



5G Opportunities for MVNOs

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Version one

Agenda

- What 5G brings.
- Opportunity for MVNOs.
- Hype vs reality.
- The foundation for success.



The BT story

We've been around since 1846.

We're a global company, operating in around 180 countries.

We own the country's largest and best* mobile operator – EE.

Our coverage reaches more than 99 per cent of the UK population.

BT Wholesale is the home for MVNO on the EE Network.



* Winner of Rootmetrics Overall Rootscore for 5 years in a row

BT Wholesale – who we are and what we do



- Europe's largest wholesale telecoms provider.
- £1.5 billion annual wholesale revenues.
- 1,700 dedicated employees.
- Voice, Data, Hosted Comms, Machine to Machine, Managed Services & Mobile.
- Partnership-driven MVNO platform on EE. With a win/win commercial, technical and commercial framework.
- **Your success is our success!**

Over four million MVNOs users across 30 brands



5G

EE Network rollout plans for 5G, targeting 16 hotspots of highest demand

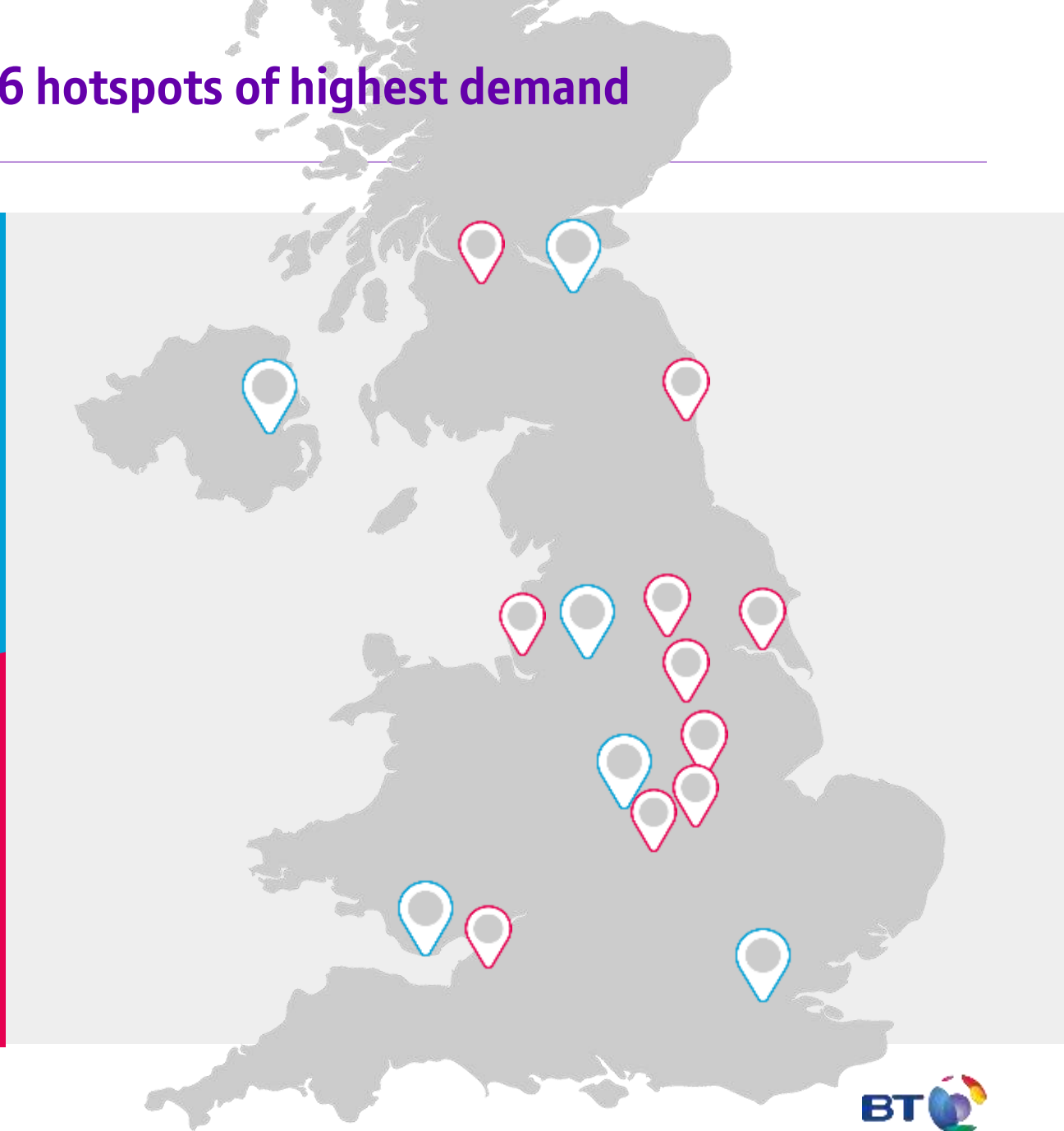
We plan to switch on 5G services in 10 UK cities next week (30th May)

Starting with:

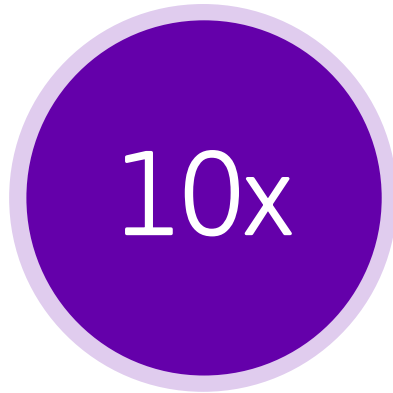
London Cardiff Birmingham
Manchester Edinburgh Belfast

and by end 2019, extending to:

Glasgow Newcastle Liverpool Leeds Hull
Sheffield Nottingham Leicester Coventry Bristol



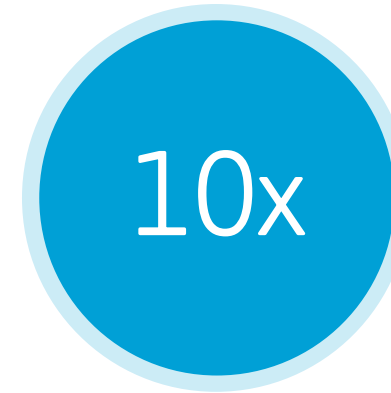
5G promises mobile network improvements



Decrease in latency



Traffic capacity



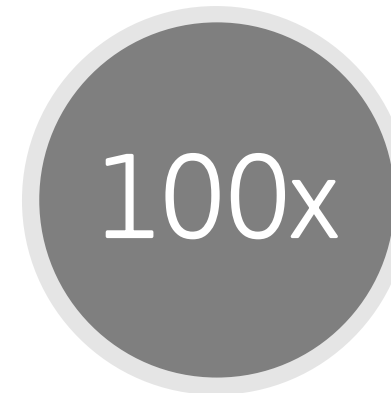
Experienced throughput



Spectrum efficiency



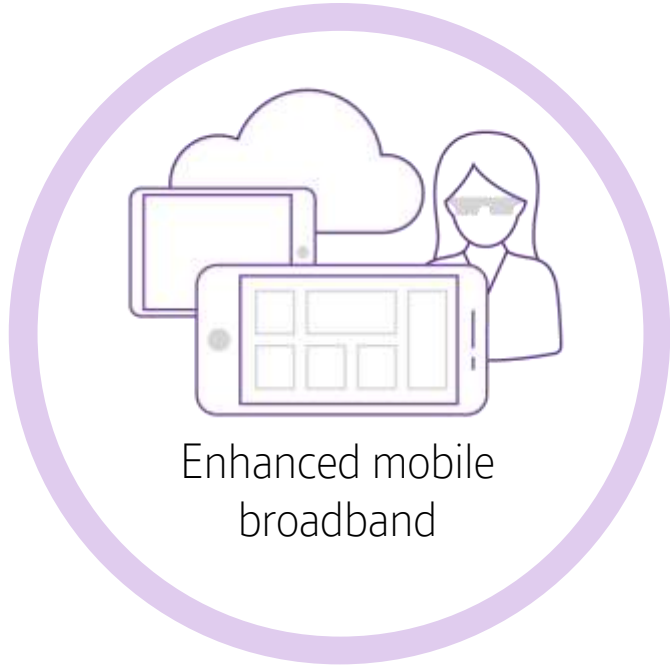
Connection density



Network efficiency

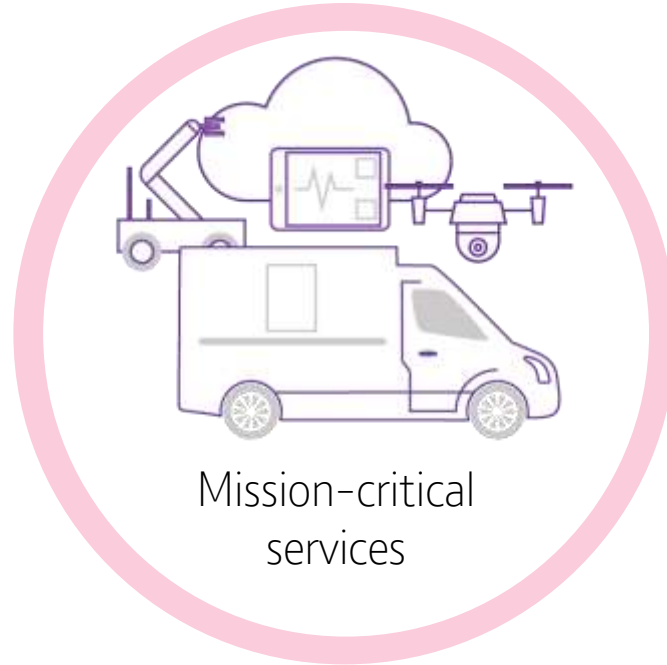
Source: BT

5G promises a range of use cases



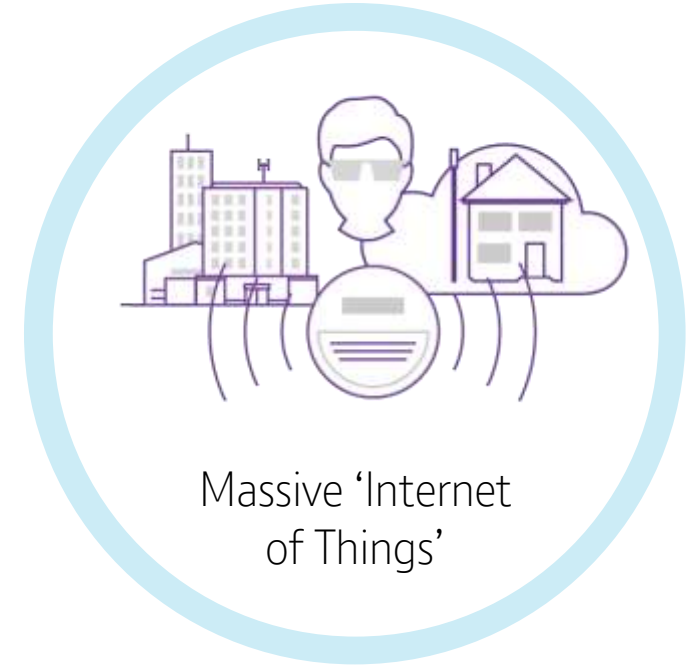
Enhanced mobile
broadband

**UHD Video Virtual/Assisted
Reality Interactive gaming
Tactile Internet**



Mission-critical
services

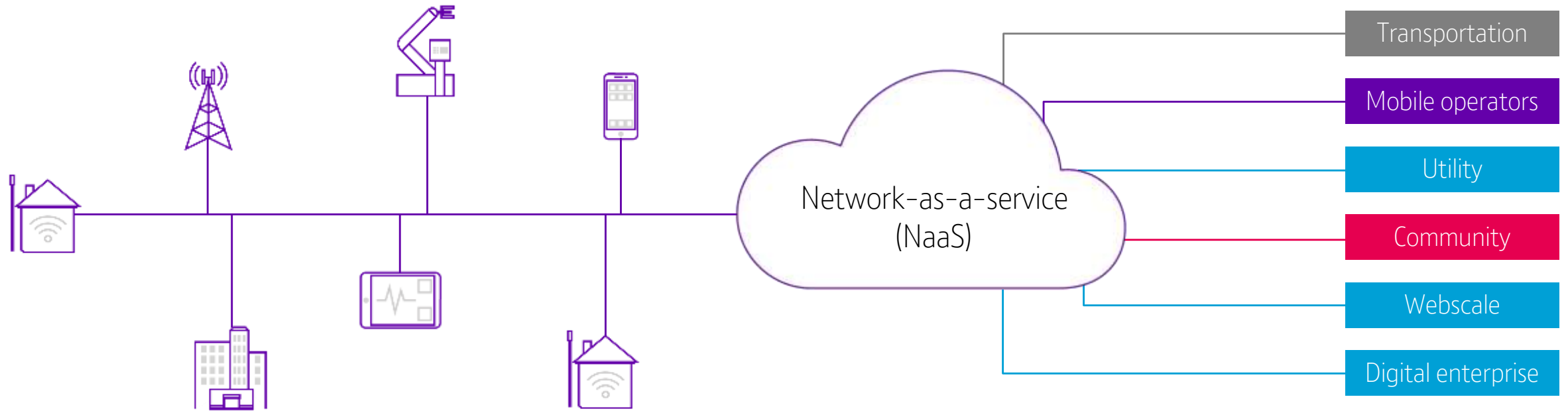
**Self/assisted driving
Traffic safety and control
Industry automation
Remote surgery**



Massive 'Internet
of Things'

**IoT
Smart Home/Building/
Factory/Energy
Smart Agriculture, Logistics,
Asset Tracking**

5G offers the ability to differentiate at the network level



Differentiation

Flexible

Autonomy

Scalable

Network capability drivers for differentiation

Example network slice by capability

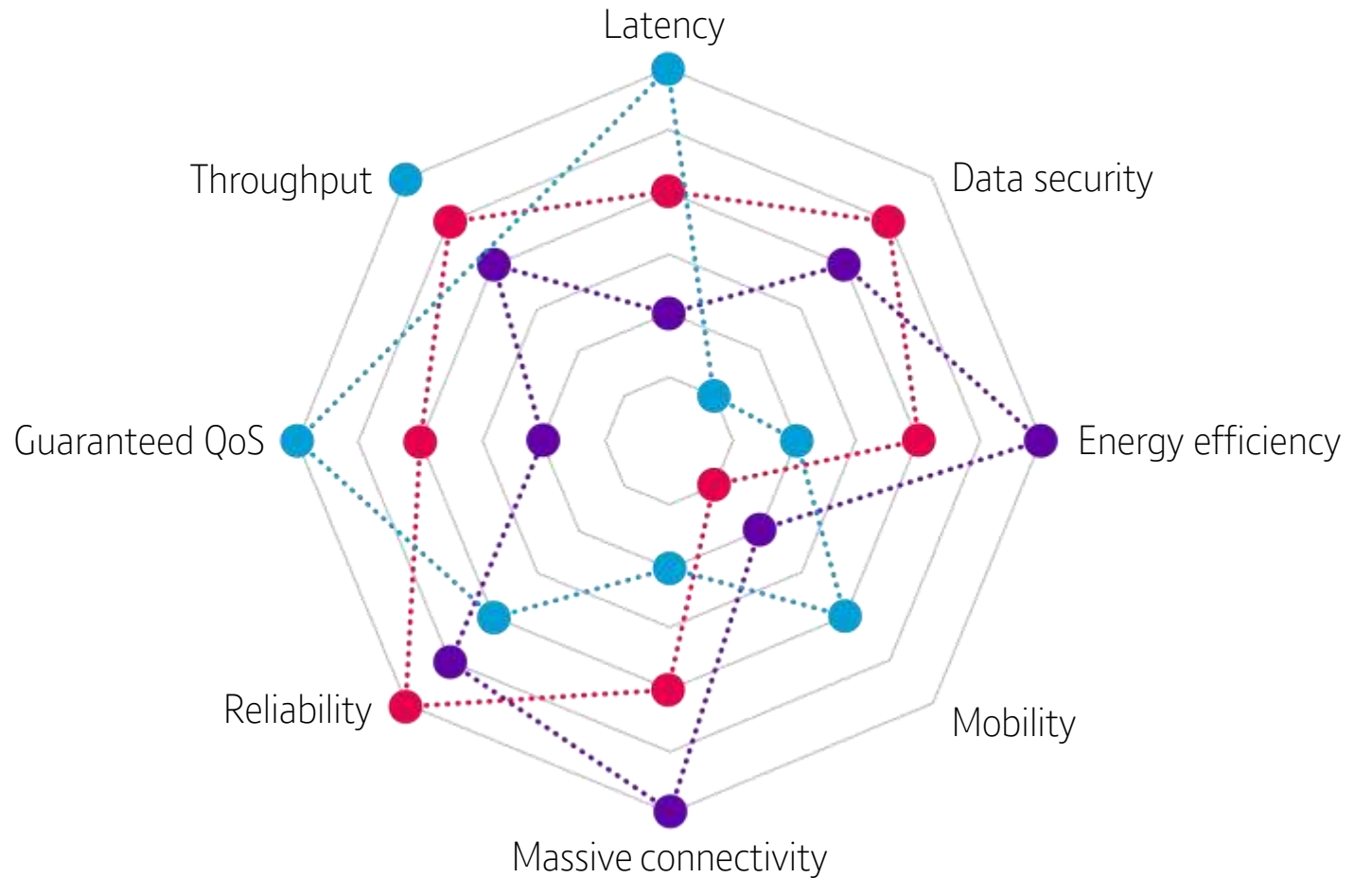
Network slice for telematics



Network slice for AR/VR



Network slice for CCTV surveillance



Source: Ericsson

Industrial MVNO opportunities



M Health



Logistics



Connected Car

5G consumer propositions



Gamer MVNO



Media MVNO

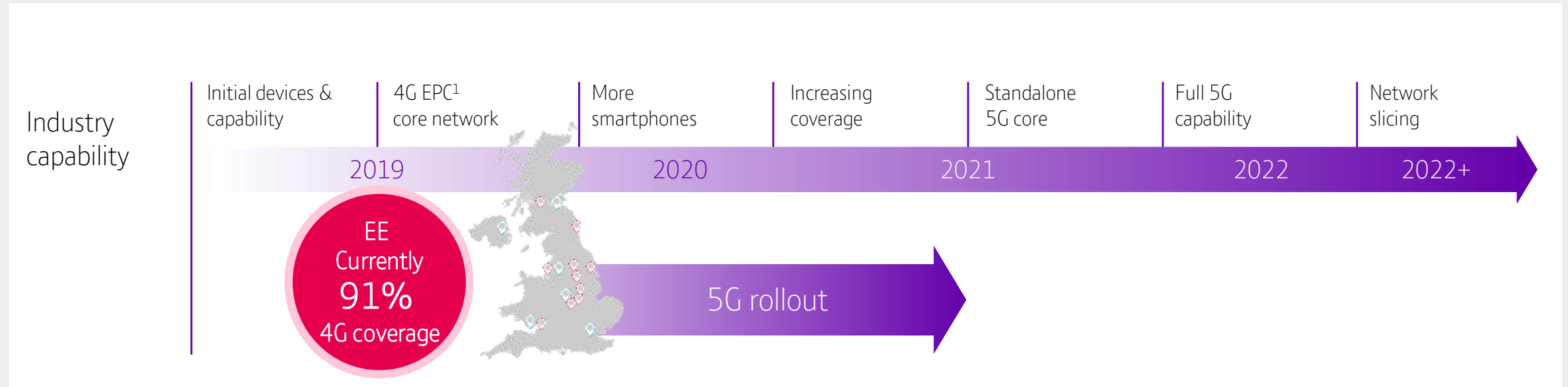


Real-time speed
sport betting pack

Hype vs Reality

The 5G vision will take some time to deliver

5G technology will launch in 2019 but the capability will evolve massively from there.



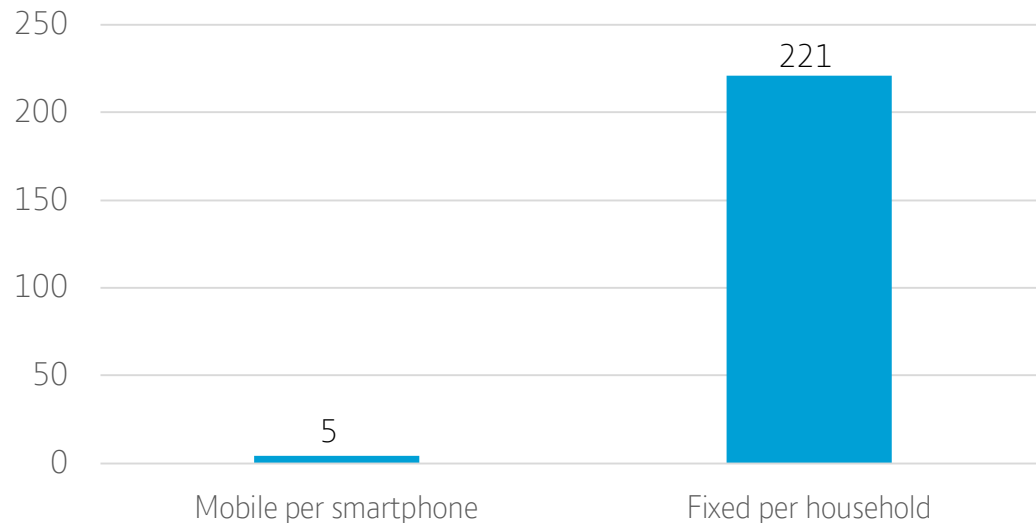
- Early 5G service will enhance mobile broadband and address high congestion areas.
- Coverage and handsets will be limited with initial mass market handsets not available until 2020.
- 4G nationwide network coverage and speeds will remain the important customer service differentiator.

5G will create limited fixed substitution effects

Today

Today usage between fixed and mobile is a multiple of 50X

Network usage in 2018: GB/month



Source: Enders

2025

Fixed household f/c = 1TB/month
Mobile f/c = 20GB/month

Cloud VR Gaming



SVOD / VR

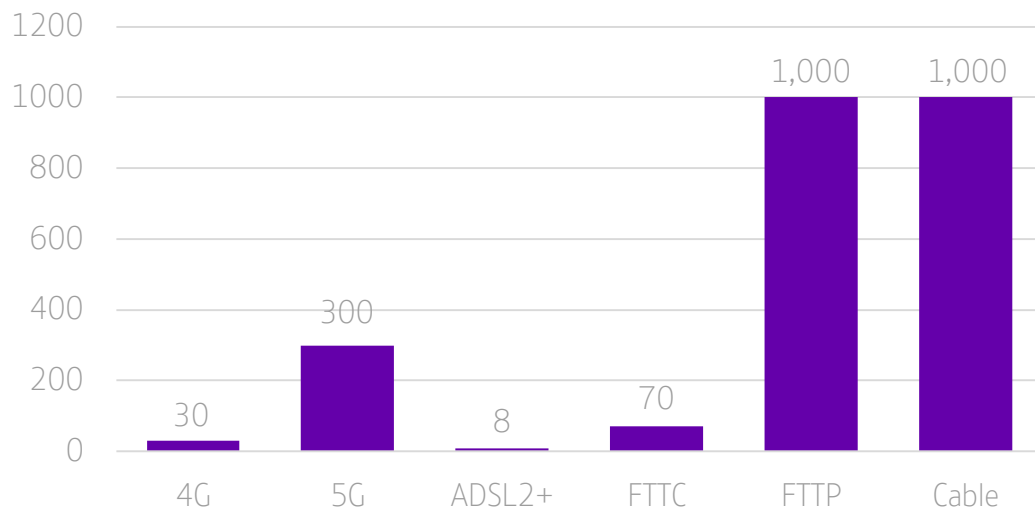


Source: Analysys Mason

Capacity may be an issue sooner than we think

Fixed and mobile capability gap is huge

Network bandwidth capabilities: Mbps



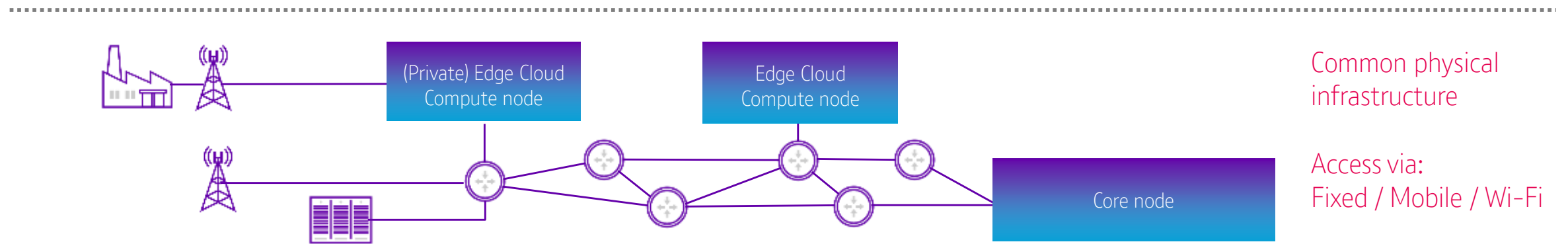
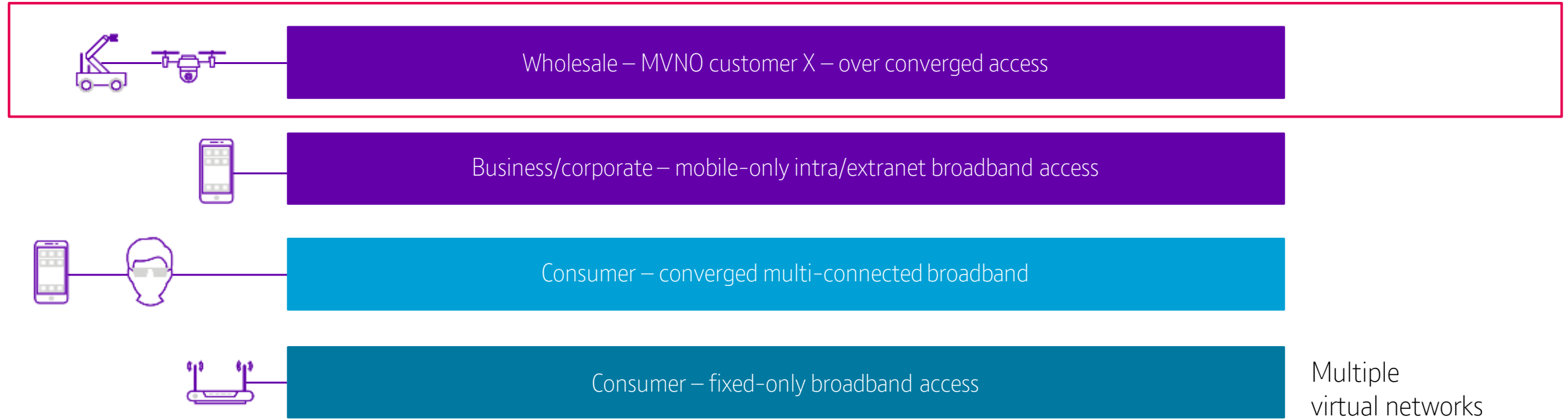
Capacity utilisation



Average operator

Source: Enders analysis based on company reports and Ofcom

Long-term vision is not just about 5G – Converged Network



Single converged core delivering a seamless user experience

Network optimisation

- Single converged core to manage and operate.
- Best use of networks.
- Improved reliability.
- Simplified OSS.
- New service and revenue opportunities.

Seamless user experience

- Access to all services regardless of access network.
- Single set of identities and credentials.
- Consistent policies and services.
- Best available network for bandwidth and latency.
- Seamless mobility.



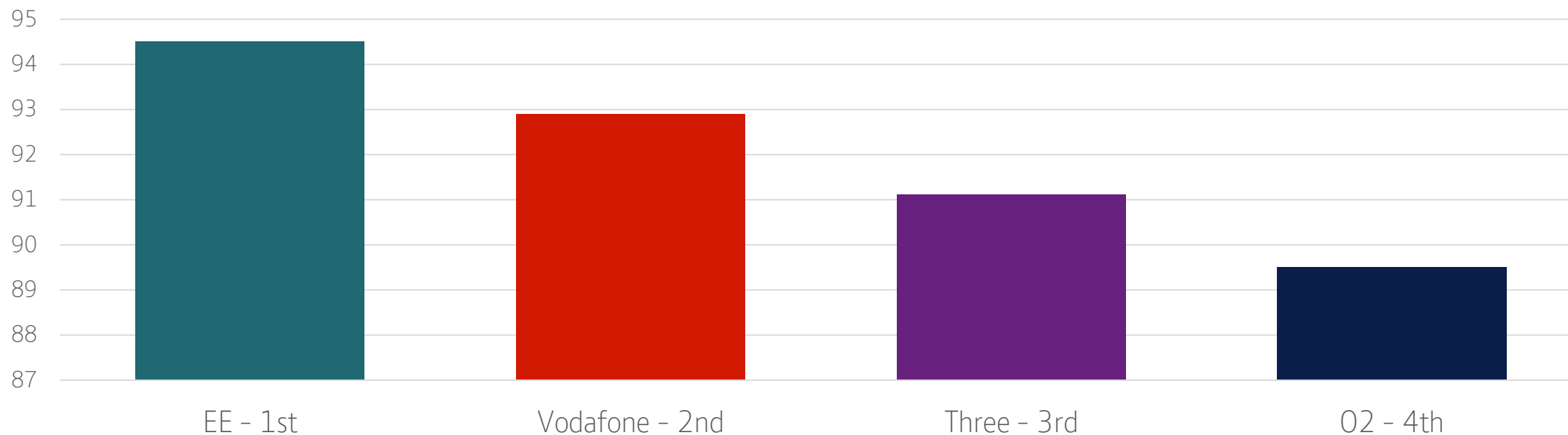
Foundations for success

Network leadership in 4G will be the foundation for success in 5G

Overall Best Network for last 5 Years

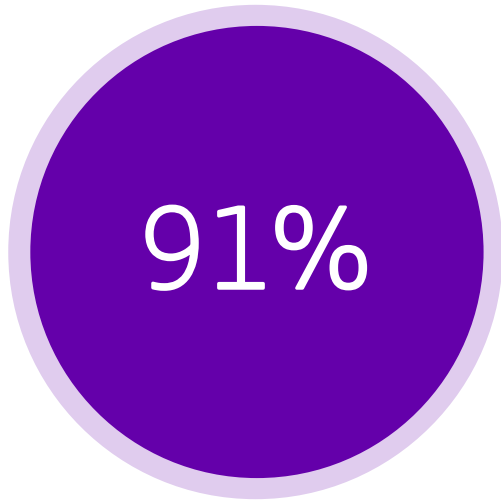


UK Rootscore performance 2H 2018



No 1 for coverage and speed

4G in more places than any other UK network



EE coverage November 2018



Number one for speed achieved

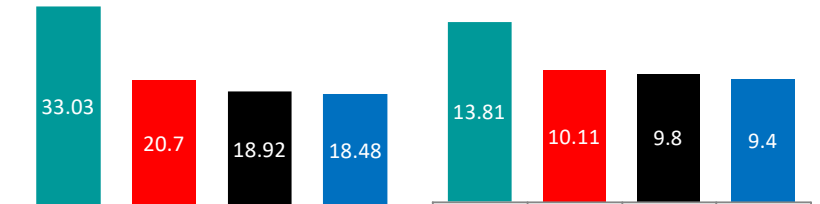


“Speeds that are in some cases faster than BT’s fibre-based infinity service”



Download








Upload



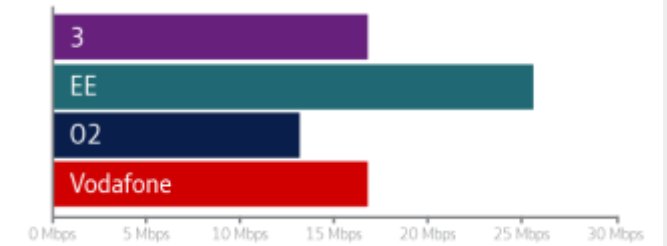
EE continues to dominate the awards table - Opensignal



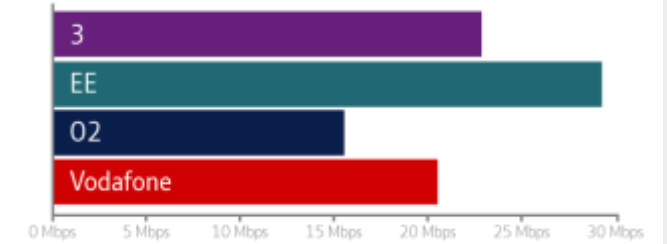
OpenSignal Awards

	Download speed: 4G	Download speed: 3G	Download speed: overall	Latency: 4G	Latency: 3G	Availability: 4G
3						
EE						
O2						
Vodafone						

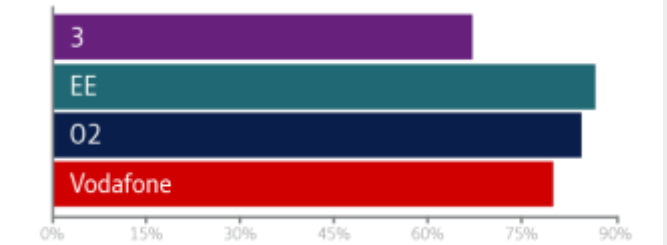
Download speed: Overall



Download speed: 4G



Availability: 4G



Source: OpenSignal State of the Mobile Networks Report – April 2018



Investing to continue our network leadership in both fixed and mobile

£3.7bn annual investment



Increased investment in 4G and expanding into rural UK



3G refarm for 5G



All IP UK Network & Single converged core



Thank you !

Kushal Shah,
business development director,
BT Wholesale