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globalstar.com

July 21, 2015

Via Electronic Filing

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: *Ex Parte Notice: Terrestrial Use of the 2473-2495 MHz Band for Low-Power Mobile Broadband Networks – IB Docket No. 13-213*

Dear Ms. Dortch:

On July 17, 2015, L. Barbee Ponder IV, General Counsel & Vice President, Regulatory Affairs, for Globalstar, Inc. (“Globalstar”), Dennis Roberson, President and Chief Executive Officer of Roberson and Associates, LLC, Regina M. Keeney and Steve Berman of Lawler, Metzger, Keeney & Logan, LLC, and I met separately with Commissioner Jessica Rosenworcel and Jennifer Thompson, Special Advisor to Commissioner Rosenworcel; Brendan Carr, Legal Advisor to Commissioner Ajit Pai; and Erin McGrath, Legal Advisor to Commissioner Michael O’Rielly. At these meetings, we urged the Commission to adopt its proposed rules in the above-captioned proceeding. These rules would both maintain Globalstar’s licensed Mobile Satellite Service (“MSS”) operations and permit Globalstar to provide low-power terrestrial mobile broadband service (or Terrestrial Low Power Service (“TLPS”)) using its licensed MSS spectrum and adjacent unlicensed 2.4 GHz spectrum. We provided Commissioner Rosenworcel, Ms. Thompson, Mr. Carr, and Ms. McGrath with the attached slide presentation.

As we described in these meetings, Globalstar is first and foremost a satellite company and is committed to the future success of its MSS business. Over the past few years, Globalstar has invested more than \$1 billion in an entirely new satellite constellation and second-generation ground infrastructure. Globalstar plays an important public safety role, serves traditional enterprise segments, and has a growing and innovative suite of consumer products. Since this proceeding began in 2013, Globalstar’s SPOT personal tracking devices have been used to initiate over 1600 life-saving rescues, including 63 rescues during June 2015. Globalstar’s largest single customer for SPOT is the U.S. government.

We explained in our meetings that Globalstar wants to extend its innovative approach to the terrestrial mobile broadband marketplace through the use of a combination of licensed and unlicensed spectrum. Globalstar recognizes the critical benefits of unlicensed services to the wireless ecosystem and the U.S. economy more generally, as those operations promote innovation, experimentation, and the development of new applications. We emphasized that, rather than having a detrimental impact, TLPS on IEEE Channel 14 will enhance existing unlicensed Wi-Fi services in the 2.4 GHz band in a number of different ways.

As Globalstar has described in this proceeding, TLPS operations on Channel 14 are consistent with the IEEE 802.11 protocol and do not overlap with the nearest Wi-Fi operations on Wi-Fi Channel 11. By enabling consumers to spread their wireless broadband usage over four rather than just three channels, TLPS will help relieve worsening congestion in the 2.4 GHz band. TLPS will thereby *improve* the experience of consumers using Wi-Fi hotspots around the country. Whatever hypothetical situation is assumed – twenty students in a classroom; thirty-five patrons at a coffee shop; one hundred travelers waiting in an airport terminal – all of those users will receive the benefits of increased broadband capacity across the 2.4 GHz band, whether or not they individually utilize TLPS. These students, customers, and travelers will enjoy faster data rates and a higher quality of service.

At these meetings, we pointed out that Globalstar and its partners will not operate TLPS as a standalone, one-channel system. The use of Channel 14 will be integrated into a wireless network that uses other publicly available unlicensed spectrum, including Wi-Fi Channels 1, 6 and 11 in the 2.4 GHz ISM band. Globalstar has no desire or competitive reason to degrade these Wi-Fi channels or other unlicensed spectrum, since such degradation would undercut its own terrestrial broadband offerings at 2.4 GHz.

The significant consumer benefits of TLPS were shown during a March 2015 demonstration at the FCC’s Technology Experience Center (“TEC”). At the request of the Commission’s Office of Engineering & Technology, Globalstar and other parties conducted this demonstration to consider the compatibility of TLPS with other unlicensed services. The activation of TLPS on non-overlapping Channel 14 yielded an approximately *forty percent* increase in aggregate measured data throughput across the 2.4 GHz 802.11-capable spectrum. TLPS transmissions had no negative impact on the data throughput on Wi-Fi Channel 11 or any other 802.11 Wi-Fi channel.¹

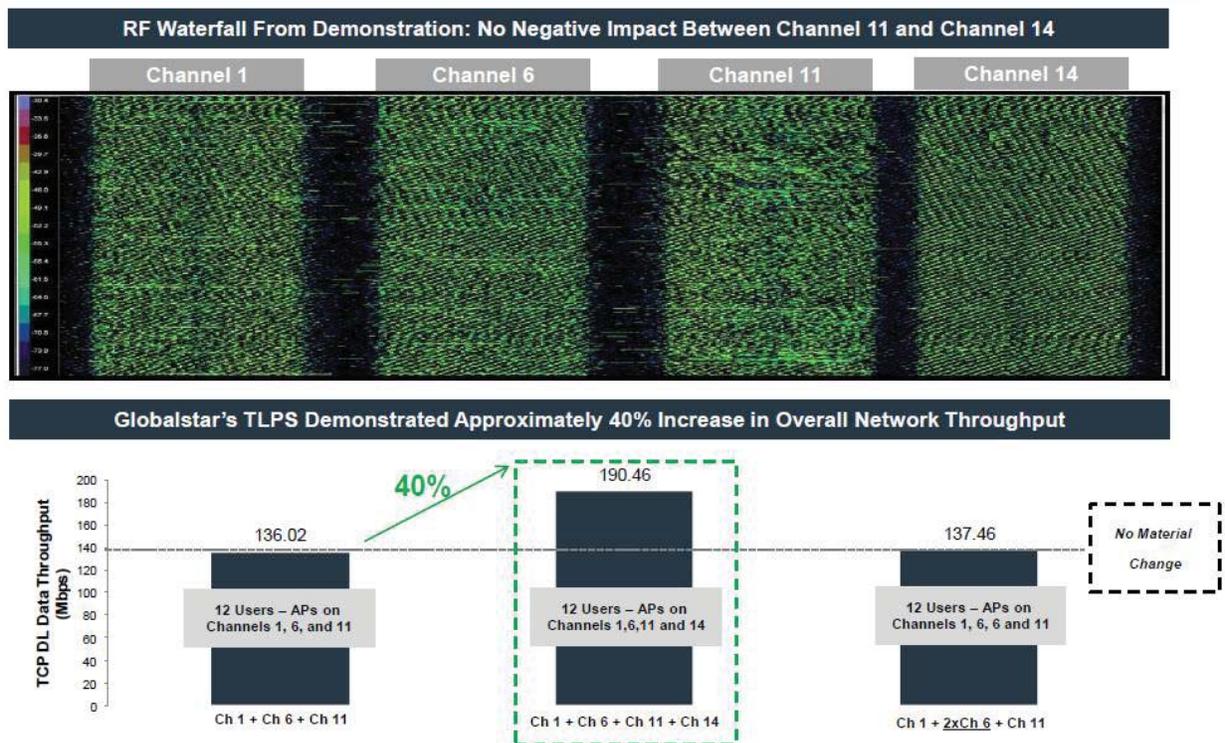
We also explained at our meetings how Globalstar measured this substantial increase in data throughput. First, Globalstar’s representatives took a baseline measurement of access point

¹ In contrast, the results of the CableLabs demonstration at the FCC should be disregarded. In the CableLabs demonstration, TLPS Channel 14 access points were placed only a few feet from other access points and client devices. This “methodology” was designed to generate a negative impact on Channel 11. The enormous consumer benefits of a fourth non-overlapping 802.11 channel far outweigh the alleged harms seen in CableLabs’ contrived, far-fetched scenario.

throughput on each of the four non-overlapping IEEE channels (Channels 1, 6, 11 and 14). Second, Globalstar measured the aggregate throughput on Wi-Fi Channels 1, 6 and 11 operating simultaneously with a total of twelve client devices (four per channel). Then, Globalstar activated a TLPS access point and shifted three client devices to Channel 14, such that all four channels were used by three clients each. Measured aggregate throughput increased by approximately forty percent. The demonstration at the FCC also showed that, if a fourth access point operated instead on one of the Wi-Fi channels already in use (in this case Channel 6), aggregate data throughput did *not* increase due to the overlapping nature of the Channel 6 access point. This result demonstrates that schools and other institutions will not be able to increase broadband throughput at 2.4 GHz merely by investing in additional access points. TLPS access points on Channel 14, however, will achieve that goal.

Below, we provide an image of the radiofrequency spectrum “waterfall” that was displayed during the demonstration at the FCC, showing the four non-overlapping 802.11 channels operating independently. We also provide a graph showing the relative throughput achieved under the different scenarios demonstrated at the FCC.

March 2015 TLPS Demonstration Summary



At the meetings, we indicated that the TEC demonstration results are being confirmed by real-world TLPS deployments under Globalstar’s experimental authorizations. These deployments are utilizing prototype TLPS access points manufactured by Ruckus and client devices from HTC, Microsoft, and Apple that were upgraded to operate on Channel 14 or were able to operate on Channel 14 “out of the box” with no changes necessary.

Ms. Marlene Dortch

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We also emphasized that TLPS will be a managed service with networked access points that will be individually controlled through a carrier-grade network operating system (“NOS”) analogous to the systems used to manage pico- and femto-cellular infrastructure. With this NOS, Globalstar will be able to terminate specific access point transmissions, reduce access point power, or shift access points to another 802.11 channel in a given environment to prevent or respond to interference should it be alleged, or to help determine the actual cause of claimed interference.

Finally, we reiterated that, unlike other spectrum initiatives that will take years if not a decade to benefit consumers, TLPS offers *immediate* relief from broadband congestion and provides substantial consumer benefits anywhere it is deployed. These benefits are beginning to be experienced by consumers who are using all four non-overlapping 802.11 channels in real-world deployments. Globalstar will provide additional information regarding these TLPS deployments in the near future.

Pursuant to section 1.1206(b)(2) of the Commission’s rules, 47 C.F.R. § 1.1206(b)(2), this *ex parte* notification and the attached presentation are being filed electronically for inclusion in the public record of the above-referenced proceeding.

Respectfully submitted,

/s/ James Monroe III

James Monroe III

Globalstar, Inc.

cc: Commissioner Jessica Rosenworcel
Brendan Carr
Erin McGrath
Jennifer Thompson



Globalstar Materials

July 2015

1) Globalstar Introduction

Globalstar Overview

Globalstar is a leading provider of mobile satellite services with a full product suite supporting communications beyond the range of traditional cellular services and emergency services

History & facts

- Founded in 1991 as a partnership between Loral Space and Qualcomm
- Listed NYSE MKT (GSAT)
- Headquartered in Covington, LA with network control center in Milpitas, CA and Aussaguel, France
- Sales offices in USA (Covington), Ireland (Dublin), France (Toulouse), Brazil (Rio de Janeiro), Canada (Ontario) and Panama (Panama City)
- 311 employees

Network & Spectrum

- Global satellite network
 - New satellite upgrade recently completed (~\$1bn investment)
 - ~650k subscribers
 - 2014 Revenue and Adjusted EBITDA growth of 9% and 47%, respectively, over 2013
- 25.225 MHz of spectrum globally authorized by ITU
- Terrestrial Low Power Service (“TLPS”) NPRM subject to FCC approval

Globalstar's Core MSS Market



No terrestrial network

Areas outside cellular networks

- Connectivity to **two billion people** who live, work and/or play in areas not covered by cellular service
- Over **150 million adventure trips** taken annually ⁽¹⁾
- **75% world's land mass** is without terrestrial cellular coverage ⁽²⁾



Failure of terrestrial network

Critical mobile satellite services during disasters

- Provides **public safety** with needed connectivity when cellular service is down due to overloaded / failed infrastructure
- Provides alternative network access in areas prone to **natural disasters**
- Enables basic services, NGOs, **emergency response** and business continuity



Existing terrestrial network

Asset tracking / low cost alternative to international roaming

- Provides the ability to **track anything, anywhere, anytime** globally
- Provides **low cost alternative to international roaming** when traveling abroad
 - \$2–\$3 per minute with traditional cellular companies vs. \$0.12 per minute on Globalstar's unlimited usage plans ⁽³⁾



Source: *Adventure Tourism Market Report* by George Washington University, Adventure Travel Trade Association, Xola Consulting, Informa Telecoms & Media.
 (1) *Adventure Tourism Market Report* by George Washington University, Adventure Travel Trade Association, Xola Consulting, Informa Telecoms & Media.
 (2) CIA World Factbook, as of 2010.
 (3) Based on plan "Evolution III" at \$49.99 / month assuming 400 minutes per month of usage.

Globalstar Network

- Globalstar operates a constellation of low-earth-orbit (LEO) satellites
 - Constellation orbits at 1,414 km (~850 miles) while Geostationary (GEO) satellites orbit at approximately 22,240 miles
- While a GEO satellite covers a specific region of the earth's surface, each Globalstar satellite's coverage moves across the Earth's surface continuously
- Advantages of LEOs include:
 - True mobility
 - Virtually no latency
 - Lower power requirements for handsets and data terminals
 - Network and satellite redundancy
- Globalstar's current "Bent-Pipe" architecture provides communications through a network of 25 terrestrial gateways around the world
- Architecture offers enhanced voice quality
- "Brains" of the system are located in ground stations, enabling faster and more cost-effective system maintenance and upgrades

Select Current Globalstar Products

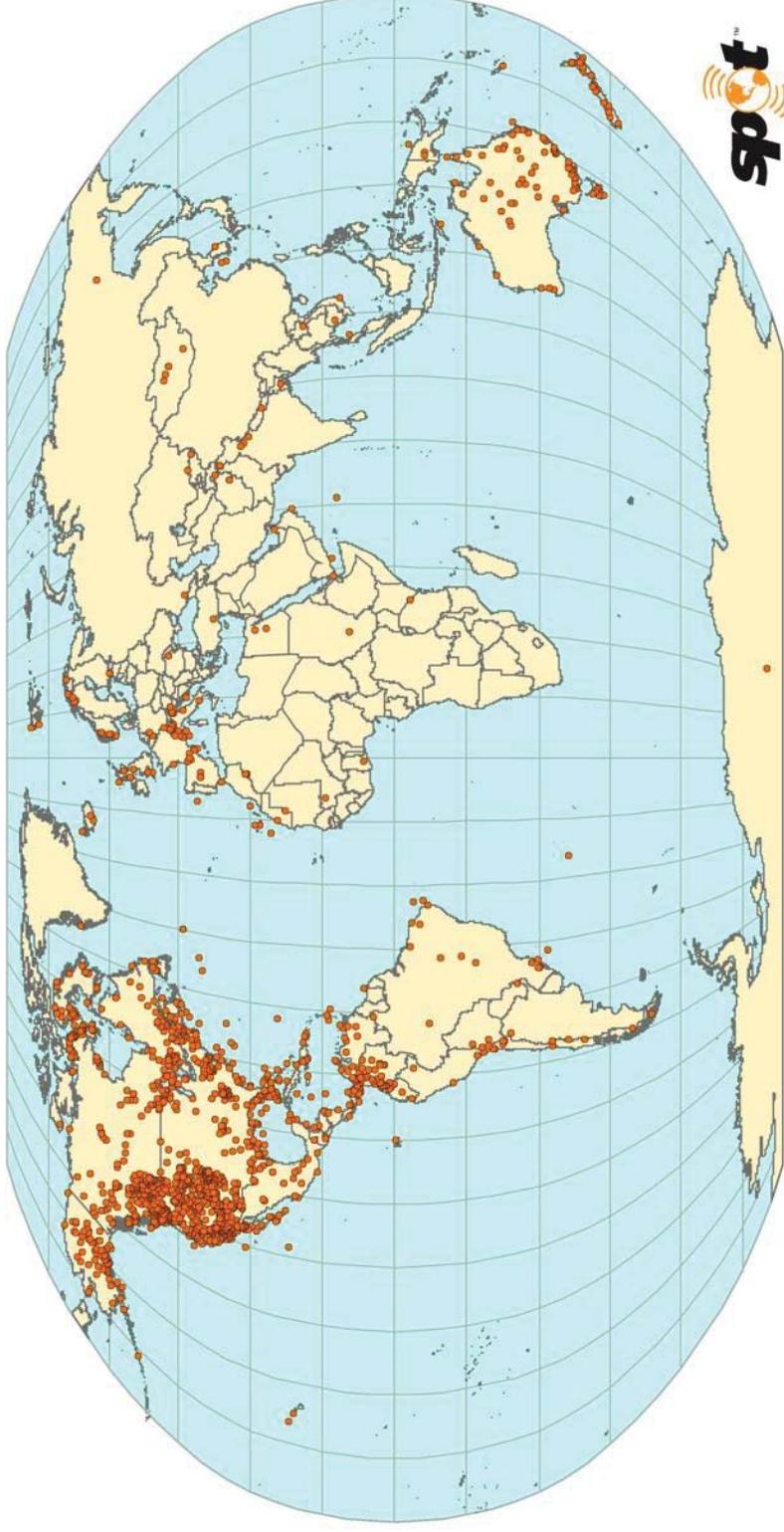
Globalstar has a full product suite supporting both one-way and two-way communications

Duplex		SPOT		Simplex	
GSP 1700 / SPOT Global Phone	Sat-Fi	SPOT Gen3	SPOT Trace	STX3	SmartOne C
					
<p>Image</p>	<ul style="list-style-type: none"> Converts any Wi-Fi enabled device to a satellite phone Targets boaters, emergency responders, oil & gas workers, miners, ranchers etc. 	<ul style="list-style-type: none"> Provides location based messaging when off the grid including SOS feature Battery life 2x enhanced customization features – smaller form factor 	<ul style="list-style-type: none"> Tracks consumer assets anytime, anywhere Key applications include theft prevention for consumer assets 	<ul style="list-style-type: none"> World's smallest M2M transmitter Enables VARs and OEMs to develop smaller, more efficient M2M solutions 	<ul style="list-style-type: none"> Designed for the intelligent management of fixed and mobile assets; practical solution for multiple reporting times and low battery messaging Generates opportunities for Globalstar subscribers to leverage the power of the Internet of Things (IoT)
<p>Features</p>	<ul style="list-style-type: none"> Portable two-way satellite phone with full voice and data capabilities While the GSP-1700 targets the commercial market segment, the SPOT Global phone is consumer-focused 				

SPOT Product Rescues Exceed 3,700

- Since 2007, Globalstar's SPOT customers have initiated over 3,700 rescues, averaging 2 people per rescue
- In June 2015, Globalstar's customers initiated 63 rescues
- On average, customers are initiating 1 rescue every day around the world
- No other communications product has achieved the life saving record of SPOT

SPOT Rescue Map: 3,700 Rescues and Counting



Live SPOT Messages - <https://logintest.findmespot.com/spot-locations/index.jsp>

2) Terrestrial Low Power Service

TLPS 101

What is TLPS?

- Utilizes 22 MHz wide channel in 2.4 GHz, including 11.5 MHz over Globalstar's licensed spectrum and 10.5 MHz on an unlicensed non-exclusive basis
- Can uniquely leverage existing ecosystem – accelerates time to consumer use vs. other new bands requiring additional ecosystem development

Where can TLPS be deployed?

- Domestic – Post approval, license is proposed to cover all of U.S.
- Rest of World – Subject to local regulatory requirements

TLPS technical characteristics

- Clean, quiet spectrum avoids acute co-channel interferences / high noise floor of traditional 2.4 GHz – most wireless traffic takes place over 3 channels in 2.4 GHz ISM band
- Superior capacity and performance
 - Significantly more effective capacity versus any single public Wi-Fi channel
 - Performance differential heightened in dense, metropolitan areas
 - Enhanced security capability
 - Ability to operate a managed, controlled network with Network Operating System (NOS)
- Not limited by high attenuation factor of 5 GHz

Why is TLPS Important?

TLPS offers a secure high performance wireless broadband service

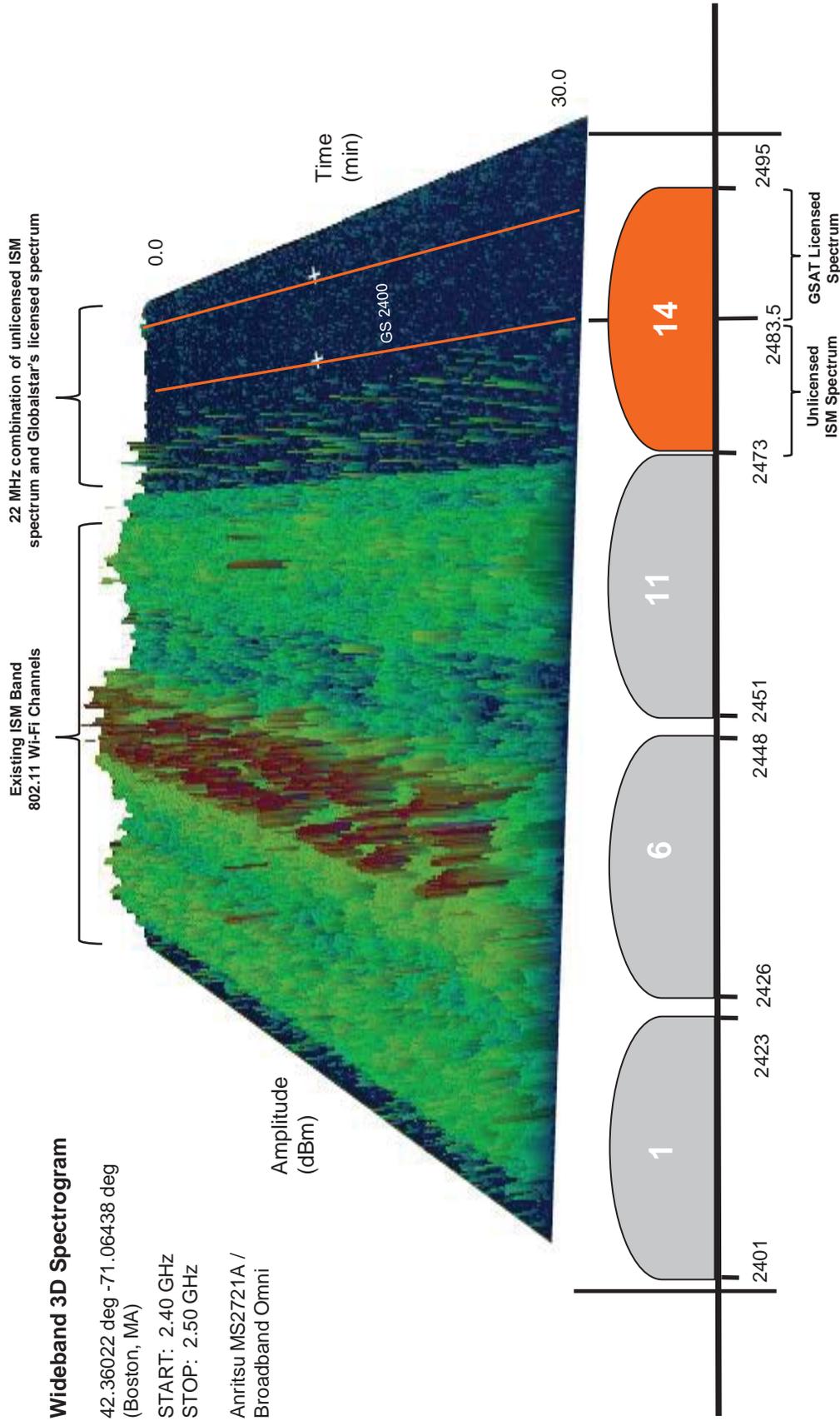
- Today, the vast majority of all Wi-Fi traffic transits over three non-overlapping public channels – 1, 6, and 11 – in the 2.4 GHz ISM Band. TLPS opens a managed, secure and high performance 4th channel to an existing ecosystem and network infrastructure. These unique attributes allow for near-immediate deployment and, thus, immediate consumer benefits.
- With millions of uncoordinated access points and devices, 2.4GHz has reached exhaustion. TLPS will open up a new and sustainable high-performance wireless broadband resource.

Wideband 3D Spectrogram

42.36022 deg -71.06438 deg
(Boston, MA)

START: 2.40 GHz
STOP: 2.50 GHz

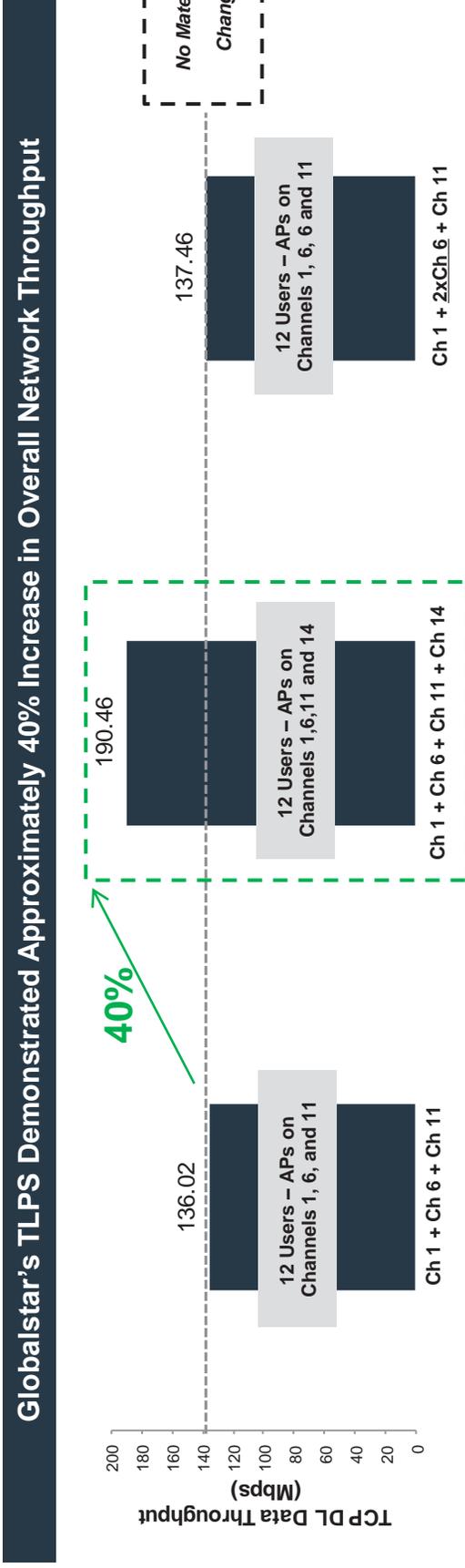
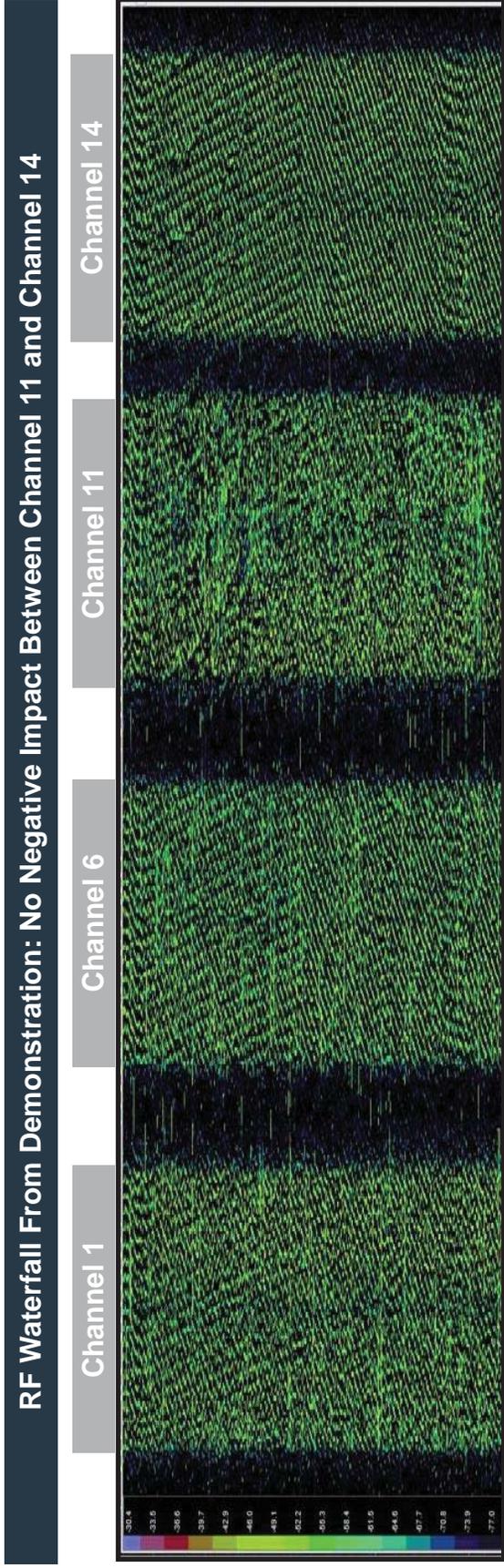
Anritsu MS2721A /
Broadband Omni



FCC NPRM Highlights and Timing

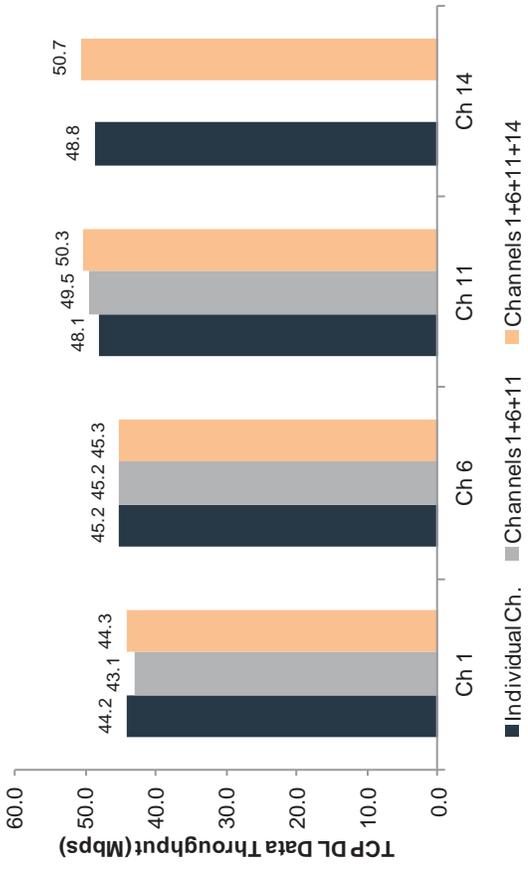
FCC's NPRM Process Overview	
Completed	
November 13, 2012	Globalstar Files Petition for Rulemaking
November 30, 2012	FCC Placed Petition on Public Notice
January 29, 2013	Comment Period for Petition Ended
November 1, 2013	FCC Releases NPRM
February 19, 2014	NPRM Publication in Federal Register
May 5, 2014	Comment Due Date
June 4, 2014	Reply Comment Due Date
March 10, 2015	Successful Completion of TLPS Demonstration at the FCC

March 2015 TLPS Demonstration Summary

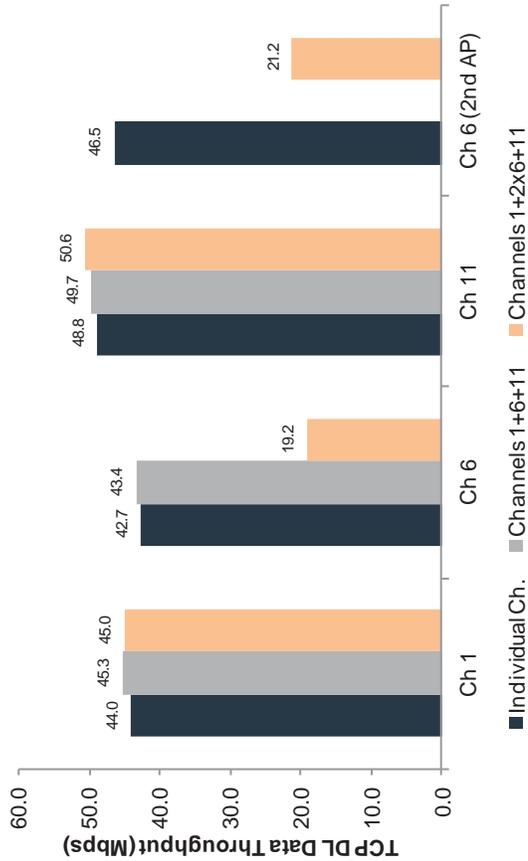


Globalstar Scenarios: TLPS Has No Negative Impact on Public Wi-Fi

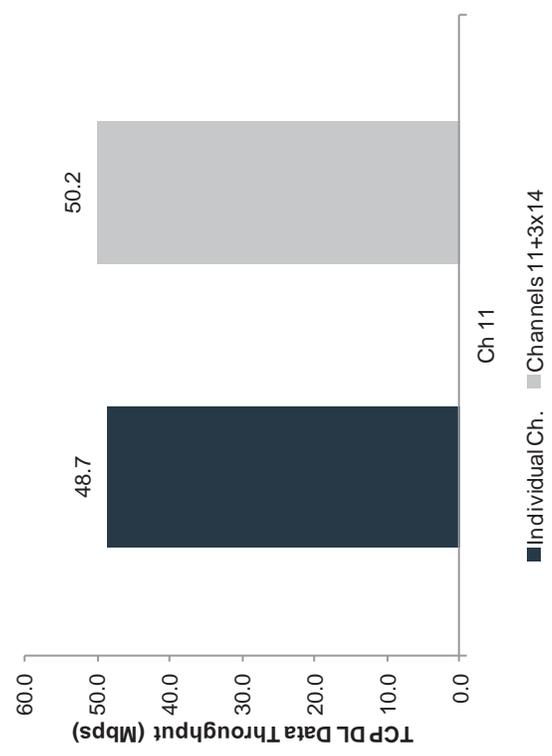
Scenario 2: 4 APs with TLPS



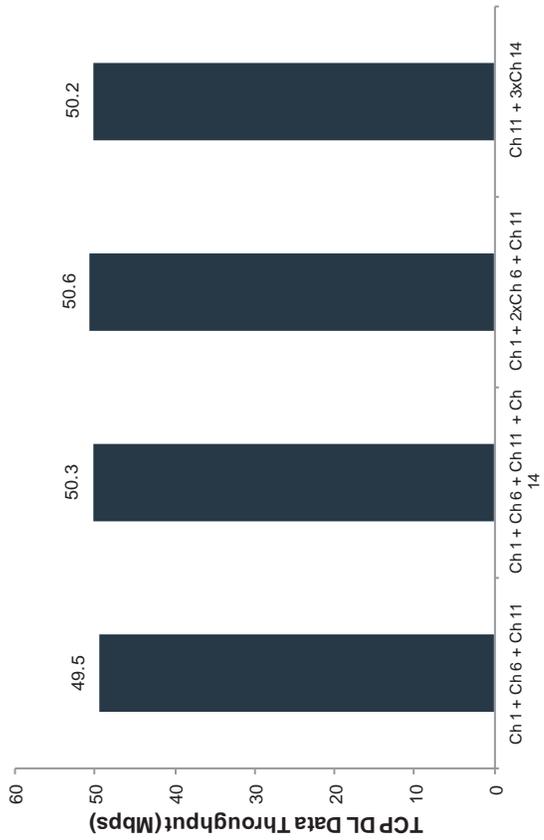
Scenario 3: 4 APs without TLPS



Scenario 4: TLPS on Multiple APs



Channel 11 Summary: 3 Active Users



Source: TLPS Operations Demonstration available on www.globalstar.com/tips

