

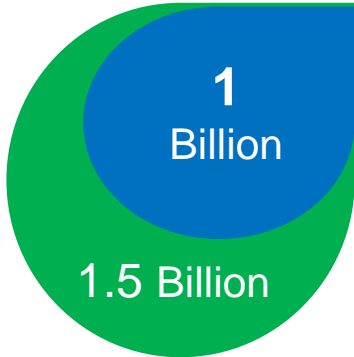


5G Americas works on industry initiatives that foster innovations for technology evolution, regulatory policies and spectrum planning.

## Deployments Today

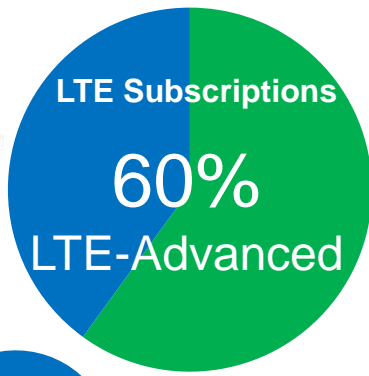


## Connections

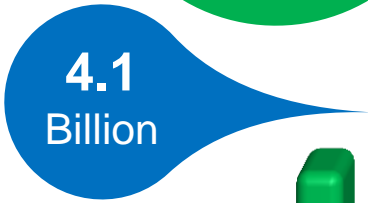


2015

2016

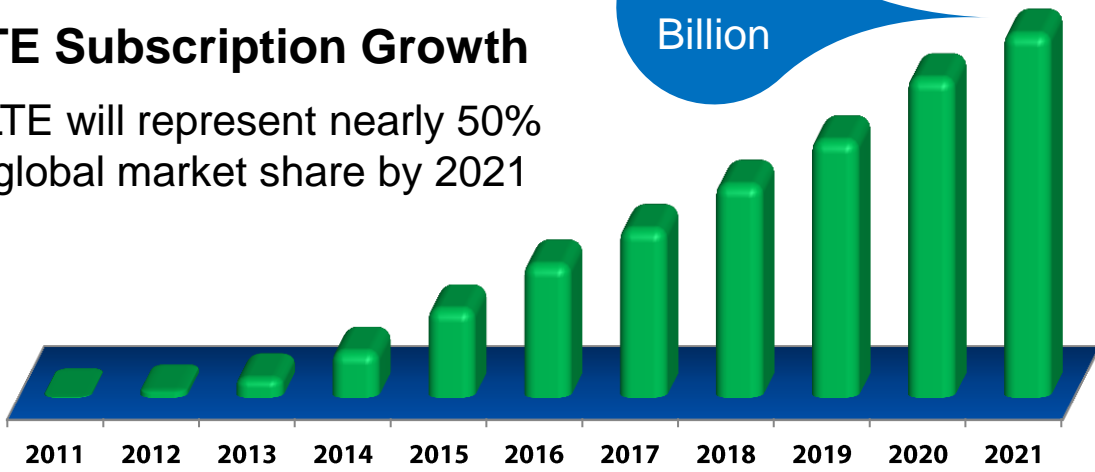


2021



## LTE Subscription Growth

LTE will represent nearly 50% global market share by 2021



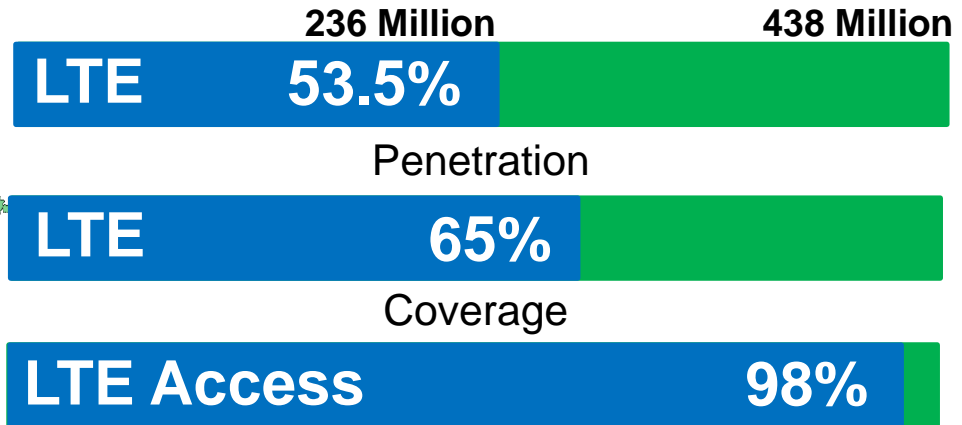
Deployments: 5G Americas, February 1, 2016  
Connections: OVUM, WCIS+ December 2015  
Note: Forecast does not include M2M

# The Voice of 5G and LTE for the Americas

North America is a globally recognized leader in LTE implementation. It is important for the social and economic development of the region to continue this innovation and deployment leadership in 5G.

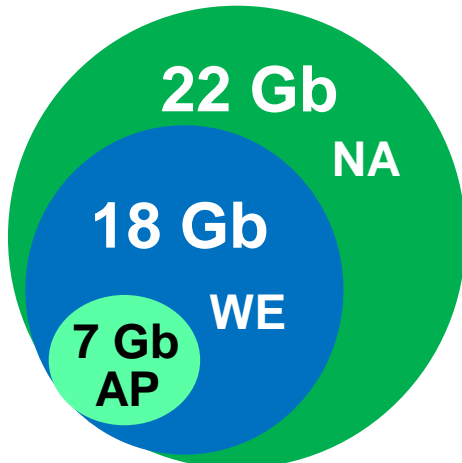


North America Wireless Subscriptions - Dec 2015



North America comprises only **5%** of the world's population but **22%** of its LTE users.

In the next 5 years, monthly smartphone data consumption per active subscription in North America will be 1.2 times that of Western Europe and 3 times that of Asia Pacific



## High-End Devices Significantly Multiply Traffic

	M2M Module	=	7 x
	Wearable Device	=	7 x
	Smartphone	=	41 x
	Tablet	=	113 x
	Laptop	=	118 x



A single smartphone can generate as much traffic as 41 feature phones.

Source: Cisco VNI Mobile, 2016

# The Voice of 5G and LTE for the Americas



**LTE and its further development to LTE-Advanced and LTE-Advanced Pro networks will lead our communications technology well into the next decade and provide the wireless technology foundation for 5G.**

**LTE-Advanced Pro** is a new LTE marker that will be used for the appropriate 3GPP specifications from Release 13 onwards when the LTE platform will be dramatically enhanced to address new markets as well as adding functionality to improve efficiency.

## LTE-Advanced Pro Areas of Development

3D/FD-MIMO  
MTC enhancements  
Public safety features

Carrier aggregation enhancements  
Small cell dual-connectivity and architecture

Latency reduction  
Indoor positioning  
Interworking with Wi-Fi

Single cell-point to multi-point  
Licensed assisted access  
(at 5 GHz)



## LTE VS LTE-ADVANCED PERFORMANCE INDICATORS

	Release 8 LTE		Release 10 LTE-Advanced	
<b>Peak Data Rate</b>	Downlink: Uplink:	300 Mbps 75 Mbps	Downlink: Uplink:	1 Gbps 500 Mbps
<b>Peak Spectrum Efficiency</b>	Downlink: Uplink:	15 (bps/Hz) 3.75 (bps/Hz)	Downlink: Uplink:	30 (bps/Hz) 15 (bps/Hz)
<b>Latency</b>	User plane: Control Plane:	10 Msec 100 Msec	User plane: Control Plane:	5 Msec 50 Msec
<b>Scalable Bandwidth Support</b>	Up to 20 MHz		Up to 20 MHz with band aggregation up to 100 MHz	
<b>MIMO (spatial multiplexing)</b>	Downlink: Uplink:	Up to 4x4 N/A	Downlink: Uplink:	Up to 8x8 Up to 4x4





## Internet of Things

By 2019, M2M service revenues will more than double the size of today's market. The telematics sector will continue to outperform all other M2M markets over the next five years.

One in five passenger vehicles connected globally by 2019.



3GPP is defining Cellular Internet of Things (CIoT) technology refinements in a progressive approach that will occur over multiple 3GPP releases beginning with Release 11.

	NB LTE-M Rel-13 	LTE-M Rel-13 	ED-GSM Rel-13 	5G (Targets) 
<b>Range (Outdoor) MCL</b>	<15km 164 dB	<11 km 156 dB	<15 km 164 dB	<15 km 164 dB
<b>Spectrum</b>	Licensed 7-900 MHz	Licensed 7-900 MHz	Licensed 8-900 MHz	Licensed 7-900 MHz
<b>Max Device Bandwidth</b>	180 KHz	1.4 MHz	200 KHz	TBD
<b>Data Rate</b>	<150kbps	<1 Mbps	10 Kbps	<1 Mbps
<b>Battery Life</b>	>10 years	>10 years	>10 years	>10 years
<b>Availability</b>	2016	2016	2016	2025

5G Americas is invested in leading 5G development for the Americas region and advancing the current innovation lead that North America has with the LTE technology ecosystem.

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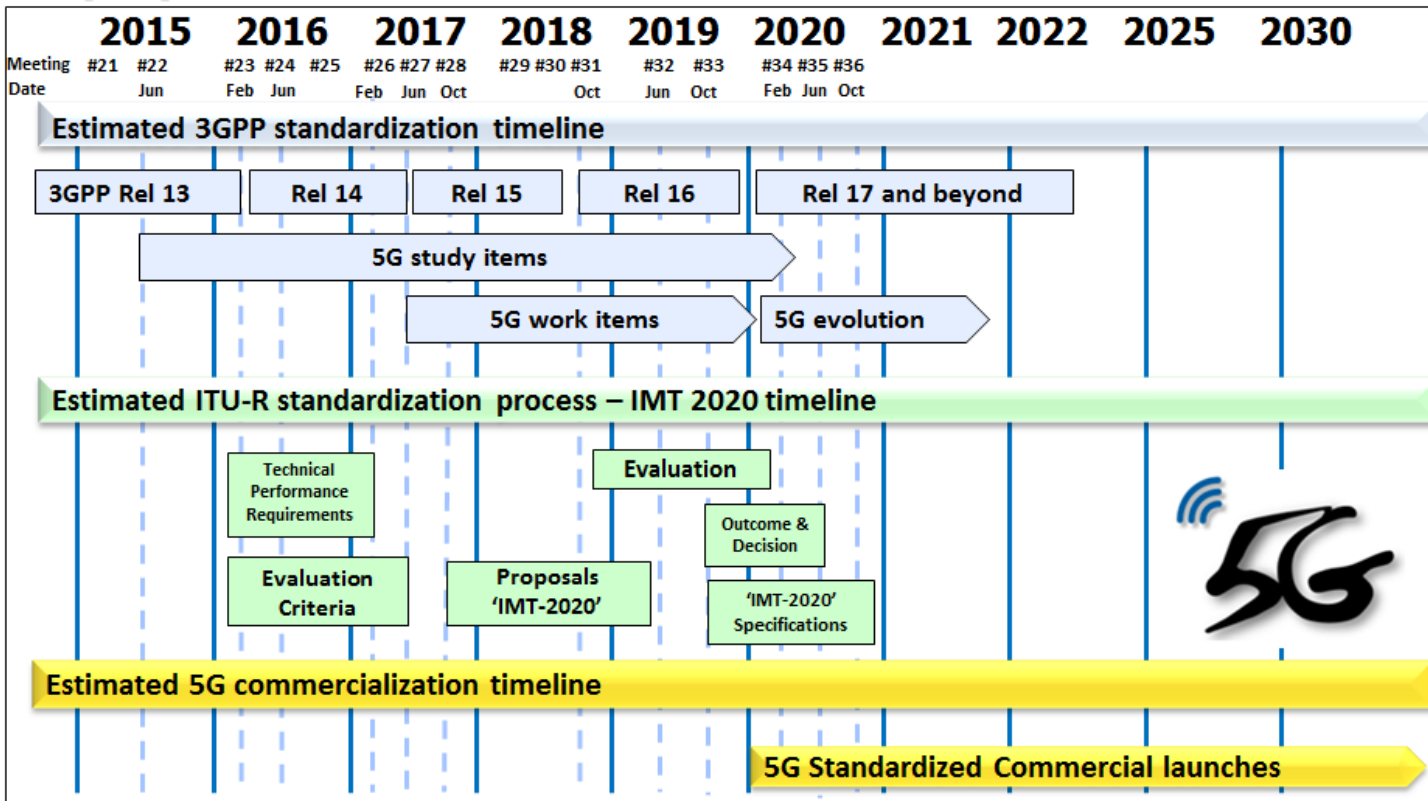


# The Voice of 5G and LTE for the Americas

5G is the next phase of mobile technology, and will provide high bandwidth, broader coverage and ultra-low latency. Deployments will depend on approval of regulatory standards, spectrum availability and ROI strategies.



## The Evolution to 5G Timeline



- 3GPP Rel-15 Phase 1 of the 5G standard is expected to be completed **2H 2018**.
- 3GPP Rel-16 Phase 2 of the 5G standard is expected to be completed **Dec 2019**.
- Commercial standardized deployments of 5G technology are expected in **2020 and beyond**.

**WRC-15 identified 11 potential IMT-2020 technology spectrum bands to be studied for WRC-19**

