TLPS

Understanding the Terrestrial Low Power Service

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What is the Terrestrial Low Power Service?

TLPS is a proposed new 802.11 based service that…

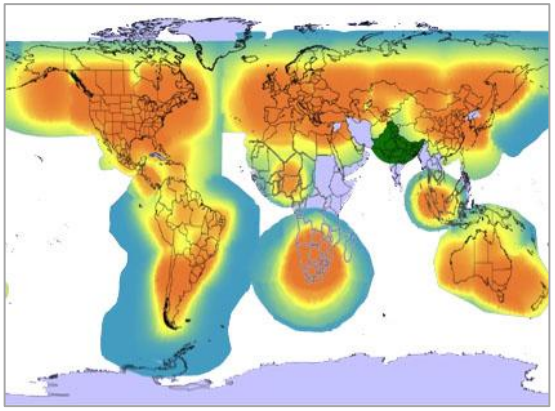
- will significantly expand the effective data capacity of mobile networks.
- will enable a privately managed extension to the 2.4 GHz 802.11 band.
- will be readily compatible with the massive existing 802.11 ecosystem.

I. Background of Globalstar and its Spectrum

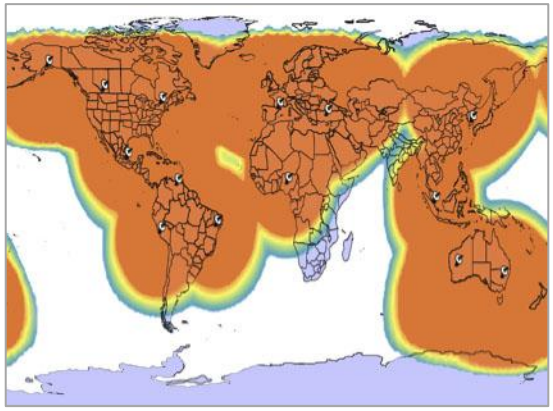
The Globalstar Satellite Network at a Glance

Global Coverage Footprint:

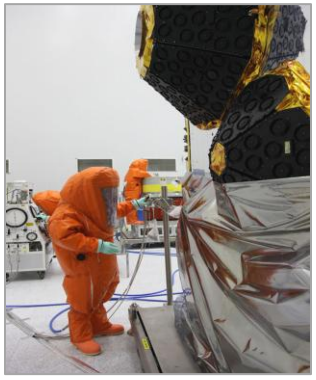
- 25 Ground Stations
- Near Total Land Mass Coverage Capability
- Flexible “Bent Pipe” Architecture
- Consumer / Commercial Apps



2nd Generation Duplex Coverage (2013)*



Current SPOT / Simplex Data Coverage



Enhanced Next-Generation Satellites:

- 24 New Next-Generation LEO Satellites
- Enhanced Duplex Voice Reliability
- Enhanced Data Speed and Quality
- Doubled Spacecraft Life Expectancy

*Please visit http://www.globalstar.com/en/index.php?cid=101&sidenav=85 for additional information regarding current and future duplex coverage.

Globalstar Commercial and Consumer Applications

GSP-1700 PORTABLE PHONE

GSP-2900 FIXED PHONE

GPS TRACKERS STX-2 / SmartONE / MMT

- Newly enhanced duplex voice and data service
- Superior mobile voice quality and data speeds
- Growing suite of simplex GPS tracking products

COMMERCIAL

CONSUMER

- Fast growing simplex GPS tracking / messaging
- Award winning consumer product line
- More than 2200 rescues initiated since 2007

SPOT GPS TRACKER

SPOT 2 GPS MESSENGER

SPOT CONNECT

HUG GPS TRACKER

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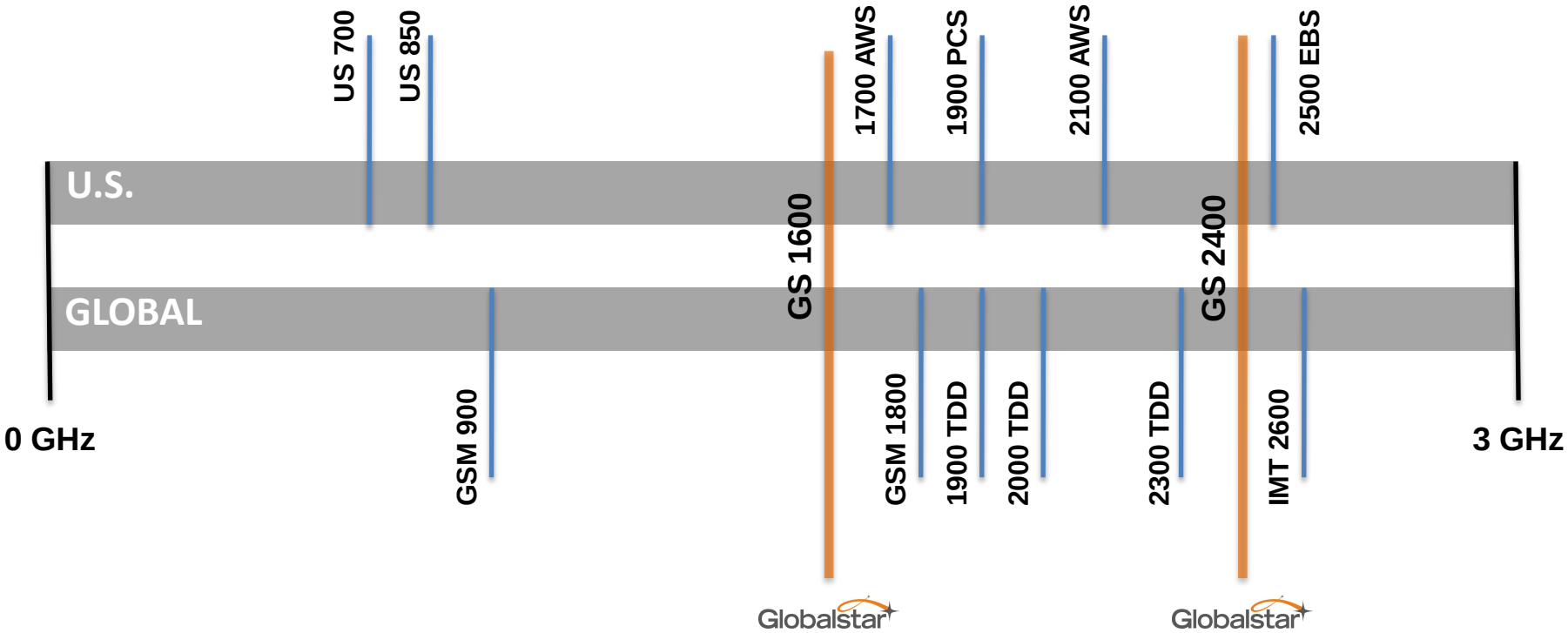
Primary U.S. and Global Wireless Bands



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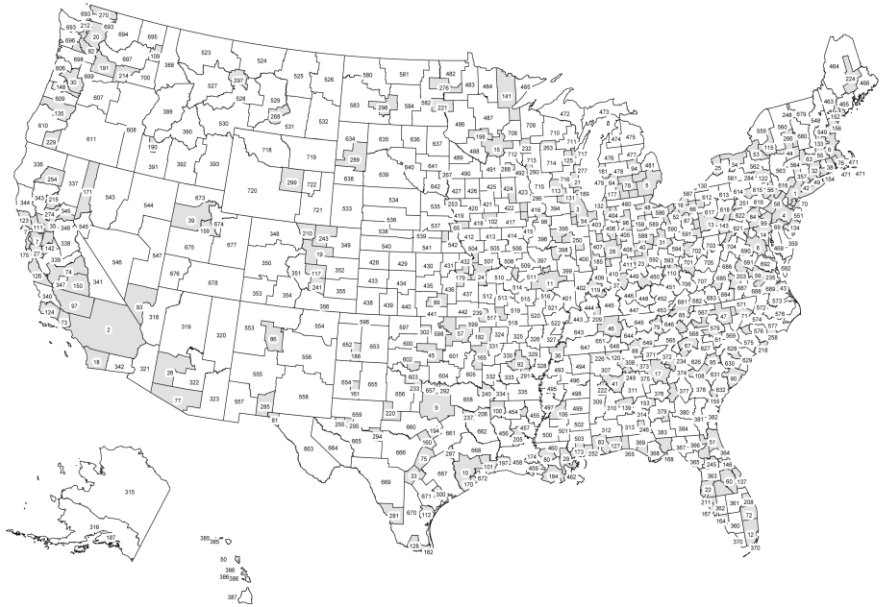
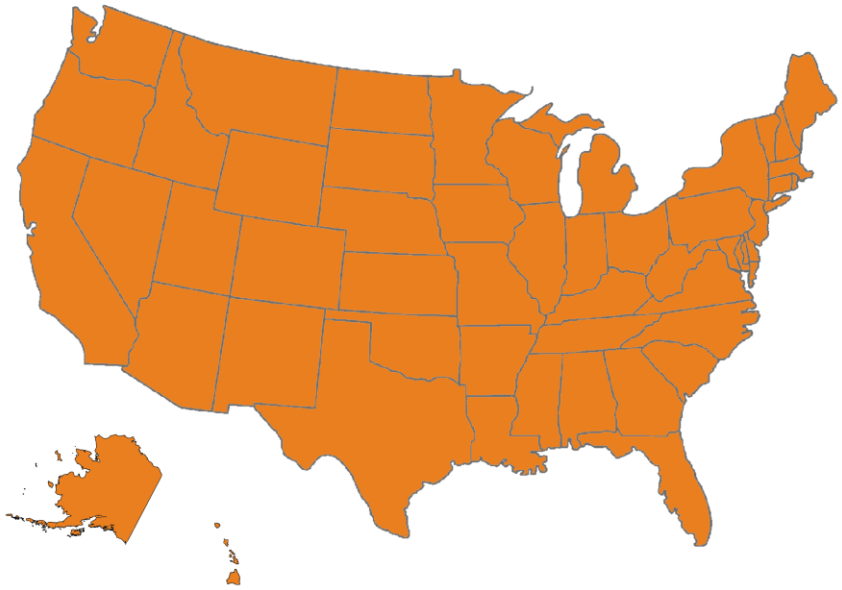
Terrestrial Market Continuity for GS Spectrum

Conventional CMRS Spectrum



12 Regional Economic Areas
176 Basic Economic Areas
734 Cellular Market Areas

Globalstar



1 Nationwide License

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Status and Regulatory Outlook for **TLPS**

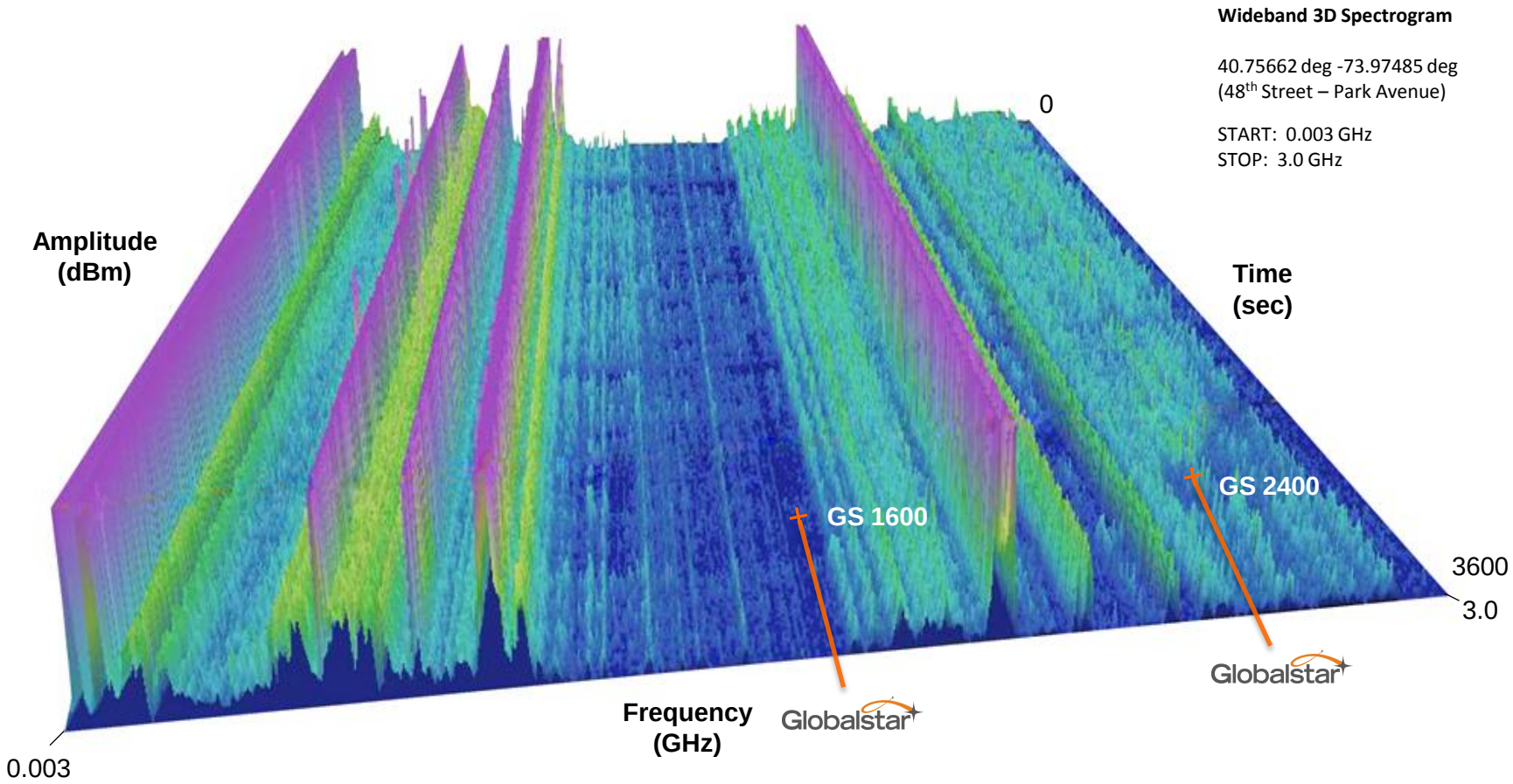
Chairman Genachowski has identified the "Wi-Fi Traffic Jam" as a critical problem that should be solved near term: "As consumer adoption of wireless devices continues to soar, Wi-Fi congestion is becoming a critical problem for consumers and innovators."

Globalstar believes the timing is right for FCC action:

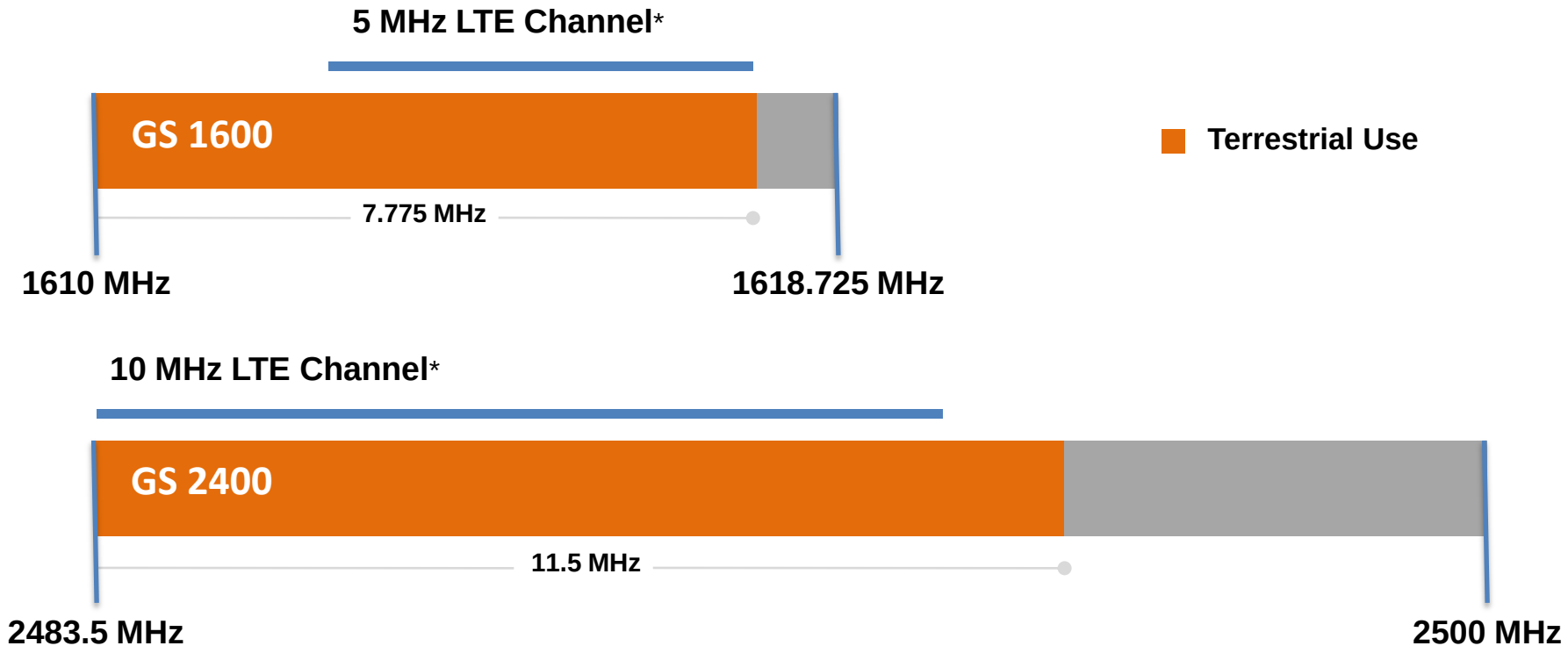
- **November 13, 2012** Globalstar filed petition for rulemaking
- **November 30, 2012** FCC placed petition out for Public Comment
- **January 14, 2013** Deadline for interested parties to file Comments
- **January 29, 2013** Deadline for interested parties to file Reply Comments

II. Genesis of the **TLPS** Concept

Unique Location and Characteristics of GS Bands



Conventional Use of Globalstar Bands



*Anticipated use. Other standards and channelizations are possible.

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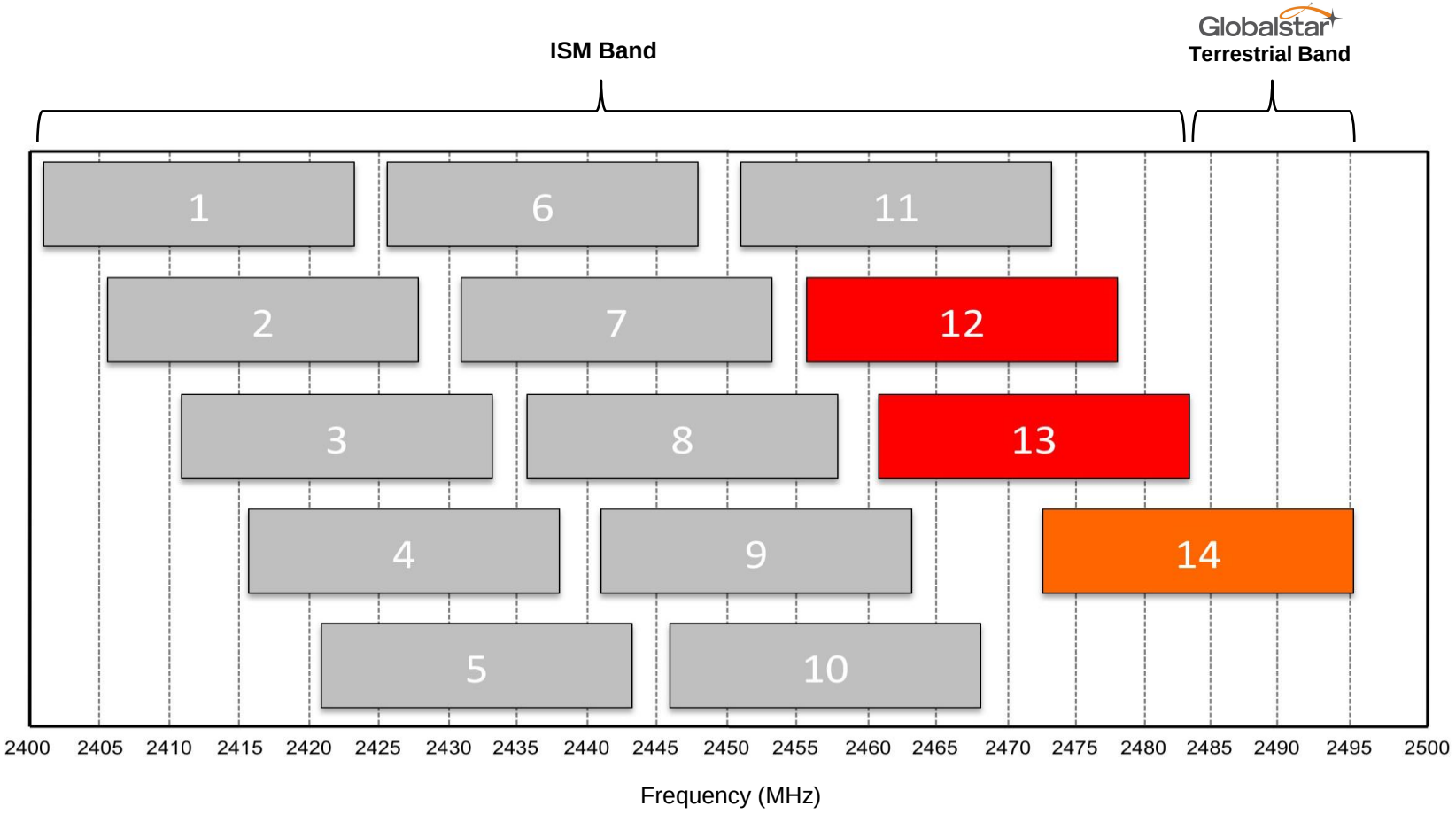
2.4 GHz 802.11 Channelization in the United States



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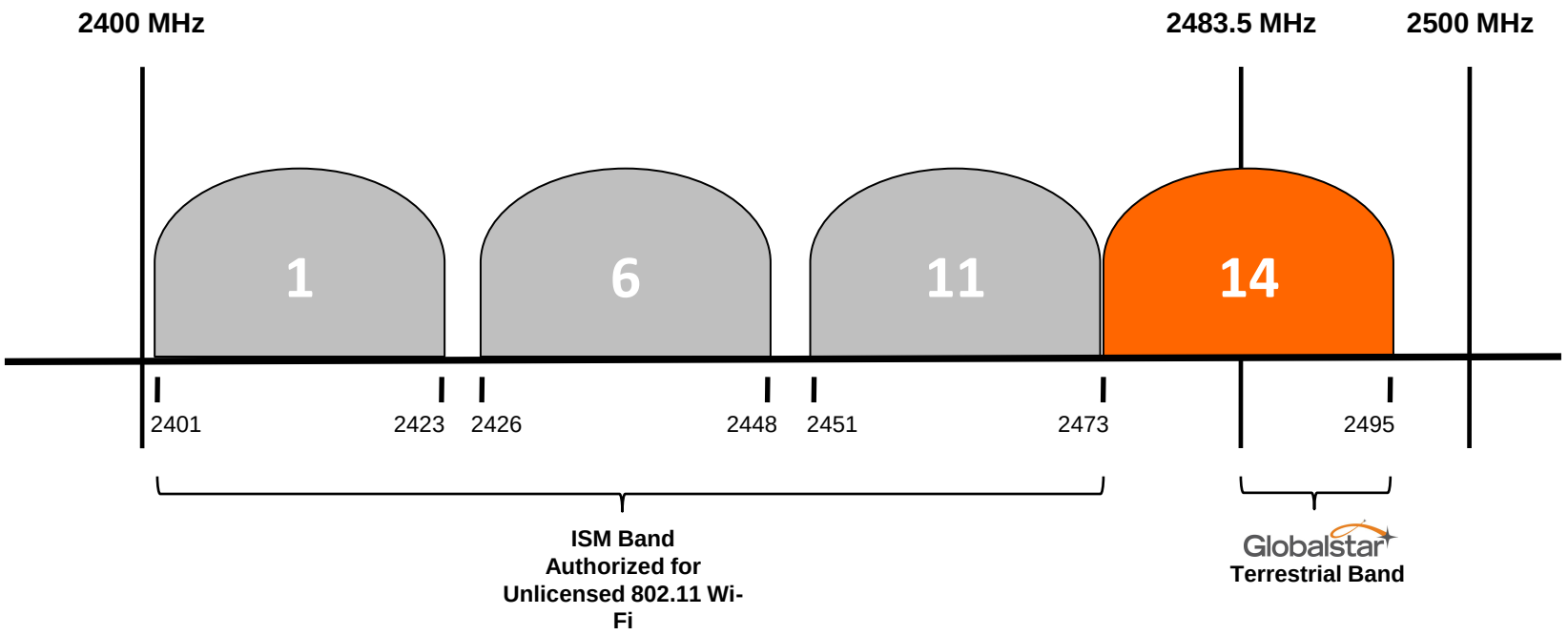
Potential Expansion of 2.4 GHz 802.11 with **TLPS**



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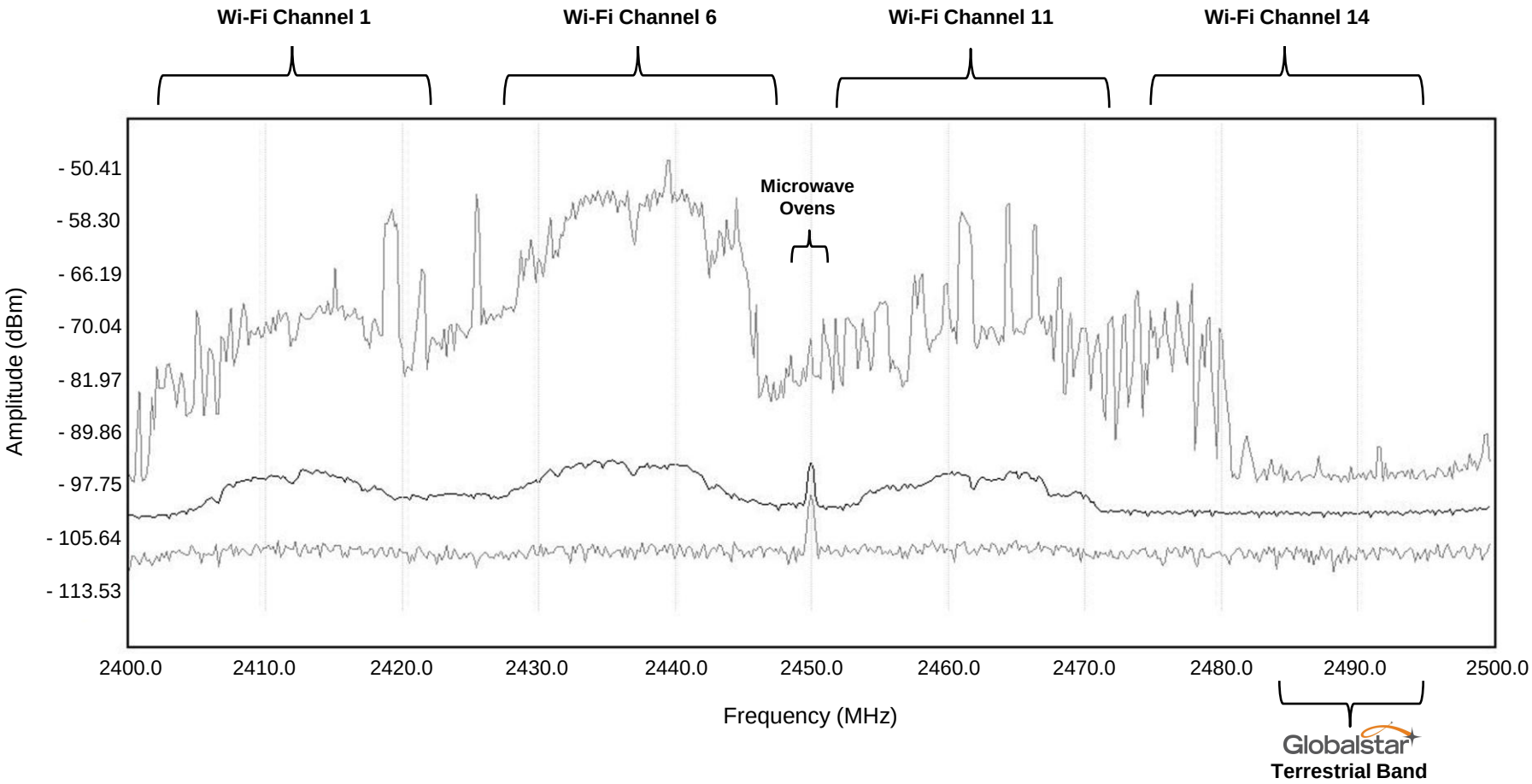
2D Spectrographic View of the 2.4 GHz Band



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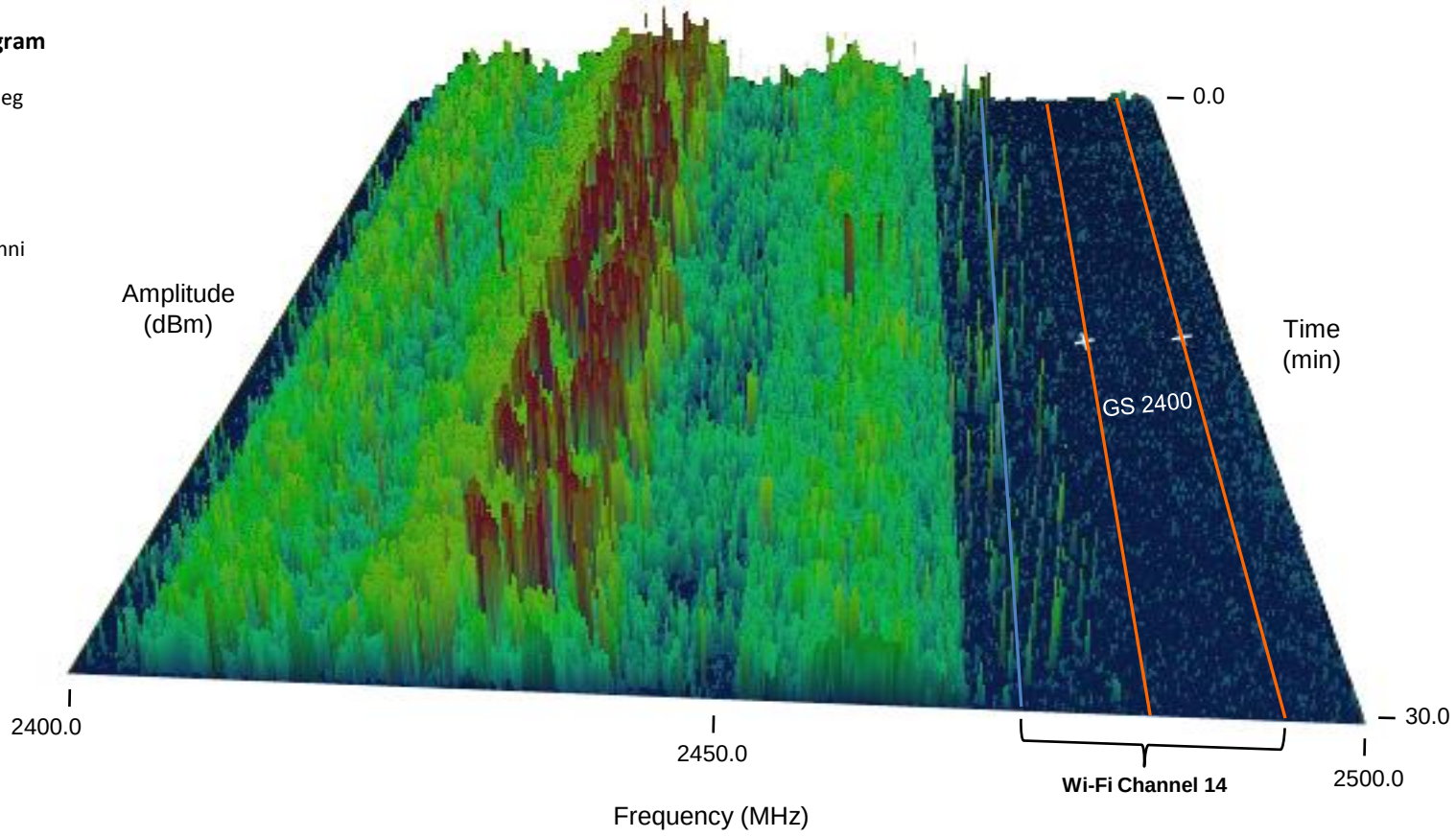
3D Spectrographic View of the 2.4 GHz Band

Wideband 3D Spectrogram

42.36022 deg -71.06438 deg
(Boston, MA)

START: 2.40 GHz
STOP: 2.50 GHz

Anritsu MS2721A / BB Omni



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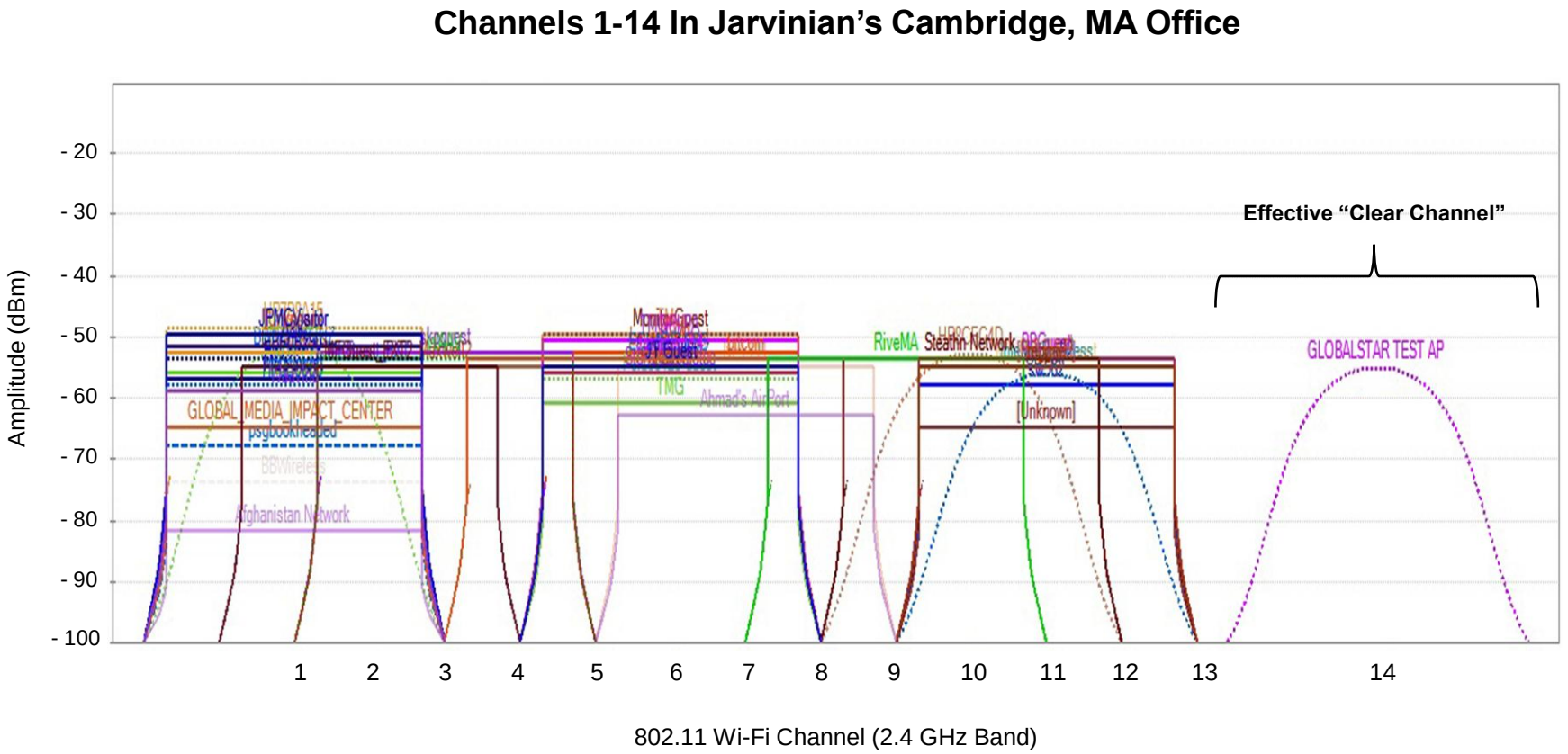
Device Level Network View of 2.4 GHz 802.11 Wi-Fi



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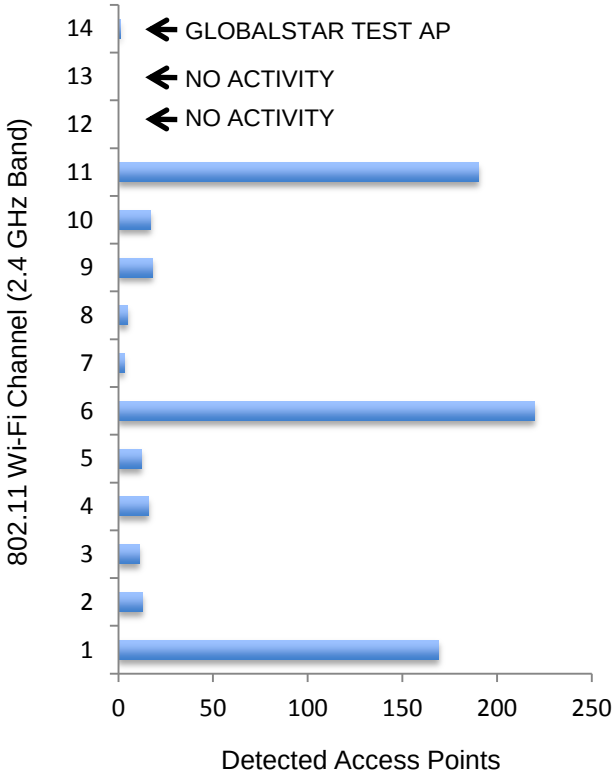
300 Meter Semi-Urban 2.4 GHz Wi-Fi Study



Cambridge, MA Survey Area

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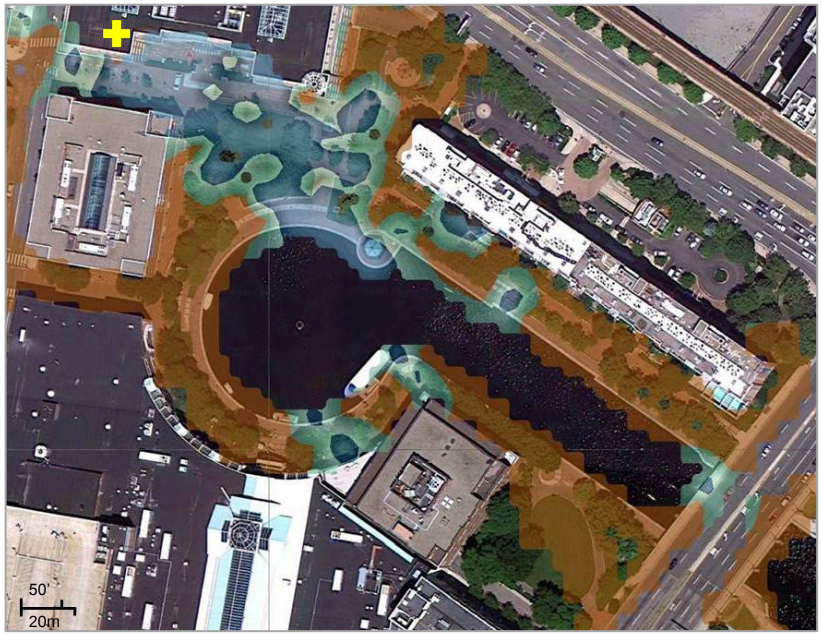
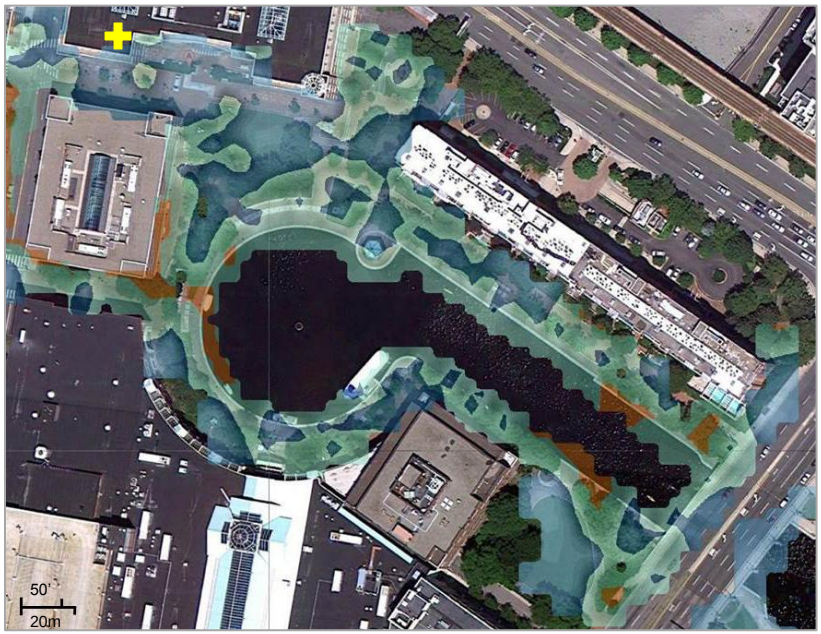
Channel 14 SNR Comparison in Semi-Urban Survey

Channel 6 – 2.437 GHz



Channel 14 – 2.484 GHz



AP Signal to Noise Ratio – SNR (dB)

>20 >10 <10

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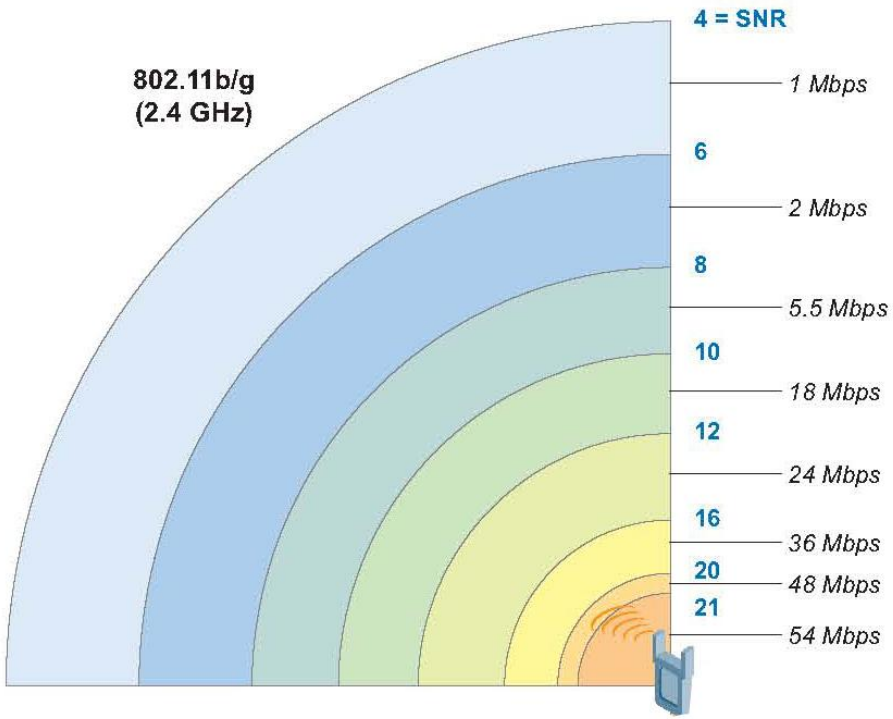
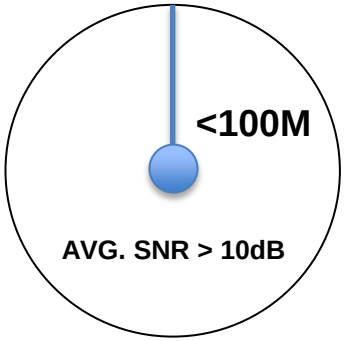
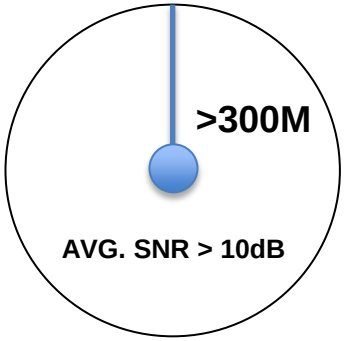
Textbook Range and Throughput Expectations





Channel 6

CF: 2437.0 MHz



Channel 14

CF: 2484.0 MHz

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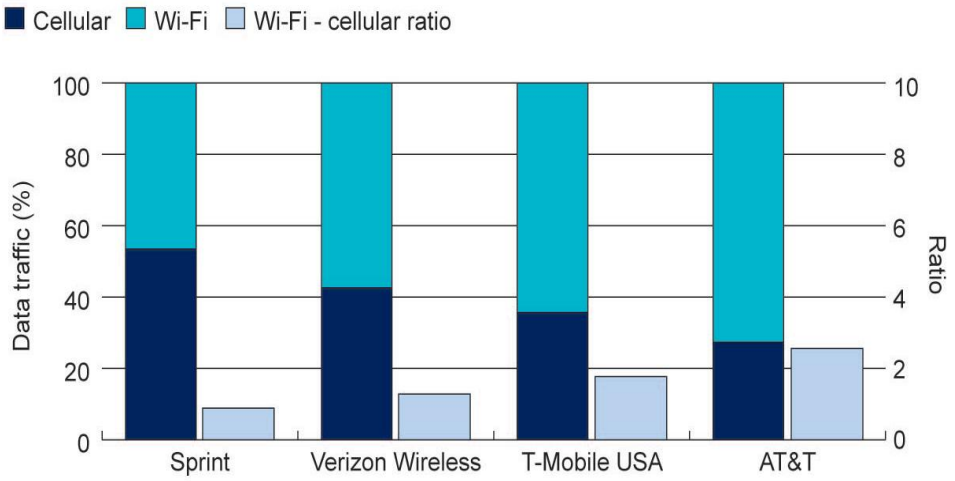
III. Enabling a **TLPS** Architecture

The Extraordinary Efficiency of Public 2.4 GHz 802.11

Smartphone Originated Data Traffic – January 2012



Source: Mobidia

- **72 MHz of Public 2.4 GHz 802.11 Spectrum Equivalent to 22 Billion MHz / POPS**
- **Top 4 U.S. Carrier Spectrum Holdings Equivalent to 135 Billion MHz / POPS**
- **TLPS Will Manage the Equivalent of 7 Billion MHz / POPS with Spectral Efficiency Many Times That of Public 802.11 Applications**

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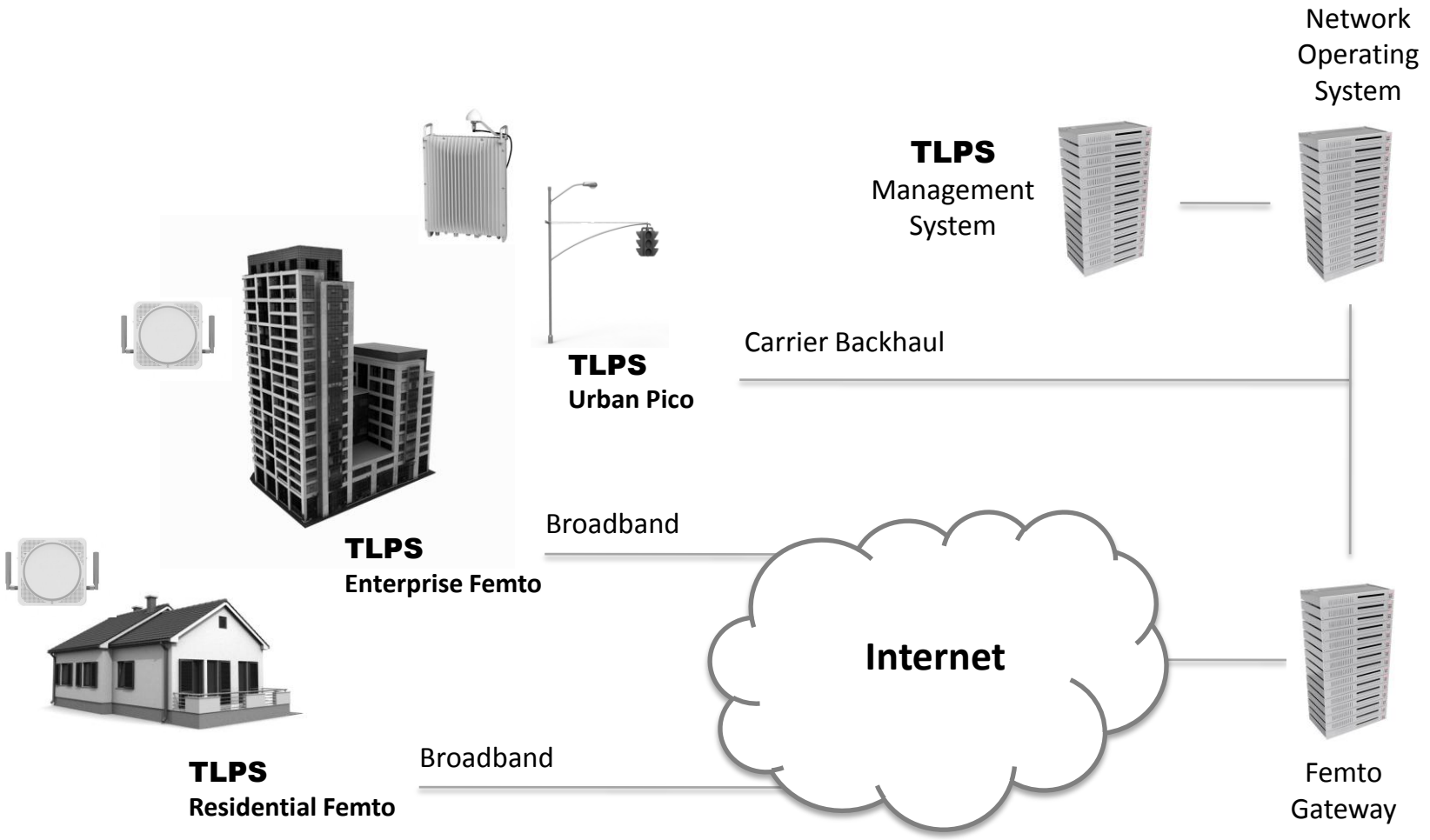
A Low CapEx / High Capacity **TLPS** Architecture



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TLPS as a Foundation for Multi-Carrier Small Cell

at&t

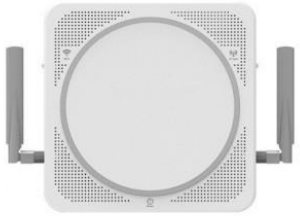
Carrier Specific 800 MHz Femto

Sprint

Carrier Specific 1900 MHz Femto

Wi Fi ONLY

Generic ISM 802.11 Access Point



TLPS

High Grade
Managed Service for Virtually All
Carrier Devices

+

High Grade
Managed Service for Virtually All
Non-Carrier Devices

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Enabling Devices and Infrastructure for **TLPS**

Existing Devices

Output Power <20 dBm

OTA Software / Chipset Firmware Update

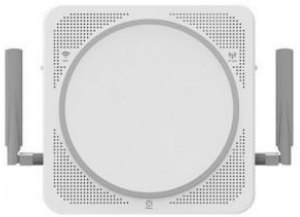
Existing Carrier Infrastructure

Output Power >20 dBm

High Selectivity Passive Filter Integration

Software / Chipset Firmware Update

New Carrier Infrastructure



Output Power >20 dBm

Factory Ready

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