



5G Wireless Why it is Needed and How it Will Affect Public Safety



Why is 5G Wireless Needed and How it Will Affect Public Safety

Introduction of 4G wireless (LTE) to public safety through the deployment of FirstNet provides a platform that has the potential to transform emergency communications.

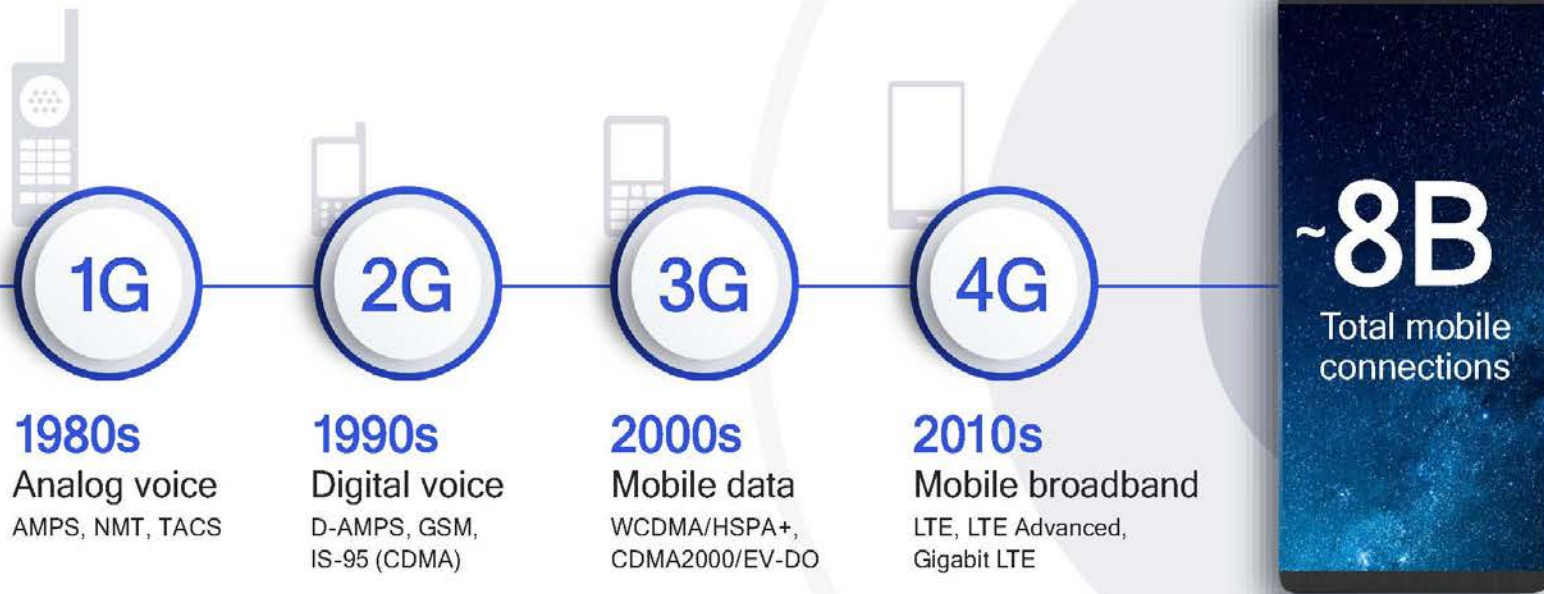
Before FirstNet is fully deployed 5G wireless networks will be brought into service in some markets in the US.

How will this affect public safety?

Is 4G obsolete before it is fully deployed?



Mobile is the largest technology platform in human history








1. Source: GSMA Intelligence, January 2018

2

Source: Qualcomm

The Progression of Wireless Technology

4

	1G	2G	3G	4G	5G
					
ROAD TYPE:	Dirt road	Paved one lane road	Two lane road	Four lane highway	Ten lane superhighway
CHANNEL SIZE:	30 KHz	200 KHz	1.25 MHz	20 MHz	200 MHz
APPLICATIONS:	Voice	+ Text, Email, Limited Internet	+ Internet, low quality video	+ Social media, streaming video	+ HD video, VR, AR, High-speed data
FREQUENCY BAND:	800 MHz	800/1900 MHz	800/1700/1900 MHz 2.1 GHz	700/800/1700/1900 MHz 2.1/2.3/2.6 GHz	High Band+

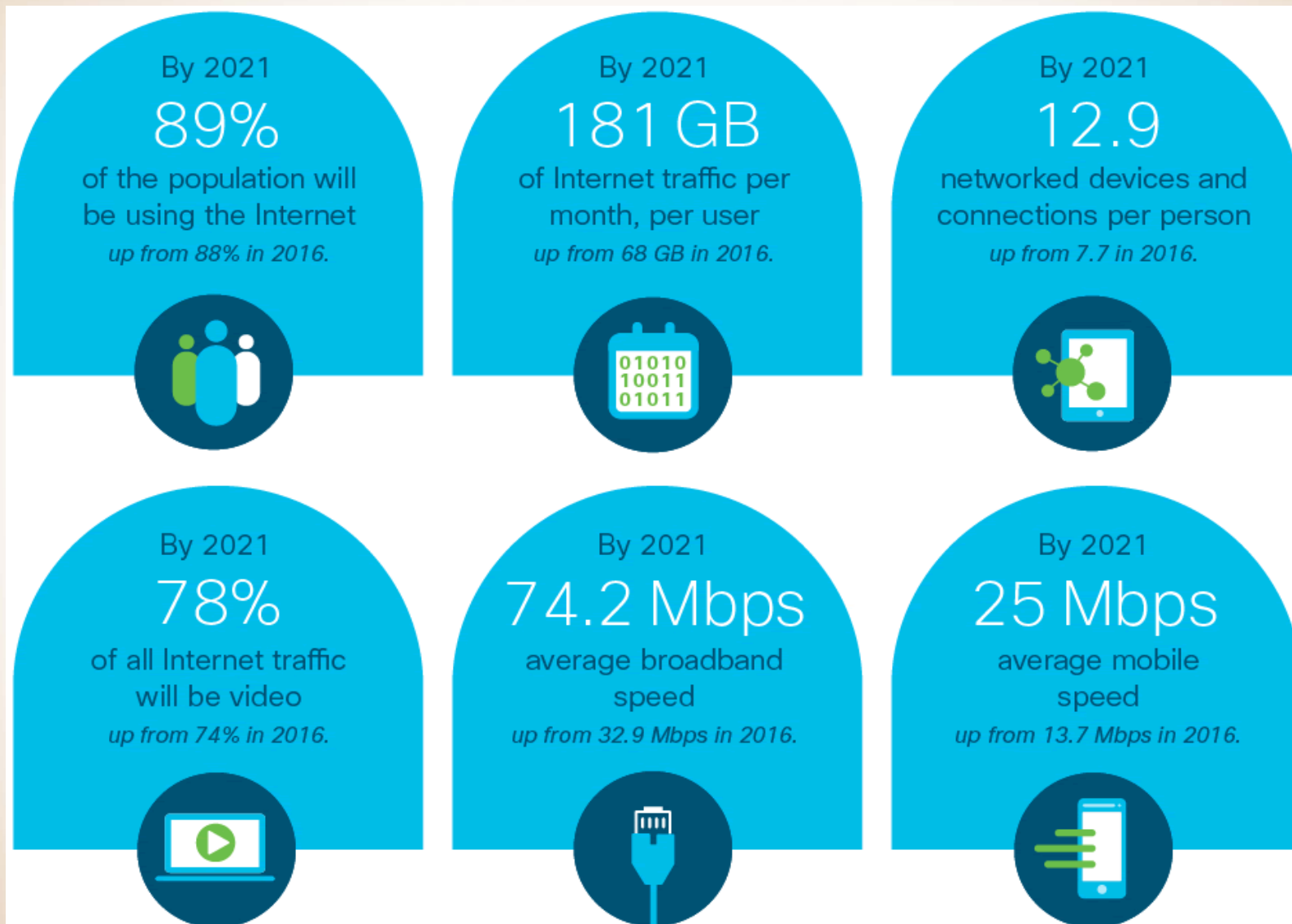
Wireless technology has evolved from analog, voice-centric, service to all digital data centric service.

Technology has evolved from vendor and continent specific standards and frequency bands to international standard technology. But, different frequency bands are still in use.

Source: CTIA *ex parte* presentation to FCC

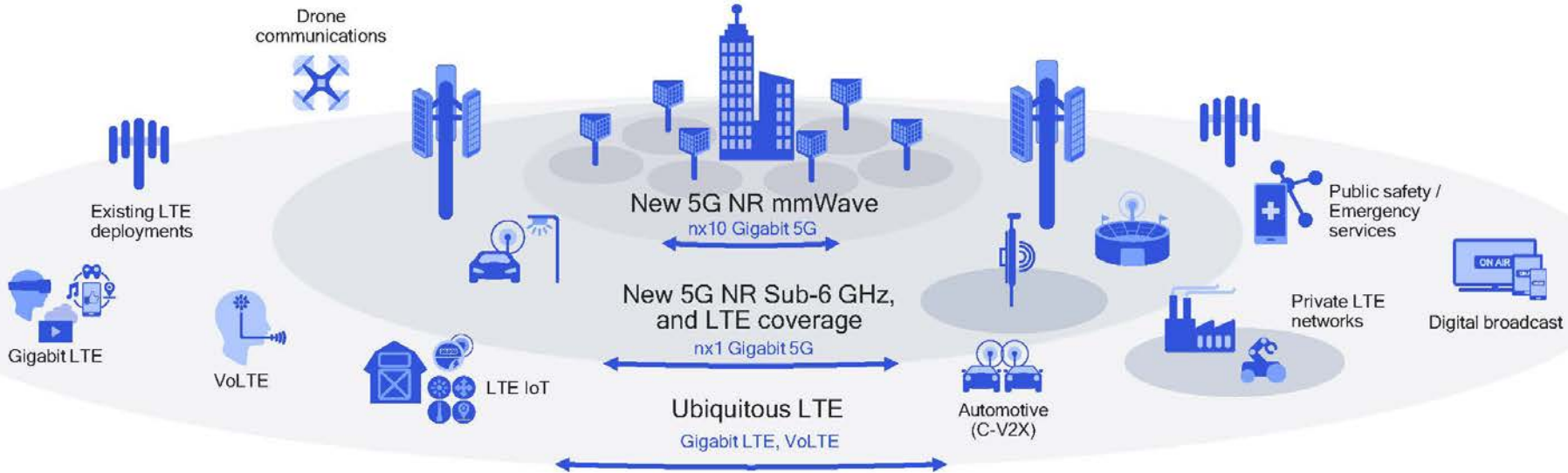
Why do we Need 5G?

5



How does 5G fit into the wireless ecosystem?

6



Gigabit LTE is here now and delivers a seamless 5G mobile experience

LTE IoT, private LTE network, C-V2X are enabling new mobile use cases today

LTE Advanced Pro leadership is essential to success in the 5G Era

4

Source: Qualcomm

5G Will Have Global Financial Impact

7



5G will expand the mobile ecosystem to new industries

*The 5G Economy, an independent study from IHS Markit, Penn Schoen Berland and Berkeley Research Group, commissioned by Qualcomm

Powering the digital economy
>\$12 Trillion
In goods and services by 2035*

Source: Qualcomm

Global Growth in the Use of Wireless Data is Driving the Future of Telecommunications



Worldwide Smartphones in Use:

2016 3.9 Billion

2022 6.8 Billion

CAGR: 10%

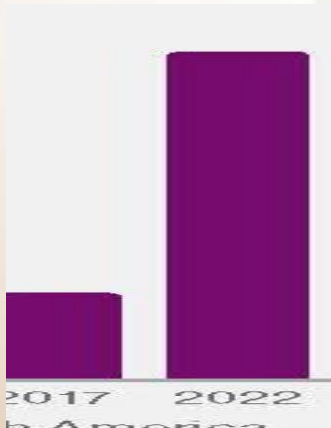


Worldwide LTE Subscriptions

2016 1.9 Billion

2022 5.0 Billion

CAGR: 18%



Worldwide Data Traffic by Smartphone per Month

2016 2.1 GB

2022 12 GB

CAGR: 33%



Worldwide Total Wireless Data Traffic

2016 8.8 Exabytes

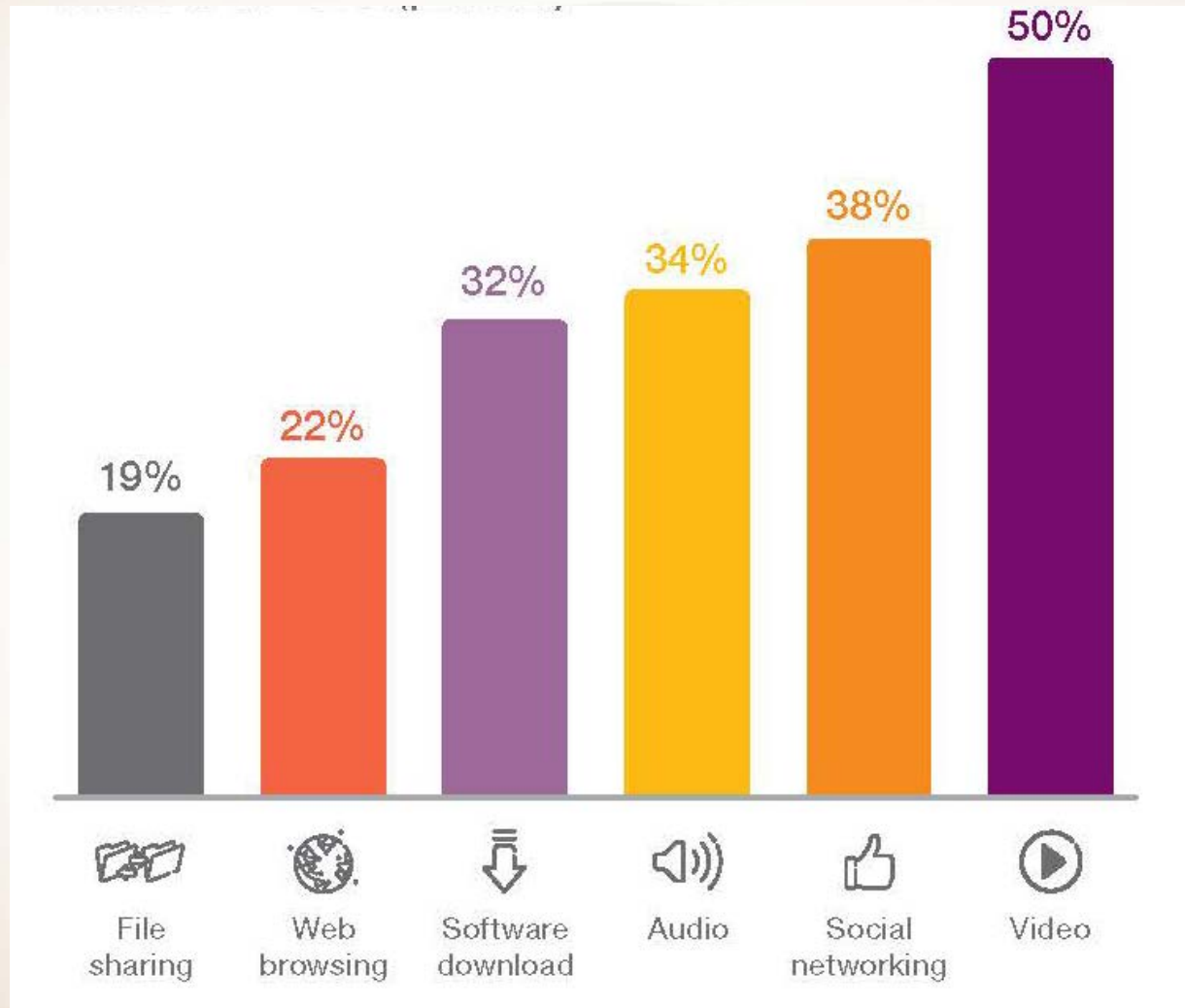
2022 71 Exabytes

CAGR: 42%

Source: Ericsson Mobility Report 2017

Growth in Wireless Data Traffic is Driven by Social Media, Audio, Video

9



Source: Ericsson Mobility Report 2017

Is 4G Obsolete? How about P-25?

10

Pundits tend to declare existing technology to be obsolete.

“Just delay technology investment because the new, new thing will be better”

For the record P-25 LMR will continue to be used for the foreseeable future. But, never underestimate the pace of adoption of disruptive technology.

3GPP is the standards body for both 4G LTE and 5G wireless.

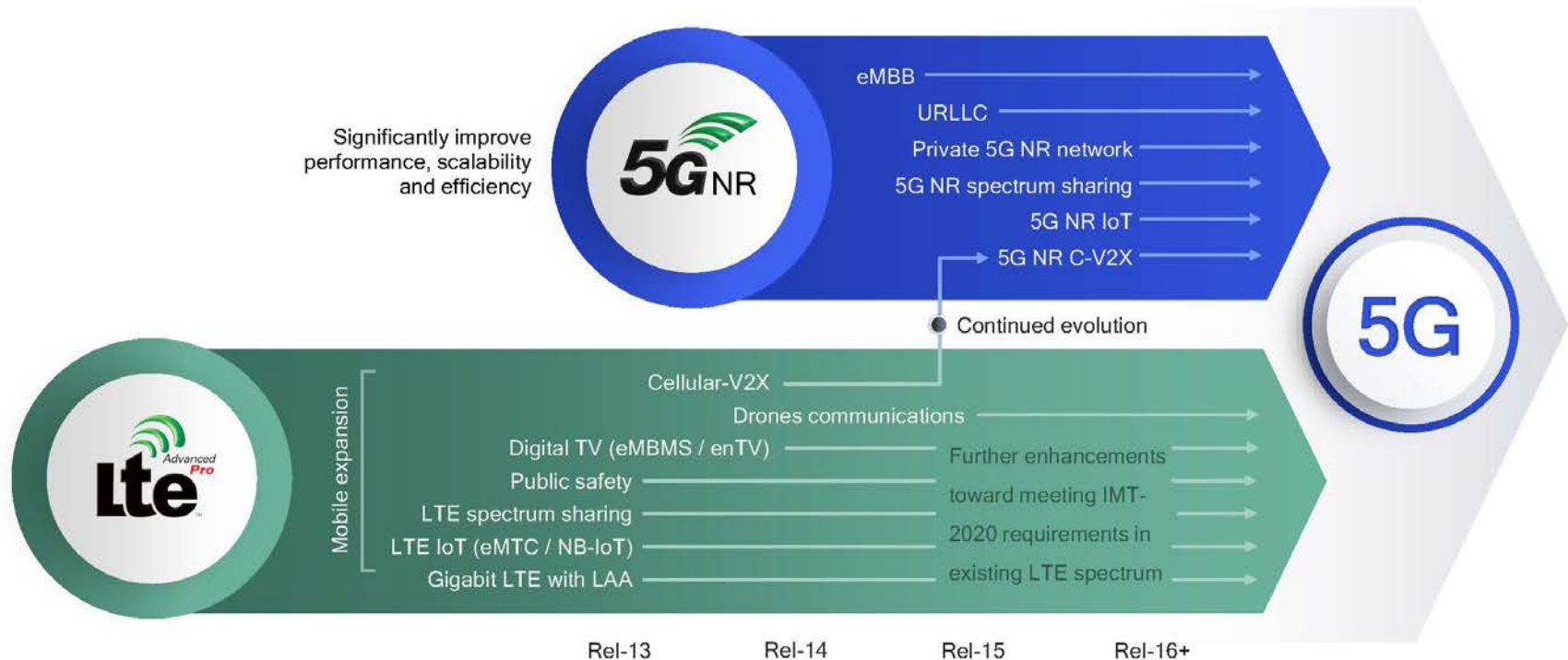
LTE = Long Term Evolution, and 5G provides forward and reverse compatibility with the Evolved Packet Core (EPC) used in 4G.

So, LTE is not made obsolete by 5G.

The dreaded technology forklift



A rich and continued roadmap of LTE Advanced Pro advancements is foundational to the 5G evolution



Source: Qualcomm

In Public Safety 5G Wireless will be Symbiotic with LTE

- Massive IoT
 - Sensors combined with artificial intelligence (AI) will analyze the meaning of inputs from numerous devices
 - Traffic control – predict emergency vehicle routes use signals to clear path
 - Biometric sensors for first responders
 - Gunshot location to greater accuracy
 - Fire reporting inside buildings improved
 - Improved EMS response - IFACGU
- Camera networks aided by AI
 - Association of all possible video sources to aid in first response and evidence
 - Object and person searching to assist investigations
 - Compilation of multimedia data sent to PSAP via NG-911.
- Autonomous vehicles
 - When there is an accident or breakdown who is the operator?

