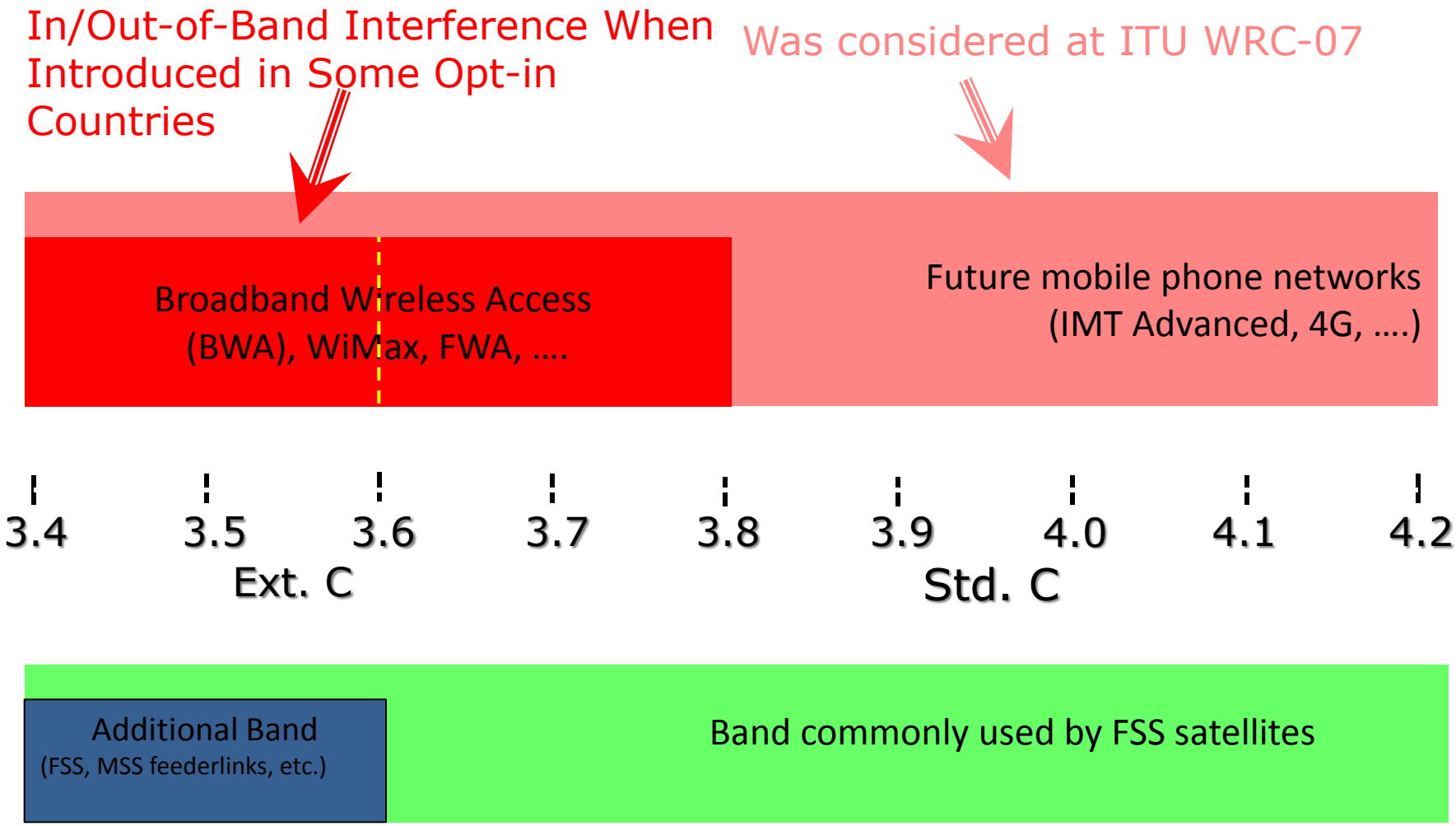
GVF Satellite. Solutions. The World.

# *Preserving Satellite Spectrum for Mission-Critical Communications:*

## *WRC 2015 and The Future*

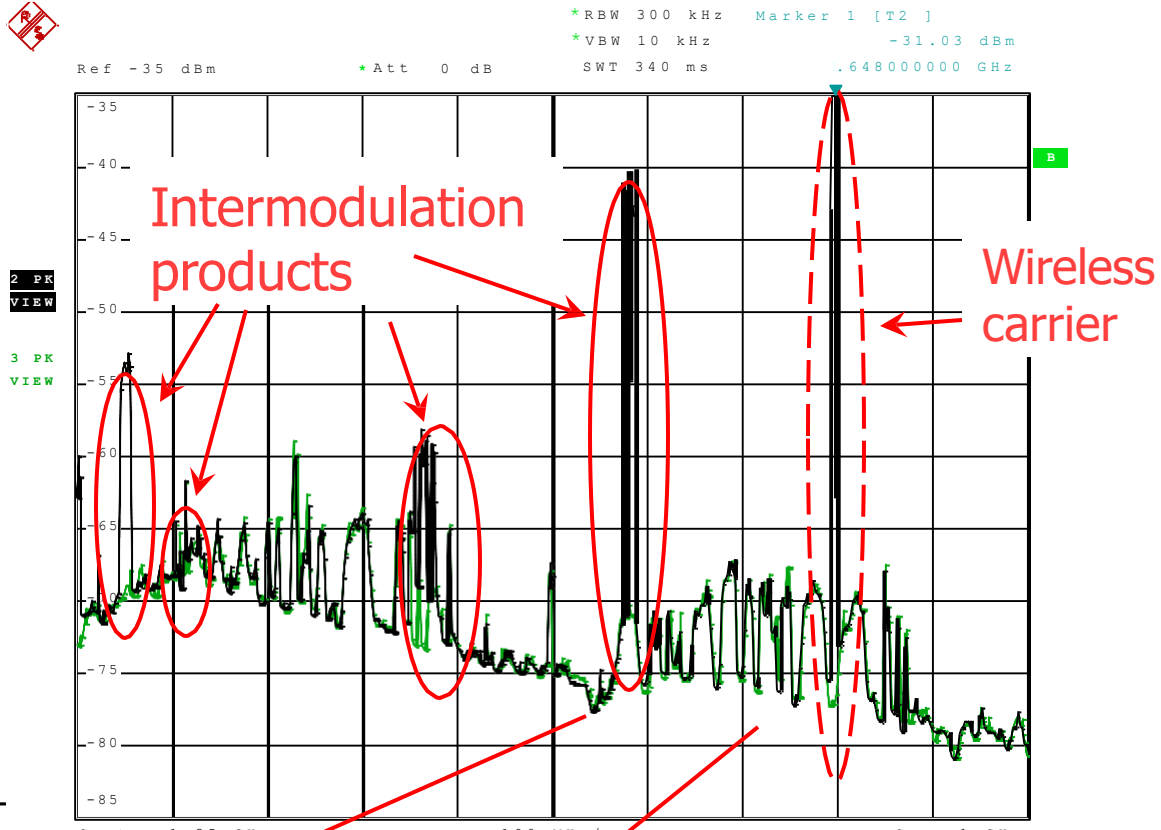
**David Hartshorn**
**Secretary General**
**GVF**

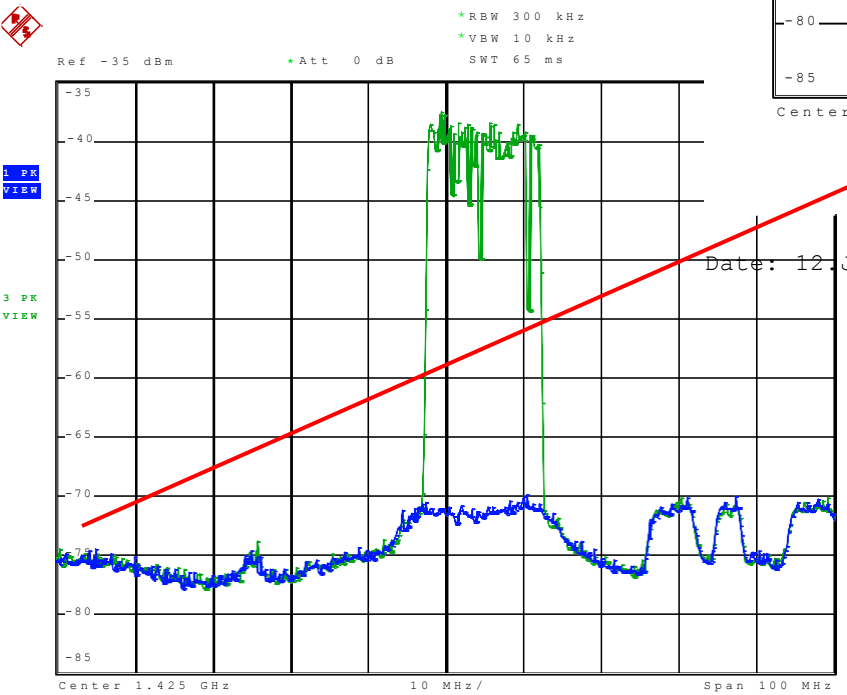
# WRC-07 & AI 1.4: No Global ID of C-band for IMT But…



# The Escalation of Wireless Interference:

## Overdrive of LNB

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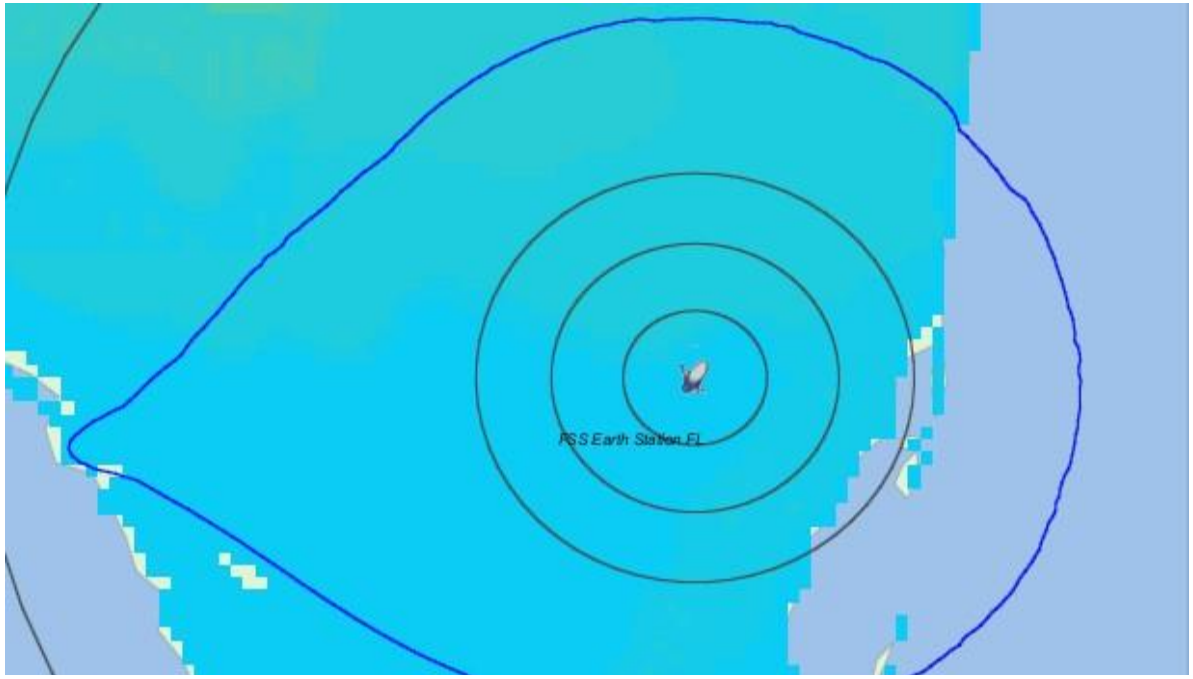
## Distortion of Received FSS Spectrum by Wireless Signal

**Interference is Unavoidable…**

# Exclusion Zones: A Viable Solution?




New Report ITU-R [FSS-IMT C-BAND DOWNLINK] - Sharing studies between International Mobile Telecommunication-Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3 400-4 200 MHz and 4 500-4 800 MHz frequency bands in the WRC study cycle leading to WRC-15

Calculated exclusion zone around Florida showing a distance separation of 57.1 km to 87.1km, depending on direction, to counter interference from a single IMT base station.

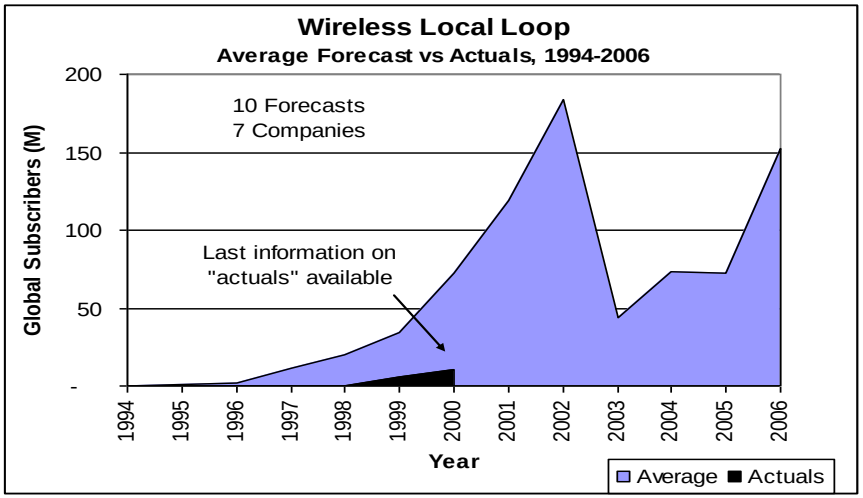
**Adequate Exclusion Zones Make Operations Geographically Impossible**

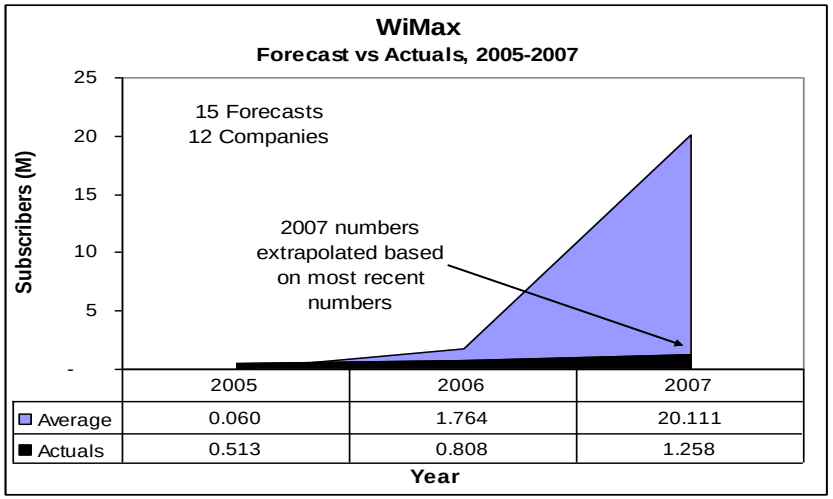
# Shielding - An Interference-Mitigation Solution?


**Impossibly Costly, Time-Consuming and Ineffective for C-band Earth Stations, including Millions of Receive-Only Terminals**

# WRC-07 & AI 1.4: Huge Wireless Forecasts…

## That Overestimated Needs




Tremendous industry excitement in mid-1990s surrounding low cost, rural opportunities worldwide
WLL forecasts, some projecting over 1.5B subscribers by 2002, significantly overestimated subscriber levels, time-to-market, and consumer demand
WLL technology was largely overtaken by 2G cellular services
Multiple standards and platforms increased equipment price
Regulatory issues extended anticipated timeframe for commercial deployment

- WiMAX forecasts were overly optimistic
- WiMAX customers were approx. 1M subscribers in 2007 compared to some 15M+ average of 15 forecasts
- There were several potential obstacles for large-scale commercial success:
  - Consumer interest
  - Equipment costs
  - Regulatory issues
  - Competition from other advanced terrestrial wireless and fiber technologies

# WRC-15 Agenda Item 1.1: The C-band Stakes … and Stakeholders

*The Issue*

**Agenda Item 1.1 considers additional spectrum for IMT mobile broadband applications…**

**Including**

**3400-4200 MHz**

## *The Problem*

**The need for additional spectrum is vastly overstated and such use is still incompatible with the existing C-band operations, including radar, point-to-point and other links.**

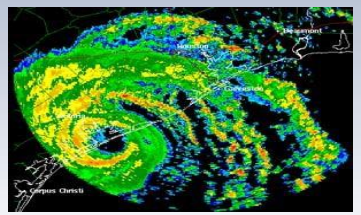
## *The Response*

**IGOs, NRAs & Satellite Users Representing Billions in Economic Impact and Immeasurable Social Benefits Are Standing Together Again to Preserve C-band Spectrum**

# MAJOR SECTORS ARE ASKING ADMINISTRATIONS

# TO PROTECT 3.4 – 4.2 GHz FOR SATELLITE SERVICES

- Widely used by major user groups
- Provides the wide geographic coverage necessary for hundreds of millions of users
- Numerous cases of harmful interference (and loss of TV signals) have been caused by terrestrial mobile services in C-band
- Extremely reliable, even in rainy regions
- Cannot be replaced by bands with narrower beams and different propagation characteristics such as Ku- and Ka-bands
- Support users' requirement to maintain satellite service availability 3.4 - 4.2 GHz



## BROADCASTING

- Hundreds of millions of households depend on C-band for tv programming, including events such as the World Cup and the Olympics
- Billions of dollars invested in by the broadcasting sector

## METEOROLOGICAL

- The World Meteorological Organisation uses C-band for vital public safety functions
- Applications support by C-band supported services include disaster relief, water management, and agricultural programmes

## AVIATION

- The safety of hundreds of millions of airline passengers is enabled by C-band satellite services
- Civil Aviation networks require the very high reliability provided via C-band satellite

## MARITIME

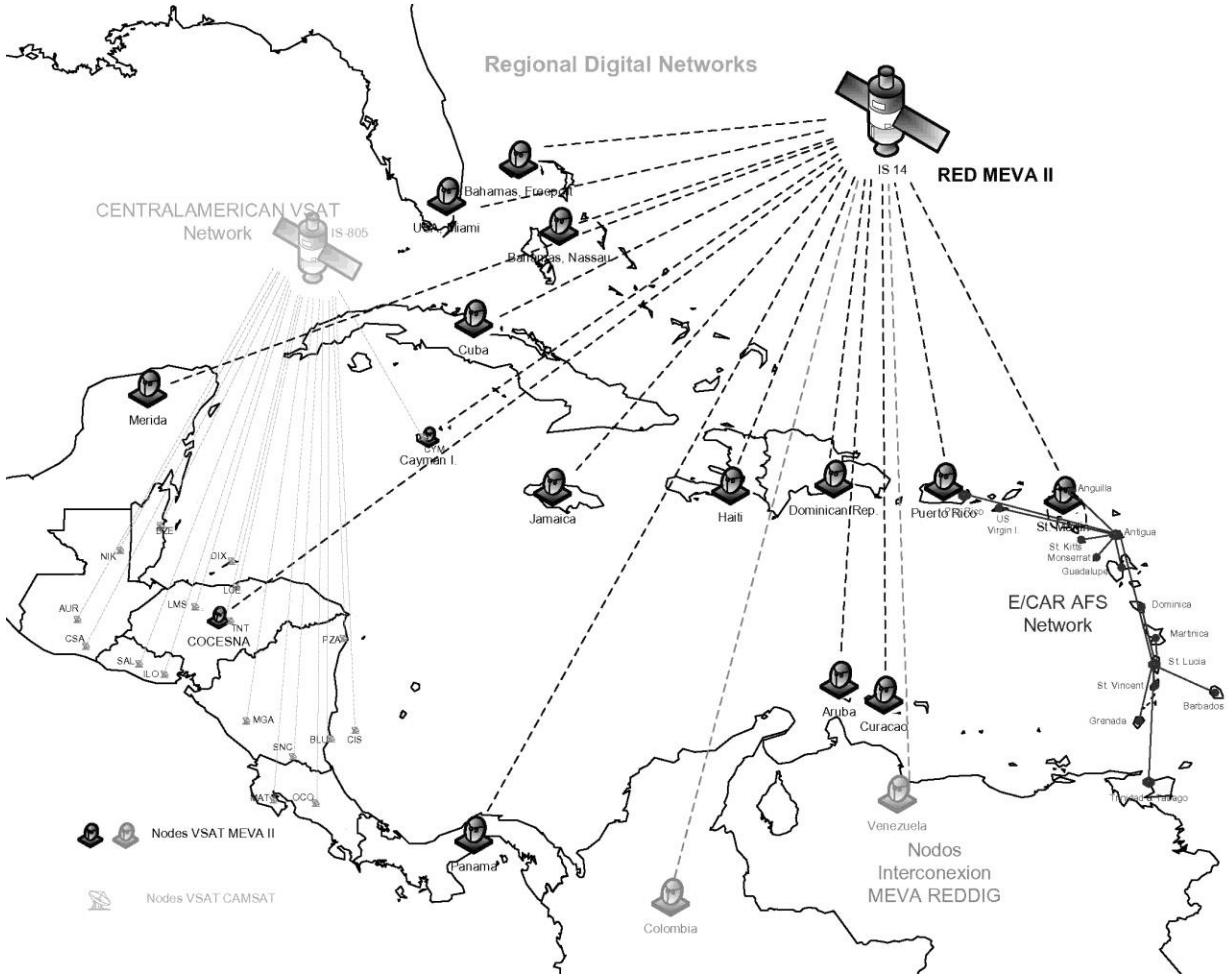
- To ensure the safety of maritime operations, GMDSS distress and safety communications rely on the C-band for Inmarsat feeder links

## HUMANITARIAN

- Nearly 50 of the world's largest humanitarian organisations depend on C-band
- Education, health, and disaster response are among the many applications supported by C-band

# MEVA Regional Communications C-band Satellite Network in the Caribbean

- **Critical Aeronautical and Meteorological Information**
- **High Reliability Essential for Aviation Operations**
- **Introduction of IMT Would Place Critical Communications At Risk**
- **Countries cannot afford equipment change-out or modification**




**ICAO Supports NOC for Aeronautical Spectrum and FSS Bands Used to Support Aeronautical Communications**

# USE OF 3625 – 4200 MHz BY THE FSS IN BRAZIL

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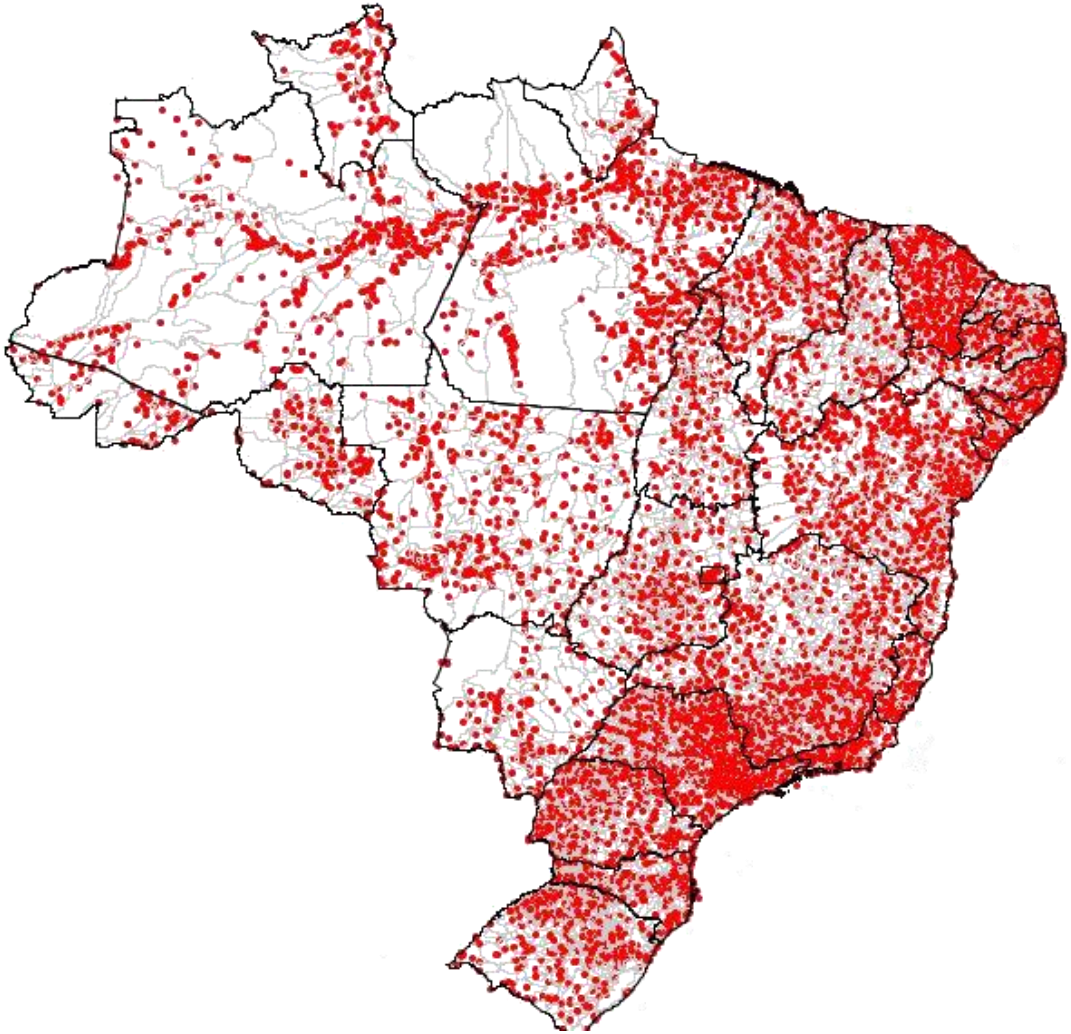
Brazilian Contribution at CITEL Meeting (OEA/Ser.L/XVII.4.2 CCP.II-RADIO/doc. 974/06):

- No Better Band to Address Rain Attenuation
- Exclusion Zones Unworkable
- Developing Countries Can't Afford Equipment Changeout



# Space Frequency Coordination Group

**"No allocations of spectrum to support mobile broadband systems, IMT or RLAN, should be made in space service science bands unless acceptable sharing criteria and conditions are developed.**

**"… the main frequency bands of concern to SFCG member agencies are [among others]: the 3400 – 4200 MHz band used for Galileo Data Distribution Network and the dissemination of meteorological data by systems like EUMETCast, CMACast, and GEONETCast…"**

# Meteorological Data Retransmission Services

| | | |
|---|---|---|
| ➢ EUMETCast Americas | SES-6 | 3.803 GHz |
| ➢ EUMETCast Africa | EUTELSAT 5 West A | 3.7317570 GHz |
| ➢ EUMETCast Europe | EUTELSAT 10A | 11.2625 GHz |
| ➢ CMACast | Asiasat 4 | C-band |
| ➢ GEONETCast Americas | IS-9 | 3.840 GHz |
| ➢ HIMAWARICast | JCSAT 2A & 2B | 4.148 GHz |
| ➢ Nat'l Weather Service | SES-1 | 4.040 GHz |

# WRC-15 Agenda Item 10: "IMT above 6 GHz": Summary of regional positions

**Every world region has indicated candidate bands above 31GHz**

| | |
|---|---|
| 31.8 – 33.0 GHz | At least 1.2 GHz contiguous spectrum available for global harmonization |
| 66-71 & 71-76 GHz | Supported by all regions with an established position |
| 81–86 GHz | Supported by most regions |

**APT**

| From | To |
|---|---|
| 25.25 | 25.5 |
| **31.8** | **33.4** |
| 39 | 47 |
| 47.2 | 50.2 |
| 50.4 | 52.6 |
| **66** | **76** |
| **81** | **86** |

**CITEL**

| From | To |
|---|---|
| 10 | 10.45 |
| 23.15 | 23.6 |
| 24.25 | 27.5 |
| 27.5 | 29.5 |
| **31.8** | **33** |
| 37 | 40.5 |
| 45.5 | 47 |
| 47.2 | 50.2 |
| 50.4 | 52.6 |
| **59.3** | **76** |

**CEPT**

| From | To |
|---|---|
| 24.5 | 27.5 |
| **31.8** | **33.4** |
| 40.5 | 43.5 |
| 45.5 | 48.9 |
| **66** | **71** |
| **71** | **76** |
| **81** | **86** |

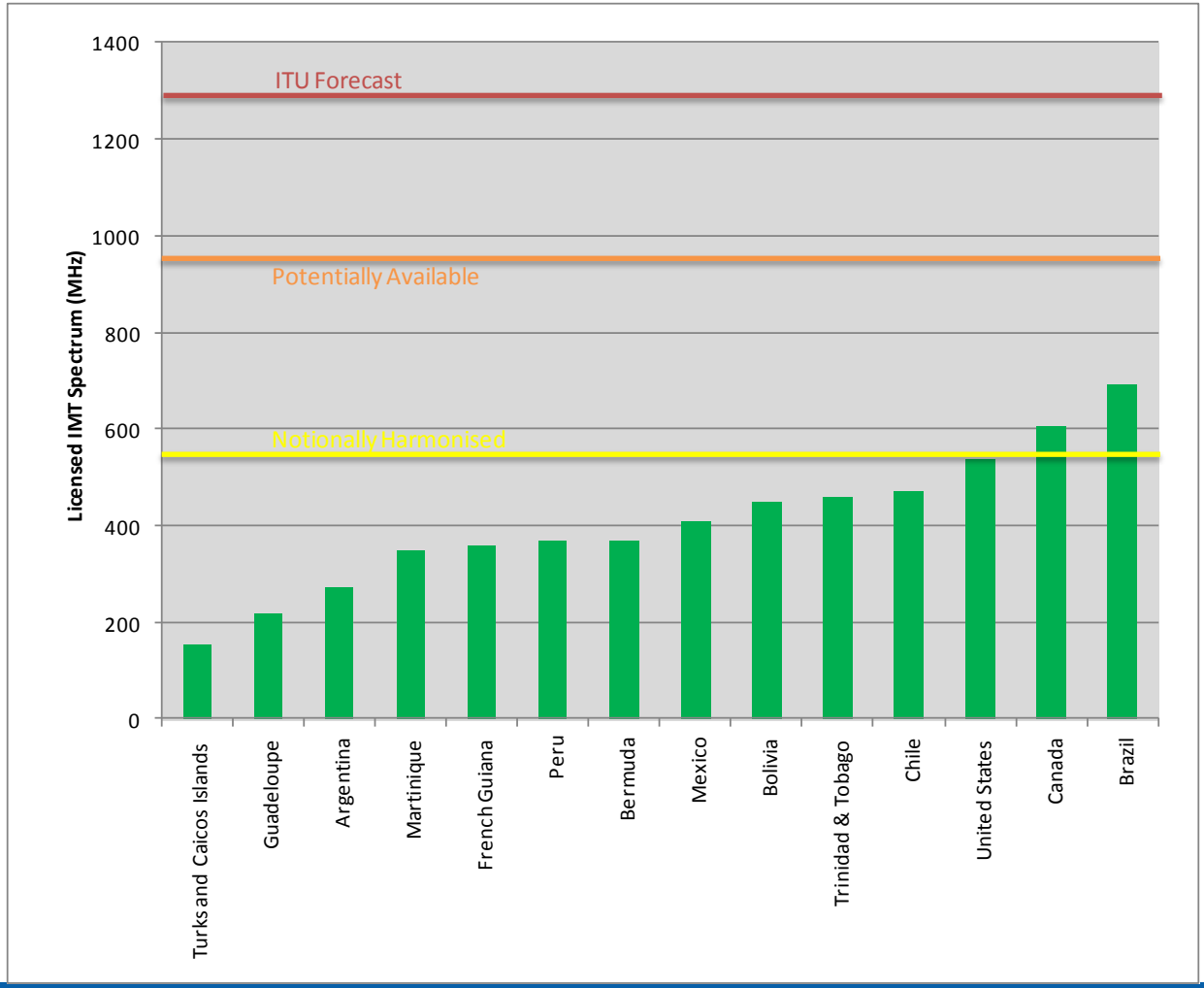
**RCC**

| From | To |
|---|---|
| 25.25 | 27.5 |
| **31.8** | **33.4** |
| 39 | 40.5 |
| 40.5 | 41.5 |
| 45.5 | 47.5 |
| 48.5 | 50.2 |
| 50.4 | 52.6 |
| **66** | **71** |
| **71** | **76** |
| **81** | **86** |

**ASMG**

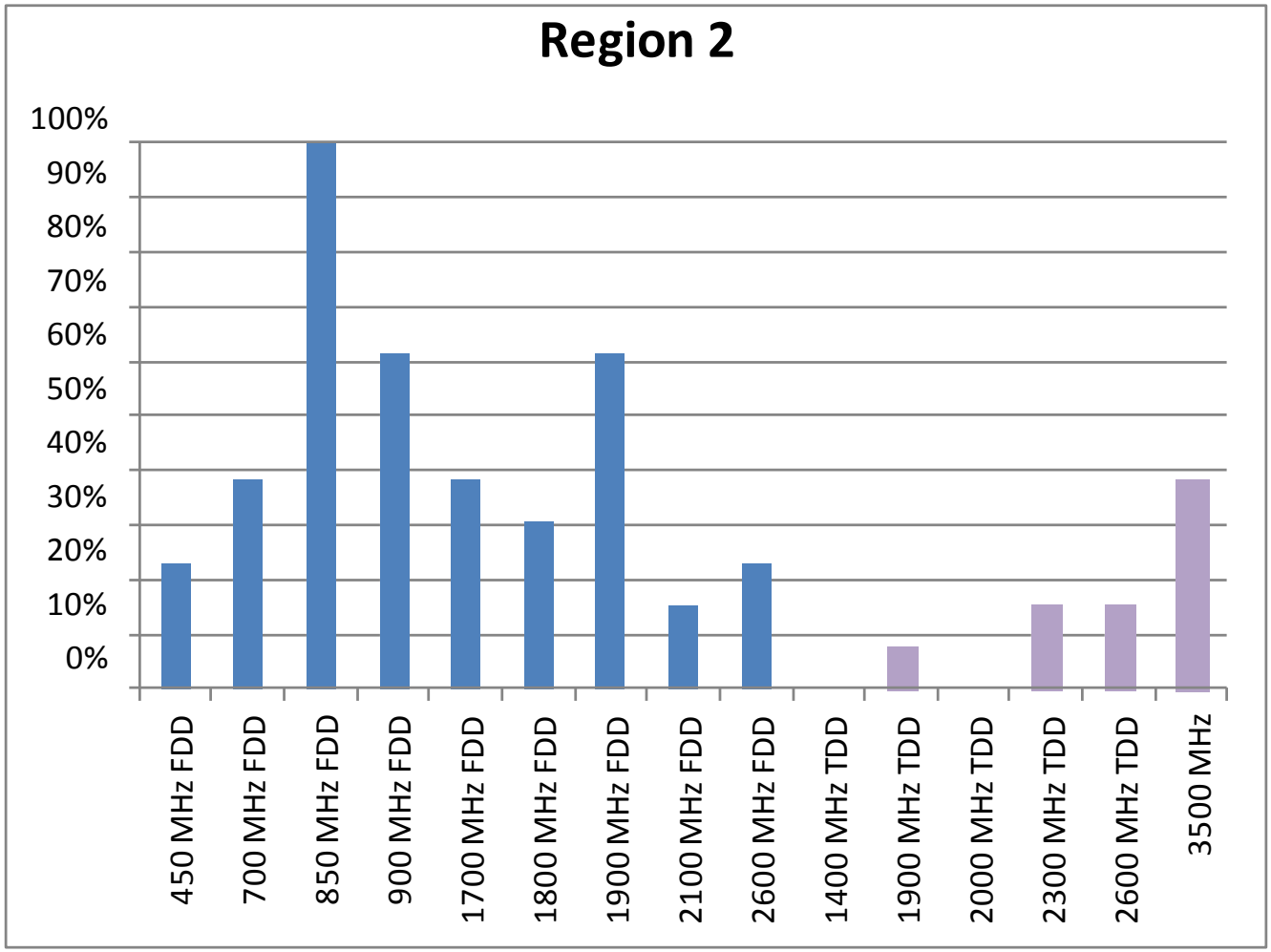
| From | To |
|---|---|
| **Above 31GHz** | |
| | |
| | |
| & | |
| BY IMPLICATION | |
| **66** | **71** |
| **71** | **76** |
| **81** | **86** |

# There is Still Plenty of Spectrum Available to be Licensed




**The Wireless Industry Can Better Use the Spectrum It Already Has**

# Major New Bands Are Not Yet Licensed (e.g. 700 MHz, 2.6 GHz)




**Additional Wireless Spectrum Is Coming Online…**
**Without the Need for a Global IMT Identification**

# Concluding Thoughts

- Wireless Industry Wants…
  - C-band
  - Removal of Interference Protections, Plus
  - Bands Above 6 GHz (Agenda Item 10)

- For Nations that Seek To Permit IMT Deployments at C-band, the WRC-07 Footnote Remains Available
- At WRC-15 Please Support:
  - NOC on Agenda Item 1.1
  - For Agenda Item 10, and in Preparation for WRC-19 Only Sharing Studies of Non-FSS Bands > 31 GHz

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## For More Information…

www.satellite-spectrum-initiative.com

# Thank You!