TEMPEST TELECOM

Spirent Promise. Assured.

ASSURING
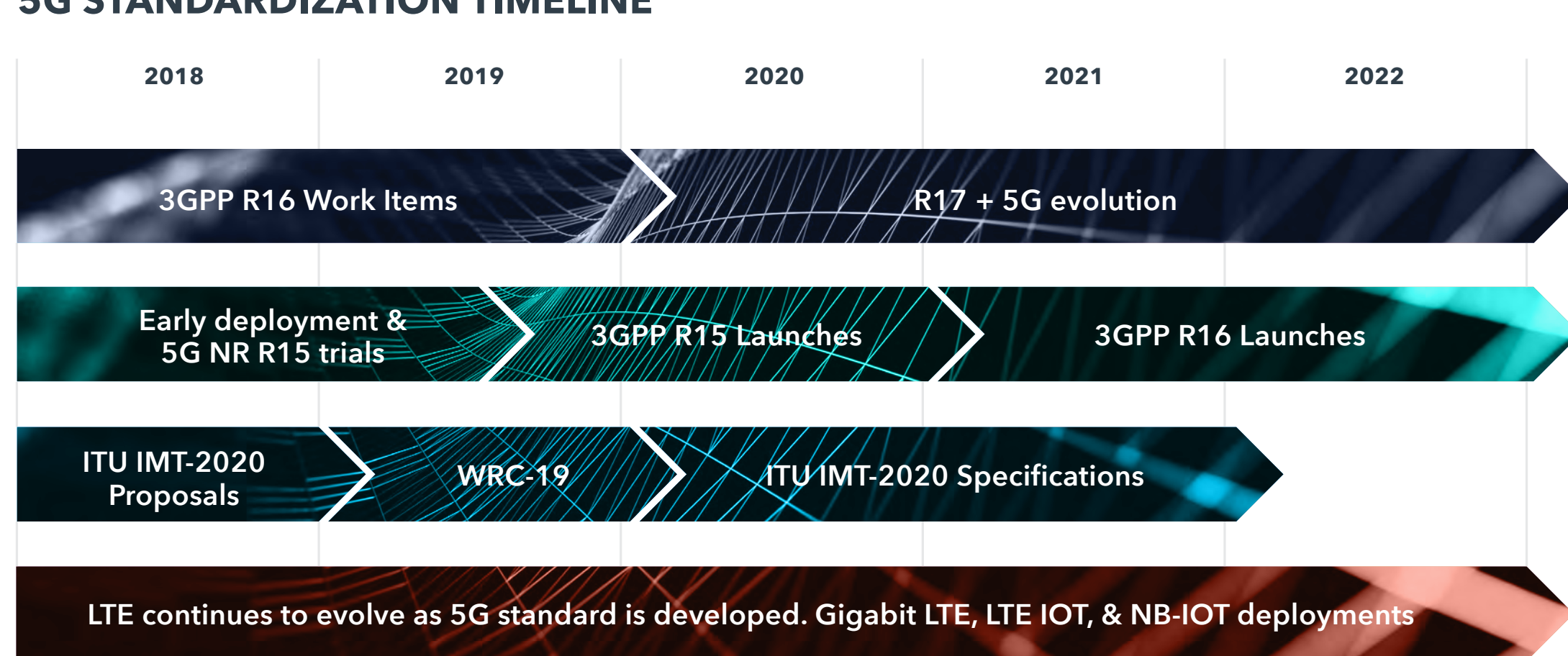# 5G DATA PERFORMANCE
AND CHALLENGES ALONG THE WAY

The race is on to deliver 5G data to your customers

THE ROAD TO 5G

By 2025 it is estimated there will be 1.1 billion mobile 5G connections worldwide. With a large-scale roll-out set to occur much earlier than originally anticipated, the race is on to deliver!
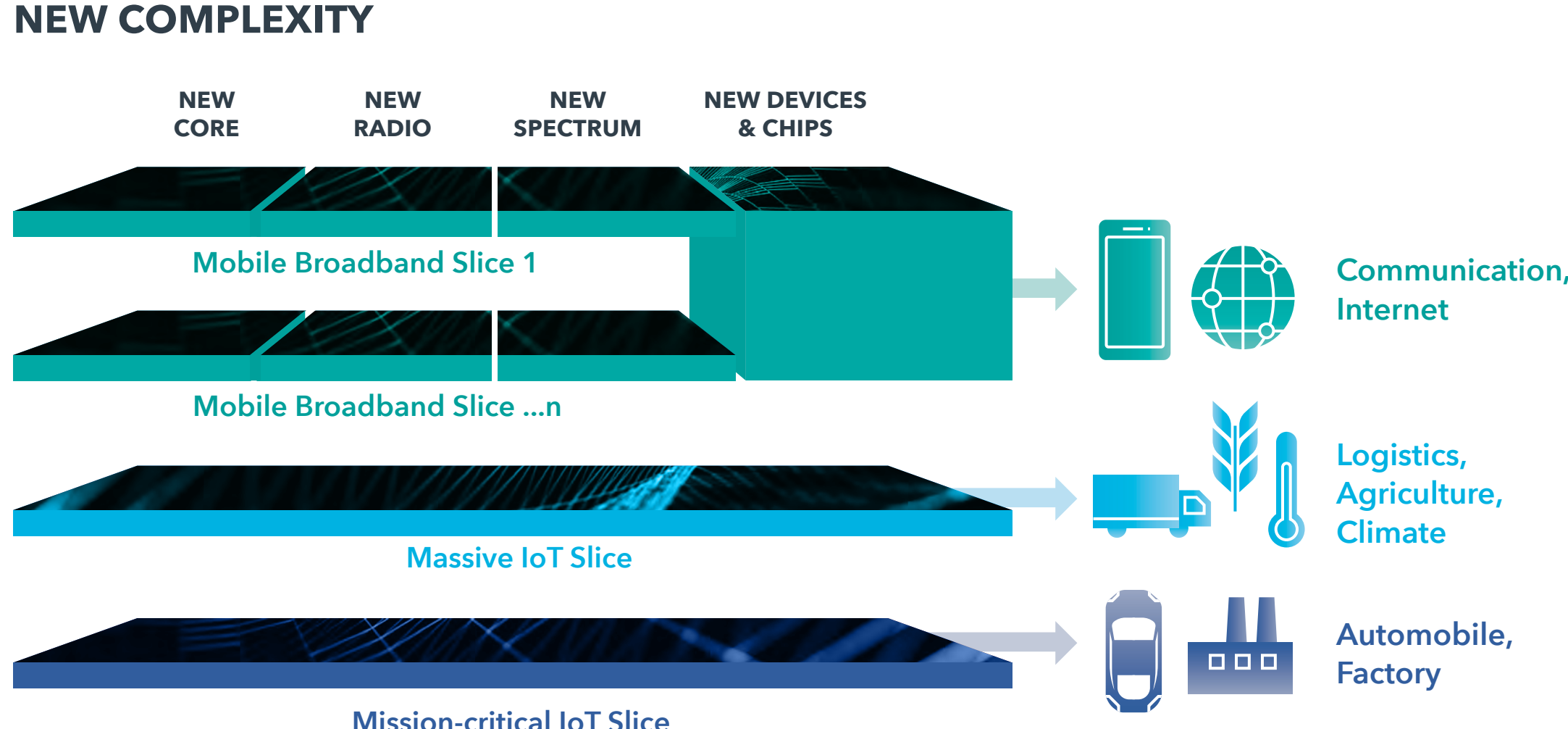
5G STANDARDIZATION TIMELINE

2018	2019	2020	2021	2022

3GPP R16 Work Items — R17 + 5G evolution

Early deployment & 5G NR R15 trials — 3GPP R15 Launches — 3GPP R16 Launches

ITU IMT-2020 Proposals — WRC-19 — ITU IMT-2020 Specifications

LTE continues to evolve as 5G standard is developed. Gigabit LTE, LTE IOT, & NB-IOT deployments

COMPLEX NEW CHALLENGES AND GREAT EXPECTATIONS

As wireless network infrastructures and devices begin to approach the new 5G standards, the rapid rate of acceleration has brought with it a host of new challenges …

NEW COMPLEXITY

NEW CORE	NEW RADIO	NEW SPECTRUM	NEW DEVICES & CHIPS

Mobile Broadband Slice 1 — Communication, Internet

Mobile Broadband Slice …n

Massive IoT Slice — Logistics, Agriculture, Climate

Mission-critical IoT Slice — Automobile, Factory

Alongside increased complexity, 5G service providers must contend with new goals and expectations:

100x peak data rates (20Gbps+)

10x experienced throughput

100x density (1m devices/km2)

10x decrease in latency (1-5ms)

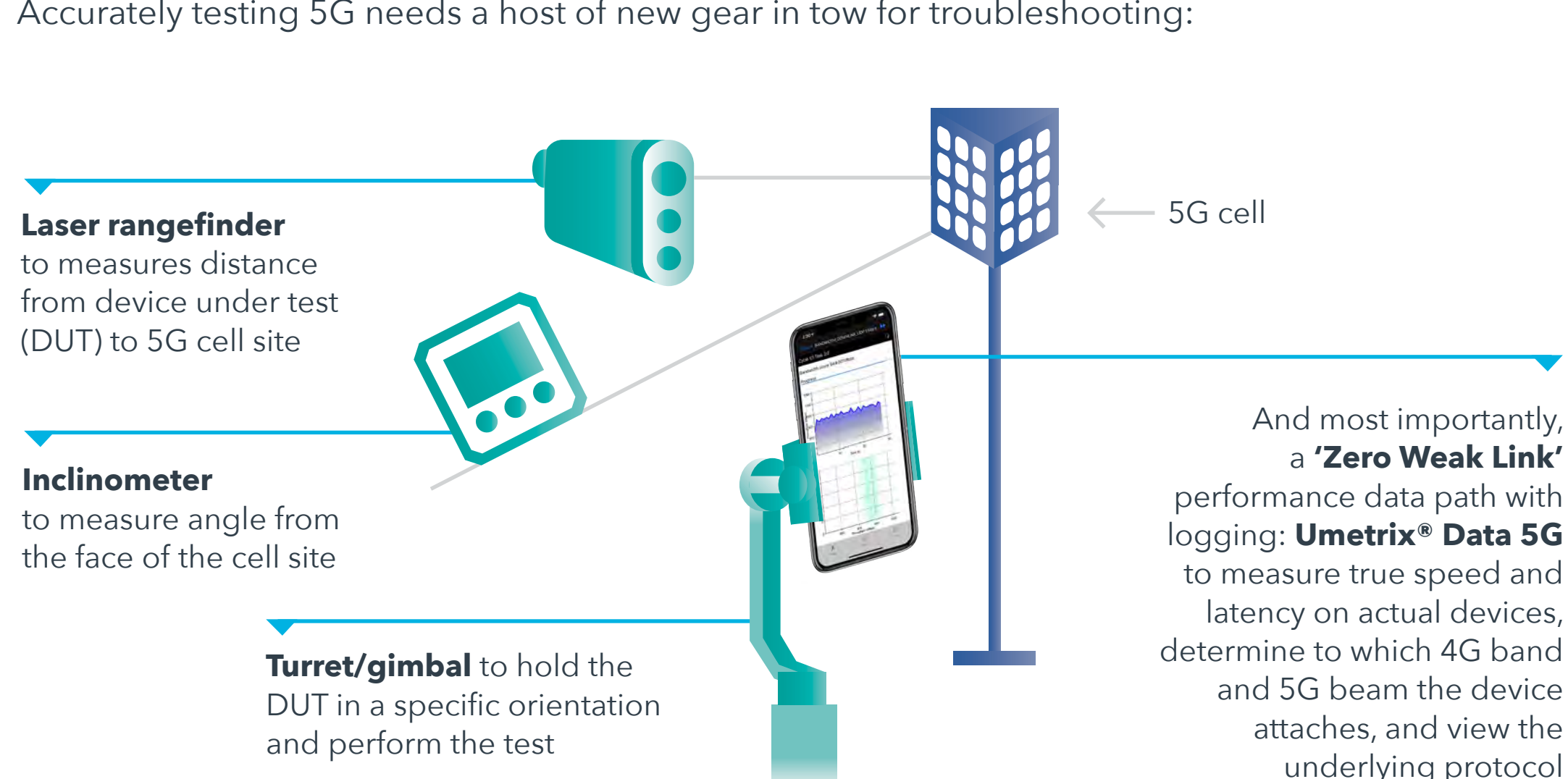**100x** traffic capacity

3x spectrum efficiency

TESTING DATA SERVICES IN THE FIELD - WHAT'S DIFFERENT WITH 5G?

As 5G introduces millimeter wave (mmWave) frequencies into the mix, cells are smaller and closer - with crazy new beamforming going on. What we saw in recent runs:

Beam acquisition is tricky - 4G anchor cell is still needed and not all 4G bands are enabled for that need

Mobility is not yet implemented well in some areas - a device may detach and ping-pong between 4G and 5G connectivity

The user experience is impacted by how the device is held - the angle of the device to the cell site is critical for testing purposes

Max download speed is 1.8Gbps thus far - but many popular big-name applications are not yet ready for 5G speeds
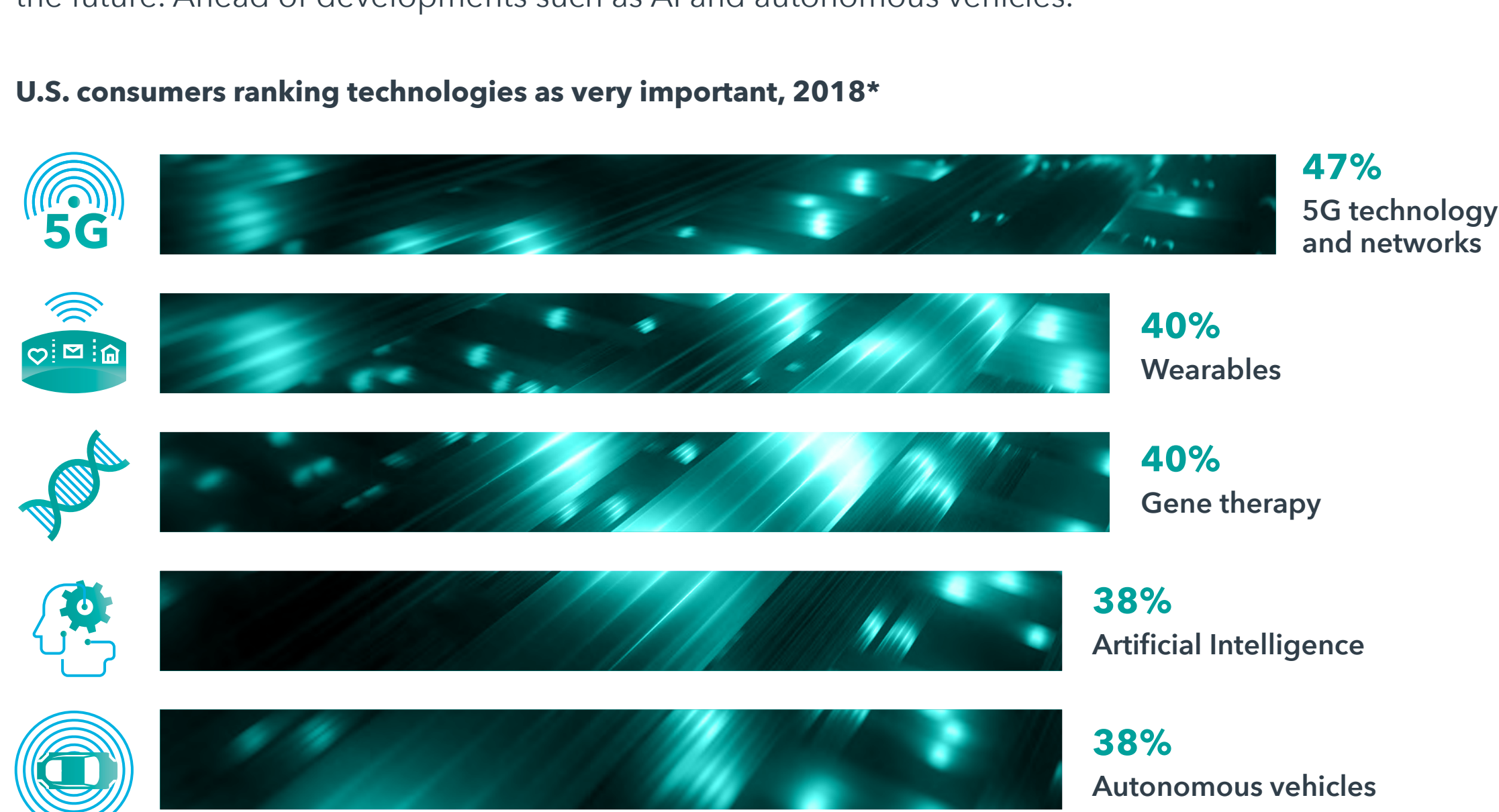
BEST TOOLS FOR THE JOB

Accurately testing 5G needs a host of new gear in tow for troubleshooting:

Laser rangefinder to measures distance from device under test (DUT) to 5G cell site

Inclinometer to measure angle from the face of the cell site

Turret/gimbal to hold the DUT in a specific orientation and perform the test

5G cell

And most importantly, a **'Zero Weak Link'** performance data path with logging: **Umetrix® Data 5G** to measure true speed and latency on actual devices, determine to which 4G band and 5G beam the device attaches, and view the underlying protocol
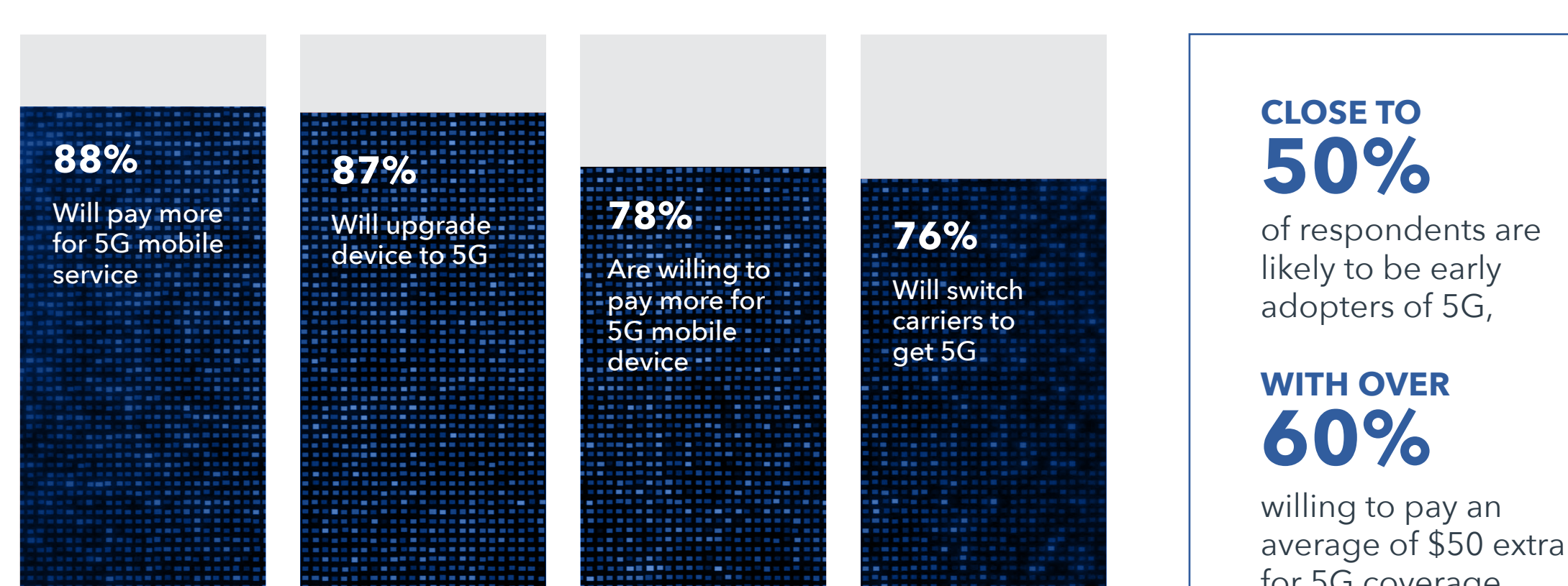
WHAT THE PEOPLE WANT

Almost half of Americans expect 5G technology and networks to be very important in the future. Ahead of developments such as AI and autonomous vehicles.

U.S. consumers ranking technologies as very important, 2018*

47% 5G technology and networks

40% Wearables

40% Gene therapy

38% Artificial Intelligence

38% Autonomous vehicles

* Expectations regarding the importance of technologies in the future among consumers in the U.S. as of May 2018

More than one-third of mobile users are confident in 5G and they are willing to pay for it

88% Will pay more for 5G mobile service

87% Will upgrade device to 5G

78% Are willing to pay more for 5G mobile device

76% Will switch carriers to get 5G

CLOSE TO 50% of respondents are likely to be early adopters of 5G,

WITH OVER 60% willing to pay an average of $50 extra for 5G coverage.

And what motivates the consumers?

63% 10x faster connection speed

55% More cost-effective data planning

54% 10x quicker response time

41% Universal coverage

41% Uninterrupted experience

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For more details, additional observations and best practice methodologies, contact us.
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