INTELLIGENT
CONNECTIVITY

'The fusion of 5G, AI and IoT :
intelligently connecting everyone and everything
to a better future'

William Tse
Head of Strategic Engagement, Hong Kong, Taiwan, Macau
GSMA

Who is The GSMA?

THE GSMA WAS FOUNDED IN **1987**

Intelligently Connecting Everyone and Everything to a #BetterFuture

The mobile industry is the first to formally commit to the UN Sustainable Development Goals

Representing the interests of

750+ MOBILE OPERATORS

NEARLY **400** COMPANIES IN THE BROADER MOBILE ECOSYSTEM

Hosting the world's leading mobile industry events, MWC Barcelona, MWC Shanghai, MWC Los Angeles and the Mobile 360 Series attract

230,000 people from across the globe

The GSMA works to deliver a regulatory environment that creates value for consumers by engaging regularly with

MINISTRIES OF TELECOMS

TELECOMS REGULATORY AUTHORITIES

INTERNATIONAL & NON-GOVERNMENTAL ORGANISATIONS

8.7 bn+ MOBILE CONNECTIONS WORLDWIDE

InfoCentre[2] Member-only platform connects 23,000+ **industry experts**

100+ TECHNICAL WORKING GROUPS Promote industry best practice, harmonise operational frameworks and standards

Global market

Internet of Things

9.1bn 2018 — Total connections — **25.2bn** 2025

Unique mobile subscribers

2018
5.1bn

67% PENETRATION RATE (% of population) 71%

CAGR 2018–25

5.8bn
2025

↑ 1.9%

Mobile internet users

2018
3.6bn

47% PENETRATION RATE (% of population) 61%

CAGR 2018–25

5.0bn
2025

↑ 4.8%

Smartphones
% of connections*

60% 2018
79% 2025

4G % of connections* 43% 2018 — **59%** 2025

5G **1.4bn** 2025 — **15%** of connections*

*Excluding cellular IoT

Mobile industry contribution to GDP

4.6% of GDP — **$3.9tn** 2018

4.8% — **$4.8tn** 2023

SIM connections
Excluding cellular IoT

7.9bn 2018

9.2bn
2025

103% PENETRATION RATE (% of population) 112%

CAGR 2018–25

2.2%

Operator revenues and investment

2018
$1.03tn

$1.14tn 2025

Operator capex of $321 billion for the period 2019–2020

Public funding

Mobile ecosystem contribution to public funding (before regulatory and spectrum fees)

$510bn
2018

Employment

2018
14m Jobs
directly supported by the mobile ecosystem

+17m indirect jobs

Smart Platforms With AI

Intelligent Connectivity – the next step
'The confluence of high internet speeds, big data, the Internet of Things, analytics and artificial intelligence will fundamentally alter the way we live and work, intelligently connecting virtually every device, making our cities smarter and our lives easier and more productive.'
Mats Granryd, Director General, GSMA

5G era Mobile Networks
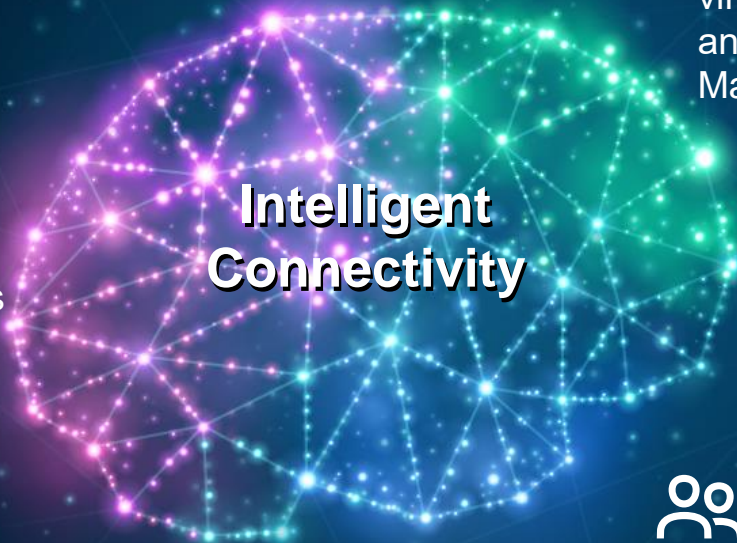
Intelligent Connectivity

IoT Everything connected

People

Houses

Infrastructure

Vehicles

Factories

Cities

the value created by
the fusion of 5G, AI and IoT

Intelligent Connectivity

The enterprise opportunity could be worth >60% of current revenues

Retail — $29bn; 3%

Transport (incl. Automotive) — $122bn; 12%

Manufacturing — $113bn; 11%

$620 bn
62% of current rev.

Financial Services — $30bn; 3%

Energy & Utility — $101bn; 10%

Media and entertainment — $62bn; 6%

Healthcare — $76bn; 8%

Public Safety — $78bn; 8%
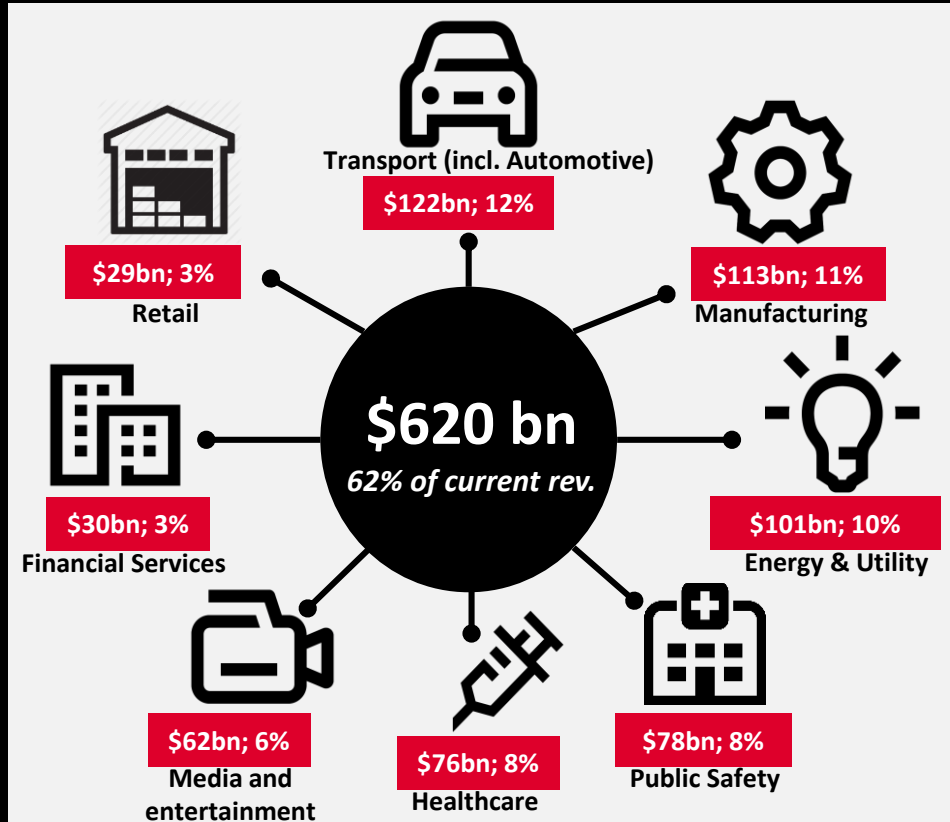
- 60% of new opportunities will be straightforward B2B (rest will be B2B2C)

- Public Safety opportunity is mostly B2B; Media and entertainment is mostly B2B2C

- Enterprises require a simple and singular way to reach all their customers

- Engaging with Enterprise requires a change of mind-set to tap into the huge value

- If Operators do not adapt, the opportunity will be provided by others or developed by themselves (e.g. Ocado)

5G Expectation from Vertical Market

1 Automotive
- Seamless QoS for automotive services
- Low latency, eMBB for platooning
- Autonomous vehicles and remote support and diagnostics
- Network slicing for infrastructure mgnt.

2 Media & Content
- VR for living broadcasting and immersive entertainment experiences
- Enhanced retail experience / commerce
- Cloud gaming
- Alternative to satellite
- 5G for content production

3 Public / Smart City
- Connected police vehicles
- Equipping police officers with smartphones for a variety of use cases
- Smart city management

4 Healthcare
- Replacing wired equipment in surgery rooms
- Remote diagnostics
- Robotics (pharmaceutical dispensary, surgery)
- AI & analytics on medical records

5 Manufacturing
- Wireless / cheaper connection of mass devices
- Virtual control of CPUs
- Telemetry / exchanging of information in real-time
- Network slices for simplification of hardware

6 Energy & Utilities
- Edge computing to scale devices and process analytics
- 5G as substitute for last mile
- Micro-robotics
- Virtual plant management / efficiency management

7 Software & tech
- Next generation work sites
- Network slices / personalized networks provide flexibility to enterprises
- New services opened by real-time interpretation
- Robotics

5G Mobile and Related Technologies

Source: China Unicom and Deloitte
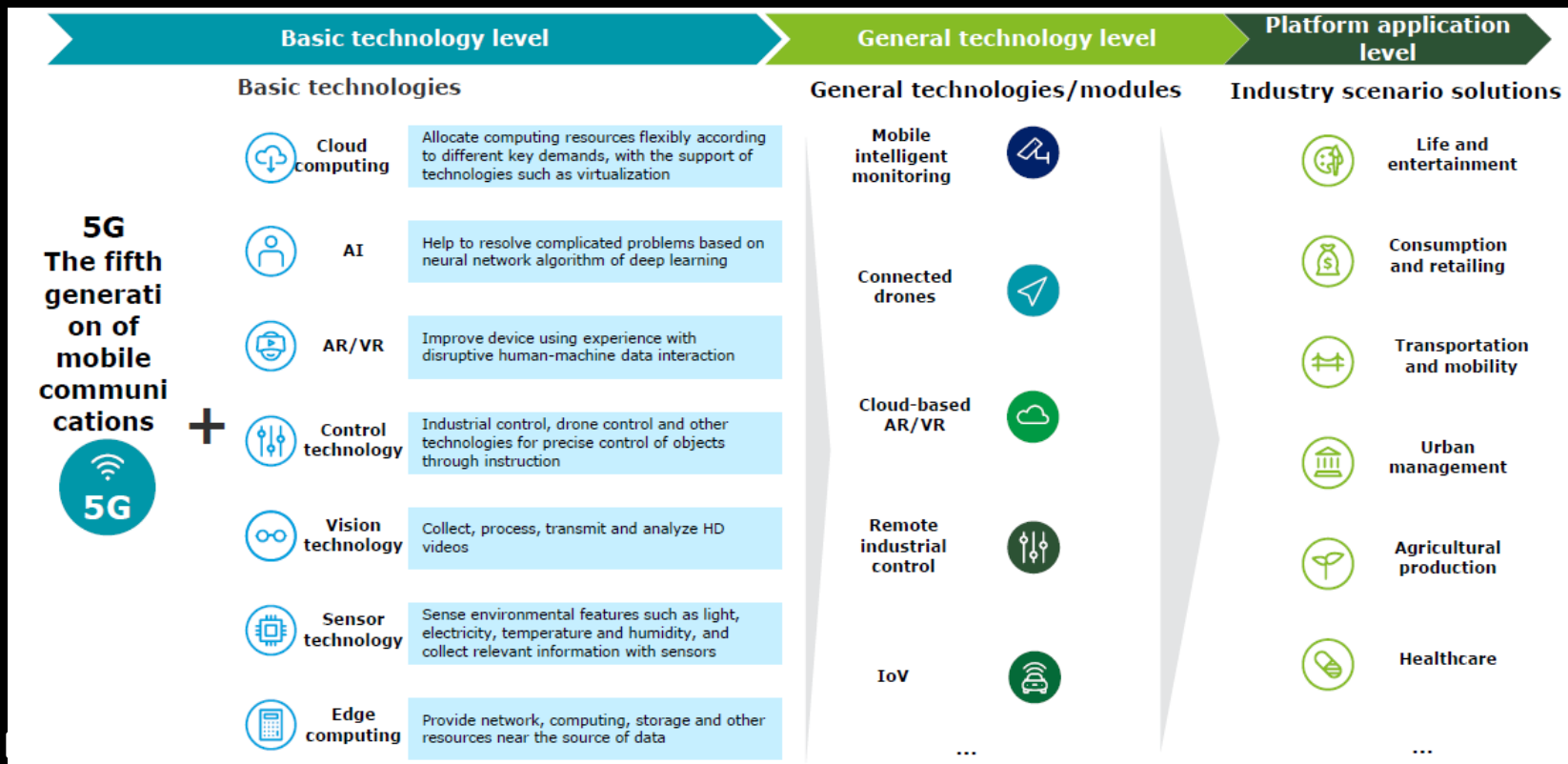
5G Innovation and Application Model

5G Connectivity

5G

"100+Mbps"
And
">5ms Latency"
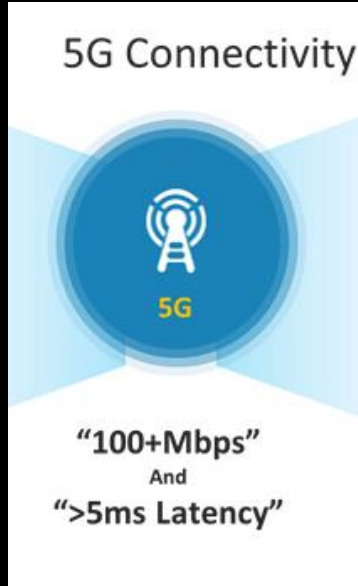
- Consumer Robot & Soundbox

- Baby Care
- Elder Care

Heart Beat Detection

Voice Recognition

VR/AR Processing
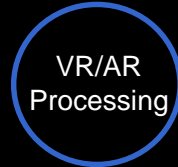
- Remote Training & Education

Behavior Analysis

- School
- Bank
- Shop

Machine Learning

Facial Recognition
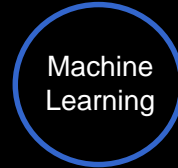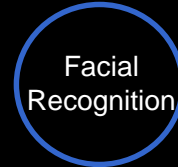
- Smart Factory
- Smart Traffic
- Smart Health

- People Count
- Access Control
- VIP List

CLOUD BASED MOBILE GAMING, IMMERSIVE CONTENT

Immersive gaming and virtual concert

KEY ENABLERS

Intelligent Connectivity
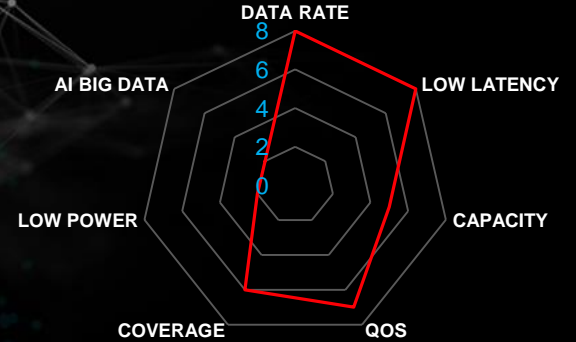
DYNAMIC ADVERTISING
AI and personalised advertising and reception

Advertising

Data Rate
8
6
4
2
0

AI Big Data

Low Latency

Low Power

Capacity

Coverage

QoS

Intelligent Connectivity
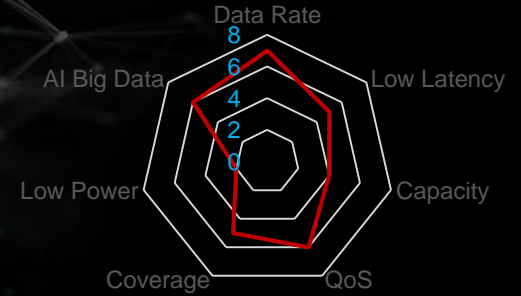
REMOTE TRAINING AND EDUCATION
Telepresence and learning
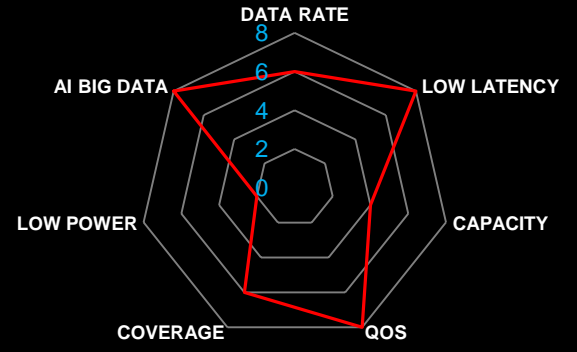
SMART AGRICULTURE
Enhanced food production & efficient distribution

KEY ENABLERS
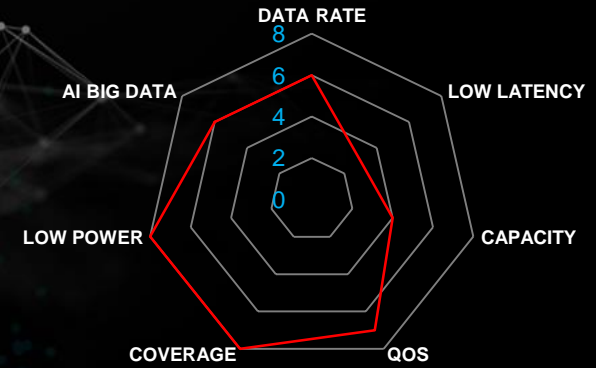
CONNECTED CARE
Real time healthcare, homecare monitoring, remote surgery

Source: CCTV

KEY ENABLERS

DATA RATE
LOW LATENCY
CAPACITY
QoS
COVERAGE
LOW POWER
AI BIG DATA

8
6
4
2
0

Intelligent Connectivity
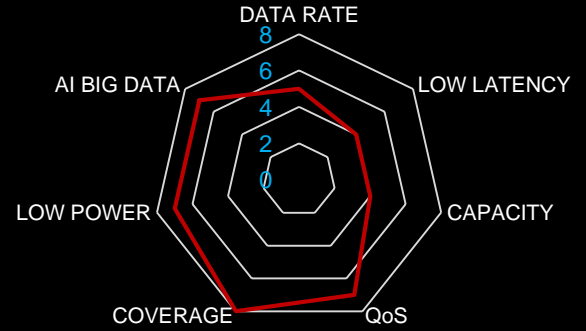
AUTONOMOUS TRANSPORTATION
Convenient, safe, independent travel

KEY ENABLERS

Emergency Electronic Brake Lights (EEBL)

In-Vehicle Speed Warning

Right Turn Assist

Red Light Violator Warning
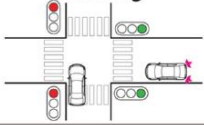
Curve Speed Warning

Cooperative Forward Collision Warning

DATA RATE

8
6
4
2
0

AI BIG DATA

LOW LATENCY

LOW POWER

CAPACITY

COVERAGE

QOS
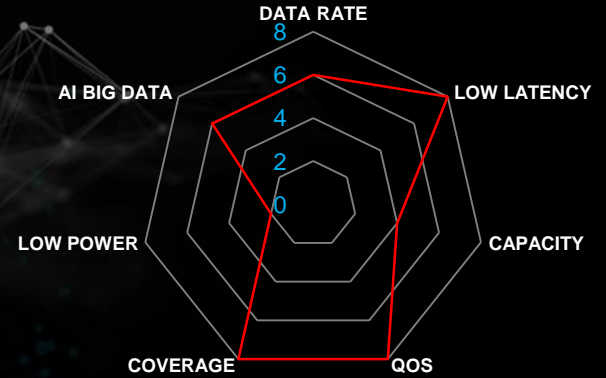
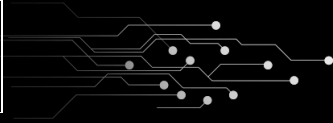Baidu and China Mobile partner on AI and 5G, focusing on self-driving cars

Intelligent Connectivity

SMART CITY AND SMART BUILDING
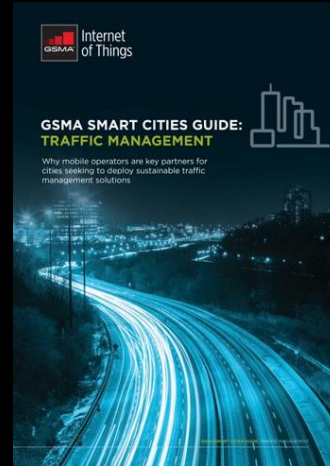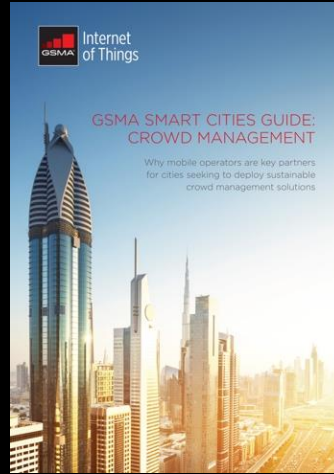
www.gsma.com/iot/smart-cities/

Intelligent Connectivity

To find out more visit www.gsma.com/IC

#IntelligentConnectivity

Thank You

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