

**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)	
)	
Rural Health Care Support Mechanism)	WC Docket No. 02-60
)	

COMMENTS OF INMARSAT

Inmarsat, Inc. (“Inmarsat”) submits these Comments in response to the Commission’s request for comments on *Health Care Delivery Elements of National Broadband Plan, NBP Public Notice #17* released on November 12, 2009 in the above-referenced proceedings.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 several related proceedings on its own² and as a member of the Satellite Industry Association (SIA)³ and the MSS/ATC Coalition.⁴

¹ *Public Notice, Comment Sought on Health Care Delivery Elements of National Broadband Plan NBP Public Notice #17*, GN Docket Nos. 09-47, 51, 137 and WC Docket No. 02-60, DA 09-2413 (rel. Nov. 12, 2009) (“*Public Notice*”).

² *See, Reply Comments of Inmarsat Inc., 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); *Comments of Inmarsat Inc., Comment Sought on Public Safety Issues Related to Broadband Deployment in Rural and Tribal Areas and Broadband Communications*

Inmarsat is also a corporate member of the American Telemedicine Association (ATA) which has filed comments on behalf of its membership in response to this *Public Notice* and related broadband strategy proceedings.⁵ Among the recommendations that ATA has put forth in its filings, Inmarsat particularly supports the goal of using the rural health care program to encourage building and expanding use of existing commercially available wireless networks (including satellites where terrestrial is degraded or unavailable) and seamlessly integrating such services with existing landline networks, rather than constructing entirely new dedicated networks. As described in our comments below, Inmarsat’s mobile satellite service offers an immediate, cost effective solution for broadband access in rural and underserved areas to provide the same or similar medical applications that are being deployed in areas with terrestrial broadband connectivity.

In these comments, Inmarsat seeks to provide the Commission with information about its technology that is already in place that can be used to fill the gaps that exist “between current connectivity infrastructure and the connectivity requirements for various health IT applications across the healthcare ecosystem.”⁶ In particular, Inmarsat will address the extent to which satellite broadband technologies can fill the mobile broadband gaps to meet the communications needs for primary care and emergency response by sharing information about its global

to and from Persons with Disabilities NBP Public Notice #14, GN Docket Nos. 09-47, 51 and 137, DA 09-2369 (rel. Nov. 2, 2009).

³ See, e.g., *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”).

⁴ 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).

⁵ See, e.g., *Comments of the American Telemedicine Association, , NBP Public Notice #11*, GN Docket Nos. 09-47, 51 and 137, DA 09-2186 (rel. Oct. 8, 2009).

⁶ *Public Notice* at 1.

broadband mobile satellite network and unique applications for mobile and fixed healthcare delivery using voice and broadband communications.

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.⁷ In addition and at significant capital expense, Inmarsat completed construction of and was granted Commission authorization for a Satellite Access Station in Paumalu, Hawaii to connect BGAN user terminal traffic to the public switched network and the Internet.⁸

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 built-in WiFi or Bluetooth

⁷ See, Inmarsat Press Release, Inmarsat Broadband Goes Global (Feb. 26, 2009) announcing completion of global coverage for Inmarsat broadband services.

⁸ 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).

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.⁹ 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.

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

⁹ *See*, Exhibit A for a list of available Inmarsat land BGAN terminals.

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 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.

network and is expected to be available in the United States in mid-2010. All of these applications will equally benefit the health care delivery community.

II. Health Care Delivery Applications for Inmarsat's Broadband Mobile Satellite Service

Inmarsat's BGAN terminals are used in the United States by many 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 mission critical 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, health care delivery personnel, and private industry around the world have available a robust and quickly deployable communications alternative on a routine basis in hard-to-reach areas.

BGAN service is now a critical broadband communications tool for U.S. Government, first responders, industry and media in the United States.¹³ As the opportunities for using BGAN spread, it is also transforming healthcare communications opportunities with a compelling combination of voice and high-speed data, completely independent of terrestrial networks. BGAN provides mobile communications operability even when terrestrial networks are degraded or disrupted, or in areas where they are unavailable. For example, BGAN technology is being used to extend existing networks by bridging gaps in terrestrial coverage to provide instant IP

¹³ 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 simultaneous broadband data and voice services in a single device.

data and voice backhaul for such telemedicine service drivers as basic Internet connectivity, VPN access (e.g., medical records, diagnostic tools), and store and forward test data.

While Inmarsat's unique mobile satellite communications technology has only been available worldwide for a relatively short time, service providers and end users are actively exploring how best to use the technology for health care delivery. Specific examples of BGAN use currently being deployed include the following:

Ambulances: performing lifesaving procedures in the field or 'on the move'

Mobile clinics: delivering primary and specialty care in rural communities

Hospice and homecare: providing access to electronic medical records and support.

A. Primary Care

In addition to the specific applications of Inmarsat's BGAN technology discussed above, other potential uses are currently being developed and tested for mobile health clinics and rural homecare services. With respect to mobile health clinic applications, Inmarsat is partnering with health care providers and organizations to investigate opportunities for:

- vehicular BGAN to help deliver basic healthcare services in underserved, rural or other hard-to-reach communities
- basic voice and data connectivity for patient communications and access to medical records
- real-time transmission of diagnostic tests and live, interactive consultation with specialists.

Other opportunities are being investigated for rural homecare service including:

- portable or vehicular BGAN connections for homecare nurses from rural areas to fixed clinic or hospital locations, where specialists can be consulted in real-time
- online access to medical records
- real-time transmission of diagnostic tests and live support from other medical staff.

- location-based services to improve health care personnel security and time management.

Primary care applications are thus an important aspect of satellite-delivered mobile broadband offerings.

B. Emergency Response

BGAN is also an extremely valuable form of connectivity in time-critical, lifesaving emergency response situations. BGAN can facilitate seamless and ubiquitous mobile connectivity in ambulances as back-up to cellular data services in terrestrially covered areas, or as a primary form of connectivity in remote locations. Today, because ambulances are essentially mobile emergency rooms requiring reliable connectivity for monitoring diagnostics, real-time video consultation, and remote procedures, uninterrupted mobile broadband access is critical.

In addition, because of BGAN's nationwide footprint it can extend the reach of fixed facilities and medical personnel to any location and 'on the move.' It also provides a fail over seamless solution for first responders and health care professionals when cellular networks are out of reach because of geography or unavailability.

BGAN is also being evaluated as a backhaul link for portable telemedicine response kits. These kits, which can be easily deployed for emergency response, disaster relief, or search and rescue, consist of portable examination kits that permit transmission of diagnostic data to fixed sites for higher level evaluation. Kits can also include voice and video capabilities allowing live, real-time support for emergency treatment. In many situations, enhanced field care minimizes the need for medical evacuations and, ultimately, costs.

III. Conclusion & Recommendations

Inmarsat today provides reliable and secure access to broadband information resources for health care providers in the United States and around the world, no matter whether they are on land,

sea or in the air.¹⁴ On all these platforms Inmarsat mobile satellite service offers secure communications to permit communications via email, Internet, file transfers, and videoconferencing.

All of the capabilities identified above make Inmarsat's BGAN technology a unique solution for health care delivery across the nation because of the national (and global) footprint of Inmarsat's satellites.¹⁵ Inmarsat and its partners are constantly investigating opportunities to bring our unique mobile broadband communications technology to the users that can put it to the best use.

Inmarsat requests that the Commission's National Broadband Plan recognize that mobile satellite-provided broadband solutions, such as BGAN, can play an important role in serving critical health care delivery needs. In order to encourage adoption of mobile satellite-delivered services as part of the broadband "toolkit", Inmarsat urges that the Commission's Broadband Plan make the following recommendations:

- Satellite services should routinely be considered as a cost-effective means of delivering mobile broadband reliably and ubiquitously in hard-to-reach areas, compared to building out terrestrial wireless or wired infrastructure. This approach would help ensure that broadband is delivered to unserved and underserved users quickly and cost-efficiently.
- Gating criteria adopted in guidance, pilot programs, grants, rural health care and universal service fund eligibility criteria, or other similar contexts addressing broadband health care needs, should encourage meaningful consideration of satellite-delivered mobile broadband in circumstances where a satellite solution would be more cost effective in serving hard-to-reach areas than building out terrestrial infrastructure.
- Funding should be provided for pilot projects to evaluate the cost-effectiveness and desirability of mobile satellite broadband solutions for addressing telemedicine broadband needs in hard-to-reach areas. Funding should help support training, equipment, and airtime requirements.

¹⁴ 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.

¹⁵ See, Exhibit B showing Inmarsat's three I-4 BGAN satellite footprints and spot beams for the United States and the rest of the world. The fact that Inmarsat's BGAN service is available around the world means that equipment purchased in the United States can also be taken and used anywhere in the world.

- In the adoption context, health care professionals are less familiar with satellite-delivered broadband than terrestrial alternatives because such offerings have entered the market so recently. To encourage such users to become familiar with the ability of satellite-delivered broadband to offer a cost effective, reliable and ubiquitously-available alternative to terrestrial offerings in appropriate circumstances, the Broadband Plan should encourage targeted training programs for health care users of mobile broadband. These training programs should include support for users in how to use the equipment, as well as funding for airtime to enable users to gain familiarity with the satellite broadband capabilities.

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

Respectfully submitted,

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Exhibit A



BGAN terminals

A quick reference guide



Inmarsat's Broadband Global Area Network service – BGAN – is accessible via a small, lightweight, satellite terminal, which is quick to set up and easy to use. And you can use the same device worldwide.

A range of terminals is available, providing performance options to suit different operational needs. The service is accessed via BGAN LaunchPad, a software interface, which is standard across all terminals.

	 Wideye™ Sabre™ 1 Voice and data, single-user device	 EXPLORER® 110 Smallest, lightest device in the range	 EXPLORER® 300 Highly compact, robust device	 EXPLORER® 500 High bandwidth, highly portable device	 HNS 9201 High performance, multi-user device	 EXPLORER® 700 Multi-user device with extensive functionality
Standard terminals	Manufacturer: Addvalue Communications www.wideye.com.sg	Thrane & Thrane www.thrane.com	Thrane & Thrane www.thrane.com	Thrane & Thrane www.thrane.com	Hughes Network Systems www.hns.com	Thrane & Thrane www.thrane.com
Size:	259 x 195mm (1.6kgs)	200 x 150mm (<1kg)	217 x 168mm (1.4kgs)	217 x 217mm (<1.5kgs)	345 x 275mm (2.8kgs)	297 x 399mm (3.2kgs)
Standard IP:	Up to 240/384kbps (send/receive)	Up to 240/384kbps (send/receive)	Up to 240/384kbps (send/receive)	Up to 448/464kbps (send/receive)	Up to 492kbps (send & receive)	Up to 492kbps (send & receive)
Streaming IP:	32, 64kbps (send & receive)	32, 64kbps	32, 64kbps	32, 64, 128kbps	32, 64, 128, 256kbps	32, 64, 128, 256kbps
ISDN:	N/A	N/A	N/A	1 x 64kbps via USB only	1 x 64kbps	2 x 64kbps
Voice:	Via RJ-11 or Bluetooth handset/headset	Via RJ-45 ISDN handset, Bluetooth handset	Via RJ-11 or Bluetooth	Via RJ-11 or Bluetooth handset, 3.1 kHz audio	Via RJ-45 ISDN handset, RJ-11; 3.1kHz audio	Via RJ-11 (x2), Bluetooth handset; 3.1kHz audio
Data interfaces:	Bluetooth, Ethernet – static and dynamic IP addressing	USB (with adapter), Bluetooth, Ethernet – static and dynamic IP addressing	Bluetooth, Ethernet	USB, Bluetooth, Ethernet	USB, Ethernet, WLAN 802.11b	USB, Ethernet (x2), Bluetooth, WLAN 802.11g, Digital I/O
Ingress protection:	IP 54	IP 44	IP 54	IP 54	IP 55	IP 52 (terminal), IP 66 (antenna)

Broadband for a mobile planet™

Vehicular terminals			
		EXPLORER® 527 Multi-user, trackable antenna	HNS 9250 Multi-user, trackable antenna
	Manufacturer:	Thrane & Thrane www.thrane.com	Hughes Network Systems www.hns.com
	Size:	Terminal 403 x 483mm (5kgs) Antenna 500 x 150mm (5kgs)	Terminal 275 x 345mm (2.8kgs) Antenna 477 x 153mm (5.5kgs)
	Standard IP:	Up to 448 / 464kbps (send / receive)	Up to 464kbps (send / receive)
	Streaming IP:	32, 64, 128kbps (send & receive)	32, 64, 128, 256kbps (send & receive)
	ISDN:	N/A	1 x 64kbps
	Voice:	3.1kHz, 2-wire phone/fax	3.1kHz via ISDN handset
Data interfaces:	Bluetooth, Ethernet	Ethernet, ISDN, WLAN 802.11b	
Ingress protection:	IP 56 antenna	IP 56 antenna	



How to buy BGAN

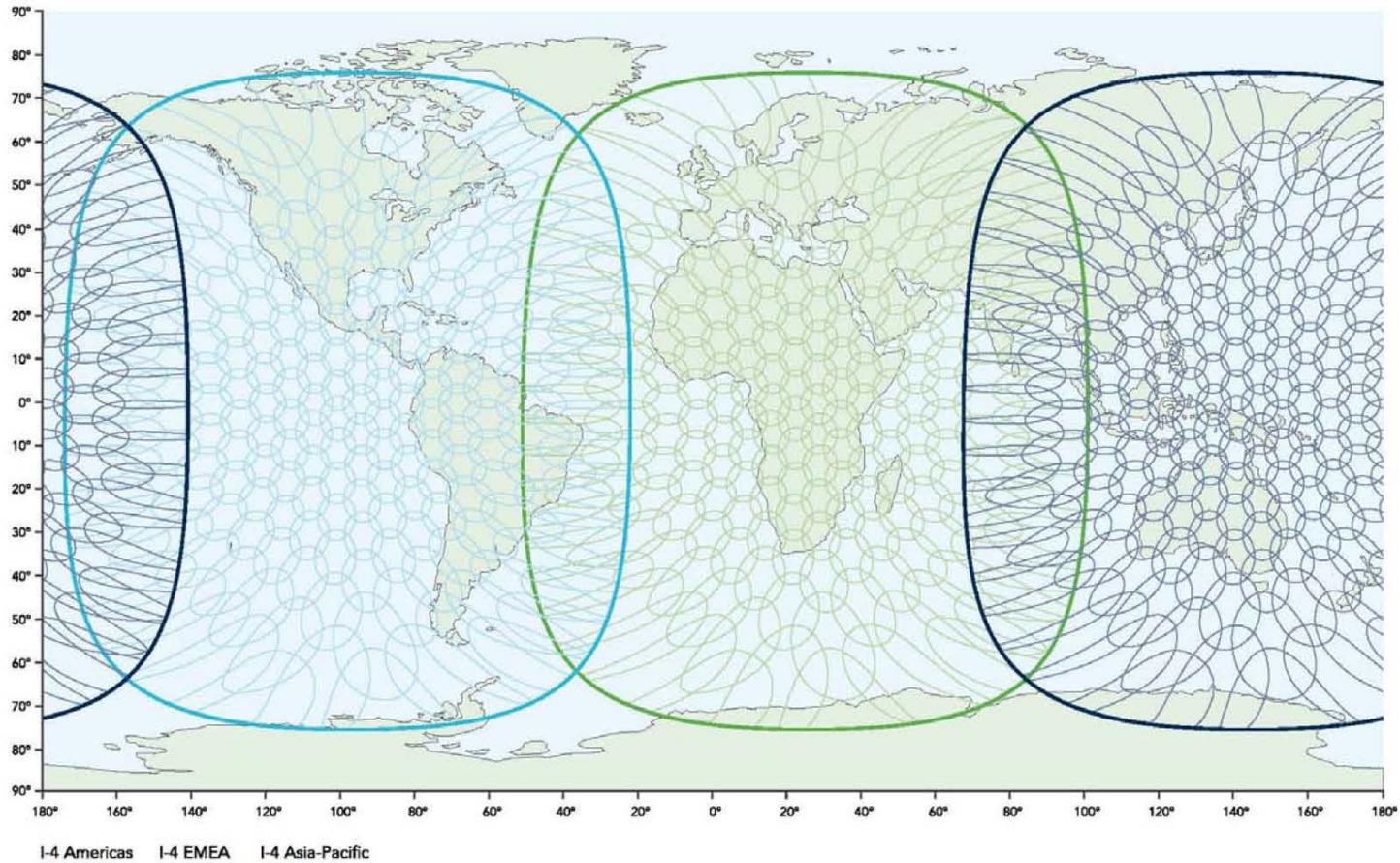
BGAN is available through Inmarsat distribution partners and service providers in more than 80 countries. Visit our website to find the right partner for your organisation.

inmarsat.com/bganterminals

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Exhibit B

BGAN coverage



This map depicts Inmarsat's expectations of coverage, but does not represent a guarantee of service. The availability of service at the edge of coverage areas fluctuates depending on various conditions. BGAN spot beam coverage February 2009.