differ slightly from comparable data reported in the *First* and *Second Reports*.

¹² Separate revenue data for U.S. domestic and international fixed satellite services are not available because we do not ask satellite operators to provide separate domestic and international revenue data; in 1996, the Commission eliminated the distinctions in its regulations for domestic and international satellite services. See *Amendment to the Commission's Regulatory Policies Governing Domestic Fixed Satellites & Separate International Satellite Systems*, IB Docket No. 95-41, Report and Order, 11 FCC Rcd 2429 (1996). Some expert opinion, however, estimates that U.S. domestic revenues in recent years are approximately 20 to 25 percent of world revenues. Estimate supplied by Futron Corporation.

¹³ See Section III, *infra*.

TABLE II.1
WORLD SATELLITE SERVICES REVENUES
(IN BILLIONS OF U.S. DOLLARS)¹⁴

SERVICE	2005	2006	2007	2008	2009	2010
Consumer	41.3	48.9	57.9	68.1	75.3	83.1
Satellite TV (DBS/DTH)	40.2	46.9	55.4	64.9	71.8	79.1
Satellite Radio (DARS)	0.8	1.6	2.1	2.5	2.5	2.8
Consumer Satellite Broadband	0.3	0.3	0.4	0.8	1.0	1.1
Fixed	9.3	10.7	12.2	13.0	14.4	15.0
Transponder Agreements ¹⁵	7.3	8.5	9.6	10.2	11.0	11.1
Managed Services ¹⁶	2.0	2.2	2.6	2.8	3.4	3.9
Mobile (Voice and Data)	1.7	2.0	2.1	2.2	2.2	2.3
Remote Sensing	0.5	0.4	0.4	0.7	1.0	1.0
TOTAL	52.8	62.0	72.6	84.0	93.0	101.3

Notes: Numbers may not sum exactly due to rounding.

Definitions of the terms used in Table II.1 are included below.¹⁷

¹⁴ Data replicated from Futron Corp., Satellite Industry Association, *State of the Satellite Industry Report* (June 2011)

¹⁵ Includes capacity for DTH platforms.

¹⁶ Includes VSAT; Space Flight Management Services included in Managed Services beginning in 2010.

¹⁷ A transponder agreement is an agreement under which a satellite system operator provides its customer with transponders for sale or lease for full-time or occasional use. These transponders are typically used to provide video and radio services, data/business services, and telephone relay services. Transponder capacity or time is sometimes re-leased or re-sold, but revenues stated in Table II.1 above do not reflect companies, other than satellite operators, engaged in the re-sale or re-lease of transponders or brokering of transponder time and/or capacity.

Managed network services include satellite-based data communication networks that are operated by government, corporate, and other entities to provide a mix of data, voice and video communications to widely separate or remotely located facilities through a transponder or transponders, often using VSATs. These also include network services provided by satellite operators, teleport operators, and other major resellers, but not the sale of ground stations or related equipment.

Mobile service includes mobile satellite telephony and mobile satellite data services such as messaging and paging, but not the costs of the end-user equipment.

Consumer Satellite Broadband, in Table II.1, refers to broadband or high-speed Internet access services provided via satellite directly to fixed residential and small business users.

Remote sensing, in Table II.1, refers only to satellite imagery sales and closely related services, such as creating ortho-rectified scenes or other first-order processing, but does not refer to other value-added services or enabled products, such as Geographic Information Systems or cartography.

D. Report Methodology

12. Any analysis of the nature and extent of competition in an industry requires a framework that identifies pertinent questions; organizes, evaluates, and interprets data; and reaches logical conclusions that are consistent with empirical information. The traditional analytical industrial organization framework used is the Structure-Conduct-Performance (SCP) paradigm,¹⁸ which hypothesizes that elements of market or industry structure (e.g., barriers to entry, number of buyers and sellers, cost structure, product differentiation) influence firm conduct (e.g., pricing behavior, plant investment, research and development), which, in turn, determines observed market performance (e.g., the extent that static and dynamic economic efficiency is achieved in the utilization of resources). The Commission has used the SCP framework in its competition reports on the mobile wireless and multichannel video programming distribution industries to organize industry metrics and information,¹⁹ but has not drawn conclusions about the causal relationships among the structure, conduct, and performance of these industries.

13. As we noted in the *First* and *Second Reports*, although section 703(b)(2) directs the Commission to analyze “whether there is effective competition in the market for domestic and international satellite services,”²⁰ the term “effective competition” is not defined in section 703 nor in the context of satellite services generally. We note as well that there is no definition of “effective competition” widely accepted by economists or competition policy authorities such as the U.S. Department of Justice.²¹ In this *Third Report*, we evaluate the evidence on competition in the record and make appropriate finding for each sector of the satellite communications industry covered by this *Report*.

14. This *Report* recognizes several key attributes of the commercial satellite communications industry that have a direct influence on the nature of competitive rivalry and performance observed in the major industry segments. More specifically, the Fixed-Satellite sector is dominated by wholesale transactions.²² In general, the commercial satellite communications industry is dominated by a relatively few sellers and relatively few buyers compared to most retail markets for consumer goods and services. Unlike mass market retail transactions which are often impersonal and executed pursuant to standard terms and conditions of sale and uniform pricing to all retail customers, wholesale transactions for satellite communications services are typically individually negotiated between the wholesale customer and the satellite operator. The pricing of satellite communications services is bilaterally negotiated and

¹⁸ Classic references on the SCP paradigm include Joe S. Bain, *Industrial Organization* (2nd ed., John Wiley & Sons, Inc., New York, 1968), and F.M. Scherer & David Ross, *Industrial Market Structure & Economic Performance* at ch. 1 (3rd ed. Houghton Mifflin Co., Boston, 1990) (Scherer & Ross). A contemporary textbook reference is Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization* at 4 (4th ed., Addison-Wesley, Boston, 2005) (Carlton & Perloff). The paradigm was originally developed by Edward S. Mason at Harvard University in the 1930s and 1940s.

¹⁹ See, e.g., *Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, WT Docket No. 05-71, Tenth Report, 20 FCC Rcd 15908 (2005) (“*Tenth CMRS Competition Report*”); *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, MB Docket No. 05-255, Twelfth Annual Report, 21 FCC Rcd 2503 (2006) (“*Twelfth MVPD Competition Report*”).

²⁰ 47 U.S.C. § 702(b)(2).

²¹ See Department of Justice and Federal Trade Commission *Horizontal Merger Guidelines*, (Aug. 19, 2010). See also *Ex Parte* Submission of the United States Department of Justice, *Economic Issues in Broadband Competition, A National Broadband Plan for Our Future*, GN Docket No. 09-51 at 11 (filed Jan.4, 2010).

²² By contrast, markets for multichannel video distribution services and wireless telecommunications services reported on annually in separate Commission competition reports are principally retail industry segments with thousands, or even millions, of retail customers.

will often differ from one transaction to another and from one wholesale customer to another.

III. ORGANIZATION OF THE COMMERCIAL COMMUNICATIONS SATELLITE INDUSTRY

A. Output Definitions and Industry Segments in the Communications Sector

15. The first two *Satellite Competition Reports* described the concept of relevant markets (as adapted from antitrust law) by noting that a relevant market has product and geographic dimensions; once a relevant market has been described in those two dimensions, market participants (*i.e.*, competitors) can be identified.²³ Our further analysis of the satellite communications industry, however, has led us to revise what previous *Reports* described as “product markets”.

16. Previous *Reports* described product market groups (*e.g.*, Network Services or Capacity for Video Contribution) as specific applications.²⁴ An application is a standard or pre-determined bundle, or bundle of attribute bundles, specifically tailored for the transponder requirements of a particular group of wholesale customers (*e.g.*, broadcast television networks or private corporate VSAT networks). It is industry practice to group these attribute bundles in terms of specific applications, *i.e.*, attribute bundles are grouped according to the specific business context and objective that the wholesale customer expects to achieve by leasing transponder capacity.

17. Although such application-oriented concepts broadly describe the services offered by satellite carriers, they obscure what the wholesale customer actually negotiates and then buys from a satellite communications operator. The following clarifies and extends the analysis of our previous *Reports* by discussing the nature of output produced and sold by FSS and MSS satellite operators to wholesale customers. This discussion provides a more detailed and realistic view of the factors that determine the extent of substitution possibilities available to wholesale customers when choosing the transponder capacity offered by competing satellite operators. This more detailed analysis supports our determination that substitution is a constraint on both the profitability and exercise of market power of satellite carriers.

18. Given the complex, multidimensional nature of differentiation of attribute bundles in satellite communications, it is difficult to make broad generalities about substitution possibilities between and among one attribute bundle for another supplied by different satellite operators. Moreover, there is an important temporal dimension to any potential substitution of one attribute bundle for another supplied by a competing satellite operator. For any specific footprint or satellite coverage area required by a wholesale customer, the availability of a substitute attribute bundle depends crucially on whether some other satellite operator presently has excess transponder capacity that will generate the desired characteristics for the desired coverage area. Since satellite operators attempt to negotiate long term transponder leases, the availability of transponder capacity at the required frequency band, power, and coverage at the desired orbital location may be quite limited, notwithstanding the availability of excess capacity in general on the satellite. In other words, the extent of substitutability of one attribute bundle for another supplied by a competing satellite operator will differ substantially over time as transponder leases expire and satellites in a specific orbital location are replaced with new capacity with different

²³ *First Report*, 22 FCC Rcd at 5963-75, at ¶¶ 24-63; *Second Report*, 23 FCC Rcd at 15173-77, at ¶¶ 13-24. As noted in earlier *Reports*, the industry segments delineated in this *Report* may not reflect the appropriate markets to be considered in other Commission proceedings, such as merger reviews, rulemakings, and other reports to Congress. See *e.g.*, *Second Report*, 23 FCC Rcd at 15174, at ¶ 13 n. 15.

²⁴ *First Report*, 22 FCC Rcd at 5963-75, at ¶¶ 24-63.

payloads and technical configurations. As a result, each wholesale customer must negotiate for its bundle of attribute bundles with the satellite operator, with the balance of negotiating power favoring either the customer or the operator depending on the unique substitution possibilities available at that specific instance in time.

19. Since beam coverage is a critical attribute of the definition of the output produced by a satellite carrier, the geographic dimension of an industry segment where substitutable transponder capacity of a given satellite operator may be found is necessarily implicit in the product itself. If, for example, a wholesale customer requires beam coverage of the entire continental United States, then the only relevant substitutable bundles of transponder attributes must be provided by satellite operators with excess transponder capacity with continental beam coverage.²⁵ A satellite operator with transponders covering exclusively the Atlantic Ocean region cannot provide a substitute bundle of transponder attributes for the continental United States and is not a participant in the industry segment delineated by the boundaries of the continental United States.

20. In summary, defining the output of the satellite communications industry in terms of attributes and characteristics provides a detailed, realistic description of what satellite operators actually offer for lease to both wholesale and retail customers and provides a realistic conceptual approach for assessing the extent of substitutability of the output of one satellite operator for the output of a competitor. Thus, to describe a product market group, as we did in previous *Reports*, solely in terms of a specific application only partially captures how the various combinations of the above-mentioned attributes can be substituted one for another. A clearer understanding of what a wholesale customer actually buys and what a satellite operator is willing to sell provides a more detailed and realistic view of the substitution possibilities – *i.e.*, substitutes for what the satellite operator can provide – available in industry segments for domestic and international wholesale satellite services. This in turn enables a clearer view of competition in the satellite communications services industry.

²⁵ For some applications, terrestrial fiber optic cables may provide an effective substitute bundle of attributes in the geographic area delineated by the required beam coverage.

1. Wholesale and Retail Industry Segments

TABLE III.1
INDUSTRY OUTPUTS
Wholesale Domestic Transponder Applications
<i>Video Services</i>
<i>Network Services</i> (fixed & mobile)
Retail Transponder Service Applications
<i>Broadband Services</i> (fixed & mobile)
<i>Mobile Broadcast Services</i> (audio & video)
<i>Network Services (Emerging)</i> (fixed & mobile)

21. To simplify terminology throughout this *Third Report*, the term “application” is used as a shorthand to distinguish among the different outputs produced and supplied by satellite operators within the fixed and mobile satellite sectors. It is emphasized, however, that any assessment of the degree of substitutability of one application for another requires a careful assessment of the elements of the bundle of attributes that comprise any particular application for any given customer.²⁶ Further, the term *transponder service* or *lease of capacity* will generally imply an application that is not differentiated in terms of any particular user or user group.

22. Table III.1 identifies the major industry segments within the fixed and mobile satellite communications sectors. These industry segments represent broad groups of transponder service applications supplied by satellite operators.²⁷ The foregoing discussion explains why each transaction between a satellite operator and a wholesale customer is likely unique given the multiple technical, supporting, and contractual attributes involved in every sale, describing bundles of attribute bundles in terms of specific applications simplifies an otherwise complex, multi-dimensional, and technical description of the output produced and supplied by satellite operators to their wholesale customers. As noted previously, the geographic dimension of the industry segments is intrinsic to any particular application, since transponder coverage varies dramatically depending on the particular configuration of power, bandwidth, and antenna type.²⁸

²⁶ Since the bundle of attributes comprising any given application will differ from one wholesale customer to the next, it is essential that the specific attributes of the customer are recognized in assessing the extent of substitutability of one application for another.

²⁷ The industry segments roughly correspond to groupings of applications offered by satellite operators in the contemporary satellite communications industry.

²⁸ The wholesale industry segments identified in Table III.1 do not necessarily represent a “relevant market” delineated from an antitrust perspective following the methodology of the U.S. Department of Justice and Federal (continued....)

23. The wholesale industry segments identified in Table III.1 differ from the retail segments in several important ways. In wholesale segments, each customer negotiates a transponder lease individually with the satellite carrier that is specifically tailored to the customer's requirements. By contrast, in retail segments, a satellite carrier, such as Wild Blue, for example, offers its end-user retail customers a pre-determined, fixed bundle of attributes at a fixed, uniform price. Nevertheless, we find that the framework for wholesale industry segments also reasonably applies to retail industry segments. In other words, viewing commercial satellite services as consisting of a bundle of attributes that provide characteristics to a consumer is a realistic way to view services provided to retail and wholesale consumers.

24. In both the *First* and *Second Reports*, transponder service applications were classified as domestic and international. For this *Third Report*, generally, we omit this distinction except where appropriate. Depending on the quantity of transponder bandwidth allocated to a given application and the transponder's coverage area, the same physical transponder may be used simultaneously to transmit and receive signal paths that include both domestic and international traffic. Additionally, some satellite operators are adding capacity, either owned or leased, to increase their span of coverage and becoming, in effect, global satellite systems despite their origins as domestic or regional satellite operators. The notion of domestic versus international satellite communication services as an operational business distinction is becoming less clearly drawn compared to earlier phases of industry evolution.²⁹ Further, in 1996, the Commission eliminated the regulatory dichotomy between the provision of international and domestic satellite services.³⁰

(Continued from previous page)

Trade Commission, *Horizontal Merger Guidelines* (August 19, 2010), available at <http://www.justice.gov/atr/public/guidelines/hmg-2010.pdf>.

Determining the relevant product and geographic markets in a horizontal merger case is specific to the unique factual circumstances of the proposed transaction. The relevant product and geographic markets in a different but similar proposed merger in the same broad industry may be quite different but appropriate for analyzing competitive effects given the specific facts of the case.

A purpose of antitrust market definition is to assist in the analysis of the probable incremental effects on competition resulting from a proposed horizontal merger. Our purpose here, however, is the assessment of the state of competition. For this purpose, our delineation of industry segments is appropriate and useful in our assessment of the state of effective competition.

Precise delineation of product and geographic markets is not necessarily crucial to assessing the extent of competitive rivalry prevailing in a given industry. What is essential is the identification of forces or factors that effectively constrain the conduct of the firm so that anticompetitive behavior harmful to consumers is deterred. This point is clearly explained in Franklin M. Fisher, John J. McGowan & Joen E. Greenwood, *Folded, Spindled & Mutilated: Economic Analysis & U.S. vs. IBM* at ch. 2, esp. 24-33 (MIT Press, Cambridge MA, 1983). A similar perspective is reflected in Professor Michael Porter's "five competitive forces" methodology for analyzing competition and formulating competitive strategy for a given industry. See Michael E. Porter, *On Competition* at 3-35 (chapter 1, titled *The Five Competitive Forces That Shape Strategy*) (Harvard Bus. School Pub. Corp., Boston, 2008).

²⁹ The notions of domestic and international satellite communication services were significant and important for business and operational purposes prior to the privatization of Intelsat and Inmarsat, which were organized as international cooperative organizations to provide international satellite connectivity between and among nations that were parties to the treaties establishing both organizations. Nevertheless, given the coverage of some Intelsat satellites in the geostationary arc, Intelsat, even prior to privatization, offered domestic transponder services to some member nations.

³⁰ *Amendment to the Commission's Regulatory Policies Governing Domestic Fixed Satellites and Separate International Satellite Systems, and DBSC Petition for Declaratory Rulemaking Regarding the Use of Transponders to Provide International DBS Service*, IB Docket No. 95-41, Report and Order, 11 FCC Rcd 2429 (1996) ("*DISCO I* (continued....)

25. The following discussion describes the wholesale industry segments listed in Table III.1 and the telecommunications entities (in addition to satellite operators) that offer possible competitive alternatives with varying degrees of potential substitutability. These descriptions are in many respects similar to the framework of previous *Reports*,³¹ but we provide more detailed descriptions of segments that are changed or new. It is still true, as at the times of past *Reports*, that the ability of each satellite-based participant to compete in a segment will depend on the coverage areas of its satellites;³² and that some telecommunications entities in some segments use technologies other than satellites.³³

a. Wholesale

26. **Video Contribution Applications.** This segment consists of offering point-to-point transponder capacity for full-time contribution to, or occasional use by, providers of media services within the United States.³⁴ Satellite-based participants in this segment include FSS satellite operators (most notably Intelsat and SES); teleport operators; resellers; other specialized program providers engaged in occasional use for satellite news gathering; EchoStar; large media entities (e.g., CBS) which self-supply some capacity; and all foreign-licensed FSS operators permitted to serve the U.S. market, either through an earth station license or by inclusion on the Commission's Permitted Space Station List ("Permitted List").³⁵ Other participants in this segment, on certain specific routes, are providers of wireline communications transmission services such as Level 3, AT&T, and Verizon.

(Continued from previous page)

Order") (adopting policy permitting all U.S.-licensed FSS, MSS, and DBS systems to offer both domestic and international services, removing "outdated" regulatory barriers to greater competition in satellite communications services by eliminating distinction between U.S. domestic and separate satellite systems and allowing both space- and earth-segment operators to provide both domestic and international services).

³¹ *First Report*, 22 FCC Rcd at 5963-75, at ¶¶ 25-62; *Second Report*, 23 FCC Rcd at 15173-77, ¶¶ 13-24.

³² See, e.g., Comments of Microcom, filed August 20, 2010 (Microcom Comments) (describing the coverage issues of Alaska and Hawaii).

³³ *First Report*, 22 FCC Rcd at 5966, ¶ 35; *Second Report*, 23 FCC Rcd at 15174, ¶ 16.

³⁴ By the terms "contribution" or "video contribution" in this context, we mean the transmission of news, sports, and other video programming from various remote locations to central video production studios. See *Constellation, LLC & Intelsat Holdings, Ltd., Application for Transfer of Control of PanAmSat Licensee Corp.*, IB Docket No 05-290, Memorandum Opinion and Order, 21 FCC Rcd 7368, 7376, ¶ 35 (2006); *First Report*, 22 FCC Rcd at 5968, ¶ 37.

³⁵ The Commission's Permitted List denotes all satellites providing Fixed-Satellite service in the "conventional C- and/or Ku-bands (i.e., 3700-4200/5925-6425 MHz and/or 11.7-12.2/14.0-14.5 GHz), with which U.S. earth stations within routinely authorized technical parameters are permitted to communicate without additional Commission action, provided that those communications fall within the same technical parameters and conditions established in their earth stations' original licenses. See *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic & International Satellite Service in the United States*, IB Docket No. 96-111, First Order on Reconsideration, 15 FCC Rcd 7207, 7213-16, ¶¶ 13-20 (1999). An unofficial list of satellites on the Permitted Space Station List is available at <http://www.fcc.gov/ib/sd/se/permitted.html> (visited Sept. 12, 2011). See, e.g., *Telesat Canada, Petition for Declaratory Ruling for Inclusion of ANIK F1 on the Permitted Space Station List*, DA 00-2835, 15 FCC Rcd 24828 (2000); *Telesat Canada, Petition for Declaratory Ruling for Inclusion of ANIK F2 on the Permitted Space Station List & Petition to Serve the U.S. Market Using Ka-band Capacity on ANIK F2*, DA 02-3490, 17 FCC Rcd 25287 (2002). In 2010, the Commission extended Permitted List treatment to non-U.S. licensed satellites providing fixed-satellite service in the conventional Ka-band (18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz and 29.25-30.0 GHz). See *2006 Biennial Regulatory Review – Revision of Part 25 Establishment of a Permitted List Procedure for Ka-band Space Stations*, FCC 10-20, 25 FCC Rcd 1541 (2010).

27. Video Distribution Applications. Video Distribution is the point-to-multipoint transmission of entertainment and news content between points within the United States. Participants in this industry segment include FSS operators; EchoStar; some local and regional teleports; the large media entities and terrestrial providers mentioned above; and all foreign-licensed satellite operators permitted to provide point-to-multipoint video transmissions in the United States.

28. Network Services Applications. Wholesale Network Services consist of the provision of point-to-point telecommunications transmissions to telecommunications operators and corporate users. This group of applications consists of two components. The first component is backbone capacity used for point-to-point trunking for voice, data, or Internet traffic; “backhaul” of communications services;³⁶ and redundancy and restoration of communications services when primary technologies fail. Participants in this component of the network services applications industry segment include U.S.-licensed and non-U.S.-licensed FSS satellite operators permitted to serve the United States; some teleport operators; resellers of satellite capacity; terrestrial wireline and wireless carriers where they have network facilities; some self-supplying carriers and government users; and “network integrators” (*i.e.*, companies that supply their retail customers with network services).

29. The second component consists of other fixed communications services between points within the United States, such as specialized voice and data services that a business uses to communicate between offices or between a location and many remote locations. These services may have steady or sporadic traffic patterns and may or may not be IP-based, symmetrical, and narrowband or broadband. Participants in this segment include U.S.-licensed FSS operators and those non-U.S.-licensed FSS satellite operators permitted to serve in the United States; several VSAT companies (including Hughes, iDirect, Gilat, Spacenet,³⁷ and ViaSat); Globalstar;³⁸ some teleport operators; the terrestrial participants described above; and some self-supplying military users and large enterprises.

30. The wholesale Network Services Applications industry segment also includes MSS. Traditionally, only MSS was used for point-to-point mobile applications (such as in trucks, airplanes, or ships); in some cases, however, new technology has made commercially available FSS applications competitive with MSS applications.³⁹ MSS providers include Iridium (acquired by GHL),⁴⁰ SkyTerra, Globalstar,⁴¹ and Inmarsat.⁴²

³⁶ We define “backhaul” as transmitting between a remote site or network and a central or main site, usually over a high capacity line and for purposes of efficient network management.

³⁷ Comments of Spacenet Inc., filed August 23, 2010 (Spacenet Comments) at 2.

³⁸ Comments of Globalstar Licensee, LLC, filed August 24, 2010 (Globalstar Comments) at 9 (asset tracking and fleet management).

³⁹ As the MSS/ATC Coalition notes, providers of MSS face intense competition from a variety of sources including FSS applications. Specifically the MSS/ATC Coalition notes that as a result of regulatory changes and technological developments, operators in FSS bands are now deploying mobile voice and broadband services to VSAT terminals that compete directly with services provided by satellite networks that operate in spectrum allocated only for MSS. Comments of MSS/ATC Coalition, filed June 15, 2009 at 11.

⁴⁰ See generally Comments of Iridium Satellite LLC, filed August 23, 2010 (Iridium Comments) at 1.

⁴¹ See generally Globalstar Comments.

⁴² TerreStar and ICO MSS companies are pre-operational but have launched satellites and are currently testing and developing MSS and Ancillary Terrestrial Component systems.

b. Retail

31. Fixed-Satellite Broadband Applications. In this *Third Report*, we describe an industry segment of Fixed-Satellite Broadband Applications with a local geographic aspect.⁴³ Fixed-Satellite Broadband Applications consist, as in past *Reports*, of point-to-point high-speed (or broadband) fixed-satellite Internet access service provided, for a fee, directly to retail consumers in the United States.⁴⁴ Previous *Reports* have referred to Fixed-Satellite Broadband Service by providers such as WildBlue, Hughes, and Starband (a subsidiary of Gilat Satellite Networks);⁴⁵ and, at the time of previous *Reports*, most satellite-based broadband service had a significantly lower bit-rate and higher price than broadband service provided by terrestrial carriers such as local exchange carriers (LECs), cable operators, and mobile wireless firms, such as Sprint and T-Mobile. These conditions continued in 2008, 2009, and 2010.

32. Table III.2 below provides an overview of the service offerings of three established satellite broadband operators.

U.S. Satellite Broadband	Hughes	StarBand	WildBlue
Upload speeds	200 kbps to 300 Kbps	100 kbps to 256 kbps	128 kbps to 256 kbps
Download speeds	1.0 Mbps to 2.0 Mbps	512 kbps to 1.5 Mbps	512 kbps to 1.5 Mbps
Monthly service price	\$50 to \$100	\$50 to \$100	\$50 to \$80 (1st 24 months)
Consumer equipment costs	\$10 per/month	\$0 (with rebate)	variable
Installation costs	\$150	\$0 (with rebate)	variable

33. Mobile Broadcast Applications - Audio. Our *First Report* defined satellite digital radio service (SDARS) as an industry segment with a nationwide geographic scope.⁴⁷ The *Second Report* deferred discussion of SDARS until the Commission's decision regarding the merger of the two SDARS providers, XM and Sirius.⁴⁸ That Commission decision, released after its *Second Report*, reviewed a large amount of conflicting evidence about whether SDARS was a product market unto itself or part of a large

⁴³ *First Report*, 22 FCC Rcd at 5972-73, ¶¶ 53.

⁴⁴ *First Report*, 22 FCC Rcd at 5972, ¶ 52; *Second Report*, 23 FCC Rcd at 15176, ¶ 22.

⁴⁵ See, e.g., *Second Report*, 23 FCC Rcd at 15176, ¶ 22.

⁴⁶ Data compiled by Futron from company websites. Websites last visited December 8, 2011.

⁴⁷ *First Report*, 22 FCC Rcd at 5972-73, ¶ 53.

⁴⁸ *Second Report*, 23 FCC Rcd at 15171, ¶ 4.

market consisting of AM and FM radio and perhaps other portable audio technologies. The decision found the evidence inconclusive and, for purposes of reviewing the proposed merger, assumed a product market consisting of only SDARS, and a national geographic market.⁴⁹ For purposes of this *Third Report*, we define Mobile Broadcast Applications – Audio as an industry segment that offers retail consumers subscription services for audio-form content such as music, news, information, and other entertainment delivered to the consumer on a mobile basis. At present, the only entity providing such services is SiriusXM. Thus, this *Third Report* follows the Commission’s approach towards the SiriusXM merger by including only one radio service in this industry segment – SDARS – which is currently populated by one firm – SiriusXM.

34. Mobile Broadcast Applications - Video. Our *Second Report* noted the possible emergence of a domestic retail segment for satellite-based Mobile Video Broadcasting to hand-held terminals for a fee.⁵⁰ Today, mobile video broadcasting, by both satellite and terrestrial wireless technologies and to both hand-held and in-vehicle receivers, is being offered. Satellite-based service installed in vehicles is offered by SiriusXM,⁵¹ terrestrial wireless carriers offer service via Apple’s iPhone,⁵² MobiTV,⁵³ AT&T and RaySat Broadcasting,⁵⁴ and other devices. Domestic television broadcasters may also offer a similar mobile service on a significant scale.⁵⁵ We therefore define a retail industry segment of Broadcast Services – Video, which offers retail consumers characteristics such as music, news, information, and other entertainment while on the move and in video and audio form. Because most of these services are offered nationwide and consist of nationally-oriented content (as opposed to local broadcasts), the geographic aspect of this industry segment is nationwide.

35. Network Services Applications – Emerging Industry Segment. Several companies offer satellite-based network telecommunications services. Iridium and Globalstar, for example, offer mobile voice and data services.⁵⁶ In 2008, 2009, and 2010, these services did not functionally resemble the popular cellular and PCS Commercial Mobile Radio Services (terrestrial CMRS) of terrestrial mobile providers, principally because their handsets were significantly larger. Also, the satellite services’ prices were significantly higher than terrestrial CMRS and their marketing was primarily to business and public safety users and persons in remote areas. The demand for such services by retail consumers was thus small in the years covered by this *Third Report*.

⁴⁹ *XM Satellite Radio Holdings Inc.*, MB Docket No. 07-57, Memorandum Opinion and Order and Report and Order, 23 FCC Rcd 12348, 12367-73, ¶¶ 37-49 (2008).

⁵⁰ *Second Report*, 23 FCC Rcd at 15176, ¶ 23.

⁵¹ <http://www.siriusxm.com/backseattv> (visited Aug. 21, 2011).

⁵² *The mobile video adoption still lags compared to other mobile media formats*, Communications Daily (Comm. Daily) at 9 (Jan. 12, 2009).

⁵³ *get mobitv*, http://www.mobitv.com/gettv/?utm_source=google&utm_medium=cpc&utm_term=mobile+video&utm_campaign=mobitv_northeast (visited Sept. 21, 2011).

⁵⁴ The CruiseCast service offered by AT&T in partnership with RaySat Broadcasting was launched and cancelled in 2009. See <http://www.engadget.com/2009/11/03/atandt-cruisecast-satellite-service-halts-activations-will-refund/> (visited Sept. 21, 2011).

⁵⁵ Josh Wein, *Broadcasters Herald New Era with Mobile DTV Standard*, Comm. Daily at 2 (Oct. 16, 2009); *Timing of Mobile DTV Device Rollout Unclear, Says Sinclair CEO*, Comm. Daily at 3 (Aug. 6, 2009).

⁵⁶ See, e.g., Globalstar Comments at 4.

B. Output Suppliers**1. FSS Operators****a. Facilities-Based FSS Operators****(i) Overview**

36. As noted above, FSS service is provided by satellites to fixed locations on the Earth. Some fixed-satellites operate from a geostationary orbit while others operate from a non-geostationary orbit. The primary frequency operating bands are shown in Table III.3. FSS operators that wish to provide service to or from the United States are required to be licensed by the Commission, but FSS operators are not required to be regulated as common carriers or broadcasters and generally deal with their customers on an individualized basis.

Space-to-earth (GHz)	Earth-to-space (GHz)	Band Designation
3.7-4.2	5.925-6.425	C-band
3.625-3.700	5.85-5.925 6.425-6.700	Extended C-band (international use only)
11.7-12.2	14-14.5	Ku-band
10.7-11.7	12.7-13.25 13.75-14.00	Extended Ku-band (international use only)
18.3-18.8	28.35-28.6 29.5-30.0	Ka-band (GSO)
19.7-20.2	29.25-29.5	Ka-band (GSO)
18.8-19.3	28.6-29.1	Ka-band (NGSO)

37. FSS operators are the largest satellite operators, and the FSS sector is dominated by Intelsat and SES. The global fixed-satellite industry is comprised of approximately 40 commercial firms⁵⁸ – with fleet sizes that range from one to fifty-four satellites – that generally serve historically determined geographic areas.⁵⁹ For example, Intelsat has a strong North American presence while SES has historically primarily served Europe. But both firms can reach almost all the world's markets and

⁵⁷ Source: FCC staff.

⁵⁸ The 40-firm estimate is given in Euroconsult, *Company Profiles, Analysis of FSS Operators* (2010).

⁵⁹ Intelsat states that its fleet is comprised of 52 satellites. See http://www.sbv.spacenews.com/satellite_telecom/110318intelsat-signs-for-mdas-satellite-refueling-service.html (visited Mar. 11, 2011).

have expanded their international presence by either placing new satellites over new locations or purchasing extant ones. The global reach of Intelsat and SES stands in contrast to the largely regional reach of most other FSS operators.

38. Table III.4 shows the four largest satellite companies by revenue. These four firms accounted for approximately 50 percent of FSS global industry revenues in 2007,⁶⁰ and 42 percent in 2010.

Firm Name	Satellites in Fleet	Total Revenue (billions US\$)			
		2007	2008	2009	2010
Intelsat	52	2.2	2.4	2.5	2.5
SES	34	2.4	2.3	2.2	2.3
Eutelsat	24	1.2	1.3	1.3	1.6
Telesat	12	0.7	0.6	0.8	0.8
Total 4-Firm Revenues ⁶²		6.5	6.6	6.8	7.2
Total Industry Revenues ⁶³		13.0	14.5	16.4	17.1
4-Firm Share		50%	46%	42%	42%

⁶⁰ Data from Space News, *List of Top Fixed Satellite Operator* (June 30, 2008).

⁶¹ Data from company reports and 10-K filings, then converted to US dollars using the average annual exchange rate for the original currency. Total industry revenues from Futron, p.13
[http://www.sia.org/PDF/2011%20State%20of%20Satellite%20Industry%20Report%20\(June%202011\).pdf](http://www.sia.org/PDF/2011%20State%20of%20Satellite%20Industry%20Report%20(June%202011).pdf).

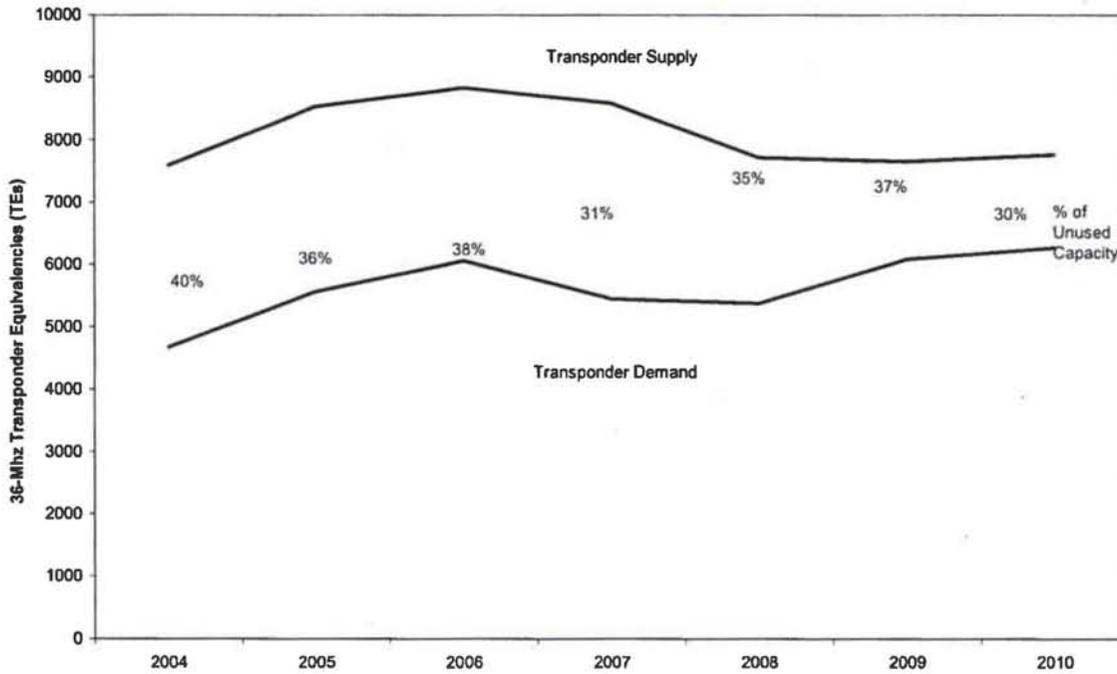
⁶² Includes revenue from transponder sales and managed networks.

⁶³ Data replicated from Table II.1, Worldwide Communications Satellite Service Revenues, Line 1, Fixed (all categories of service).

Worldwide, the fixed satellite industry has significant unused capacity. The annual levels of worldwide unused capacity for the years from 2003-2010 are given in Figure III.1.

FIGURE III.1⁶⁴

Transponder Supply and Demand (World, 2004 - 2010)

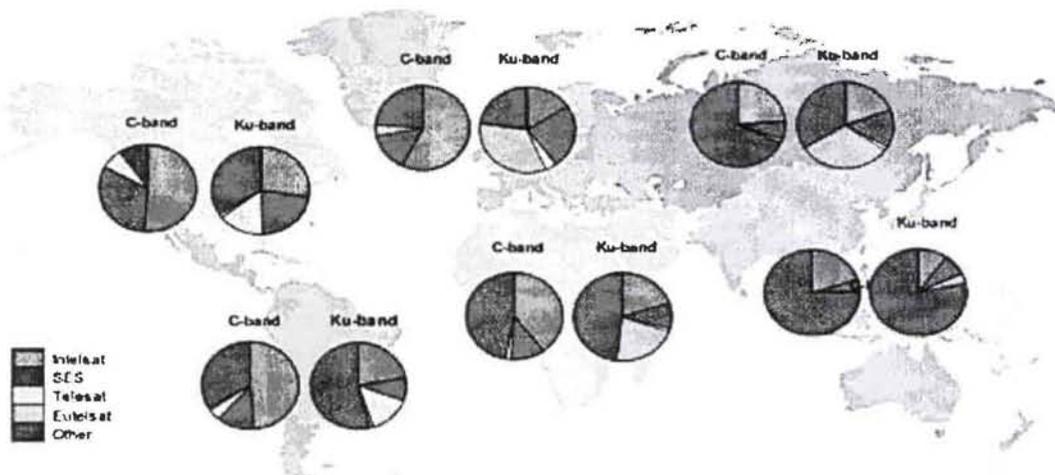


⁶⁴ Source: Futron Corporation.

39. Capacity varies by region. Figure III.2 shows worldwide capacity in C-band and Ku-bands by geographic region.

FIGURE III.2

GEO Commercial FSS Satellite Capacity Supply Distribution 10/2010⁶⁵



(ii) Facilities-based Communications Satellite Operators, North America

40. The North American industry segment is broken into C- and Ku-bands.⁶⁶ In the C-band, Intelsat provides 55 percent of satellite capacity, SES 32 percent, Telesat 5 percent, and other smaller suppliers provide 8 percent.⁶⁷ In the Ku-band, Intelsat provides 27 percent of capacity, SES 22 percent, Telesat 13 percent, Eutelsat 3 percent, and other smaller suppliers provide 35 percent.⁶⁸ The data are summarized in Table III.5.

⁶⁵ Data from *2010 Futron Forecast of Global Satellite Services Demand Overview 2010 Supply/Utilization*, available at http://www.futron.com/2010_Futron_Forecast_Supply_Utilization.xml.

⁶⁶ Data extrapolated from Futron Forecast at 4.

The C- and Ku- bands are among the bands most commonly associated with fixed satellite services. Broadcast television networks find C-band frequencies useful because C-band frequencies are less susceptible to weather interference and can provide coverage to a large geographic area, given the large dish size required to transmit on this frequency. Ku-band transponders operate at higher frequencies than C-band transponders and can, therefore, communicate with smaller dishes and offer more flexibility for customers. The military primarily uses Ku-band satellites because the dishes offer more mobility and are less conspicuous than C-band satellite dishes, and satellite television companies use this band to provide service. The Ku-band is also used to provide backup for corporate enterprise networks and for point-of-sale retail transactions, through VSAT networks.

⁶⁷ All percentages are approximations based on Figure III.2 of this Report.

⁶⁸ *Id.*

TABLE III.5

**FSS FACILITIES-BASED OPERATORS SUPPLYING TRANSPONDER
CAPACITY FOR DOMESTIC INDUSTRY SEGMENTS
IN NORTH AMERICA**
(percentages are approximate)⁶⁹

	C-band Capacity (% of total)	Ku-band Capacity (% of total)
Intelsat	55	27
SES	32	22
Eutelsat	-	3
Telesat	5	13
Other	8	35

b. Non-Facilities-Based Communications Satellite Operators

41. In addition to the large suppliers such as Intelsat and SES, specialized service in the form of “enterprise” packages are offered by firms that lease existing satellite bandwidth and combine it with fully managed, end-to-end communications infrastructure. These firms serve government and corporate clients (e.g., U.S. Army, Federal Bureau of Investigation, commercial shipping) that need communications in “thin” markets, e.g. Iraq, or need to extend the reach of their corporate networks.

42. Value-added resellers of this type include CapRock, Globecomm, Artel, and Segovia. CapRock was purchased for \$525 million by the Harris Corporation on July 30, 2010. Harris Corporation is an international communications and information technology company whose principal customer is the United States government (particularly the Department of Defense and intelligence community), and earned over \$5 billion in 2010, 76 percent of which was derived from government contracts.⁷⁰ Globecomm Systems Inc. is a publically-traded corporation that provides satellite-based communications infrastructure and managed networks and, in 2010, earned revenues of \$227 million.⁷¹ Artel also provides managed network solutions and, in 2008, earned revenues of approximately \$215 million.⁷² Segovia, Inc. is a wholly-owned subsidiary of Inmarsat.

2. MSS Operators

43. Currently, there are several frequency bands allocated for MSS: the L-band, the 2 GHz MSS band, and the Big and Little LEO bands. Voice and data services are permitted in the L-band, Big

⁶⁹ Data extrapolated from Futron at 4. The data are extrapolated from Figure III.2 of this report. The numeric data was derived by estimating the area of the given circle, where the areas depict market share, for C-band and Ku-band transponders covering North America.

⁷⁰ Harris Corporation, 10-K, 2010, <http://investing.businessweek.com/research/stocks/financials/drawFiling.asp?docKey=136-000095012310082207-700J80FPJV1QRIAHOOC9TLGHF&docFormat=HTM&formType=10-K>.

⁷¹ <http://phx.corporate-ir.net/phoenix.zhtml?c=77373&p=irol-fundsnapshot>.

⁷² <http://www.artelinc.com/frameset.htm>.

LEO band and 2 GHz bands. The Little LEO band is limited to non-voice services.⁷³ Below, we review each of these frequency bands and provide a brief history in addition to discussing current licensees and operators in each band.⁷⁴

	Frequency Band	Spectrum Bandwidth (MHz)	ATC Status	Satellite Type
LightSquared	L-band	26-30*	ATC	GSO
Inmarsat	L-band	26-30*		GSO
TerreStar	2 GHz	20	ATC	GSO
DBSD	2 GHz	20	ATC	GSO
Iridium	Big LEO	8		NGSO
Globalstar	Big LEO	25	ATC	NGSO
Orbcomm	Little LEO	3		NGSO

* LightSquared and Inmarsat share the L-band over North America, and their respective shares of bandwidth are governed by their December 2007 agreement. A small amount of the North American L-band is used by Mexican and Russian MSS operators.

a. MSS Frequency Bands⁷⁶

(i) L-band

44. We license MSS operations in the 1525-1559 MHz and 1626.5-1660.5 MHz segments of the L-band, and Inmarsat and LightSquared are the two L-band satellite operators currently providing

⁷³ 47 C.F.R. § 25.142(b)(i).

⁷⁴ In 2003, the Commission adopted a Report and Order that permits MSS licensees (except in the Little LEO band) to provide Ancillary Terrestrial Component (ATC) to their mobile satellite systems using spectrum in certain portions of the MSS bands. See generally Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz band, the L-band, and the 1.6/2.4 GHz bands, *Report and Order and Notice of Proposed Rulemaking*, IB Docket No. 01-185, Order on Reconsideration, 18 FCC Rcd 1962 (2003) (*ATC Report and Order*), modified sua sponte by Order on Reconsideration, 18 FCC Rcd 13590 (2003), reconsidered in part in Memorandum Opinion and Order and Second Order on Reconsideration, 20 FCC Rcd 4616 (2005), further recon. pending. ATC consists of terrestrial base stations and mobile terminals that re-use frequencies assigned for MSS operations. To obtain ATC authority, an MSS operator must first satisfy certain "gating criteria," which collectively refers to the Commission's prerequisites that an MSS operator must demonstrate that it will satisfy in order obtain ATC authority. *ATC Report and Order*, 18 FCC Rcd at 1964-65, ¶¶ 1-2.

⁷⁵ Source: FCC licensing records.

⁷⁶ Ninety megahertz of MSS spectrum has been identified as potentially available for terrestrial broadband use. *National Broadband Plan* at 87. The 90 megahertz is comprised of 40 megahertz from each of the L-band and 2 GHz MSS allocations, and 10 megahertz from the Big LEO allocation. *Id.* The Plan at 88 also states, "At the same time, the FCC must take care to ensure that the MSS market continues to provide public safety and government users with mission-critical satellite capabilities."

service in the United States.⁷⁷ LightSquared has been granted ATC authority, while Inmarsat has not requested ATC authority. We discuss these operators in more detail below.

(a) Inmarsat

45. Inmarsat began as an inter-governmental organization created in 1978 to develop a global maritime satellite system to meet commercial maritime and safety communications needs of the United States and other foreign countries. That organization was privatized on April 15, 1999, and, in 2000, Congress enacted the ORBIT Act, which, among other things, specified a number of criteria for determining whether privatization was pro-competitive.⁷⁸ On October 9, 2001, the Commission released an Order in which it concluded that privatization was consistent with the non-IPO (initial public offering) requirements of the ORBIT Act.⁷⁹

46. Inmarsat currently has 11 satellites in 9 orbital locations, including three satellites in Inmarsat's I-4 constellation.⁸⁰ In the United States, Inmarsat space segment was initially used primarily for the provision of maritime mobile satellite service (MMSS) in portions of the L-band. The Commission has also authorized use of Inmarsat space segment for the provision of domestic MSS, including land mobile satellite service.⁸¹ The Commission has also authorized certain aeronautical mobile uses.⁸²

⁷⁷ Throughout this Report, we generally refer to LightSquared and its predecessors in interest all as "LightSquared," unless otherwise indicated. LightSquared predecessors in interest include SkyTerra Communications, Inc. (SkyTerra), Mobile Satellite Ventures (MSV), Motient Services Inc. and American Mobile Satellite Company (AMSC). The initial L-band license currently held by LightSquared was issued in 1989. *Order and Authorization*, FCC 89-183, Memorandum Opinion, Order and Authorization, 4 FCC Rcd 6041 (1989), *remanded by Aeronautical Radio, Inc. v. FCC*, 928 F.2d 428 (D.C. Cir. 1991); *Final Decision on Remand*, 7 FCC Rcd 266 (1992); *aff'd*, *Aeronautical Radio, Inc. v. FCC*, 983 F.2d 275 (D.C. Cir.1993); *see also* AMSC Subsidiary Corporation, *Memorandum Opinion and Order*, FCC 93-243, Memorandum Opinion and Order, 8 FCC Rcd 4040 (1993).

⁷⁸ Open-Market Reorganization for the Betterment of International Telecommunications Act, Pub. L. No. 106-180, 114 Stat. 48 (2000), *as amended*, Pub. L. No. 107-233, 116 Stat. 1480 (2002), *as amended*, Pub. L. No. 108-228, 118 Stat. 644 (2004), *as amended*, Pub. L. No. 108-371, 118 Stat. 1752 (Oct. 25, 2004), *as amended*, Pub. L. No. 109-34, 119 Stat. 377 (July 12, 2005).

⁷⁹ *Comsat Corp.*, FCC 01-272, Memorandum Opinion, Order and Authorization, 16 FCC Rcd 21661 (2001) (*Comsat Order*).

⁸⁰ Inmarsat plc, Annual Report and Accounts 2009, http://www.inmarsat.com/Downloads/English/Investors/Inmarsat_Annual_Report_2009.pdf, p. 2. *See also*, <http://www.inmarsat.com/About/default.aspx>. The I-4 series provide mobile broadband services and are 60 times more powerful than the I-3 series. They were first launched in 2005 and are anticipated to continue in commercial operation until about 2020. In August 2010, Inmarsat announced a contract with Boeing to build a constellation of three I-5 satellites. The I-5 satellites will operate in the Ka-band, with operations expected to start in 2014, and will enable Inmarsat to provide a global high speed mobile broadband service offering. *See* Press Release: "Inmarsat announces \$1.2bn investment in next generation Ka-band satellite network," August 6, 2010, <http://www.inmarsat.com/About/Newsroom/Press/00036066.aspx>.

⁸¹ *See Comsat Corporation et al*, Memorandum Opinion, Order and Authorization, 16 FCC Rcd 21661 (2001) (*Comsat Order*).

⁸² In October 1989, amendments to the Inmarsat Convention and Operating Agreement allowed the organization to provide aeronautical services in addition to maritime services. *See also Provision of Aeronautical Services via the Inmarsat System*, CC Docket No. 87-75, 13 FCC Rcd 21155 (1998).

(b) LightSquared⁸³

47. In 1987, the Commission determined that the available L-band spectrum could support only one U.S. space station licensee in addition to the then intergovernmental Inmarsat. The Commission directed the U.S. applicants in the L-band processing round to form a consortium.⁸⁴ Subsequent to this directive, LightSquared's predecessor in interest, AMSC, was formed, and in 1989 the Commission granted AMSC authority to construct, launch, and operate a three-satellite geostationary-satellite MSS system to operate in 28 MHz of L-band spectrum (14 MHz in each transmission direction).⁸⁵ AMSC was authorized to operate only in portions of the L-band, subject to international coordination.⁸⁶

48. Since 1996, LightSquared has provided service covering North America via two geostationary satellites⁸⁷ that provide voice and low-speed data services to customers, including: (1) land-based applications (e.g., voice, asset tracking); (2) maritime applications; and (3) government applications (e.g., disaster relief).⁸⁸

49. In 2003, in an effort to provide MSS providers greater flexibility in the delivery of their services by enabling them to integrate ATC into their MSS networks,⁸⁹ the Commission adopted ATC rules. The Commission stated that allowing ATC would, among other things, enhance MSS spectrum efficiency, expand the consumer market for MSS, lower consumer prices, increase competition, and enable operators to offer a single consumer device that could communicate with both the satellite and terrestrial network.⁹⁰ In 2004, LightSquared was granted ATC authority to operate facilities providing

⁸³ Throughout this *Report*, we generally refer to LightSquared and its predecessors in interest all as "LightSquared," unless otherwise indicated. LightSquared predecessors in interest include SkyTerra Communications, Inc. (SkyTerra), Mobile Satellite Ventures (MSV), Motient Services Inc. and American Mobile Satellite Company (AMSC). The initial L-Band license currently held by LightSquared was issued in 1989 to AMSC. *Order and Authorization*, FCC 89-183, Memorandum Opinion, Order and Authorization, 4 FCC Rcd 6041 (1989), *remanded by Aeronautical Radio, Inc. v. FCC*, 928 F.2d 428 (D.C. Cir. 1991); *Final Decision on Remand*, 7 FCC Rcd 266 (1992); *aff'd*, *Aeronautical Radio, Inc. v. FCC*, 983 F.2d 275 (D.C. Cir.1993); *see also* AMSC Subsidiary Corporation, *Memorandum Opinion and Order*, FC 93-243, Memorandum Opinion and Order, 8 FCC Rcd 4040 (1993).

⁸⁴ *See Amendment of Parts 2, 22 and 25 of the Commission's Rules to Allocate Spectrum for and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service for the Provision of Various Common Carrier Services*, Hughes Communications Mobile Satellite, Inc., et al., Gen. Docket No. 84-1234, Memorandum Opinion, Order and Authorization, FCC 89-183, 4 FCC Rcd 6041 (1989), *remanded by Aeronautical Radio, Inc. v. FCC*, 928 F.2d 428 (D.C. Cir. 1991), *Final Decision on Remand*, 7 FCC Rcd 266 (1992), *aff'd*, *Aeronautical Radio, Inc. v. FCC*, 983 F.2d 275 (D.C. Cir. 1993).

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ These satellites are MSAT-1 (at 106.5° W.L., Canadian licensed) and MSAT-2 (at 101° W.L.).

⁸⁸ *See SkyTerra Communications Inc., Transferor and Harbinger Capital Partners Funds, Transferee, Applications for Consent to Transfer Control of SkyTerra Subsidiary, LLC*, IB Docket 08-184, ¶33.

⁸⁹ *See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz band, the L-band, and the 1.6/2.4 GHz bands*, IB Docket Nos. 01-185, 02-364, 18 FCC Rcd 1962, 1964-65, ¶ 1 (2003) (*ATC Report and Order*), modified by *Order on Reconsideration*, 18 FCC Rcd 13590 (2003), reconsidered in part in *Memorandum Opinion and Order and Second Order on Reconsideration*, 20 FCC Rcd 4616 (2005) (*ATC Second Reconsideration Order*), further reconsideration pending; *see ATC Second Reconsideration Order*, 20 FCC Rcd at 4619, ¶ 9.

⁹⁰ *ATC Report and Order*, 18 FCC Rcd at 1974-79, ¶¶ 22, 24-26, 28, 30.

voice and data communication for users equipped with dual-mode MSS/ATC devices.⁹¹ On March 26, 2010, LightSquared's ATC authority was amended to allow flexibility for the technical design of LightSquared's ATC network.⁹²

50. Now owned by Harbinger Capital Partners Master Fund I, Ltd. and Harbinger Capital Partners Special Situations Fund, L.P. (Harbinger),⁹³ LightSquared is constructing an integrated satellite/terrestrial 4G network.⁹⁴ In evaluating this transaction, the Bureaus considered LightSquared's plans to construct an integrated satellite/terrestrial "fourth generation" (4G) mobile broadband network, which would primarily use LightSquared's ATC authority and its next generation satellites to provide more advanced services than are possible using LightSquared's current MSS system. The network would provide both voice and broadband data mobile services nationwide, including to rural areas that lack service from existing terrestrial providers. LightSquared proposed to use its satellite/terrestrial network to provide services on a wholesale basis to a variety of retail distribution customers, increasing competition and benefitting consumers. LightSquared committed that its network would cover 100 percent of the U.S. population via the satellite component. In addition to satellite coverage, LightSquared has committed to a buildout schedule of its 4G terrestrial service that will provide United States population coverage of at least 100 million by December 31, 2012, at least 145 million by December 31, 2013, and at least 260 million by December 31, 2015.⁹⁵

51. On November 15, 2010, as part of its new network, LightSquared launched a new satellite, SkyTerra 1, that LightSquared bills as "the nation's first wholesale-only integrated wireless

⁹¹ Mobile Satellite Ventures Subsidiary LLC Application for Minor Modification of Space Station License for AMSC-1, File Nos. SAT-MOD-20031118-00333, SAT-MOD-20031118-00332, SES-MOD-20031118-01879, *Order and Authorization*, 19 FCC Rcd 22144 (Int'l Bur. 2004) (*MSV ATC Order*).

⁹² See SkyTerra Subsidiary LLC Application for Modification Authority for an Ancillary Terrestrial Component, File No. SAT-MOD-20090429-00047, Call Sign: AMSC-1, File No. SAT-MOD-20090429-00046, Call Sign: S2358, File No. SES-MOD-20090429-00536, Call Sign: E980179, *Order and Authorization*, DA 10-534, *Order and Authorization*, 25 FCC Rcd 3043 (Int'l Bur., rel. March 26, 2010) (*2010 SkyTerra ATC Modification Order*).

⁹³ Harbinger finalized its acquisition of LightSquared on March 29, 2010. See Letter from Henry Goldberg and Joseph A. Godles to Marlene H. Dortch, Secretary, Federal Communications Commission (dated March 30, 2010), IB Docket No. 08-184. <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020399437>.

⁹⁴ See *SkyTerra Communications, Inc., Transferor and Harbinger Capital Partners Funds, Transferee Applications for Consent to Transfer Control of SkyTerra Subsidiary, LLC*, IB Docket No. 08-184, Memorandum Opinion and Order and Declaratory Ruling, 25 FCC Rcd 3059, 3087 (IB, OET, WTB, rel. March 25, 2010) (*SkyTerra/Harbinger Order*). The *SkyTerra/Harbinger Order* provides background and history on the corporate structure and transactions that led to Harbinger Capital Partners Funds obtaining control of MSS licensee SkyTerra Subsidiary, LLC (now known as LightSquared). *Id.* at 3060-3064, ¶¶ 2-8; see also LightSquared Subsidiary LLC Request for Modification of its Authority for an Ancillary Terrestrial Component, SAT-MOD-20101118-00239 (filed Nov. 18, 2010) (LightSquared ATC Modification Request). Narrative at 1 n.1.

In approving LightSquared's ATC Modification Request, the Commission stated that "LightSquared may commence offering commercial service on its MSS L-band frequencies under the authority granted herein only upon the completion of the process for addressing interference concerns relating to GPS, as set forth in paragraphs 41-43" of the Order. See *LightSquared Subsidiary LLC Request for Modification of its Authority for an Ancillary Terrestrial Component*, DA 11-133, *Order and Authorization*, 26 FCC Rcd 566, 586-587, 588, ¶¶ 41-43, 48 (2011).

⁹⁵ See SkyTerra Subsidiary LLC Application for Modification Authority for an Ancillary Terrestrial Component, File No. SAT-MOD-20090429-00047, Call Sign: AMSC-1, File No. SAT-MOD-20090429-00046, Call Sign: S2358, File No. SES-MOD-20090429-00536, Call Sign: E980179, *Order and Authorization*, 25 FCC Rcd 3043 at 3085, ¶¶ 55 & 56 (Int'l Bur., rel. March 26, 2010) (*2010 SkyTerra ATC Modification Order*).

broadband and satellite network.”⁹⁶

52. L-band Coordination Agreement. In North America and nearby international airspace and maritime areas, five satellite operators provide service in the L-band’s 66 megahertz (33 megahertz in each transmission direction) MSS allocation.⁹⁷ Under the International Telecommunication Union (ITU) Radio Regulations, operators of satellite systems are required to coordinate their spectrum use to prevent interference to, and receive protection from, other systems.⁹⁸

53. In June 1996, the United States, Canada, Mexico, Russia, and the intergovernmental organization Inmarsat developed and agreed upon a unique framework that was intended to facilitate annual spectrum assignment agreements among the operators.⁹⁹ On December 21, 2007, Inmarsat and LightSquared signed a “Spectrum Coordination and Cooperation Agreement” that resolved outstanding differences between the operators regarding use of the L-band.¹⁰⁰ On March 26, 2008, the Commission reached government-to-government satellite coordination agreements with the United Kingdom and Canada, based upon the “Spectrum Coordination and Cooperation Agreement” between Inmarsat and Lightsquared.

54. The arrangement between Inmarsat and LightSquared provides a framework that allows both operators to have contiguous blocks of spectrum that in turn will facilitate the provision of both MSS and ATC broadband services in the North American L-band. Due to the substantial expenditures required by this arrangement, Inmarsat and LightSquared agreed to a two-phase plan. On August 18, 2010, LightSquared triggered Phase I of the L-band Coordination Agreement between it and Inmarsat by making the first of \$337.5 million in total payments.¹⁰¹ The payments will facilitate transition of Inmarsat users to new equipment and will make it possible to create four 10 MHz blocks that can be used for broadband services.¹⁰² On January 28, 2011, LightSquared triggered notice of Phase II, under which

⁹⁶ <http://www.skyterra.com/media/press-releases-view.cfm?id=234&yr=2010>. See Comments of LightSquared Subsidiary LLC, in the Matter of Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-16626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz, ET Docket No. 10-142, September 15, 2010, p. 5. See Boeing Press Release, “Boeing Ships LightSquared’s SkyTerra 1 Mobile Communications Satellite to Launch Site,” October 19, 2010, available at http://www.skyterra.com/news_docs/releases/PR_Boeing_SkyTerra%201%20shipment_10-19-10.pdf, announcing shipment of LightSquared SkyTerra 1 to Kazakhstan for launch preparation.

⁹⁷ The five operators are: Lightsquared; Skyterra Canada, a Canadian operator; Telecomm, a Mexican-licensed operator; Volna, a Russian operator; and, following privatization, Inmarsat, a United Kingdom operator.

⁹⁸ See generally International Telecommunication Union’s Radio Regulations Article 9.

⁹⁹ See International Action: “FCC Hails Historic Agreement on International Satellite Coordination,” News Release, Report No. IN 96-16 (June 25, 1996).

¹⁰⁰ Press Release, “SkyTerra, Mobile Satellite Ventures and Inmarsat Sign Spectrum Coordination and Cooperation Agreement” (Dec. 21, 2007), available online at <http://www.msvlp.com/media/press-releases-view.cfm?id=158&yr=2007>.

¹⁰¹ See LightSquared Press Release, “LightSquared Delivers Notice To Inmarsat Triggering Re-Banding Of L-band Radio Spectrum In North America,” (August 18, 2010), <http://www.lightsquared.com/press-room/press-releases/lightsquared-delivers-notice-to-inmarsat-triggering-re-banding-of-l-band-radio-spectrum-in-north-america/>.

¹⁰² See Comments of LightSquared Subsidiary LLC, in the Matter of Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-16626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz, ET Docket No. 10-142, September 15, 2010, at 5.