

## MAXIMIZING THE WIRELESS OPPORTUNITY TO CLOSE THE DIGITAL GAP



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Government Affairs Europe, Qualcomm

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# More Than 1.5 Billion People Have Access to Over 535 3G Networks Today



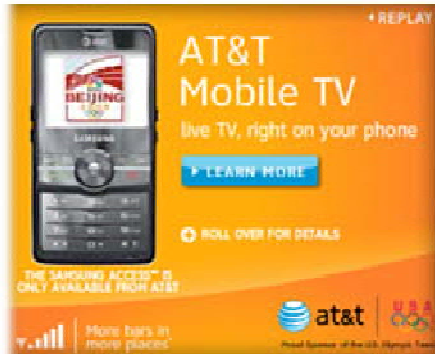
**750+ Million 3G subscribers**

Over 210 Million HSPA and EV-DO subscribers

**> 535 Commercial 3G Operators  
in 152 countries**

**> 245 HSDPA (> 65 HSUPA)  
> 260 WCDMA**

# 3G Offers Mobile Broadband Today



Planet 3  
SeeMe TV



Business users and consumers can today browse the Internet or send and receive e-mails using HSPA-enabled notebooks, or using HSPA modems including USB dongles, as well as send and receive video or music using their 3G/HSPA phones...GSA Press Release, March 2009

...the number of Mobile Broadband (HSPA\*) connections in Indonesia has surpassed the number of fixed broadband connections. ...GSMA Press Release, April 2008

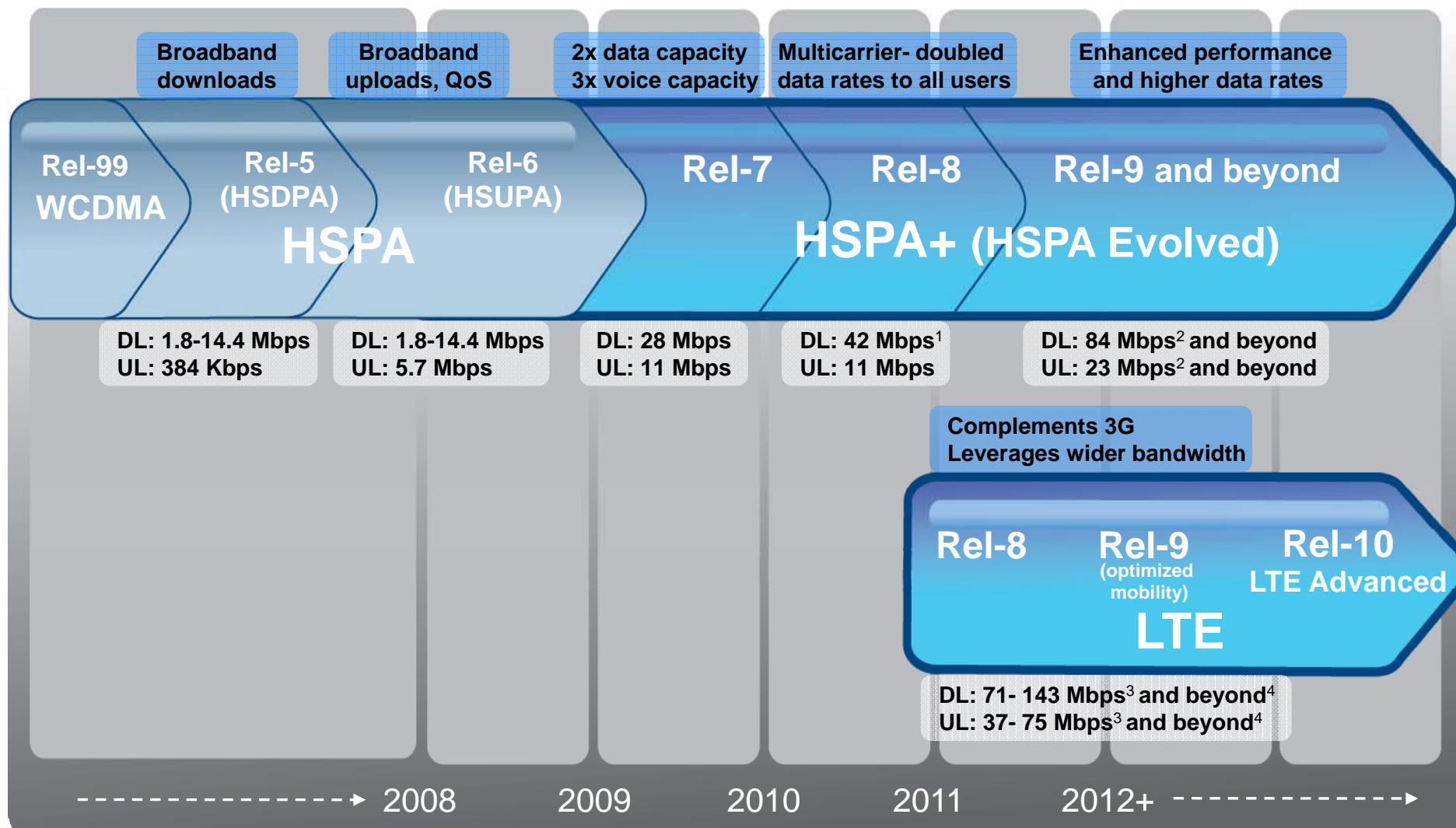
"In just over two years, we have taken our world leading network from peak network speeds of 3.6Mbps to 21Mbps and today we are launching the world's first commercial 21Mbps peak-rated modem – more than three times faster than devices currently in market," ...Mr Trujillo, CEO, Telstra, February 2009.

3 Video Telephony



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# LTE: A Parallel Evolution Path to HSPA+



<sup>1</sup> R8 will reach 42 Mbps by combining 2x2 MIMO and HOM (64QAM) in 5MHz, or by utilizing HOM (64QAM) and multi carrier in 10 MHz.

<sup>2</sup> R9 and beyond may utilize combinations of multi carrier and MIMO to reach 84 Mbps peak rates. Similarly, uplink multi carrier can double the uplink data rates.

<sup>3</sup> Peak rates for 10 and 20 MHz FDD using 2x2 MIMO, the standard supports 4x4 MIMO enabling peak rates of 278 Mbps. TDD rates are a function of up/downlink asymmetry

<sup>4</sup> Peak rates can reach or exceed 278 Mbps by aggregating multiple 20 MHz carriers as discussed for LTE Advanced (LTE Rel-10)

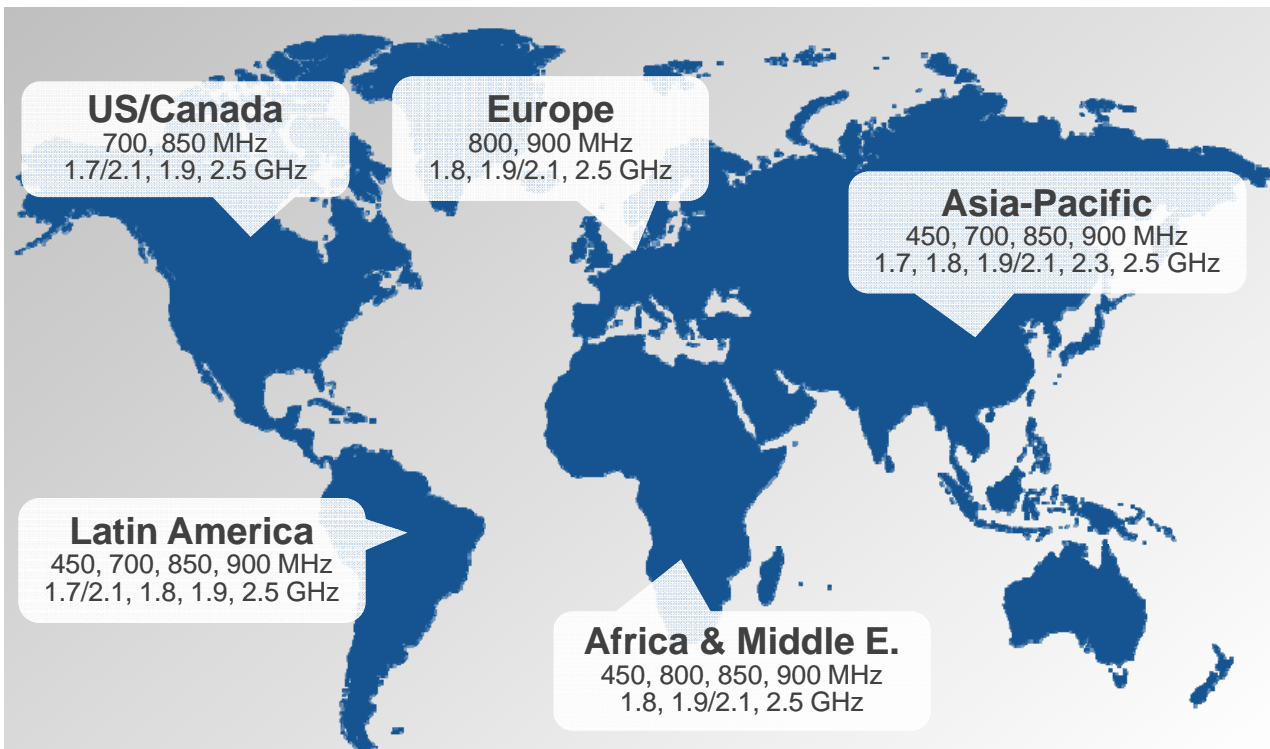
# The mobile will support a number of radio interfaces optimized for various services



# Innovation and regulation



# Worldwide Mobile Broadband Spectrum



## Recommended Technology

FDD Blocks	5 MHz	10 MHz	20 MHz
Technology optimisation	HSPA+ & EV-DO Rev. B	HSPA+ & LTE (2x5 MHz DO Rev. B)	LTE (2x10 MHz HSPA+)

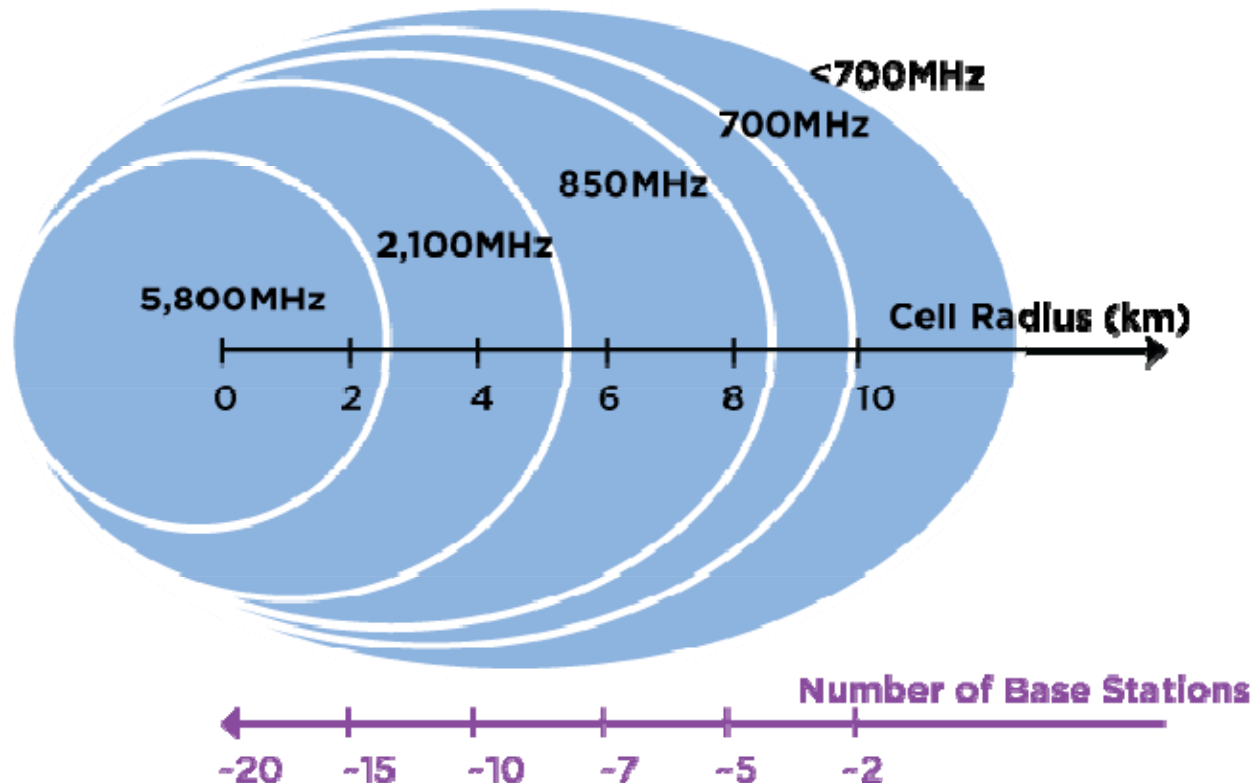
## Bandwidth Deployment Options<sup>1</sup>

FDD Blocks/ Spectrum band	5 MHz	10 MHz	20 MHz
2.5/2.6 GHz <sup>2</sup>	✓	✓	✓
2.1 GHz (1.7 or 1.9 uplink)	✓	✓	
1.5, 1.7, 1.8, 1.9 GHz	✓	✓	
900 MHz	✓		
800/850 MHz	✓		
Digital Dividend <sup>3</sup> (700 to 800 MHz)	✓	✓	

<sup>1</sup>Usable spectrum blocks for product implementation. <sup>2</sup>IMT extension 2500 to 2690 MHz, 70 MHz+70 MHz FDD in most countries. <sup>3</sup>Digital dividend; Region 1 (Europe, Middle East and Africa) 790-862 MHz, Region 2 (Americas) 698-806 MHz. Region 3 (Asia) – some 698-790 MHz (e.g. China, India, Japan, Bangladesh, Korea, New Zealand, Papua New Guinea, Philippines and Singapore) others 790-806 MHz

# 800 MHz & 900 MHz are crucial for efficient and ubiquitous mobile broadband coverage

**The Propagation Characteristics of Spectrum**



Source: BBC R&D



# Why Connectivity Matters

**+4.7%**  
Average per  
capita income



Voice

**+1%**

Penetration in  
Developing  
Countries  
Correlates to

**+10.5%**  
Average per  
capita income



Internet

› Thank You