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L Band: harmonization opportunity in Latam

QUALCOMM®

ITU FORUM
AUGUST 2014

The 1000x data challenge

Richer content

More video

~2/3

of mobile traffic will be video by 2017

More devices

Everything connected

~25B

connected devices by 2020

Industry preparing for

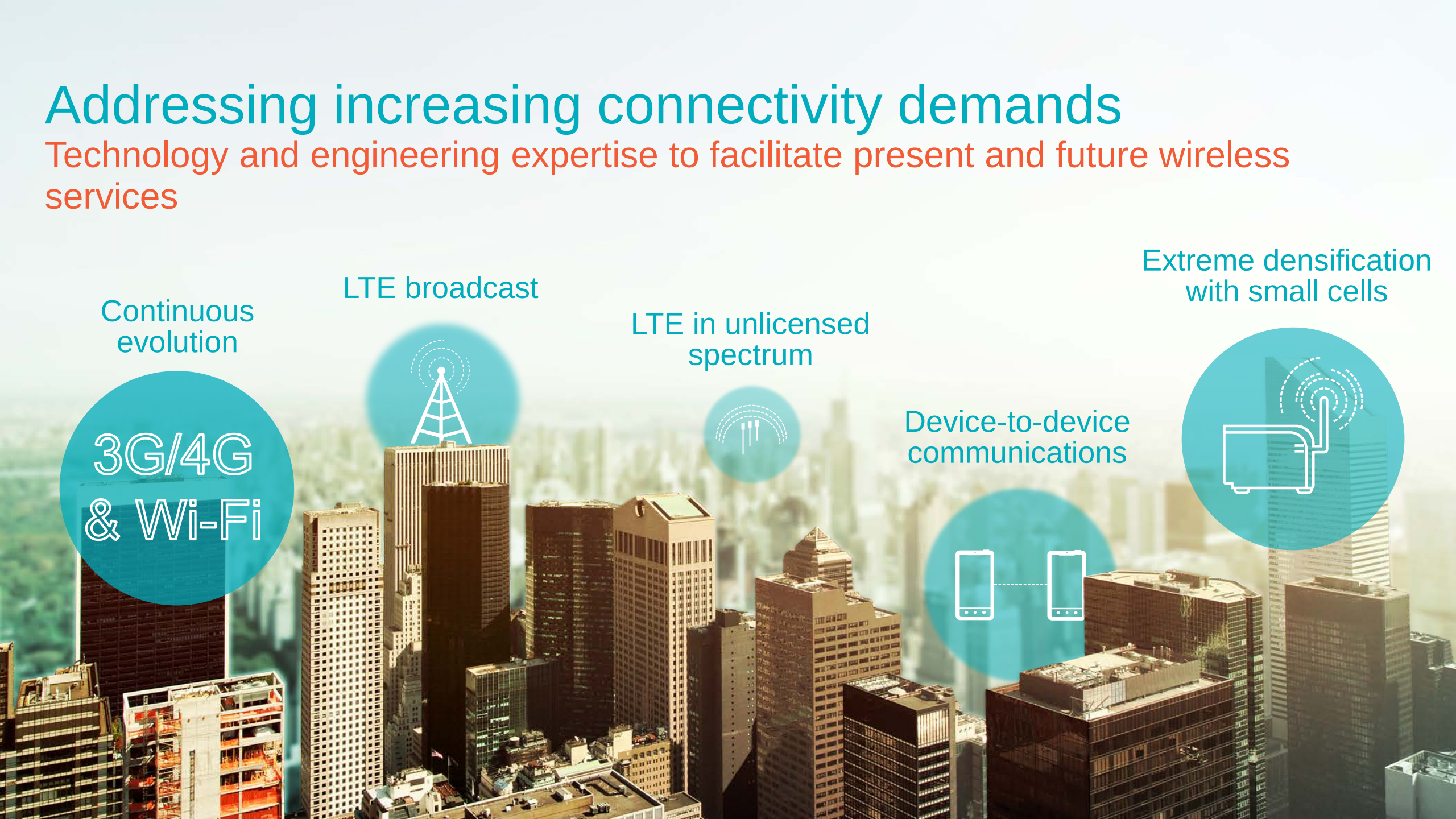
1000x

data traffic growth*

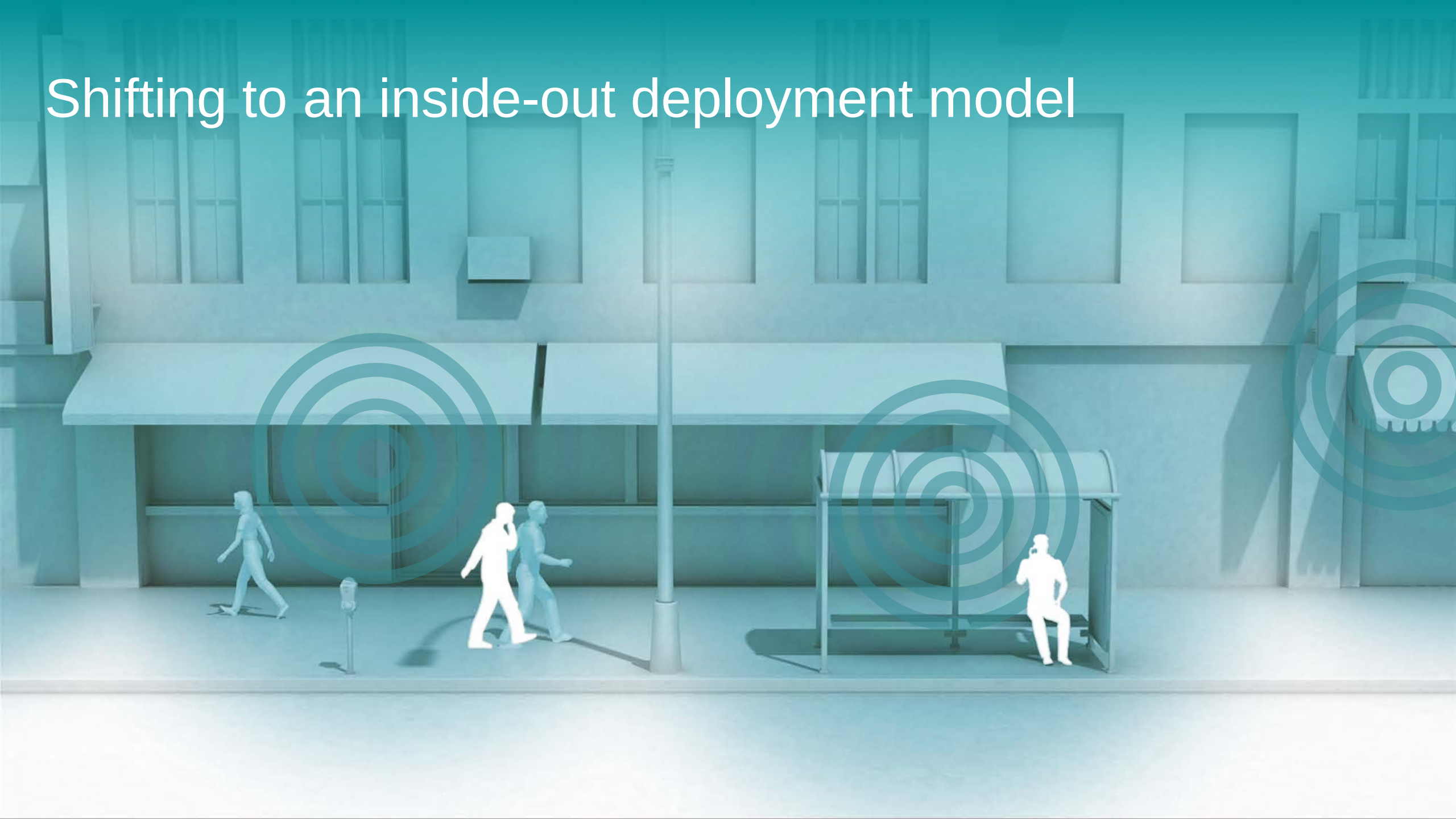
Sources: Cisco, Feb. ‘13, Machina Research on behalf of GSMA, Dec. ‘12

Addressing increasing connectivity demands

Technology and engineering expertise to facilitate present and future wireless services

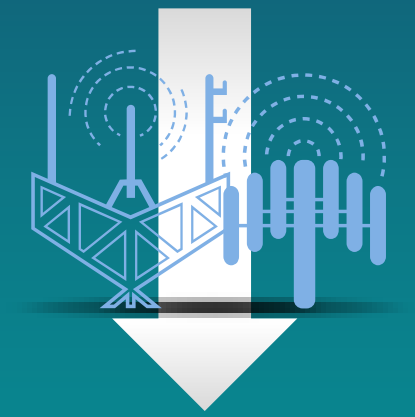


Shifting to an inside-out deployment model



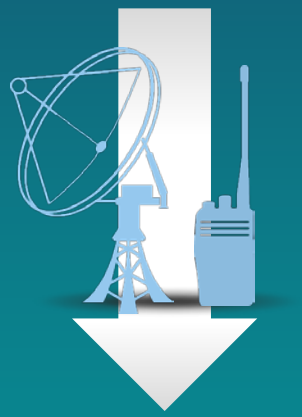
Multiple parallel approaches to gaining more spectrum

Licensed Approach
Auctions of cleared Spectrum



EXCLUSIVE USE

Complementary License Model—ASA
Authorized Shared Access



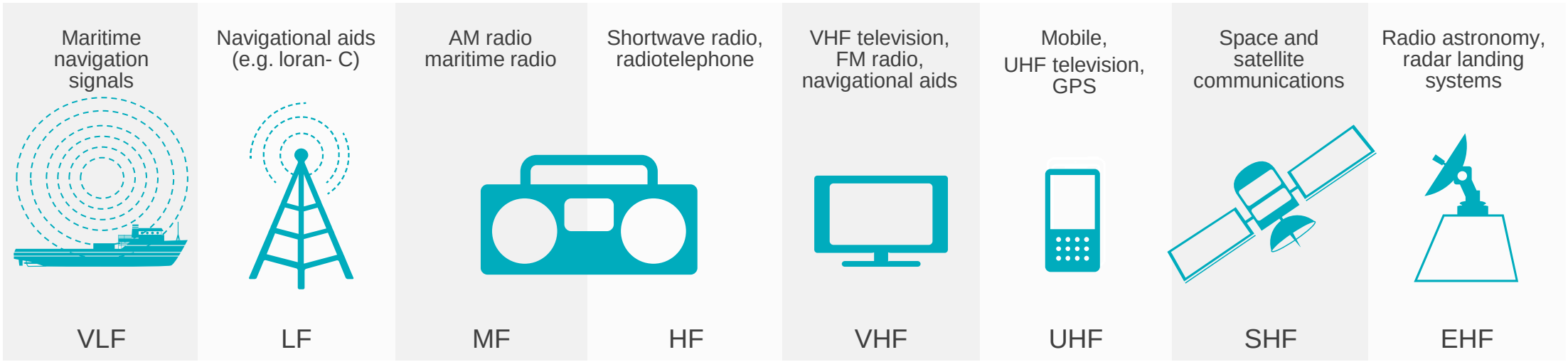
SHARED EXCLUSIVE USE

Unlicensed Approach
Dedicated to Wi-Fi & others

SHARED USE

ASA required when spectrum cannot be cleared within a reasonable timeframe, or at all locations

Spectrum is the airwaves that all wireless communications travel



Spectrum is allocated by local governments

Spectrum is divided into frequency ranges (bands) for different types of wireless communication (e.g., 87.5 to 108.0 MHz for FM radio)

Spectrum is a finite resource

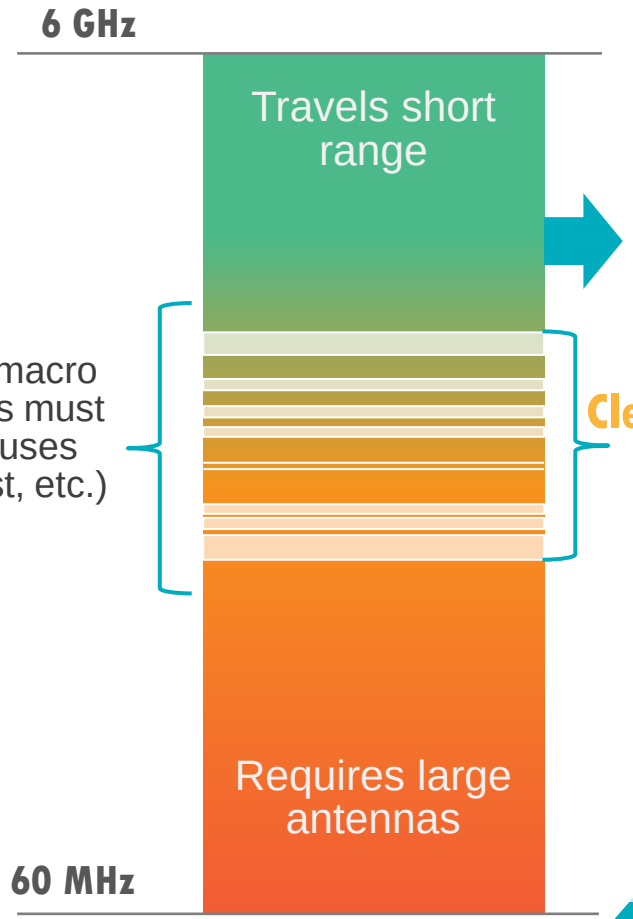
UHF spectrum is best suited for macro mobile communications; must be shared with other government and commercial uses

Mobile licensed spectrum is a finite resource – A crucial ingredient for 1000x

Industry preparing for

1000x

data traffic growth[1]



Exploring higher spectrum bands suitable for small cell coverage (e.g., 3.4 to 3.8 GHz)

Spectrum suitable for macro mobile communications must be shared with other uses (government, broadcast, etc.)

Cleared Spectrum for Mobile 3G/4G

Richer content

more video

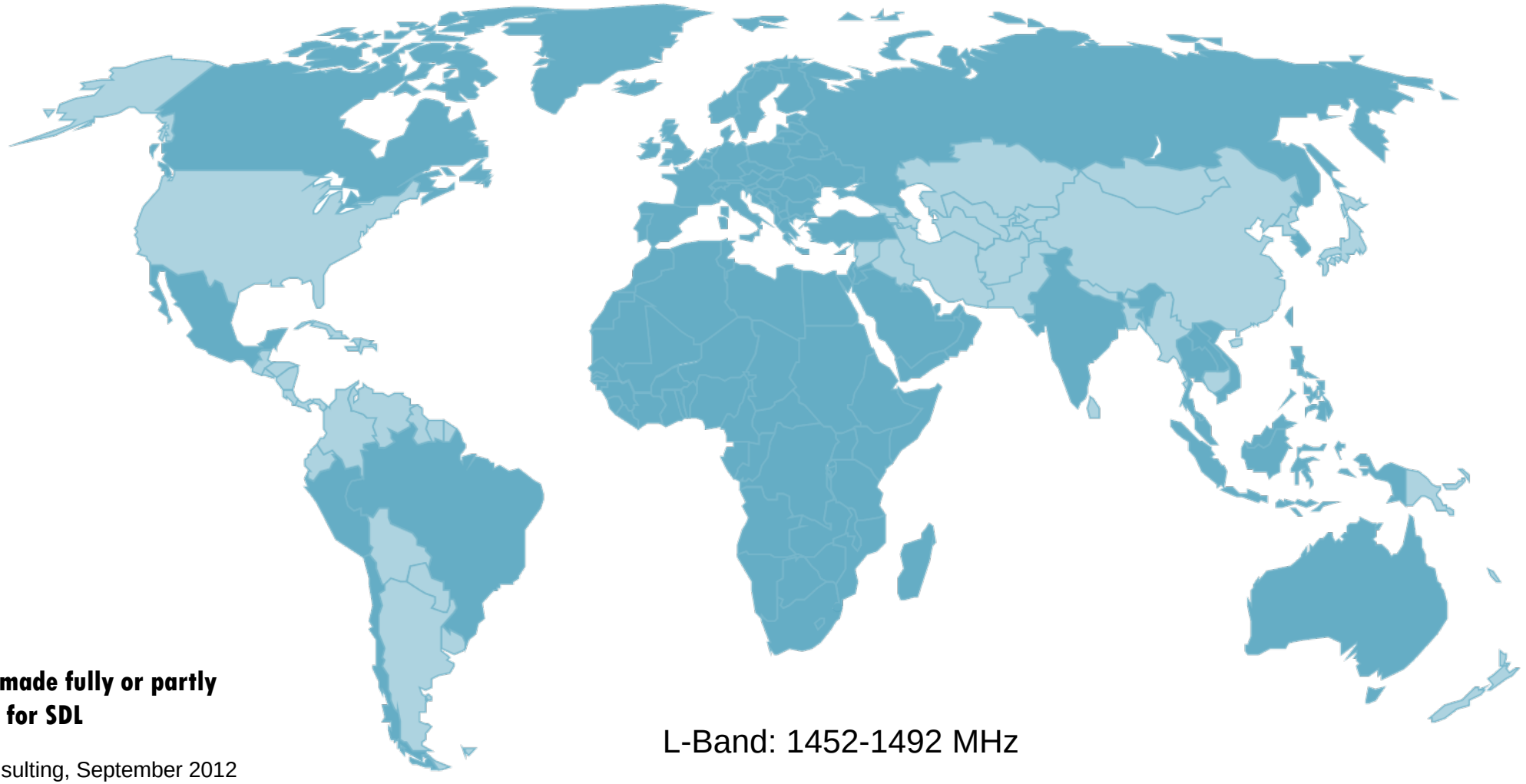
More devices

everything connected

[1] 1000x would be e.g. reached if mobile data traffic doubled ten times, but Qualcomm does not make predictions when 1000x will happen, Qualcomm works on the solutions to enable 1000x

L-Band

Widely available globally allowing for economies of scale



Could be made fully or partly available for SDL

L-Band: 1452-1492 MHz

Source: Plum Consulting, September 2012

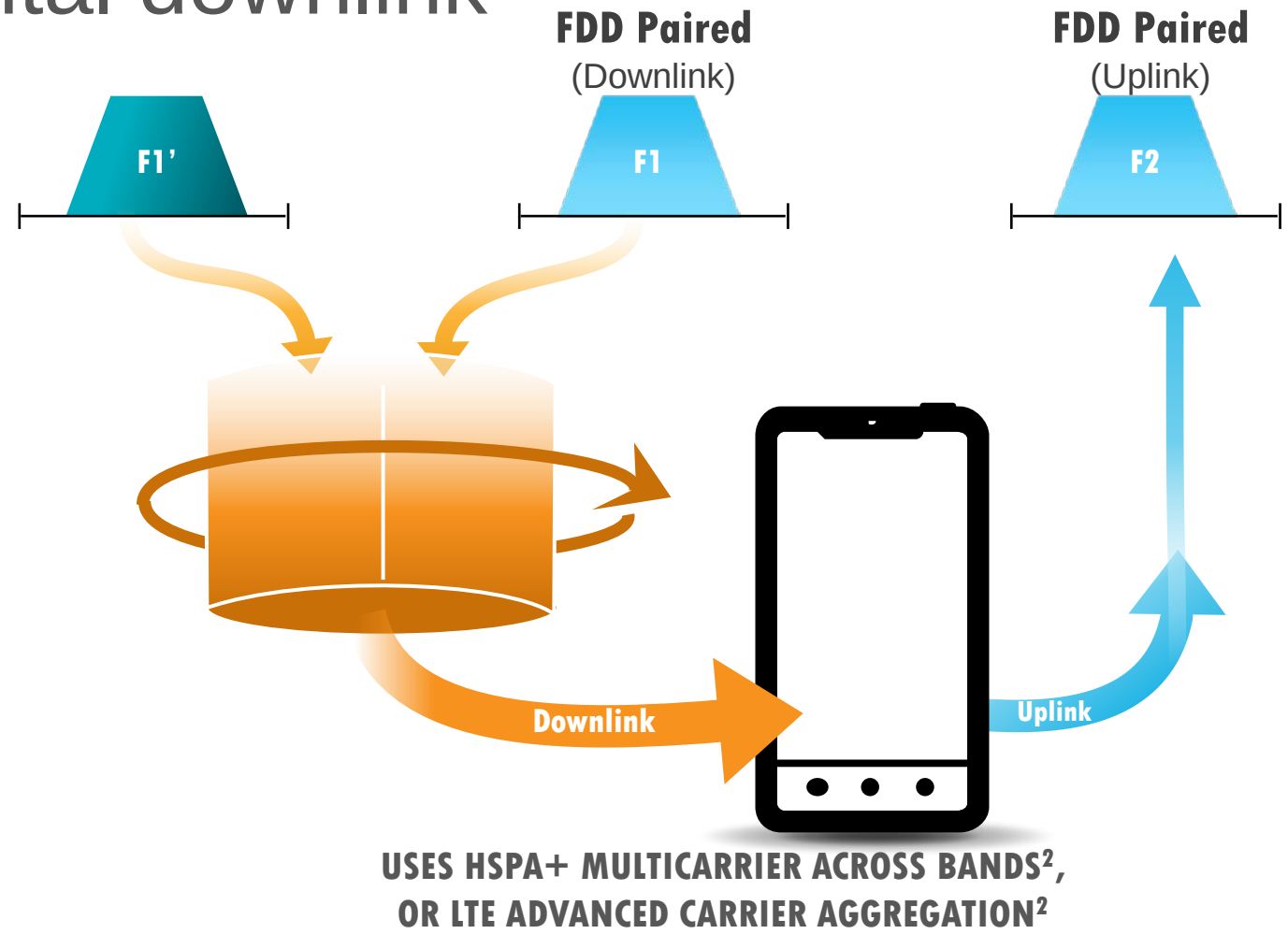
Aggregate unpaired spectrum for more downlink capacity—supplemental downlink

L-Band 1.4GHz Harmonized in Europe[1]

- L-Band 1452 MHz to 1492 MHz, with 40 MHz of idle unpaired spectrum available[2].
- Other opportunities are country specific.

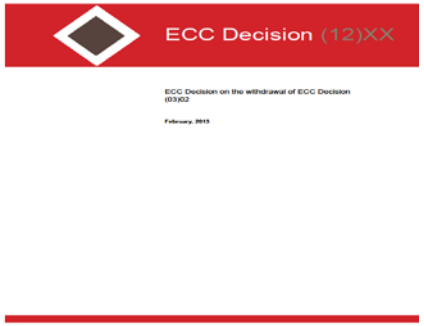
700 MHz to Launch in the US

- AT&T[3] planning to launch 12 MHz of unpaired spectrum for SDL.



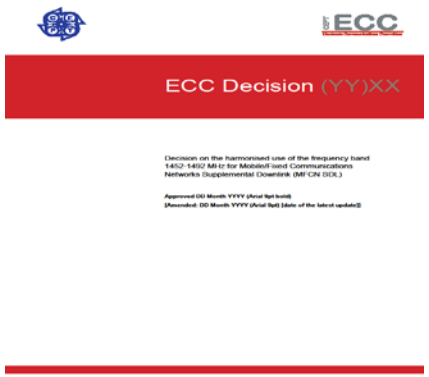
[1] L-Band in Europe: 1452 MHz to 1492 MHz, sometimes referred to as 1.4GHz or 1.5GHz spectrum. [2] Aggregation across bands is supported in HSPA+ R9 (and beyond) and LTE R10 (and beyond), but each specific band combination,
e.g. combination of band 1 and L-band, has to be defined in 3GPP. [3] AT&T is planning to deploy supplemental downlink in lower 700 MHz (12 MHz of unpaired spectrum)

1.5 GHz SDL harmonization



ECC Decision 13(02)

Decision approved and published in June 2013, suppressing satellite use, paving the way to use the whole 40 MHz for SDL across Europe



ECC Decision 13(03)

Decision on “Harmonized use of the frequency band 1452-1492 MHz for SDL" published in November 2013

3GPP specification finalized

- Finalization of the Draft ECC Decision (May ‘13) was a pre-requisite
- Work Item submitted to 3GPP RAN Plenary on June 2013
- One Work Item covering both LTE and UMTS
- Current proposed scenarios (higher priority):
  - LTE: Band 20 (800MHz) + 1.4 GHz SDL
  - UMTS: Band I (2.1GHz) + 1.4 GHz SDL
- Work Item submitted by:
  - Orange, KPN, Telenor, Telefonica, Ericsson, Qualcomm, ST-Ericsson, Huawei, ALU, Qatar Telecom, Lightsquared
  - Orange is the Rapporteur
- 3GPP RAN approved the Work Item on 14th June 2013
- Feature completed in June 2014 – Band 32

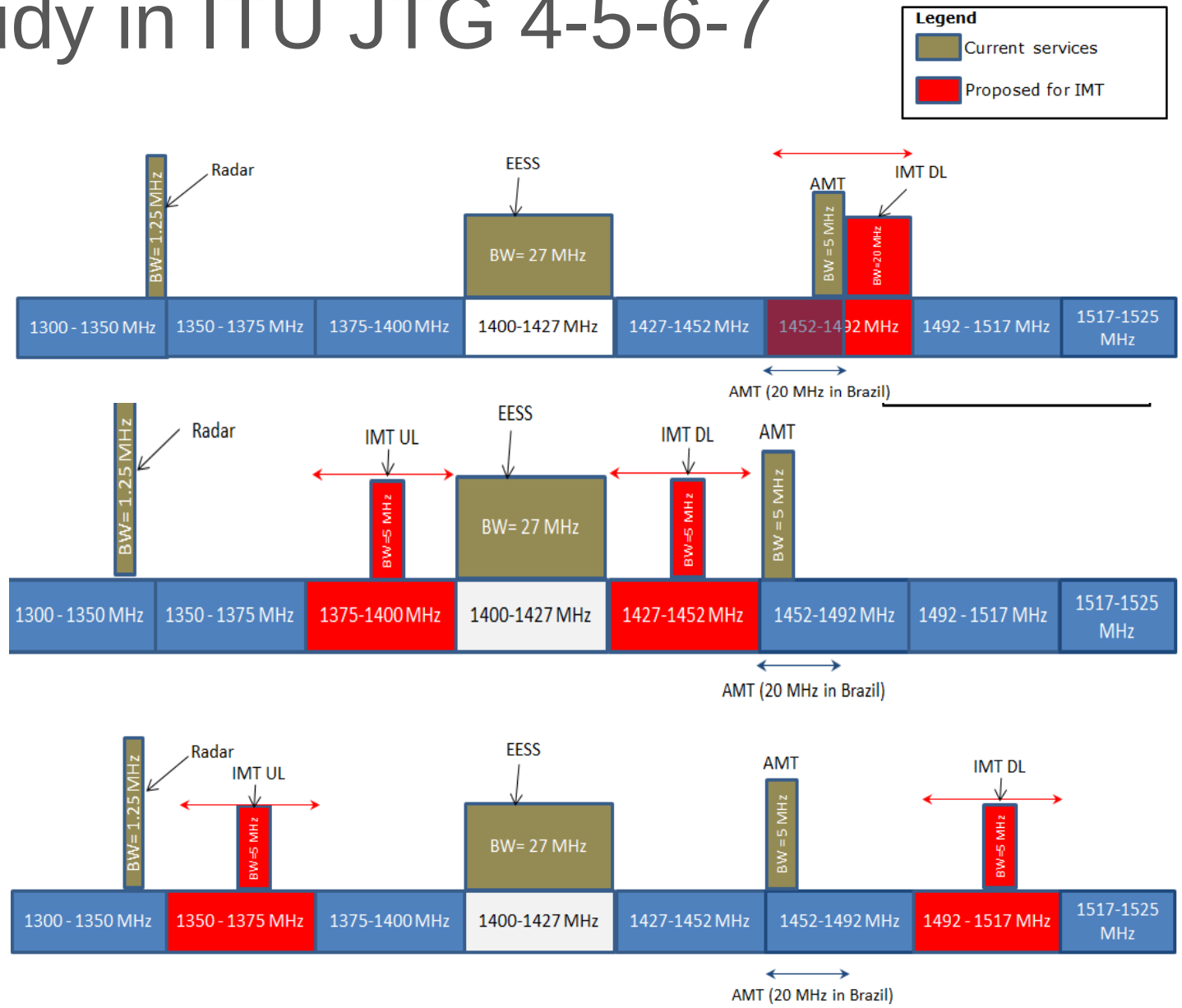
IMT in the L-Band at WRC-15

Broadening the ecosystem in the L-Band in a phased approach

- **Phase 1: 1452-1492 MHz (SDL)**
  - ECC Decision to use 1452-1492 MHz for SDL
  - **Brazil**: 1452-1472 MHz used by aeronautical mobile telemetry (AMT) / 1472-1492 MHz allocated to fixed, mobile and broadcasting
- **Phase 2: 1375-1400 / 1427-1452 MHz (FDD, 2 x 25 MHz)**
  - Used by fixed links and military, and is already subject to a harmonized channeling arrangement within CEPT (ERC Recommendation T/R 13-01, Annex B)
  - **Brazil**: 1375-1400 MHz allocated to radiolocation / 1427-1452 MHz used by fixed links
- **Phase 3: 1350-1375 / 1492-1517 MHz (FDD, 2 x 25 MHz)**
  - 1350-1375 MHz used by NATO (tactical radars)
  - 1492-1517 MHz target for Wireless Mics by CEPT
  - **Brazil**: 1350-1375 MHz allocated to radiolocation / 1492-1517 MHz used by fixed links

*Guard bands between EESS and IMT will be needed and are under study at ITU.

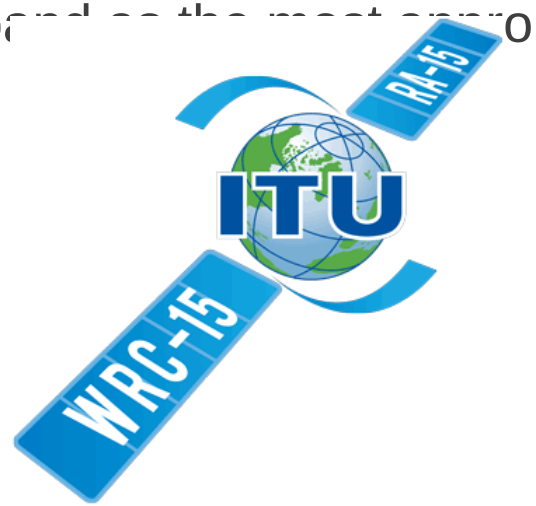
L-Band study in ITU JTG 4-5-6-7



New identification for licensed spectrum

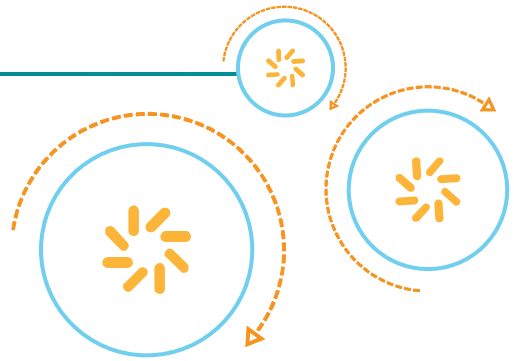
Issues for Latam

- The growth of mobile data traffic requires the identification of more spectrum for IMT
  - Several bands being discussed based on the WP 5D and JTG 4-5-6-7 studies that will be input to WRC-15
  - Most bands have difficulties within Latam
  - L ba[illegible]opriate band to be identified and harmonized in the region



It is important for the region that administrations support the preparatory process in CITEL

L band is key to identify new harmonized spectrum for IMT in WRC-15



Thank you

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