

5G TECHNOLOGY: THE NEXT LEVEL OF INNOVATION FOR A SMART NAMIBIA

MICT ICT SUMMIT 2018



CRAN
Communications Regulatory Authority of Namibia

Technological Evolution

2G	3G	4G	5G
1991	1998	2008	2020?
Voice Texting	Voice Texting Internet Access	Voice over LTE Texting Internet Access Video	Voice? Texting Internet Access UltraHD Video & 3D video Smart Home

What is 5G Technology?

- **5th Generation mobile technology**
- **Latest iteration of cellular technology since 4G**
- **Engineered to greatly increase the down and up load speeds and responsiveness of wireless networks**
- **Real time connectivity and interaction**
- **Advanced features making 5G mobile technology most powerful technology**
- **Designed to bring level of performance needed for IoT, Smart Cities and other “Smart” solutions**

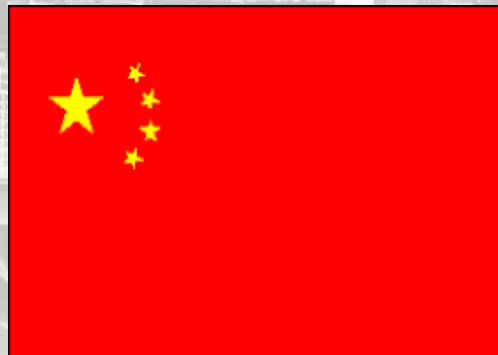
5G Features: 4G Compared to 5G

Technology	Data Rates	Latency	Mobility Support	Spectrum Efficiency	Users Density	Energy Efficiency
5G (NR)	Avg 100 Mb/s Peak 20 Gb/s	~ 1 ms	> 500 Km/h	x3 Better DL- 30 bits/Hz UL- 15bits/Hz	1000K/square Km	x100 Better
4G (LTE)	Avg 25 Mb/s Peak 300 Mb/s	~10- 50 ms	Upto 350 Km/h	DL – 6 bits/Hz UL- 4 Bits/Hz	~ 2K / square Km	Moderate



Status of 5G deployment

ITU Target date: 2020



5G: Enabler for

- ☐ Improved and greater Connectivity
- ☐ Extensive bandwidth
- ☐ Faster download and upload speeds
- ☐ Cloud-based Storage
- ☐ Range of connected devices
- ☐ Advanced digital networks
- ☐ Connect billions of devices and sensors
- ☐ Enable advances in many industry sectors
- ☐ Less latency and disruption

For whom is 5G?

In the first place it is for mobile operators to offer high-speed Broadband service due to exponential increase in data usage demand

However

- 5G is also offering new solutions for various new Business Cases to embrace a new **“Smart” Namibia** like:

5G SMART Cities

City that uses ICT's to enhance quality and performance of urban services in health, education, agriculture, tourism and economic sectors - to reduce resource consumption and overall costs

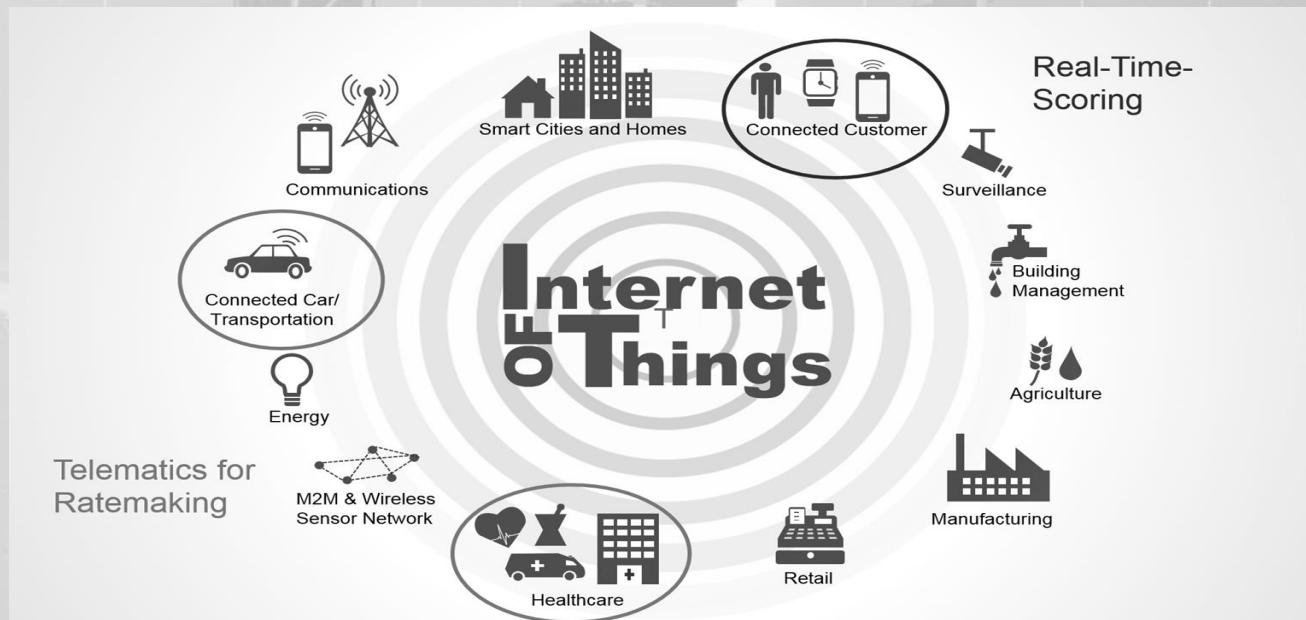
<https://youtu.be/bANfnYDTzxE>



Enhance the quality of living for its citizens through smart technology and IoT (Internet of Things)

The Internet of Things (IoT)

A network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these things to connect, collect and exchange data, creating opportunities for more direct integration of the physical world into computer-based systems, resulting in efficiency improvements, economic benefits, and reduced human exertions.



“SMART” HEALTH

Internet of Medical Things

- Improve health care, reduce strain on medical professionals and allow patients to be treated at home or away from hospitals

Namibian challenges:

- Inequities in access to basic health services especially in rural areas
- Lack of experienced medical practitioners
- Lack of Medical Supplies

What is Smart Health?

- Provision of health-related services using a network of context-aware intelligent agents



“SMART” HEALTH CONT.

- Digitally connecting medical centres, systems and medical devices across the country and across the world. Sharing of Patient information and medical imaging digitally for diagnosis and evaluation
- Connection of medical devices will allow doctors to monitor patients without the need for costly in-patient care and visits
- Real time medical treatment and medical operations/treatment guidance, diagnosis, evaluations and virtual consultations by medical specialists abroad via video calling applications



“SMART” EDUCATION

- **Use of electronic media or technologies to support and enhance teaching and learning in schools and Universities**
- **Improve the quality of education, academic achievements and classroom interaction and participation, access to education and equity through the use of e-learning programmes, mobile devices, interactive white-boards and computer technologies**
- **Real time connectivity, interaction and virtual consultations between teachers and learners, students and lecturers outside the classrooms via digital educational platforms**
- **Online “live” real-time training initiatives and programmes**



“SMART” TOURISM



- Digitization of all processes and value chains in the tourism, travel, hospitality and catering industries that will enable organisations to maximise their efficiencies and Improve service quality and production
- Real-time digitisation of anti-poaching initiatives

“SMART” TOURISM CONT.

- **Real-time virtual social media communication and interaction in relation to customer experiences, tourist experiences, destination marketing, country reviews, service and product quality etc**
- **Real-Time virtual destination /country tours and “walk-throughs” with spatial presence**
- **Real-time virtual consultations: VISA Applications**

Backhauling

- ❑ For 5G to be successful it requires a backhauling infrastructure like FTTx or high capacity radio transmission links that are affordable and accessible by all players

CONCLUSION

ROLE OF REGULATOR IN 5G DEPLOYMENT

- The following spectrum bands, are under consideration for allocation to IMT services under the agenda points for WRC-19-

- | | |
|-------------------|---------------------------|
| – 24.25-24.75 GHz | 45.5-47.0 GHz, |
| – 31.8-33.4 GHz, | 47.0-50.2 GHz, |
| – 37.0-40.5 GHz, | 50.4-52.6 GHz, |
| – 40.5-42.5 GHz, | 66-71 GHz; |
| – 42.5-43.5 GHz, | 71-76 GHz; and 81-86 GHz. |

CONCLUSION

ROLE OF REGULATOR IN 5G DEPLOYMENT

- The deployment of 5G networks will rely on the creation of ecosystems making use of different cell sizes and combining different technologies to allow for variances in coverage requirements, augment overall network capacity to provide ubiquitous services indoor and outdoor to users living in rural and urban areas.

CONCLUSION

ROLE OF REGULATOR IN 5G DEPLOYMENT

A range of spectrum bands will be required to satisfy demand from diversified services

Basic Coverage Layer

- Technology & Service neutrality to enable LTE deployment
- Release of digital dividend key for rural provision

700 MHz

800 MHz

900 MHz

1400 MHz

Basic and Core Capacity Layer

- 1.8/2.1 GHz with 4T4R
- 2.3/2.6 GHz TDD with massive MIMO for hotspot capacity

1800 MHz

2100 MHz

2300 MHz

2600 MHz

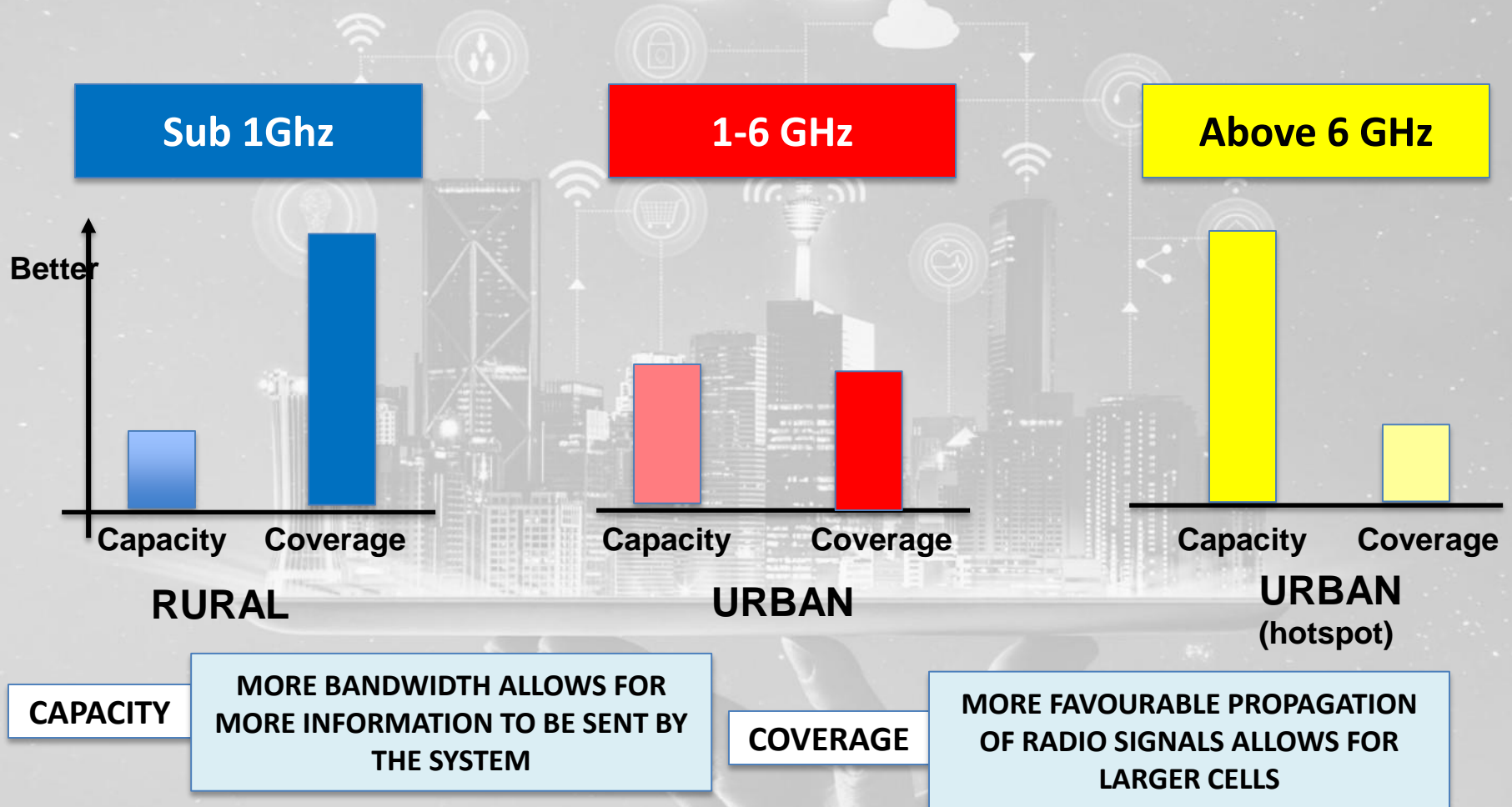
Complimentary Capacity Layer

- 5G bands
- FWA hotspot capacity
- Massive MIMO in C-band to achieve same coverage as 1800 MHz

3400-3600 MHz

WRC-19/
mmWave

Different spectrum for deployment needs



CONCLUSION

ROLE OF REGULATOR IN 5G DEPLOYMENT (IoT)

- In a large number of use cases the devices that allow for IoT are based on machine-to-machines services which is an improvement on legacy services historically provided in the fleet management and manufacturing sectors.
- Technological development has resulted in innovative new services allowing for the interconnection of these devices through machine-to-machine and machine-to-person applications, big data analytics and improved cloud services.
- These services are ultimately linked to IMT-2020, common standards and new delivery platforms.

CONCLUSION

ROLE OF REGULATOR IN 5G DEPLOYMENT

- As such these services will directly impact on regulatory frameworks in so far as licensing, standards, spectrum management, competition and privacy are concerned.
- Consideration is currently being given to assessing the 863-870 MHz band for spectrum licence exempt allocation for IoT subject to technical conditions
- Current high cost of backhauling and lack of infrastructure sharing needs to be addressed

5G



Thank you!



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