

5G- A Game Changer for Cx and Energy Management

Steve Schmerber, RCDD/DCDC/NTS

Field Application Engineering



CX
ENERGY
2019
CONFERENCE & EXPO

COMMScope®

Data Center

MACRO CELL SITES

SMART CITY

IN-BUILDING WIRELESS

SMART BUILDING

Gas

Water

Electric

Connectivity

SMART CAMPUS

FIXED WIRELESS ACCESS

SMART POLES

POWER DISTRIBUTION

SMALL CELL SITES

FIBER TO THE HOME

FIBER CONNECTIVITY

Wired & Wireless

COMMScope®



CONNECTIVITY IS EVERYWHERE.

IN AN INTERNET MINUTE



3.7 MILLION
GOOGLE SEARCHES



266,000 HOURS
NETFLIX VIDEO WATCHED



\$900,000 USD
SPEND ONLINE



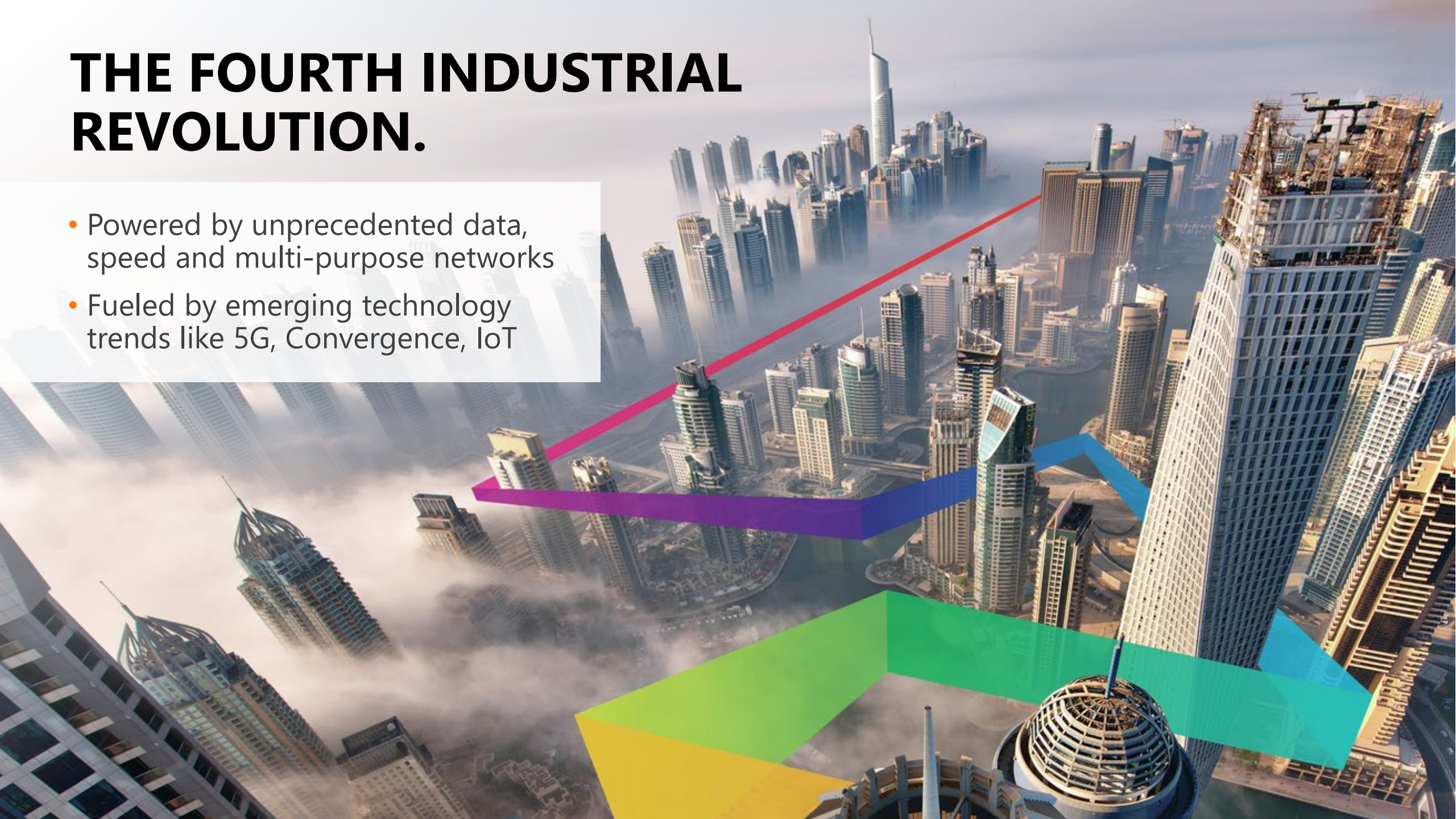
>1 MILLION
SWIPES

Another Reality for Commissioning ?



THE FOURTH INDUSTRIAL REVOLUTION.

- Powered by unprecedented data, speed and multi-purpose networks
- Fueled by emerging technology trends like 5G, Convergence, IoT



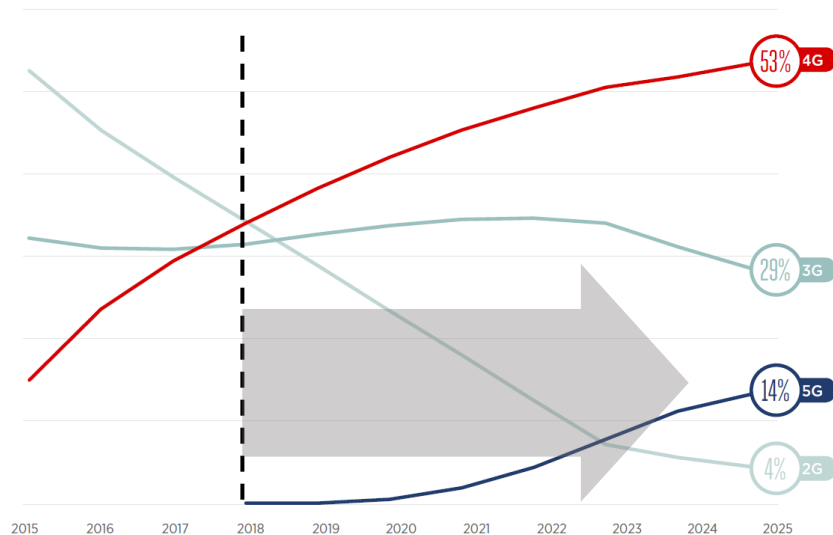
We're not done with 4G

Connections

Figure 6 Source: GSMA Intelligence

Global mobile adoption by technology

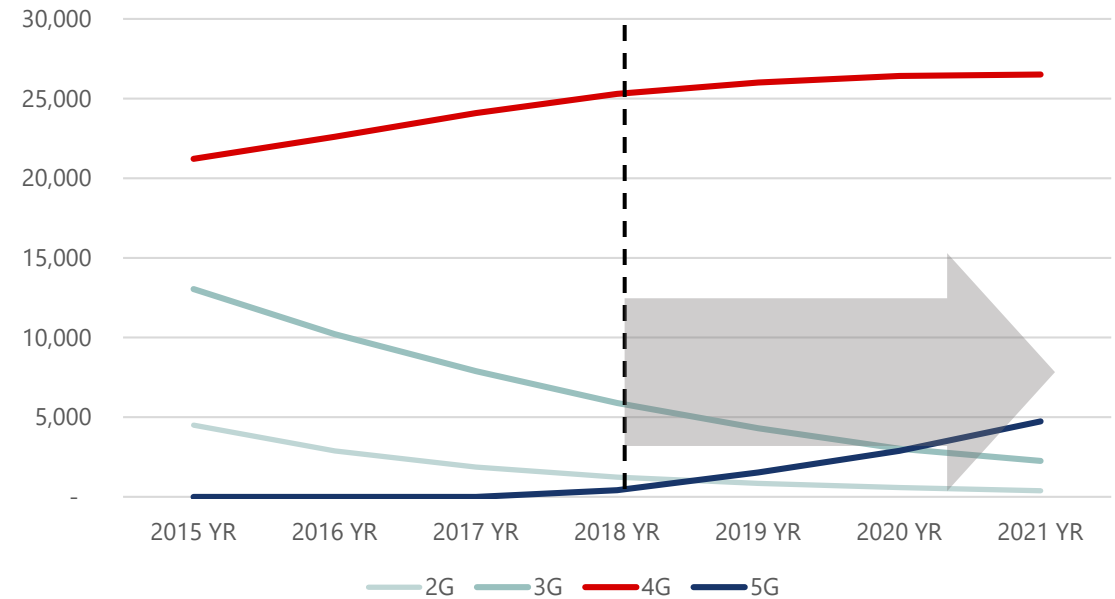
Share of mobile connections, excluding cellular IoT



Source: GSMA, *The Mobile Economy*, March 2018

Infrastructure

RAN Infrastructure Investment By Technology 2015-2021 (\$M)



Source: Gartner, *Communications Service Provider Operational Technology Worldwide*, December 2017

Continuing 4G build-out must be 5G-ready from day 1

5G

The next network evolution is shaping up to be the next revolution

10GBPS THROUGHPUT
PER USER

DENSER NETWORKS &
SUPER-LOW LATENCY SPEEDS

5G TRIALS AND PRE-STANDARD
DEPLOYMENTS



5G will be a network of networks



1 Enhanced
mobile broadband



2 Internet
of things



3 Ultra-low
latency

UP TO **10** GBPS PER
SUBSCRIBER

1-7 TYPICAL
GBPS PER
SUBSCRIBER

10-100x
CONNECTED DEVICES

MORE THAN **20** BILLION
THINGS

1,000x MORE
BANDWIDTH

5x LOCATION
DENSITY

LESS THAN **5** MILLISECONDS

5% OF 4G

Data Centers– the brain of a smart community



Big data applications are driving:

- Speed & Size
- Microservices
- Location (moving to Edge)

Enterprise

Hyperscale

MTDC

Edge DC

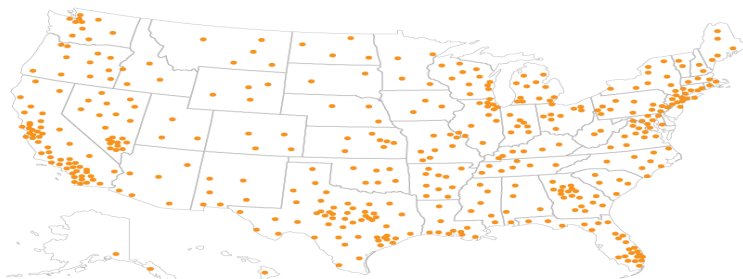
Current: 4G

Only a few large centralized data centers



Upcoming: 5G

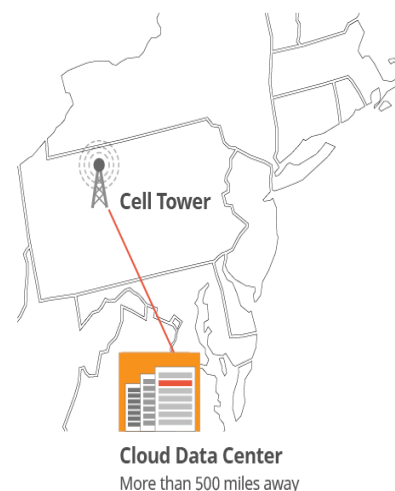
Thousands of new micro data centers under cell towers



Current Large Data Centers vs. Micro Data Centers near cell towers

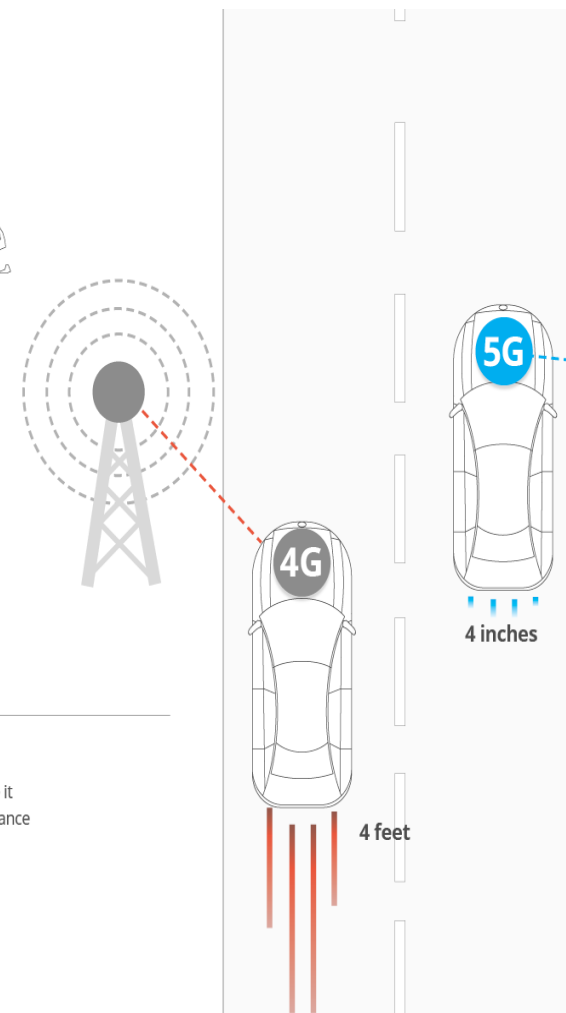
Current: 4G

Only a few large centralized data centers



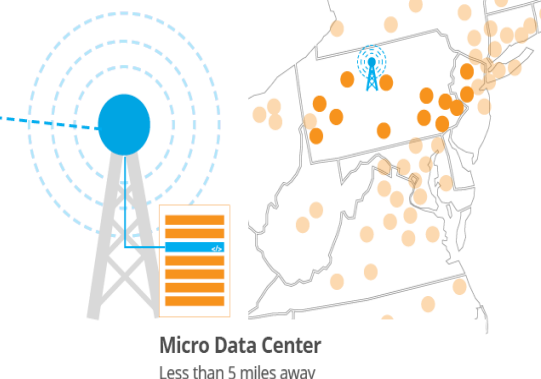
> 80 ms latency

The car moved **over four feet** by the time it received a response due to the large distance from the data center.



Upcoming: 5G

Thousands of new micro data centers under cell towers



< 5 ms latency

The car moved **less than four inches** by the time it received a response, thanks to the close distance to the Micro data center.

Latency differences between 4G & 5G infrastructure, with supportive use case — Source: [Mutable.io](https://mutable.io)

Building the foundation for 5G



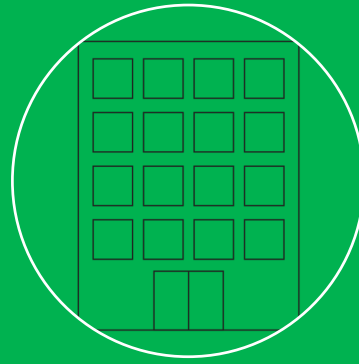
Macro Cell Sites

- Antenna and RF path solutions
- Higher frequency bands
- Higher-order MIMO



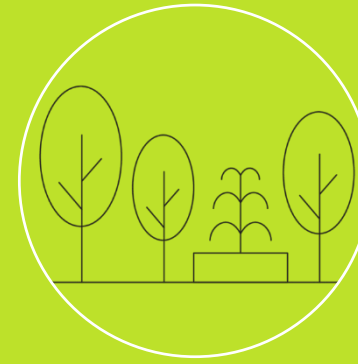
Metro Cell Sites

- Densification enabler: antennas, concealment, power, connectivity
- Smart city enabler



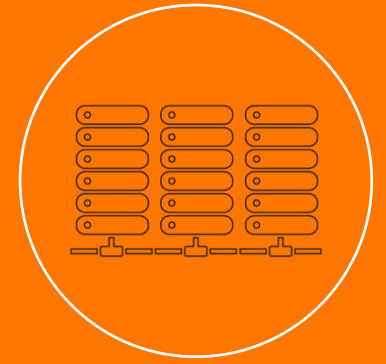
In-building

- Small cell and DAS on IT infrastructure
- Connectivity and PoE power distribution and management
- Automated infrastructure management



Outside Plant

- Cloud RAN enablement
- High-speed fiber connectivity
- Powered fiber



Data Centers and Central Offices

- High speed fiber connectivity with intelligence
- Edge data centers
- CO/ DC convergence





A brighter future
is built on smarter
networks

Thank YOU!

CX
ENERGY
2019
CONFERENCE & EXPO