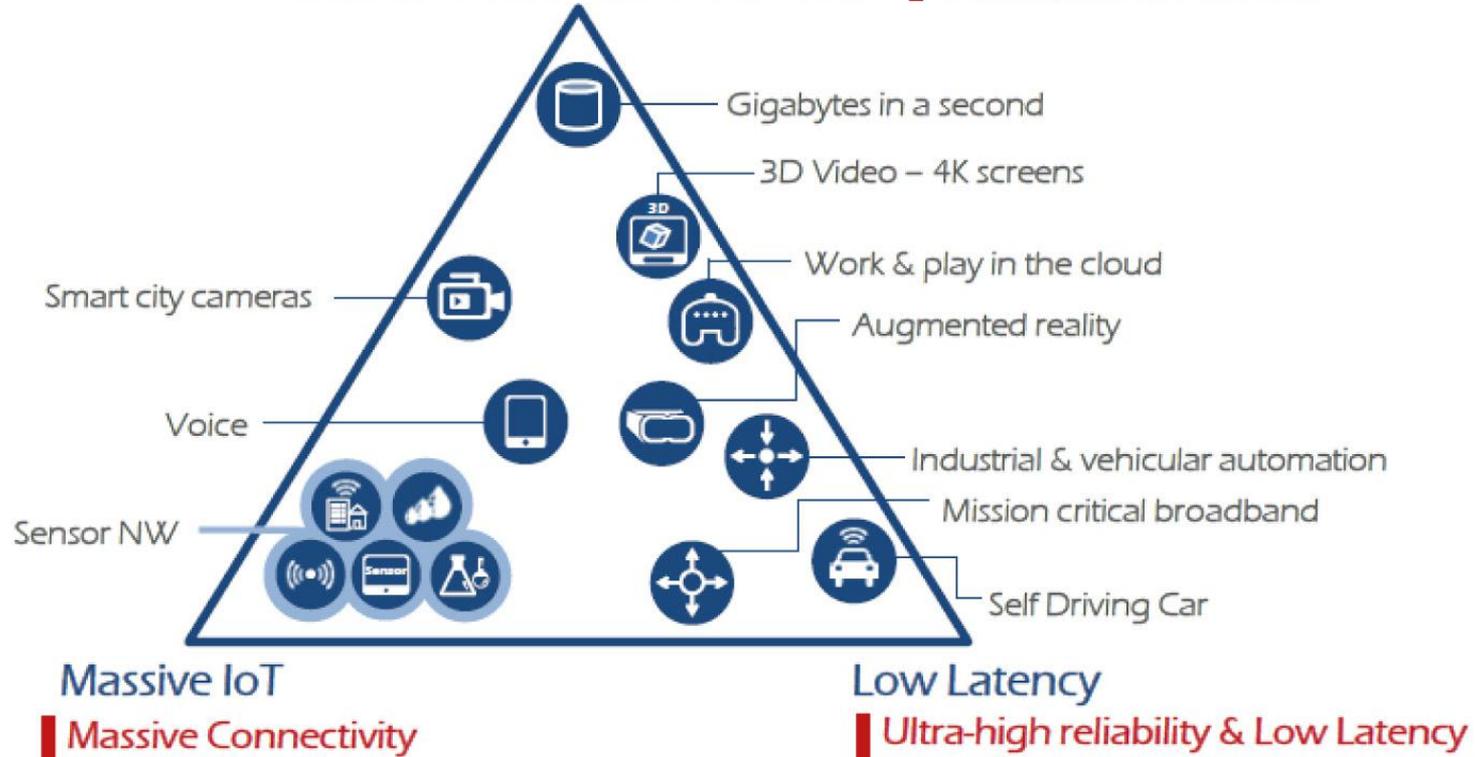


# 5G in Africa: An in-depth look at the Pros and Cons

AfriSIG - 23 November 2020  
Presented by Peter Bloom &  
Steve Song of Rhizomatica

# Enhanced Mobile Broadband | Capacity Enhancement



# 5G enhancements

**Enhanced Mobile Broadband:** The stated goal is 1 Gbps to your device, or better. To put that in perspective, the best performing 4G networks right now top out at about 45 Mbps, so not even 5% of the goal for 5G.

**Massive Machine-to-Machine Communications:** connect up to 1 million devices per square kilometer, compared to around 2,000 connected devices per square kilometer with 4G.

**Ultra-high Reliability & Low Latency:** all packets must get to their destination and do so extremely quickly (in 1 millisecond). For mission critical communications and advanced applications like remote surgery, etc.

# Examples of 5G use-cases

- Network slicing
- Autonomous vehicles
- Remote surgery
- Gaming and virtual reality (e.g. Google Stadia)
- Smart home

# 5G is a Different Kind of Generational Change

In some ways 5G is just a continuation of 4G with incremental improvements to radio performance and a focus on smaller cells and therefore higher throughput.

However, it also adds numerous additional areas of focus that benefit machine-to-machine communications and a hyper-consumerist model of mobile broadband.

## What's New?

Antennas: Massive MIMO and Beamforming

Radios: incremental improvements

Spectrum: multiple frequencies

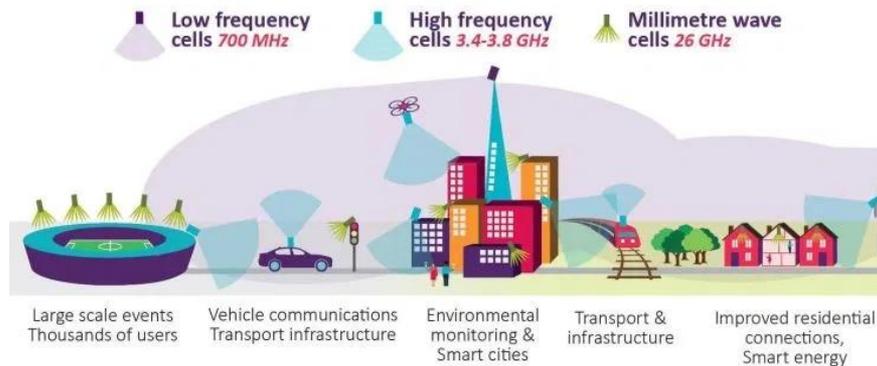
Network deployment: small cells

# 5G NEEDS ALL SPECTRUM BANDS



# Frequencies and uses for 5G

- Low-band (sub-1 GHz)
  - Best coverage but limited capacity
  - Macro cell deployment
- Mid-band (3.4 - 4.5 GHz)
  - Capacity but limited penetration
- High-band (24GHz and up)
  - Very high throughput but poor coverage and penetration
  - Many, many small cells needed e.g. streetlam



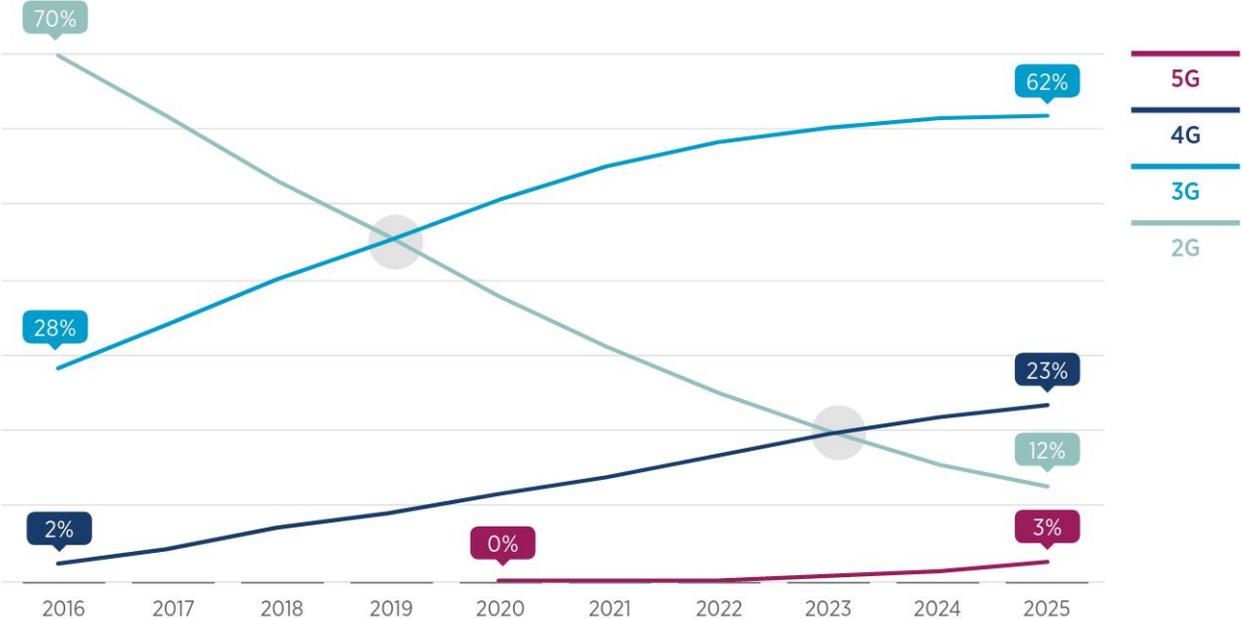
# 5G has serious drawbacks

- The amount of spectrum and infrastructure (base stations, fiber, etc.) necessary to fully deploy is substantial and unprecedented
  - Upwards of \$3 trillion US Dollars, globally!
- Uses 2 to 3 times more energy vs. 4G
- Transfer of ownership of urban infrastructure (e.g. streetlamps)

# Mobile Trends in SSA

## 3G takes the lead in 2019; 4G overtakes 2G by 2023

Percentage of connections (excluding licensed cellular IoT)



# 5G and the Digital Divide

5G does not have much to offer if our goal is the effective communication of people and their ability to access information and express themselves freely.

There are other, more affordable and appropriate options\*:

- Build out more terrestrial fiber lines
- WiFi
- Low-cost 4G (Open-Source e.g.)
- Open Standards (e.g. OpenRAN)

\* *All of the above technologies are also key enablers of 5G*



VOA News on China

# Chinese 5G Not Living Up to Its Hype

By John Xie  
October 10, 2020 06:13 AM



FILE - Visitors wearing mask to protect from the coronavirus walk past a 5G sign at the China Beijing International High Tech Expo in Beijing, China on Sept. 17, 2020.

Mounted on rooftops, utility poles and streetlights throughout China since last year are hundreds of thousands of high-tech wireless towers for 5G, a powerful sign of the country's ambition to lead in new technology. Yet many of them are operational for only half the day.

"In fact, human societies do not have an urgent need for 5G...What people need now is broadband, and the main content of 5G is not broadband."

*Huawei's founder and CEO,  
Ren Zhengfei*



5G will not solve the Digital Divide

# Thank you!

Peter Bloom @rhizomatica  
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