



ITU REGIONAL FORUM ON
OPTIMIZATION AND EFFICIENT
USE OF SPECTRUM



ERICSSON

SPECTRUM REQUIREMENTS FOR 2020 AND BEYOND

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2020



	2014	2020
› Subscriptions (M)	7,100	9,200
› MBB (M)	2,900	7,700
› Smartphone subs (M)	2,600	6,100
› Mobile Traffic (EB/Month)	3.2	30.5
› Fixed Traffic (EB/Month)	40	140
› Video (% of Mobile Traffic)	45	60
› Pop coverage (%)		
– GSM EDGE	>85	~95
– WCDMA/HSPA	~60	~90
– LTE	~20	>70

>2X

9X

13X

SOCIETAL IMPACT



+10% BROADBAND
PENETRATION



~1% OF GDP

DOUBLING OF
BROADBAND SPEED



0,3% GDP GROWTH

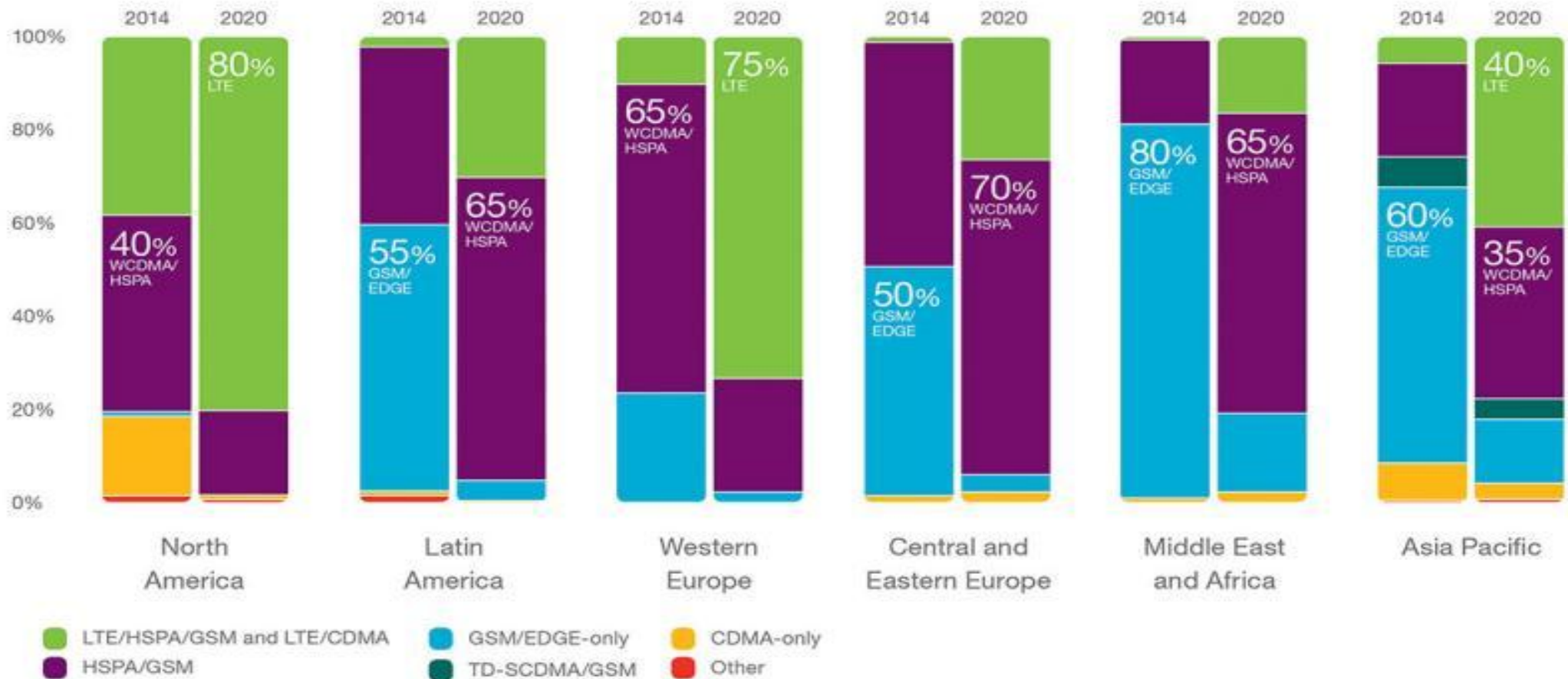
+1% BROADBAND
PENETRATION



3.8% START UP OF NEW BUSINESS

TECHNOLOGY BY REGION

Mobile subscriptions by region and technology



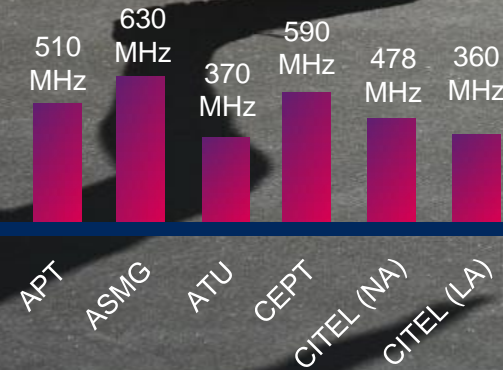
IMT SPECTRUM NEEDS FOR 2020

(AI 1.1)

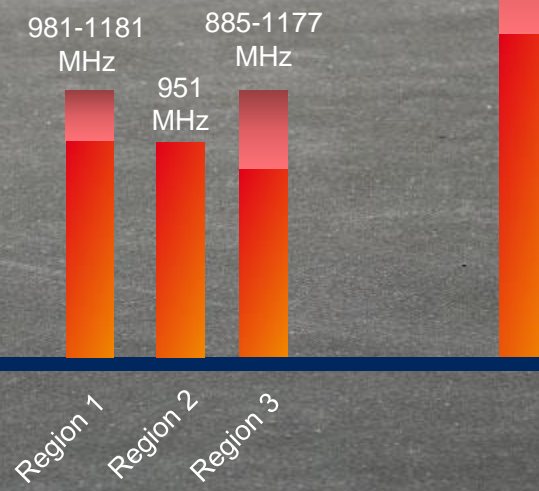


ITU-R WP5D Spectrum Estimate	Total spectrum requirements 2020
Lower user density settings	1 340 MHz
Higher user density settings	1 960 MHz

Currently available spectrum per region in MHz



Already identified spectrum per region ~1000 MHz



Spectrum needs 2020
High and low user density

400 – 1000 MHz additional spectrum needed by 2020

Desirable spectrum characteristics

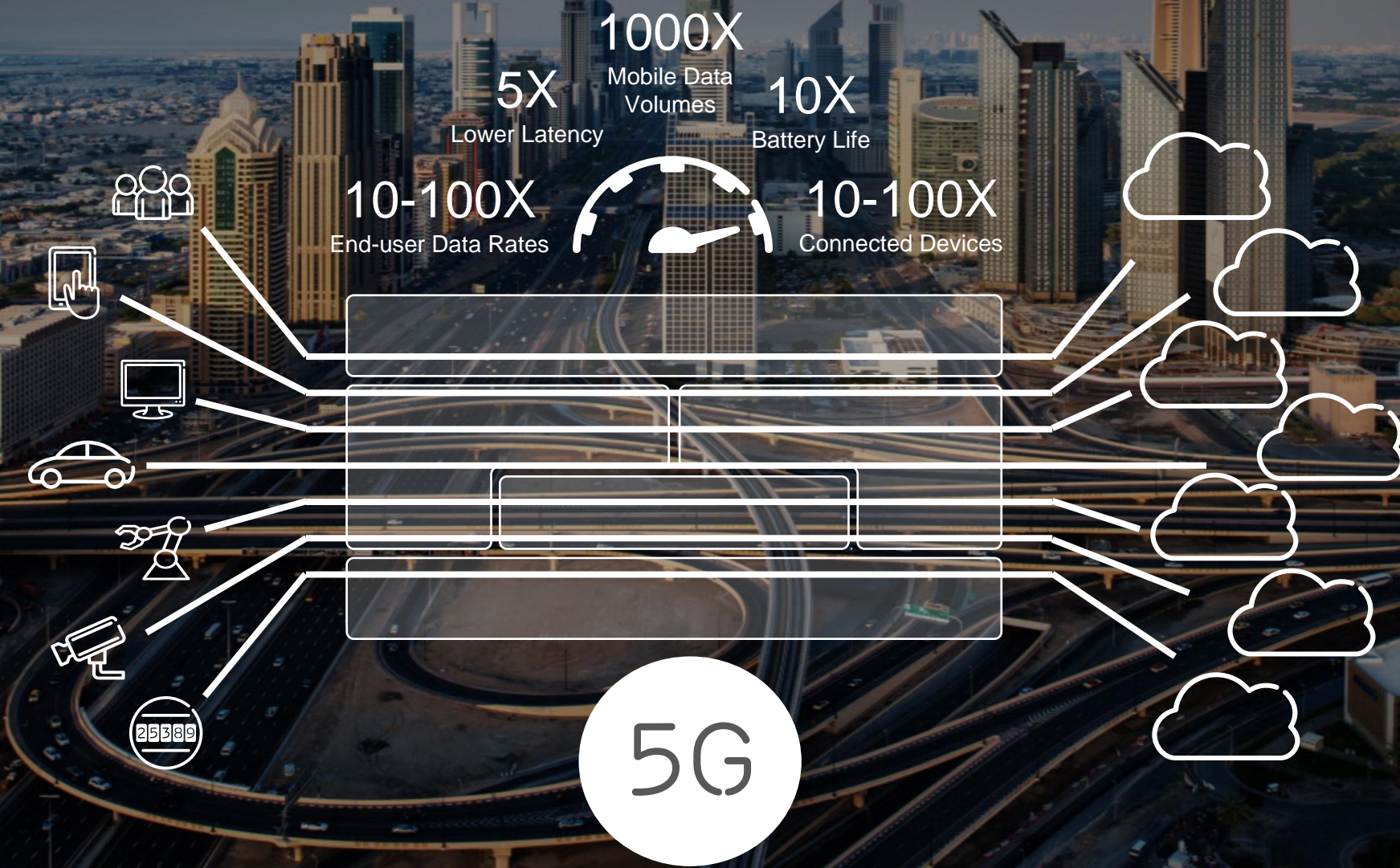
Spectrum range 470 – 6425 MHz

40 MHz contiguous bandwidth

26B CONNECTED DEVICES IN 2020



ONE NETWORK - MULTIPLE INDUSTRIES



SPECTRUM USAGE PRINCIPLES



Licensed Dedicated



Mainstream approach for MBB
350 MHz now, need 1500-2000 MHz

- Efficient for large area and population coverage
- Predictable quality of service
- Reliable at high load at all times
- Affordable, economies of scale, high valuations

FDD and TDD
Dynamic TDD
Full Duplex

Licensed Shared Access

Complementary for MBB

- Fast unlocking of mobile spectrum
- Either-or usage between incumbent and licensee
- Predictable quality of service
- Protects incumbent, lends investment security

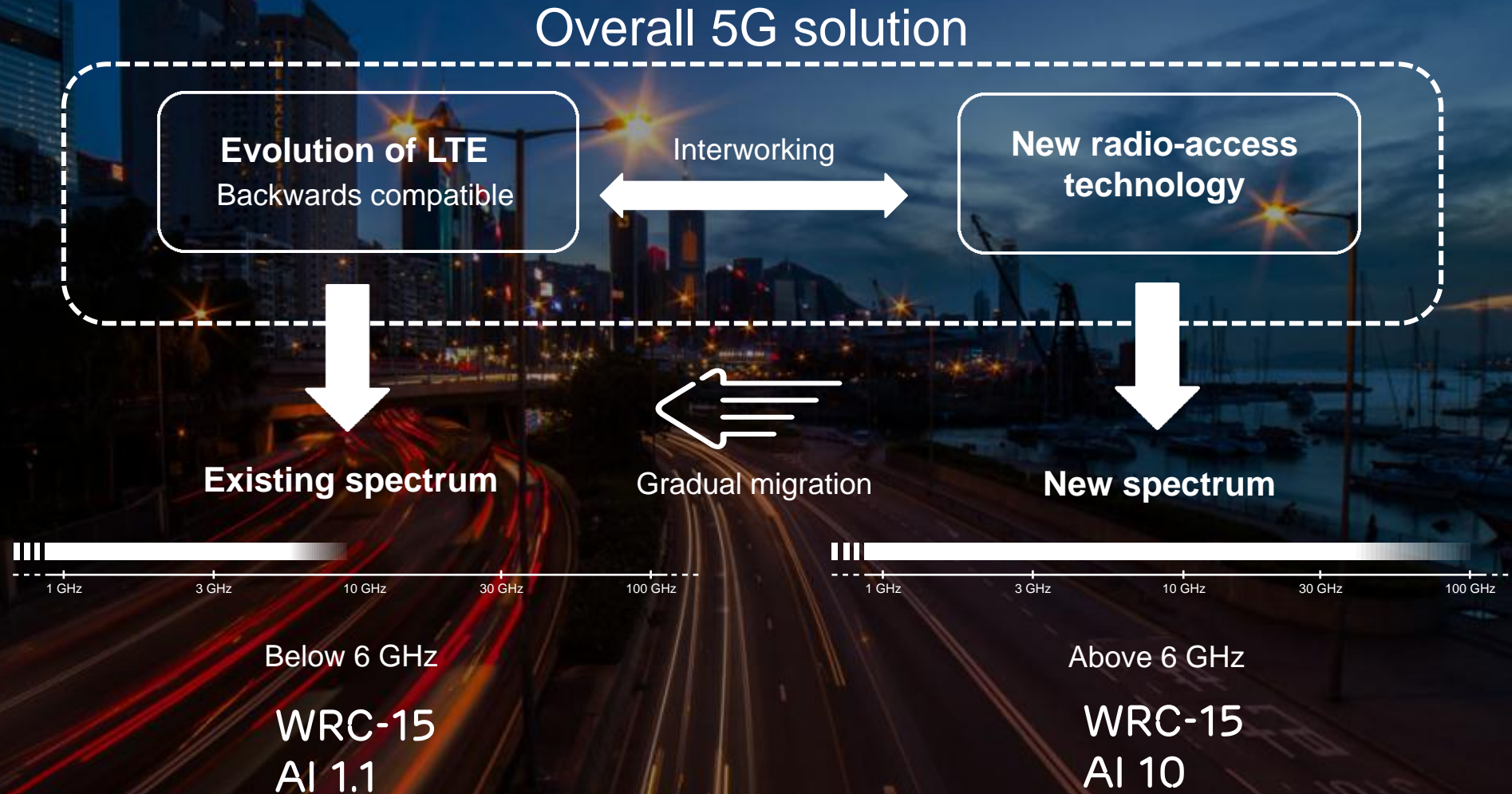
Unlicensed

Dedicated to Wi-Fi
>500 MHz today
License Assisted Access

- Efficient for indoor / controlled environments and short ranges
- Unpredictable quality of service
- Reliable at low load, unreliable at high load

Complementing dedicated licensed spectrum

5G RADIO AND SPECTRUM



POTENTIAL CANDIDATE BANDS

(AI 1.1 – IMT & RLAN)

470 - 694/698

1 350 - 1 400

1 427 - 1 452

1 452 - 1 492

1 492 - 1 518

1 518 - 1 525

1 695 - 1 710

2 700 - 2 900

3 300 - 3 400

3 400 - 3 600

3 600 - 3 700

3 700 - 3 800

3 800 - 4 200

4 400 - 4 500

4 500 - 4 800

4 800 - 4 990

5 350 - 5 470

5 725 - 5 850

5 925 - 6 425

PRELIMINARY AGENDA FOR WRC-19

(AI 10)

Outdoor-to-indoor penetration

Outdoor, hot-spot and indoor deployments

Hot-spot and indoor deployments

BWs: min 350 MHz to 1 GHz
a few to several Gbps

BW: ~1 GHz
several Gbps

BWs: ~ 1 – 5 GHz
10 Gbps and above

80 – 200 MHz per operator

> 300 MHz per operator

many 100 MHz to 1 GHz per operator

CA available, possibly also with bands below 6 GHz

CA available, possibly also with bands below 20 GHz

CA available, possibly also with bands below 30 GHz

6 GHz

20 GHz

30 GHz

100 GHz

Majority of future uses still need to be operated under licensed regimes for IMT, and able to support a variety of applications (e.g., real time critical industry, medical, TV distribution, and security)



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