

5G is in reach

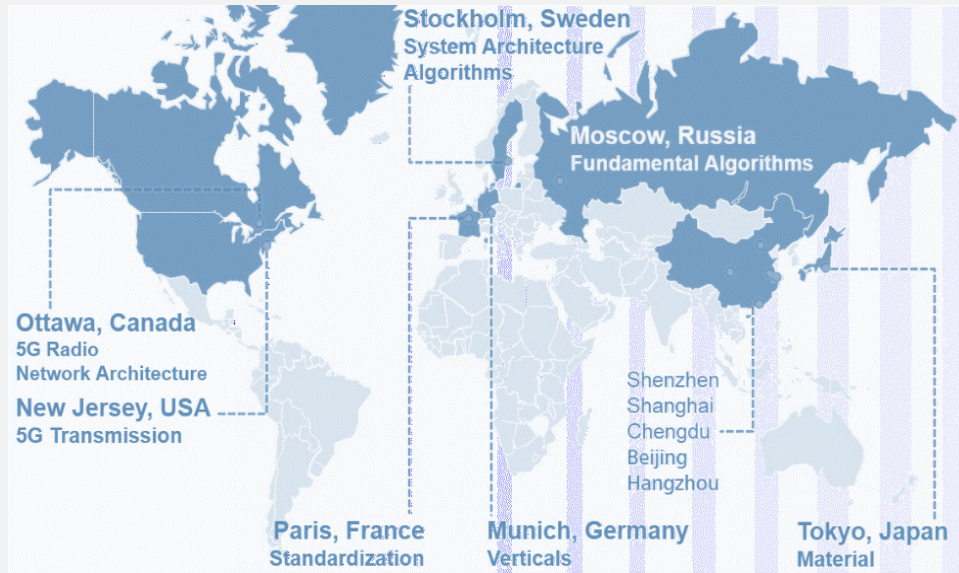
Global 5G Innovation & Cooperation

Huawei 5G R&D Activities

Since 2009 research on 5G

In 2012 first 5G prototype

In 2018Q3 5G NSA e2e solution



12 5G research centers

300+ top 5G scientists

8000+ R&D employees

Huawei in Standard Organizations and Industry Alliance



- 90+ key roles in more than 100 international standards organizations
- Initiator of 5GAA, Promoter the establishment of 5GACIA

Huawei in 5G Tests, Trials and Pilots Launched by Gov



- Make ongoing contributions to **Phase II of the EU's 5GPPP program** and regularly present the results to the EU Commission
- Work with other **EU companies** in ITU-R, H2020's 5GPPP, WWRF, and 3GPP to promote 5G R&D



- Participation in **Phase I of DCMS UK 5G Testbeds and Trials Programme**
- Communications with Ofcom concerning frequency technologies and policies



- Participation in **3 cities' 5G trials and testing** launched by the gov, in cooperation with the operators



- Participation in **IMT 2020 Phase I, II and III** of field tests with the other vendors



- Participation in **5G MF, R&D on 5G through Industry-Academic-Government cooperation**

So far, Huawei has been awarded 91 commercial 5G contracts and shipped over 700,000 5G Massive MIMO Active Antenna Units (AAUs).

5G as the National Strategy, Need President and Prime Minister as the Sponsor to Speed up Spectrum Release and Provide Supportive Policies



USA

5G Fast strategy issued by the President



2018.9.28, **Trump** issued **5G Fast** in White House: targeting at release **more 5G spectrum & supportive regulations**

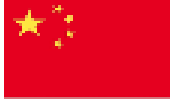


High level attendees:

- US chief economic adviser
- NTIA policy adviser
- FCC Chairman



2018.10.25, **Trump** signed & issued a **presidential memorandum** on developing 5G Spectrum Strategy

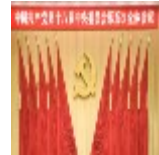


China

5G national policy signed by the prime minister



5G national commercial goals and plan signed by **prime minister** Li and issued by **the state council**



National strategy (2016-2020)

Including acceleration of 5G development and 5G commercial



- **MIIT** coordinated the **spectrum clearance** of C-Band
- **Reduction** and **exemption** of 5G **spectrum usage fee**



Japan/ Korea

Governments take the lead in 5G strategy launch



- Japan **MIC** launched **5G boost strategy** in 2016 for leading in 5G development
- Released **600MHz mid-band** 5G spectrum **free** of charge in 2019



- Korea **MSIP** launched **5G national strategy** by investing **\$14.3 billion** in 2015
- Korea **government** drive the whole **industry** involved in national 5G development, and launched **GIGA Korea** and **5G Forum**



Europe

EU committee issued 5G action plan in 2016

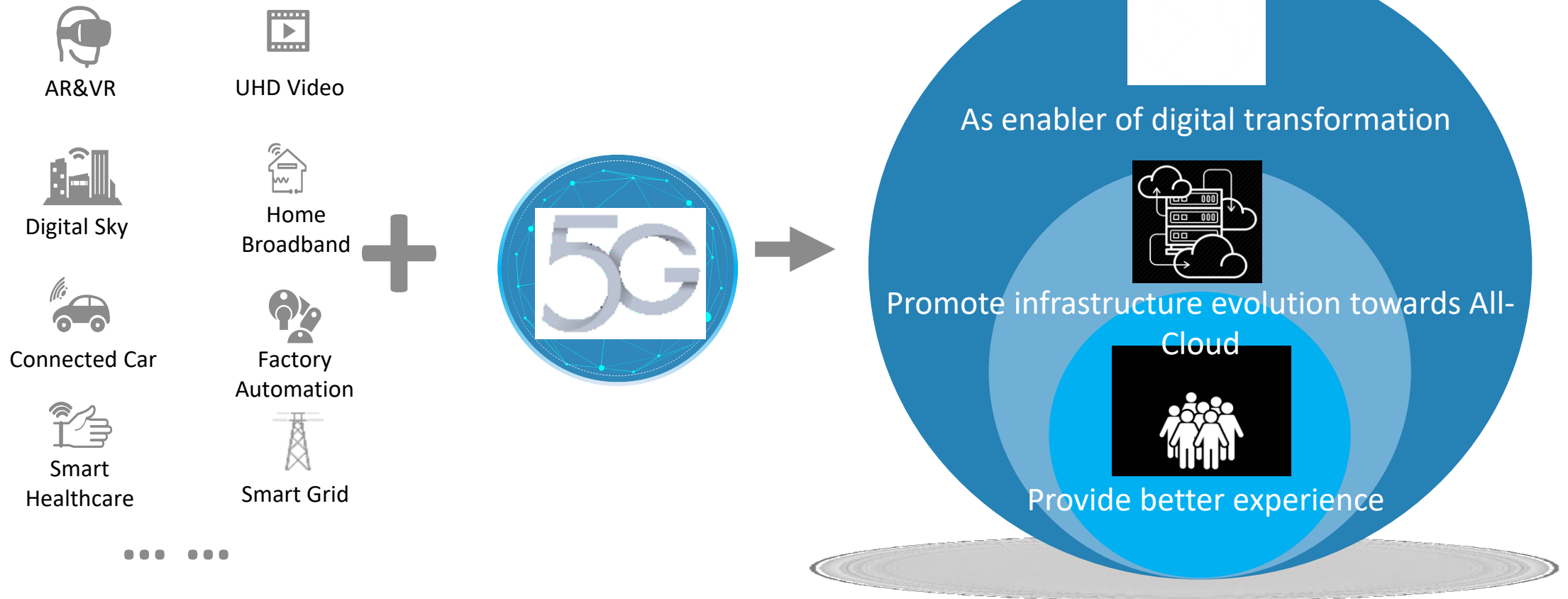


- UK Government issued **national 5G strategy** in 2017
- Government invested **£11 billion** in 5G digital infrastructure construction
- Government **coordinated** the **5G infrastructure implementation**



- Germany government issued **national 5G strategy** in 2017
- Government coordinated the **share of public infrastructure** to meet 5G deployment requirements

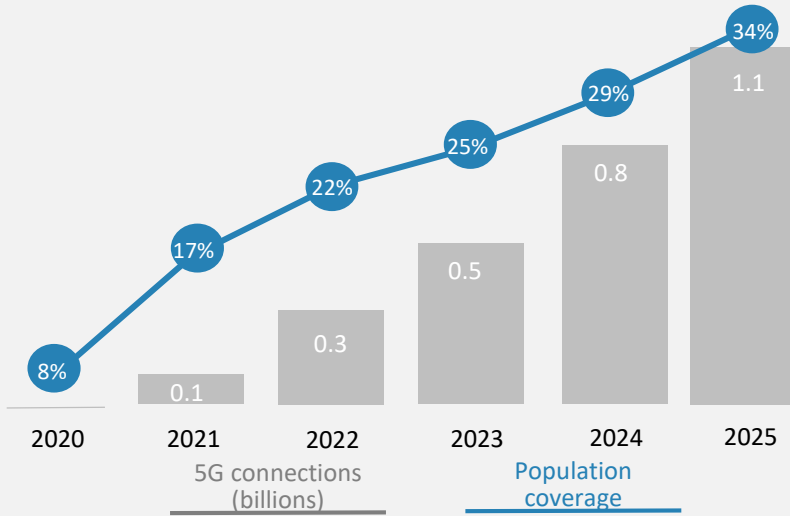
5G Enabling Digital Economy



The mobile networks and the Internet of Things will be two major driving forces for the future development of mobile communications, and will provide broad prospects for 5G to build a better digital society.

How 5G will Influence Economies

Global 5G coverage and adoption



Source: GSMA Intelligence

Global 5G value chain output and employment in 2035



United States

Gross output \$719B
Employment 3.4M



Korea

Gross output \$120B
Employment 963K



Japan

Gross output \$492B
Employment 2.1M



United Kingdom

Gross output \$76B
Employment 605K



Germany

Gross output \$202B
Employment 1.2M

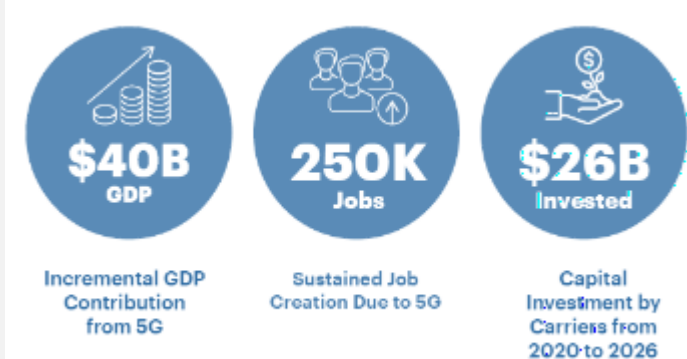


France

Gross output \$85B
Employment 396K

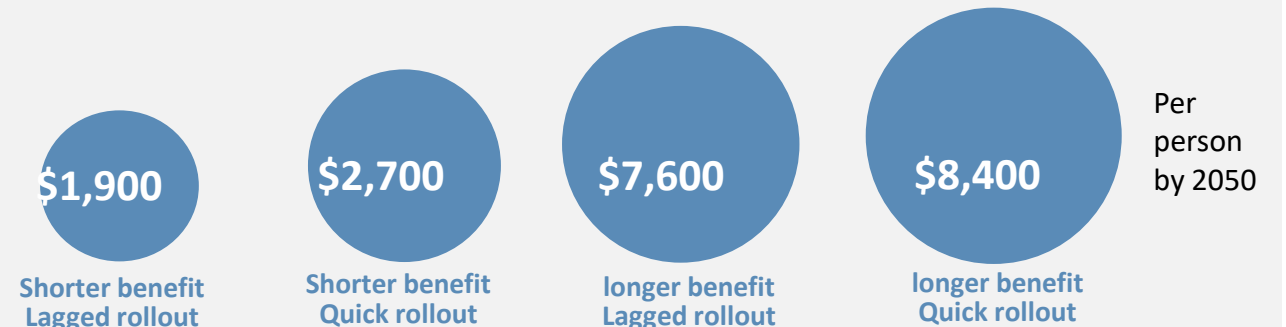
Source: IHS, The 5G economy: How 5G technology will contribute to the global economy

Contribution of 5G to Canadian Economy



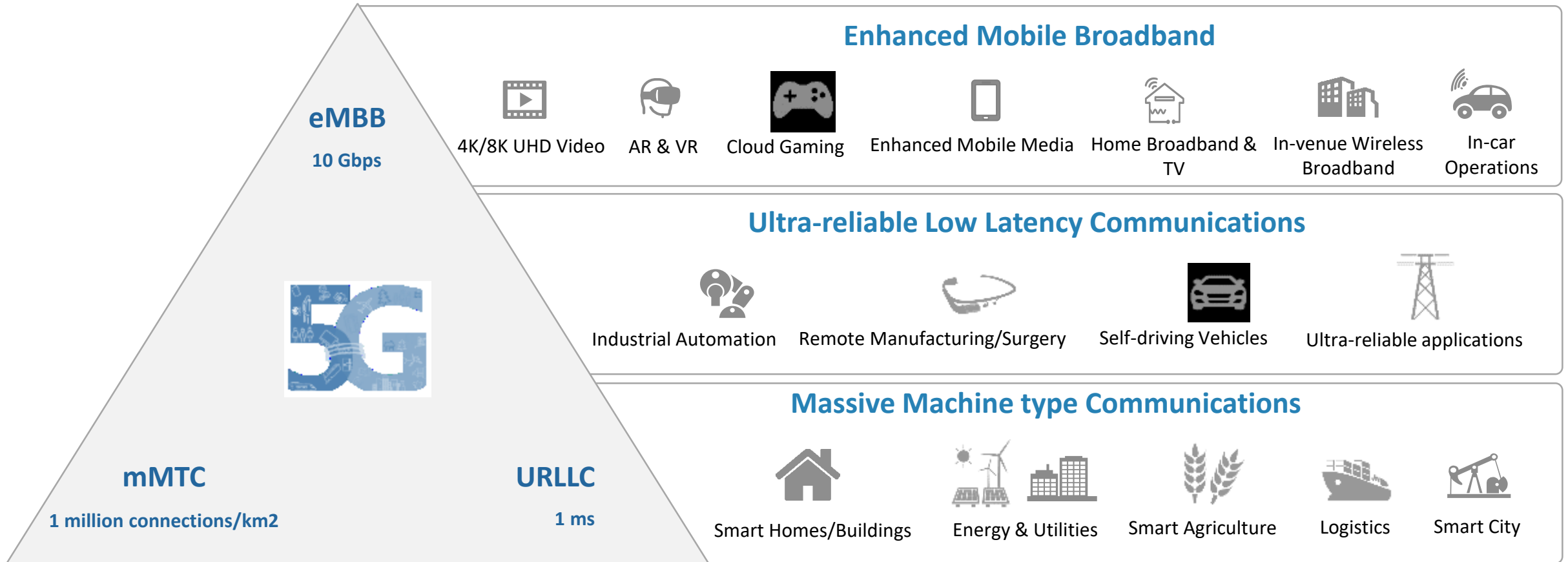
Source: Accenture strategy, fuel for innovation, Canada's Path in the Race to 5G

5G's productivity benefit on real Australian GDP per capita in 2050



Source: Australian Government, Impacts of 5G on productivity and economic growth

Key Usage Scenarios Drive for 5G



Source: Recommendation ITU-R M.2083

5G connections will go beyond human beings' communications, and will enable intelligent internet of things in the future. Next generation of telecommunication technologies will be adopted by a wider range of industries and sectors.

5G Fights Against Covid-19 and Improves the Efficiency of Diagnosis and Treatment in China

5G remote consultation



Multi-hospital expert consultation
In response to the disease, multiple expert meetings discussed, reached consensus, etc.

5G ambulance



Timely treatment of critically ill patients
Hospital experts remotely intervene in ambulances to improve the efficiency of experts

5G remote diagnosis



Improve the efficiency of medical staff
Remote treatment by remote experts to improve medical efficiency

5G Mobile trolley



The most popular 5G application
Reduce the number of quarantine by medical staff to reduce the risk of infection

5G Unmanned vehicle



Timely supply, contactless delivery
Unmanned vehicles deliver items to designated locations to reduce contact infection

Non-contact temp. detection



Epidemic prevention and control
Reduce the risk of cross-contamination caused by contact temperature measurement, $\pm 0.3^{\circ}\text{C}$

Medical robot



Medical equipment handling
Reduce the risk of personnel infection in the quarantine area

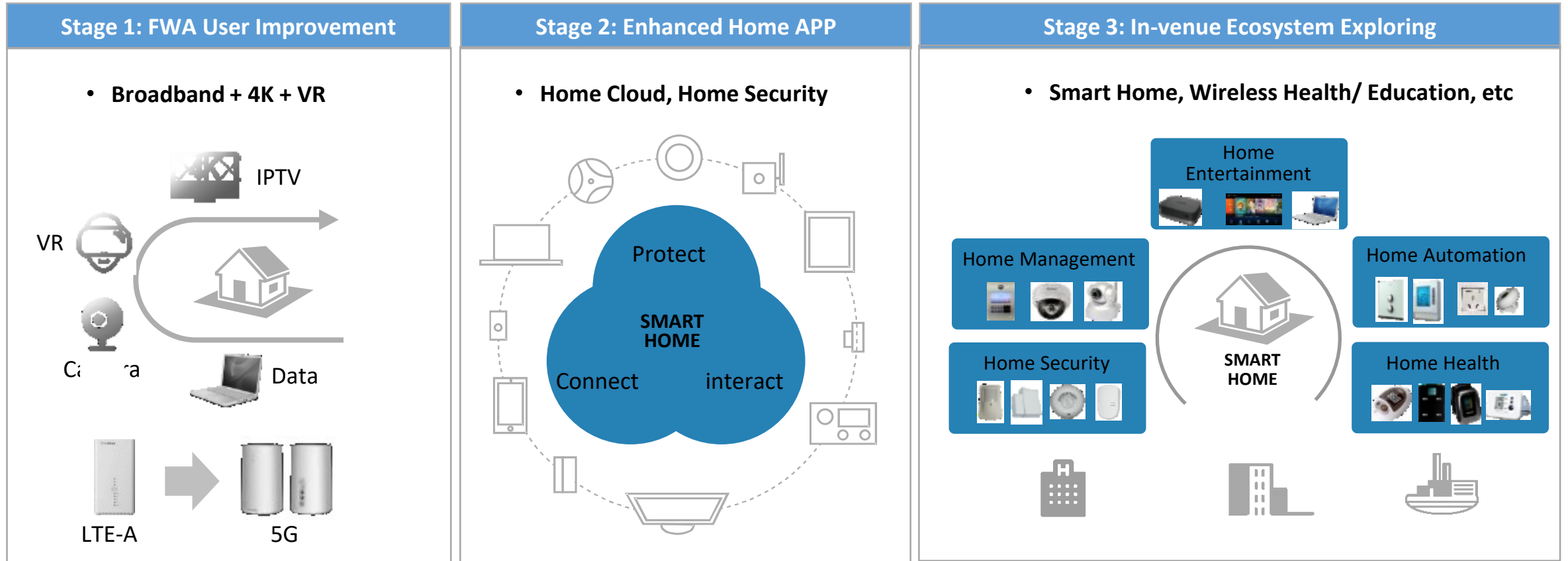
5G Mobile detection vehicle



Flexible docking, get medical treatment nearby
Reduce the possibility of cross infection due to going to the hospital

During the epidemic, 5G enabled a large number of applications such as **remote medicine, remote prevention and control, and remote diagnosis and treatment**, and improved medical efficiency with technology

5G-based Fixed-Wireless Access can Provide Gigabit Broadband to Homes



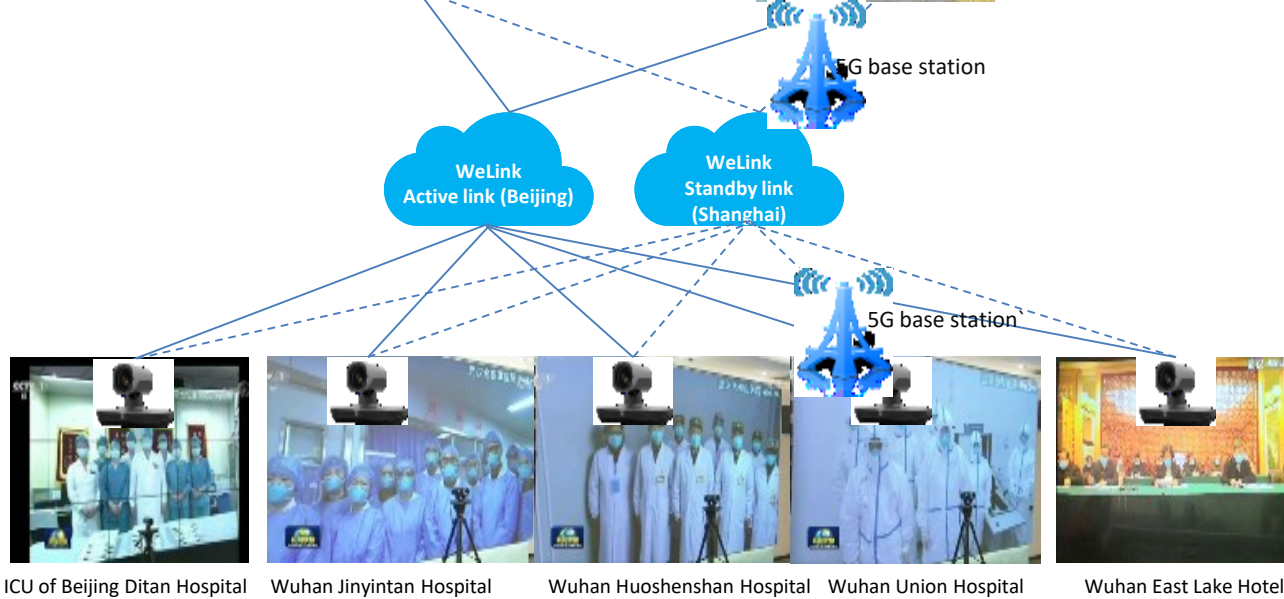
5G will provide an attractive alternative to complement existing provisioning of gigabit home broadband. Close cooperation between the telecom operator and the service creator will help to improve chances of success in the market.

Government Issued Instructions on Medical Work Arrangement to Frontline Anti-epidemic Personnel by Video Conference

General Secretary Xi Jinping held three WeLink meetings within one day to guide the anti-epidemic work arrangement.

Operation monitoring center of Beijing Ditan Hospital

Telemedicine center of Beijing Ditan Hospital



ICU of Beijing Ditan Hospital Wuhan Jinyintan Hospital Wuhan Huoshenshan Hospital Wuhan Union Hospital Wuhan East Lake Hotel

Network requirements of the national video conference:

- ❑ **Fast service provisioning:** the duration from task receiving at the night on February 9 to service provisioning in the afternoon on February 10 is **shorter than 24 hours**.
- ❑ **High business assurance level:** Zero video interruption and no frame freezing; 1+1 protection for the bearer network plane; 1+1 protection for the business plane

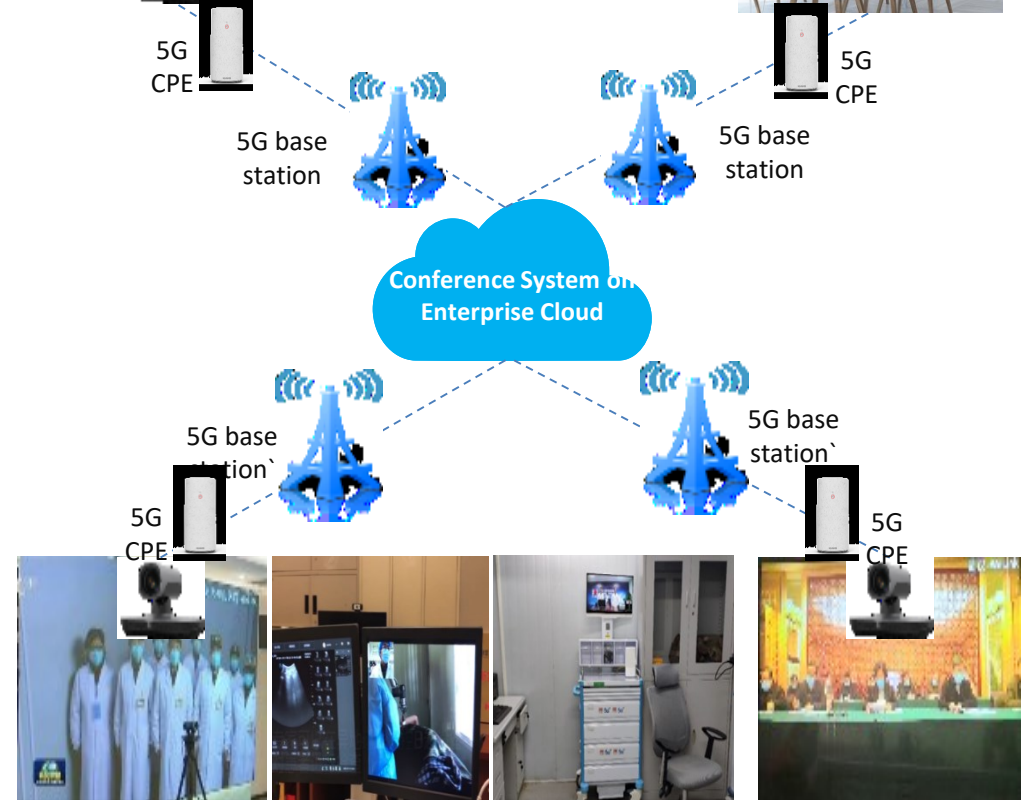
Proposal for Kenya



State House



President's House



Kenyatta/ Mbagathi Hospital Remote Diagnosis Mobile Trolley Ministry of Health

5G Enable Live Streaming of Famous Attractions

China Telecom 5G Zolmo Lungma View Broadcasting



Ads Web Flyer



User Portal



Beautiful Sunset Live Broadcasting



5G Site and 3 4K Cameras Installed A.S.L 5300m

Business Value :

- 4K UHD, VR View, 360° Immersive Experience
- 6M Customers Watched live broadcasting from China Telecom APP



Kenya 5G Safari Broadcasting Proposal



5G site + FHD Camera in Hotel or wild view spot



Cope with Tiktok, Youtube , facebook, use Web/APP live broadcasting of live wild scene for brand advocating

5G Enable Factory Automation

China Mobile 5G Based Intelligent Ningbo Port



Truck Auto Driving



5G+AI container piling



Auto Pooling Pilots



Intelligent gantry crane

Commercial Model:

- Professional Port Integration Corporation as the primary integrator, integrating Telco 5G solutions & other equipment vendors



Proposal for Kenya 5G based industrial solutions



Chemical Factory where is dangerous for human



High-tech Factory requiring advanced skills



Office park demanding 5G Private line



Mombasa Port Automaton

Commercial Model:

- Cope with professional industrial Integrators for automation solutions towards 5G suitable scenarios (High-tech, Toxic etc)

The Road to 5G

Aspiration

Roadmap

Making spectrum available in a timely manner

Reviewing existing telecommunications regulatory arrangements to ensure they are fit-for-purpose for the future

Actively engaging in the international standardization process

Stimulating the experiment and demonstration to promote the taken-up of technology(coverage, penetration, etc.)

Streamlining arrangements to allow the carriers to deploy infrastructure by timetable

Task & Tool

Resourceful Policy

Spectrum

Decretory Policy

Approval

Limits

Easing

Obligation

Participant Initiative

Interdepartmental
management

Data sharing

Platform for
dialogue

Platform for
cooperation

Economic Incentive

Funding for R&D&I, USF

PPP

Tax deduction & exemption

It's dedicated to settle down the targets, leverage existing resources, unlock bottlenecks, ease the procedures and provide the certainty for investment over the long term.

Thank you