

**PLDT**  **Smart**

WIRAHSWASTA  & WIRELESS WORLD  
RESEARCH FORUM

Presents

# HYPERCONNECTIVITY

Beyond 5G, Opportunities & Challenges

18th – 21st January 2021

# 5G as an Innovation Platform

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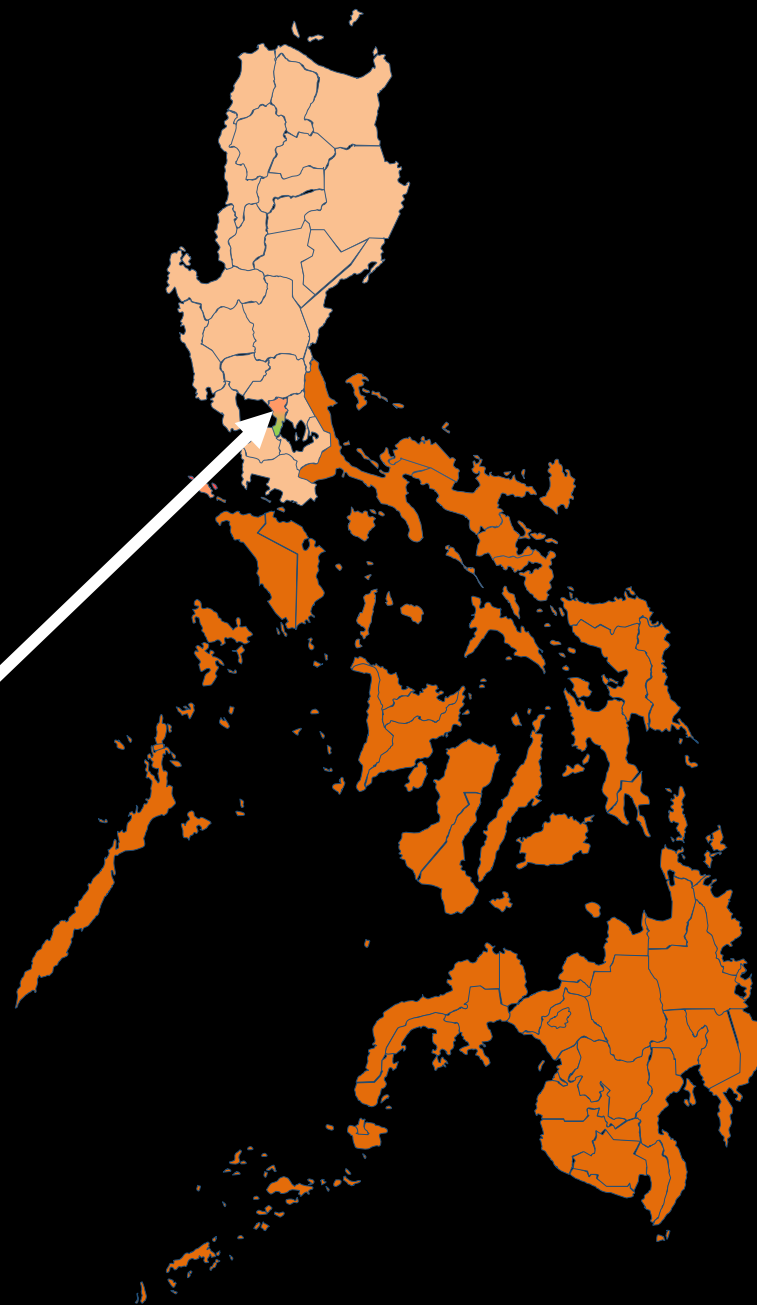
# THE PHILIPPINES

**108** M Population

**12** M in Metro Manila

**7,641** Islands

**298,000** Sq. kms



**Challenging to deploy  
Nationwide Network**

**20** Typhoons/year

**22** Active Volcanoes

**2,000** Earthquake/year

**PLDT**  **Smart**

# THE PHILIPPINES' ONLY INTEGRATED TELCO



**TO SERVE THE BROADBAND NEEDS OF ALL FILIPINOS**



**MOBILE INTERNET  
(LTE & 5G)**



**MOBILE BROADBAND  
(LTE & 5G)**



**FIXED WIRELESS  
(LTE & 5G)**



**IPTV**

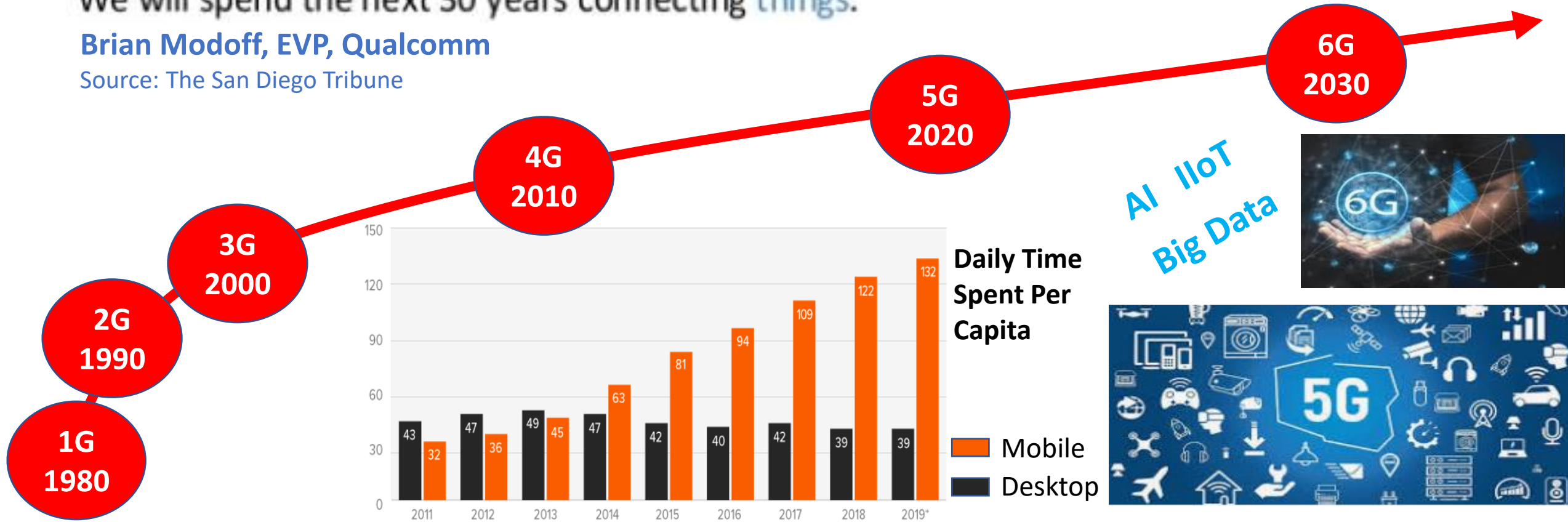


**FIXED WIRED  
(VDSL & FTTH)**

We spent the last 30 years connecting people.  
 We will spend the next 30 years connecting things.

Brian Modoff, EVP, Qualcomm

Source: The San Diego Tribune



AI  
 IIoT  
 Big Data



2000

Digital Age



2010

Connected Age



2020

Information Age




2030

Experience Age



# Experience: "Hear & See" plus "Feel, Smell & Taste"



68  
Haptic ports

Haptic Animations

Real-time  
Simulations

Weight Simulation

User calibration  
profiles

Capillary system

Haptic Library

Users can create  
custom animations  
with Haptic Editor  
application



Feelreal VR Scent Mask



<https://blog.cloudhelix.io/haptic-technology-is-making-games-more-real-than-real-life-e7b20ee08bba>

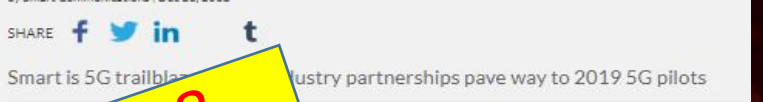
# PLDT/Smart 5G Achievements



Nokia and Smart showcase 'live' 5G for the first time in the Philippines



Smart leads 5G innovation in PH in 2018



Smart notches 5G speeds of over 14Gbps



PLDT, Smart seal 5G partnership with Huawei



PLDT and Smart power up 'Araneta 5G City'

PLDT and Smart also rolled out fast, free and open fiber-powered Wi-Fi connectivity in key areas, including Gateway Mall, Smart Araneta Coliseum, New Frontier Theater and the Araneta City bus port,



Smart and Ericsson to deploy 5G in PH



Smart showcases 5G in 30th SEA Games

New Clark City is first "Smart 5G Stadium City"



2020: First 5G PBA2020

# Smart 5G Launch: July 30<sup>th</sup> 2020



**Smart 5G CERTIFIED**

Get these 5G-ready phones with Smart Signature.  
Also available on Smart Infinity

**Huawei P40 Pro**   **Huawei Nova 7**   **Vivo X50 Pro**

**realme**   **Samsung**

COMING SOON   FOR UNVEILING

EXPERIENCE IT HERE AND NOW!  
Requires a 5G provisioned SIM and a Smart-certified 5G handset.  
All Smart LTE SIMs are 5G ready.

Smart 5G



## Smart 5G powers PBA Bubble for country's first 5G-powered sports broadcast

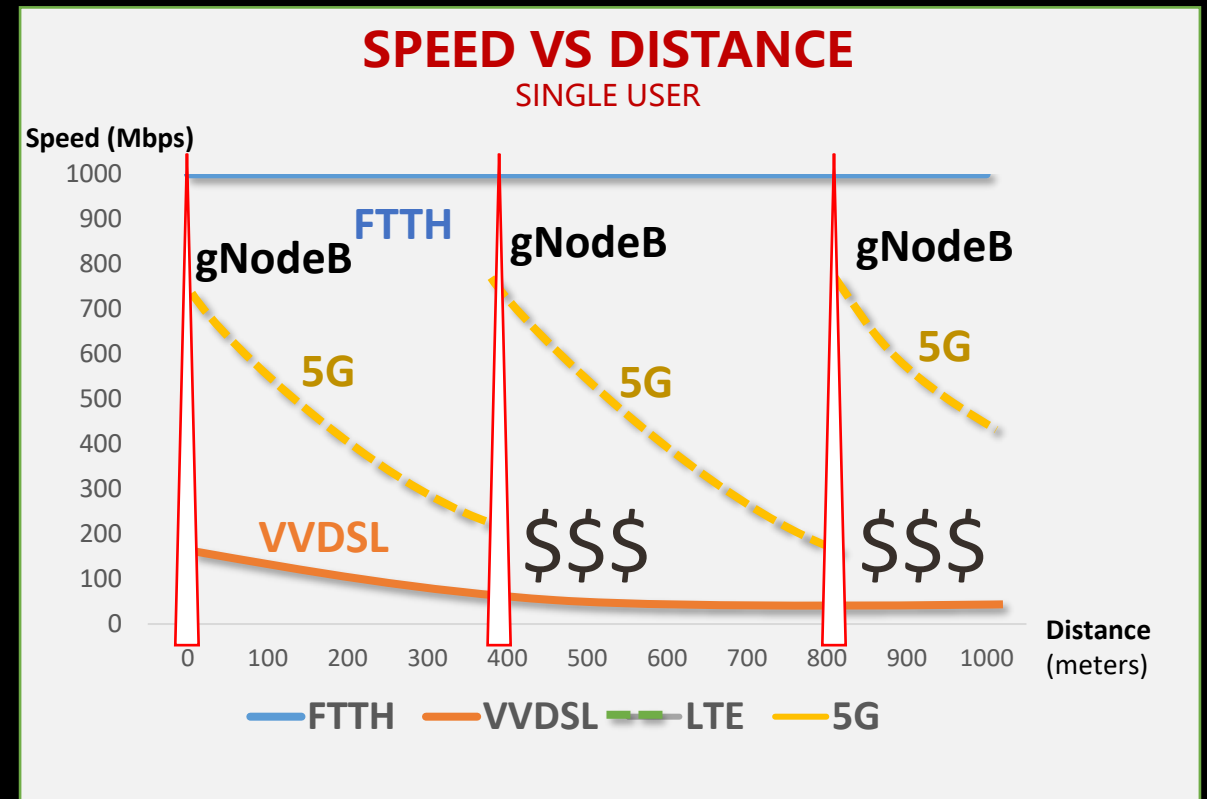
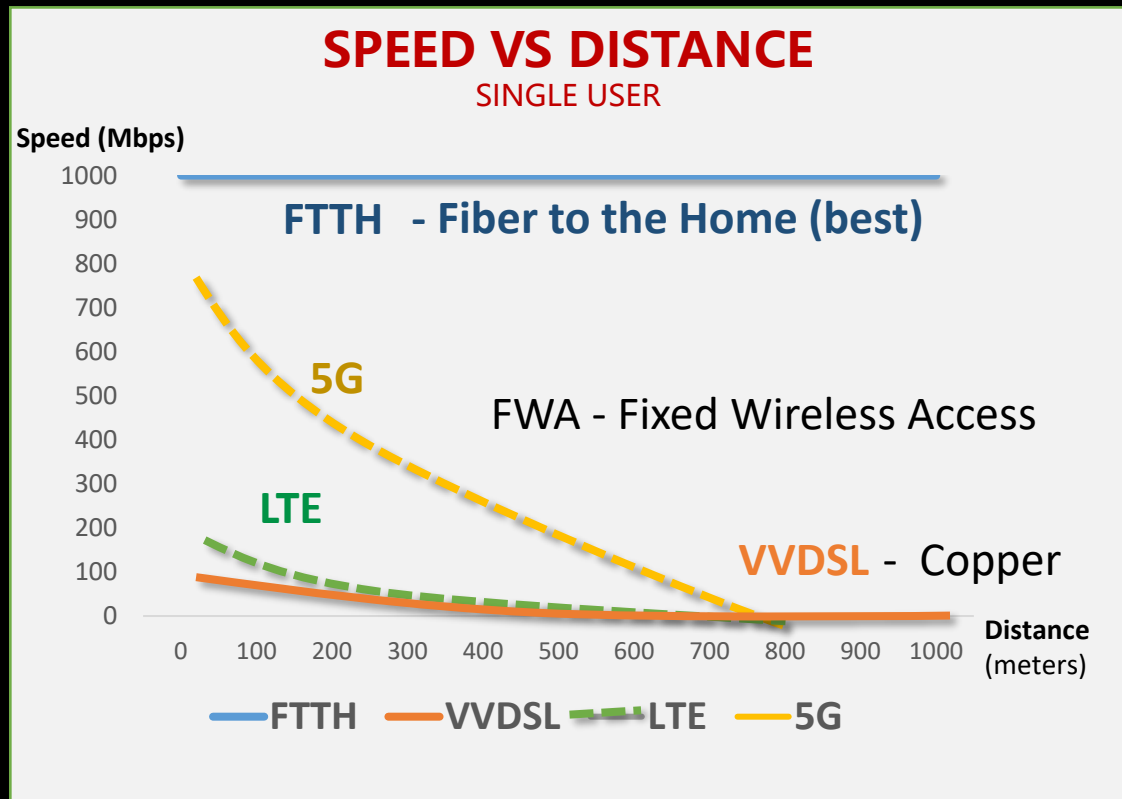


10 Oct, 2020

Mobile services provider Smart Communications, Inc. is setting another milestone in mobile technology and innovations as it brings the country's first 5G-powered sports broadcast at the start of the Philippine Basketball Association (PBA) Philippine Cup on Sunday at the Clark Freeport in Pampanga.



# Fixed Access vs. Fixed Wireless Access



*Fiber-to-the-Home, Vectoring - Very High bit Digital Subscriber Line, Long Term Evolution (4G), New Radio (4G)*

# What do we want in 5G?



1. eMBB



2. mMTC



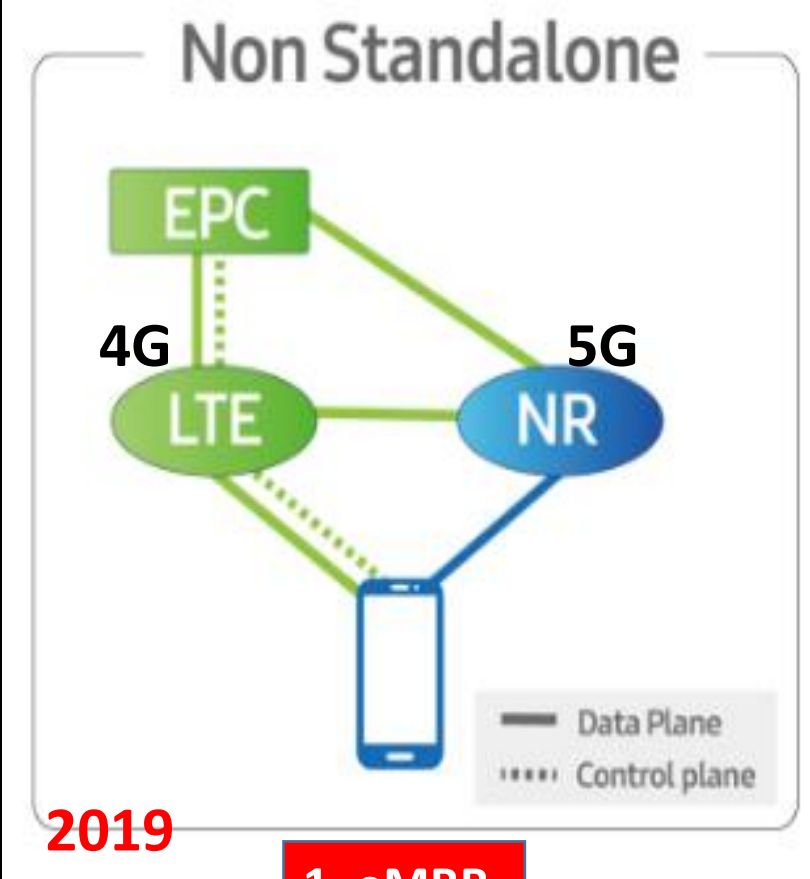
Instant Response

3. uRLLC

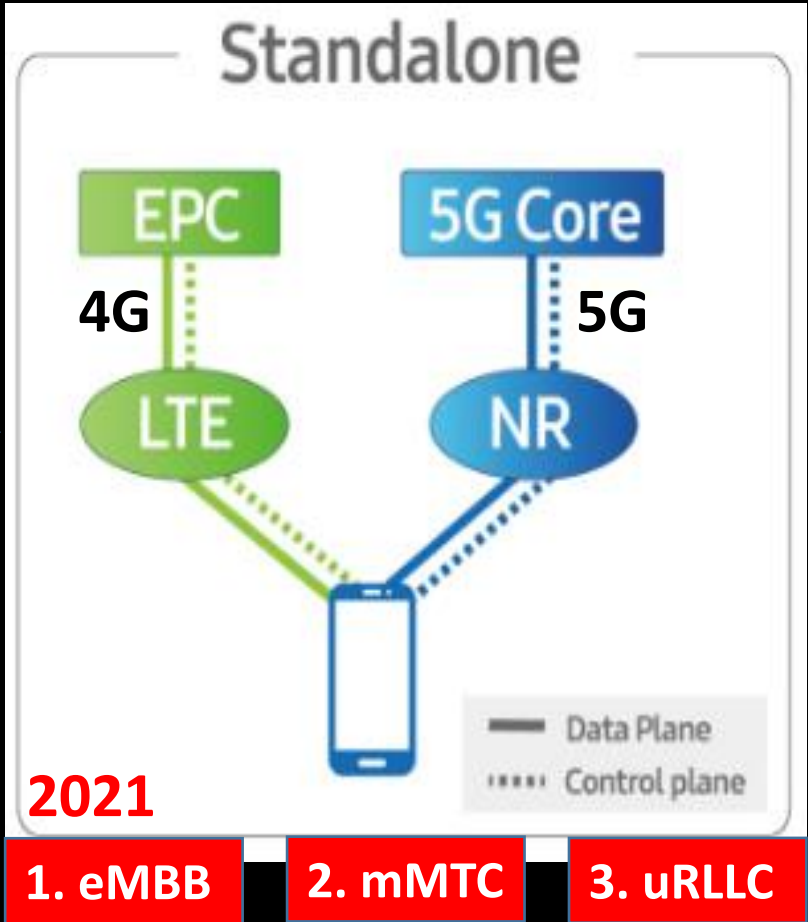


4. Network Slicing

# 5. 5G NSA vs SA



Interim till SA Devices are available

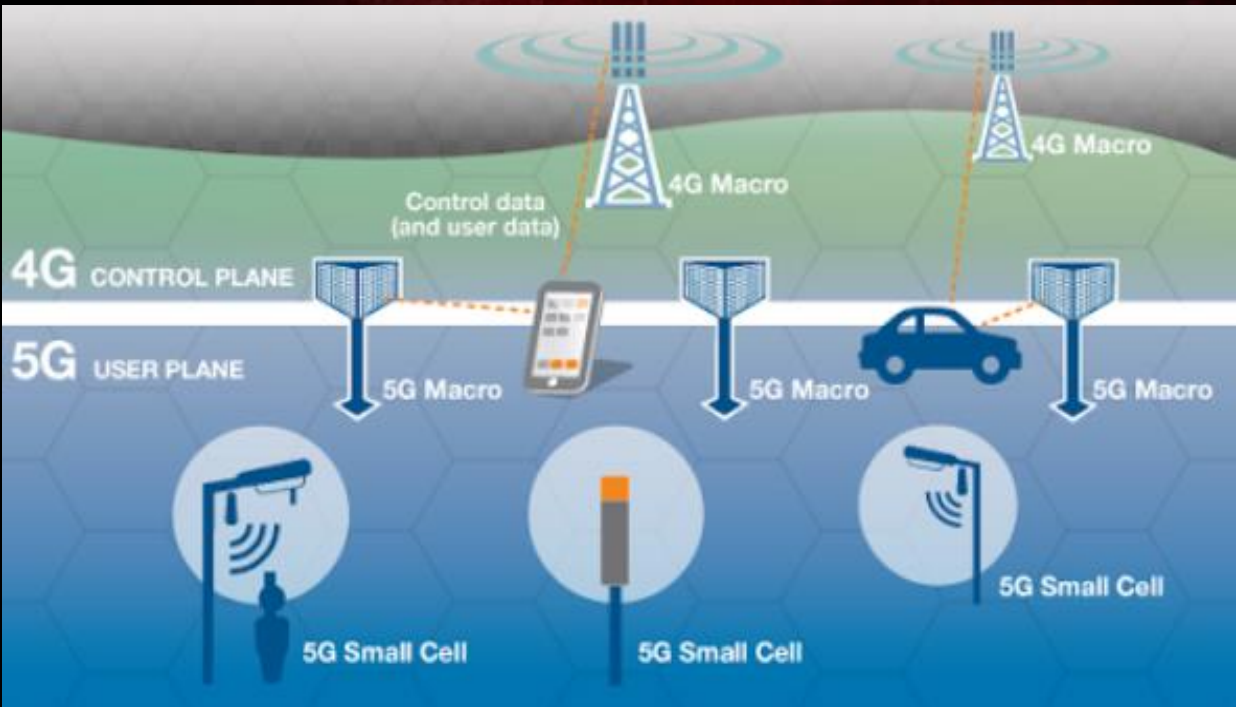
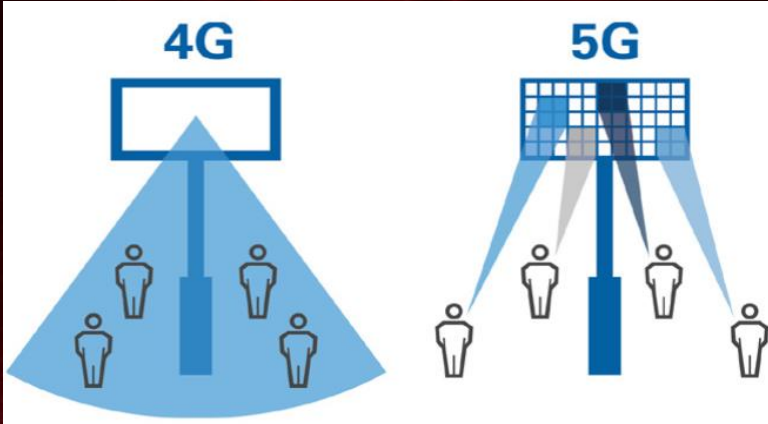
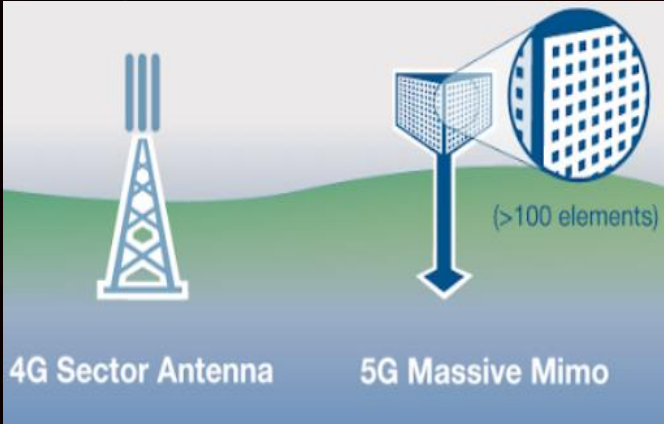
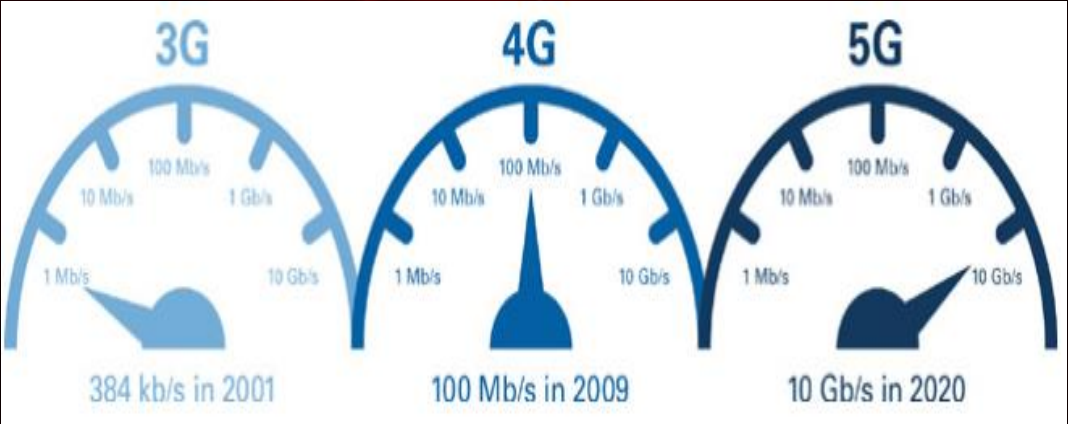


### Terminology (Alphabet Soup!)

2G GSM BTS      3G UTRAN NodeB      4G EUTRAN eNodeB      5G NR gNodeB

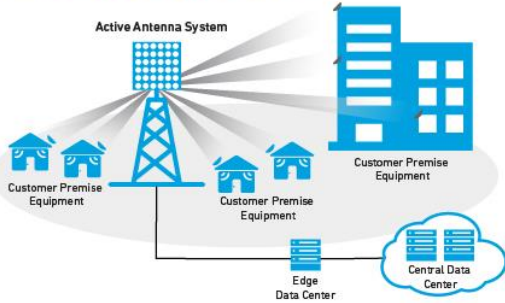
<https://www.3gpp.org/technologies/keywords-acronyms>

# 5G gNodeBs



# 1. FWA

5G End-to-End Fixed Wireless Access (FWA) Networking Using Beam Steering



# 2. eMBB



# 3. Educ / R&D



# 4. Factory



# 9. 5G for Good



# 5. e-Gaming



# 6. Sports / Media



# 7. Port / Security



# 8. Retail / Medical





# 5G for Manufacturing



# 5G for Medical



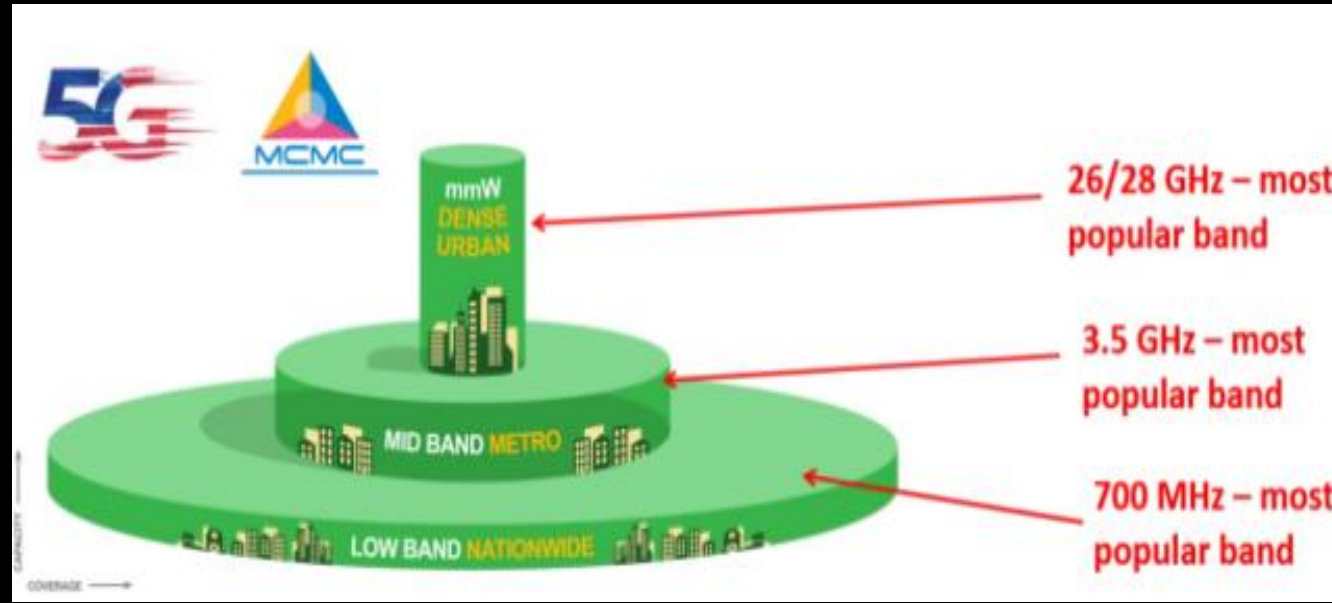
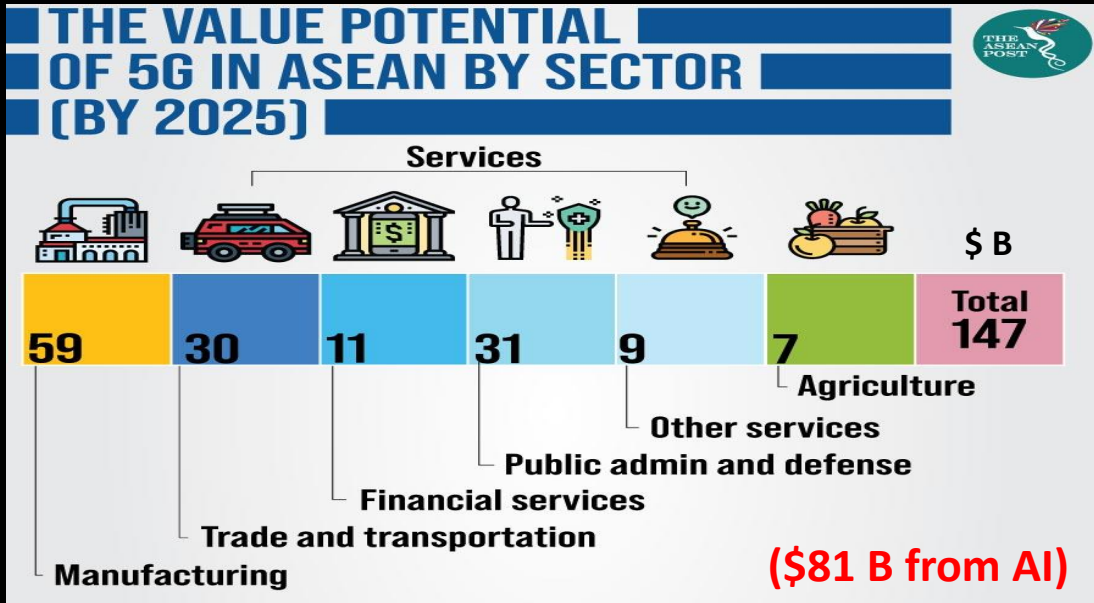
# ASEAN: VALUE POTENTIAL OF 5G & SPECTRUM

The ASEAN region could see five scenarios for 5G

ATKearney



<https://atkearney.de/documents/1781738/3697768/5G+in+ASEAN+Reigniting+Growth+in+Enterprise+and+Consumer+Markets.pdf/ccf1a9c7-1082-3bd3-b1ef-cfd2a39c2436?t=1568104453227>



<https://theaseanpost.com/article/can-5g-really-transform-businesses>

<https://operatorwatch.3g4g.co.uk/2020/01/malaysia-decides-on-innovative-approach.html>



It's just the beginning

## 5G Videos

Mercedes Car Factory 5G: <https://www.youtube.com/watch?v=UdDvDKC8FVM>

Orange 5G Services: [https://www.youtube.com/watch?v=3\\_YU0nDhHo](https://www.youtube.com/watch?v=3_YU0nDhHo)

Nokia 5G Latency: <https://www.youtube.com/watch?v=faLH3crTnfE>

Examples of Digital Twins: <https://simplicable.com/new/digital-twin>

Stara Brazil <https://www.sap.com/about/customer-involvement/customer-stories/stara.html>

<https://youtu.be/vJHPi89WQXI>

Farming (SAP)

<https://www.youtube.com/watch?v=vSjvw4toDmo>

<https://youtu.be/0Mes8qnpf9o>

Manufacturing

<https://www.youtube.com/watch?v=fEI5oz33la8>

Healthcare

<https://youtu.be/H6JzPCbyVSM>