

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of:)	
)	
International Comparison and Consumer)	
Survey Requirements in the Broadband Data)	GN Docket No. 09-47
Improvement Act)	
)	
A National Broadband Plan for Our Future)	GN Docket No. 09-51
)	
Deployment of Advanced Telecommunications)	
Capability to All Americans in a Reasonable)	
and Timely Fashion, and Possible Steps to)	
Accelerate Such Deployment Pursuant to)	GN Docket No. 09-137
Section 706 of the Telecommunications Act of)	
1996, as Amended by the Broadband Data)	
Improvement Act)	

REPLY COMMENTS OF INMARSAT

Inmarsat, Inc. (“Inmarsat”) submits these Reply Comments in response to the *Spectrum for Broadband NBP Public Notice* released on September 23, 2009 in the above-referenced proceedings regarding sufficiency of spectrum to meet demands for wireless broadband.¹ Inmarsat appreciates the opportunity to provide comments on this inquiry as part of the Commission’s larger effort to build a U.S. Broadband Plan. Inmarsat has previously participated in this and several related proceedings as a member of the Satellite Industry Association (SIA)² and the MSS/ATC Coalition.³ Inmarsat reiterates its support for the comments of the SIA in this

¹ *Public Notice, Comment Sought on Spectrum for Broadband, NBP Public Notice #6*, GN Docket Nos. 09-47, 51 and 137, DA 09-2100 (rel. Sept. 23, 2009) (“*Public Notice*”).

² *See, Comments of the Satellite Industry Association, Public Notice, Comment Sought on Impact of Middle and Second Mile Access on Broadband Availability and Deployment, NBP Public Notice #11*, GN Docket Nos. 09-47, 51 and 137, DA 09-2186 (rel. Oct. 8, 2009) (“*SIA Comments*”).

³ *See, Comments of MSS/ATC Coalition, Public Notice, Comment Sought on Defining “Broadband,” NBP Public Notice #1*, GN Docket Nos. 09-47, 51 and 137, DA 09-1842 (rel. Aug. 20, 2009).

proceeding urging the Commission to protect satellite spectrum above and below 3.7 GHz⁴ and SkyTerra Subsidiary LLC's comments describing the innovative services that can be made available in L-band.⁵ In addition, Inmarsat seeks to separately share with the Commission information about its global broadband mobile satellite network and critical customers' increasing bandwidth requirements. Inmarsat also provides important information for the U.S. Broadband Plan record about the unique international coordination environment of L-band spectrum.

I. Inmarsat's Broadband Mobile Satellite Network

Inmarsat, in an effort to respond to aggressive, highly competitive market forces, has continued to invest in new technologies for the diverse customer base that utilizes mobile satellite services. Over the last several years, Inmarsat has invested well over \$1.5 billion in the deployment of its fourth-generation, Inmarsat 4 ("I-4") satellite network, which is today providing innovative mobile satellite services to the United States and globally on one of the most advanced mobile commercial communications satellite constellations now in orbit. In 2008, Inmarsat launched the third of its fourth generation satellites, the I4F3, completing world-wide coverage for our broadband capabilities, including Broadband Global Area Network (BGAN). After the successful launch of the I4F3, Inmarsat undertook a major satellite fleet repositioning process that is now providing more efficient coverage for Inmarsat users.⁶ In addition and at significant capital expense, Inmarsat completed construction of and was granted Commission authorization for a Satellite Access Station

⁴ See, *SIA Comments*. Inmarsat in particular supports SIA's comments with respect to protecting satellite operations in C band spectrum, which Inmarsat uses for feeder link operations.

⁵ See, *Comments of SkyTerra Subsidiary LLC on Public Notice*.

⁶ See, Inmarsat Press Release, *Inmarsat Broadband Goes Global* (Feb. 26, 2009) announcing completion of global coverage for Inmarsat broadband services.

in Paumalu, Hawaii to connect BGAN user terminal traffic to the public switched network and the Internet.⁷

In order to remain competitive in the dynamic market for satellite services, Inmarsat's I-4 satellite fleet has been designed and adapted to support a new class of novel IP-based communications, including BGAN service. Using highly portable and easily deployed "notebook sized" antennas that are one-third the size, weight, and price of traditional Inmarsat terminals, BGAN provides voice and broadband service at speeds of almost half a megabit per second. After plugging a BGAN terminal into a laptop computer with a USB cable (or using a WiFi or Bluetooth connection), mobile users of all types have an immediate means of communication anywhere in the United States (and globally), including in hard-to-reach areas, or when the terrestrial network fails. BGAN thus delivers significant public interest benefits both in rural areas (*e.g.*, by supporting medical imaging and other high data-rate medical communications needs), and for purposes of disaster relief.

II. Critical Users of Inmarsat's Broadband Mobile Satellite Service

As SkyTerra points out, the Public Notice asks how the Commission "should think about the capacity of existing allocations to support growth in wireless broadband," "[w]hat spectrum bands are best positioned to support mobile wireless broadband," and "[w]hat are the key issues in moving spectrum allocations toward their highest and best use in the public interest?"⁸ Inmarsat agrees with SkyTerra that in assessing these questions, the Commission should consider the characteristics of different bands including the type of use and the public interest in that use.

⁷ See, File No. SES-LIC-20080306-00242, Call Sign E080059 (granted Dec.18, 2008); File No. SES-MFS-20080228-00207, Call Sign KA 25 (granted Dec. 18, 2008).

⁸ *Public Notice* at 5, 6.

Inmarsat's BGAN terminals are used in the United States by many U.S. Government entities, including FEMA, the National Guard, and the U.S. military, state and local governments, law enforcement personnel, and critical industries such as mining and gas, to facilitate broadband Internet access and voice communications in all areas of the country, including where and when terrestrial networks are degraded or unavailable. With the higher data-rate capabilities and smaller, easier to use mobile terminals afforded by BGAN, first responders and private industry around the world have available a robust and quickly deployable communications alternative on a routine basis in hard-to-reach areas, or when the next natural disaster, or other domestic crisis, occurs. As such, BGAN service is now a critical broadband communications tool for U.S. Government, first responders, industry and media in the United States.⁹

In anticipation of and response to customer demand, Inmarsat has also launched companion BGAN services for aeronautical¹⁰ and maritime¹¹ customers, known as SwiftBroadband and

⁹ Inmarsat's BGAN services are used because of their unique land mobile features by agricultural, media, relief agencies, and critical infrastructure industries such as oil and gas, construction and mining. For example, John Deere incorporates Inmarsat technologies on heavy farm machinery to improve precision farming techniques that prevent overuse of arable lands. Government organizations, civil and military, are also heavily reliant on BGAN services for mobile and secure last mile communications, especially when no other method of communication is reliably available. Government users often require time-critical communications with an exceptional level of availability, security and reliability. BGAN meets these requirements while offering greater speed, portability and versatility because it is able to offer broadband data and voice services in a single device.

¹⁰ Over 8,000 aircraft rely on global in-flight connectivity from Inmarsat as the most widely used satellite operator in the industry. Inmarsat was the first operator to provide global safety services that comply with the requirements of the International Civil Aviation Organization (ICAO), a United Nations agency. A single Inmarsat installation enables a diverse range of applications for both the cockpit and the cabin – from safety communications, weather and flight-plan updates, to access to the most fuel-efficient oceanic flight paths and transmissions of aircraft position and maintenance status to ground staff, to email, Internet and voices services. Outside the United States 20 international airlines offer mobile phone service on their aircraft to passengers in the cabin using Inmarsat services for the link to the ground. Every month approximately 19,000 commercial flights offer in-flight mobile phone service, serving over two million passengers.

¹¹ Inmarsat plays an integral role in the lives of seafarers. When it comes to delivering reliable maritime communications and safety services, no other network can match the global reach and breadth of services. Many modern commercial vessels require highly efficient operation and management along with the need to meet the safety requirements of the Global Maritime Distress Safety System (GMDSS) developed by the International Maritime Organization (IMO), a United Nations agency. Inmarsat service has been used to repel pirates who tried to

FleetBroadband, and continues to improve service for all its customers. For example, earlier this year, responding to significant demand from broadcasters, Inmarsat announced the enhancement of land BGAN service by providing access to the world's fastest mobile video streaming by satellite.¹² Next year Inmarsat will introduce world-wide Global Satellite Phone Service (GSPS) over its I-4 geostationary fleet with a modernized handset. This device is being optimized to operate over the I-4 network and is expected to be available in the United States in mid-2010.

Inmarsat also provides critical global communications services to heads of state, including the President of the United States on Air Force One, as well as commanders in transit and at the scene of operations. Inmarsat provides reliable and secure access to command, control and information resources for leaders in the United States and around the world, no matter whether they are on land, sea or in the air.¹³ On all these platforms Inmarsat mobile satellite service offers secure communications to permit leaders to communicate via email, Internet, file transfers, and videoconferencing. Applications offered over Inmarsat's service also include remote access to headquarters networks, weather and chart updates, remote diagnostics, safety and back-up communications, as well as welfare and telemedicine communications.

Accordingly, as the Commission proceeds to analyze spectrum requirements, its analysis and policy recommendations relating to broadband should incorporate both capacity of existing allocations *and* type of use as equally important factors in the analysis. As SIA has pointed out,

attack a bulk carrier in the Indian Ocean by allowing the ship to alert naval units in the vicinity, as well as to provide piracy warnings in order to alert ships to incidents in the area. *See*, Inmarsat News, Pirates Thwarted Thanks to Inmarsat C (Feb. 13, 2009). Inmarsat also provides critical communications to the fishing industry, allowing for sophisticated fish-finding techniques as well as transmission of catch photos to shore to research and bid on the best catch prices on the Internet, via email, and phone while still at sea, regardless of weather conditions.

¹² *See*, Inmarsat News, BGAN X-Stream Delivers Fastest Video Streaming (Apr. 20, 2009) announcing launch of BGAN X-Stream service offering video streaming rates of up to 450kbps.

¹³ Applications include multi-channel, high-quality telephony, messaging, email, Internet and government network access, safety communications, large file transfer (still images, audio and video), videoconferencing, telemedicine, STU-III encrypted communications, and real-time air-ground collaboration.

broadband should be defined in a functional manner that focuses on users' needs.¹⁴ As detailed above, Inmarsat's BGAN offerings make intensive use of L-band spectrum to provide many critical broadband services to a wide range of Government and commercial users.

III. Spectrum Demand and International Coordination

Increasing levels of competition from fixed satellite service (FSS) providers, as well as the growing demand for bandwidth-intensive MSS services, have placed significant demands on Inmarsat's spectrum and required Inmarsat to ensure that its customers have adequate spectrum to support the critical functions that they have long provided, and the new bandwidth-intensive functions they are capable of providing. Specifically, Inmarsat needs adequate spectrum to support the growing demand for multimedia and graphics-rich services that have become commonplace for business, educational, health care and governmental applications alike, and are becoming increasingly important to users such as first responders and those who work or travel in rural and remote areas.¹⁵

Inmarsat currently provides MSS in the L-Band, which is globally-harmonized spectrum that is shared around the world by over twenty spacecraft and ten operators, under "market-based" spectrum sharing arrangements that have not been used in any other satellite band. There are different multilateral L-Band sharing arrangements governing (i) Europe, Asia, and Africa (Regions 1 and 3) and (ii) North America (Region 2). Each of these sharing arrangements is designed to periodically reassign L-Band spectrum among operators according to their

¹⁴ See, *Satellite Industry Association Ex Parte Presentation to members of the FCC's Broadband Task Force* (filed Oct. 19, 2009), GN Docket No. 09-51 at p. 9.

¹⁵ Indeed, Inmarsat has consistently expressed a need for additional spectrum to provide its mobile services, in order to meet the growing needs of its user base. See, e.g., *Inmarsat Ventures Limited and Inmarsat Global Limited, Petition for Reconsideration*, File Nos. SAT-PPL-20050926-00184 et al. (filed Jan. 9, 2006). Inmarsat has also been actively studying and participating in international activities examining the possibility of additional allocations to the mobile satellite service in the bands 4-16 GHz in the International Telecommunication Union's Radiocommunication Bureau Study Group 4 in preparation for the next World Radiocommunication Conference in 2012.

demonstrated usage and short-term need.¹⁶ Moreover, because of the way the band is shared, changes in one region, for example Region 2, typically need to be coordinated with operators in the other two regions. Thus, Administrations and satellite operators have mutually established demand-driven mechanisms, under which they are to cooperate in good faith with one another to ensure that additional L-Band spectrum can be assigned to MSS operators to support continued growth of their services. L-band spectrum is thus subject to multiple international agreements that affect its use in the United States, as well as elsewhere around the globe.

As SkyTerra has explained in its comments, the North American L-band coordination process takes place under the auspices of the 1996 multilateral agreement referred to as the Mexico City Memorandum of Understanding,¹⁷ and bilateral agreements. Five national administrations, the United States, Canada, Mexico, Russia and the United Kingdom, participate in the Mexico City MoU process. Operators of multiple satellite networks from all five countries must work together to coordinate use internationally.

Inmarsat is regularly required to justify its existing L-band spectrum requirements around the world and engage in difficult international negotiations with its competitors in order to ensure it has sufficient spectrum to support its users' operations. Thus, Inmarsat's L-band usage is subject to a rigorous "marketplace" review that ensures the spectrum is utilized fully and effectively. Inmarsat and other operators and Administrations have devoted significant resources to the process over the years to ensure that users' needs are met. Inmarsat urges the Commission to take into account the challenges associated with this complex international process as part of

¹⁶ See, *FCC Hails Historic Agreement on International Satellite Coordination*, Report No. IN 96-16 (rel. Jun. 25, 1996).

¹⁷ See, *Memorandum of Understanding for the Intersystem Coordination of Certain Geostationary Mobile Satellite Systems Operating in the Bands 1525-1544/1545-1559 MHz and 1626.5-1646.5/1646.5-1660.5 MHz*, Mexico City, Mexico, 18 June 1996.

its evaluation of existing spectrum use. In particular, Inmarsat emphasizes that access to globally-harmonized spectrum is essential for operators who provide global broadband connectivity to critical users worldwide.

Inmarsat fully agrees with SIA's observation that "[o]verall, a stable, interference-protected spectrum environment for satellite services is essential if satellites are to continue providing the important public safety, voice, data and video services they provide today, and if the full potential of satellites as a platform to deliver broadband services to even the most remote populations is to be realized."¹⁸

For these reasons, Inmarsat respectfully requests that the Commission consider the above comments as it develops its broadband strategy.

Respectfully submitted,

_____/s/
Diane J. Cornell
Vice President, Government Affairs
INMARSAT, INC.
1101 Connecticut Avenue, N.W.
Suite 1200
Washington, D.C. 20036
Telephone: (202) 248-5155

_____/s/
Christopher J. Murphy
Senior Director, Government Affairs
INMARSAT, INC.
1101 Connecticut Avenue, N.W.
Suite 1200
Washington, D.C. 20036
Telephone: (202) 248-5158

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¹⁸ See SIA comments at 2.