

# 5G and densification

- A reality check - how are we doing, what have we learned and where's it going?

Mike Harrison  
April 2024

**5G has not delivered on bold promises**

**Strategic densification yet to start**



# 5G and densification

A reality check:

- UK and Europe versus international benchmarks
- Densification
- Innovating in the streetscape
- Addressing the complexities



# UK vs International Benchmarks

Overall, the UK failed to place higher than the slowest third for most KPIs

*OpenSignal*

Metric	Out of 56 Countries	Out of 23 European Countries	UK Positioning
5G Availability	39	21	In slowest third
5G Average Download	49	21	In lower quartile
5G Peak Download	37	17	In slowest third
5G Peak Upload	52	24	Slowest in Europe

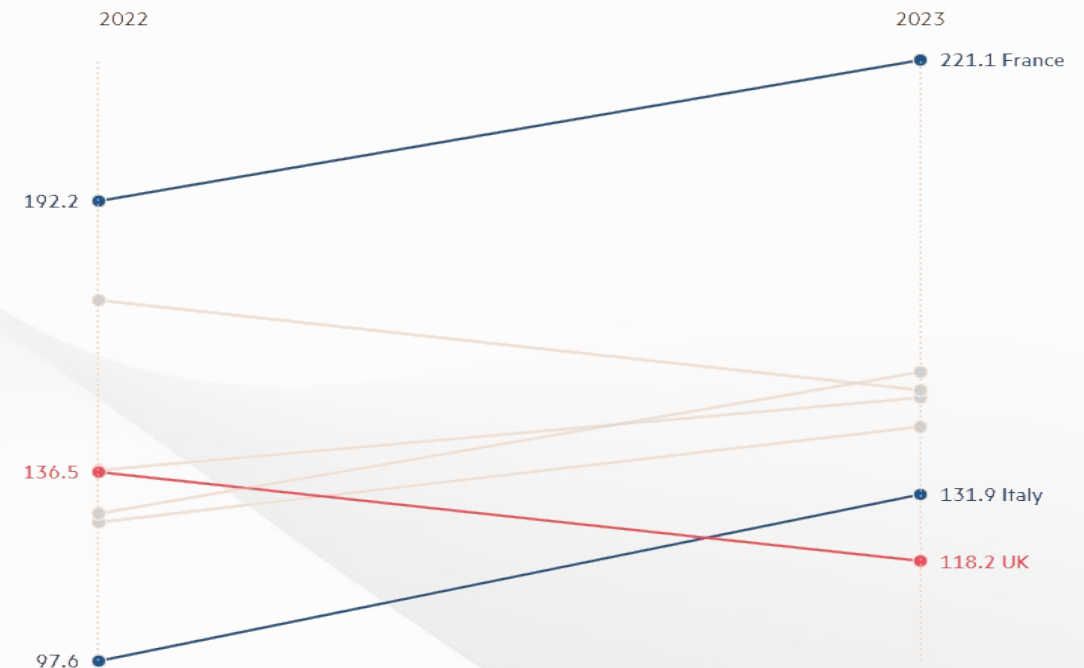
<https://www.opensignal.com/2023/06/30/benchmarking-the-global-5g-experience-june-2023>

Mobile users in Britain were hit by the slowest average 5G download speeds of any G7 country in 2023

*Financial Times*

The UK has dropped to last place in the G7 for average 5G download speed

Average 5G download speed (Mbps)



FINANCIAL TIMES

Source: Opensignal • Averages are within 90% confidence intervals for all countries. The UK and Germany ranked joint third in 2022. Data collected between August 1 and October 29

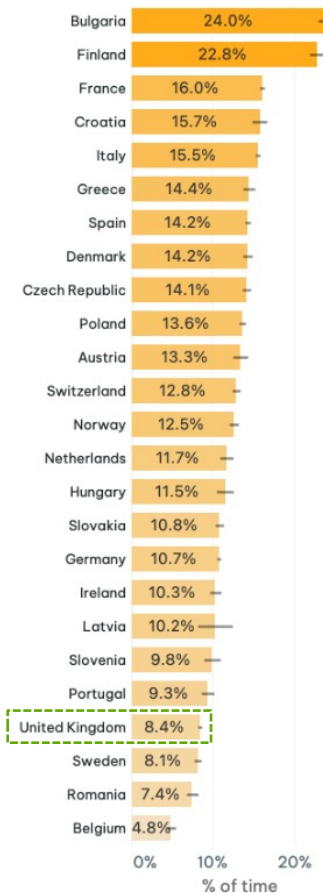
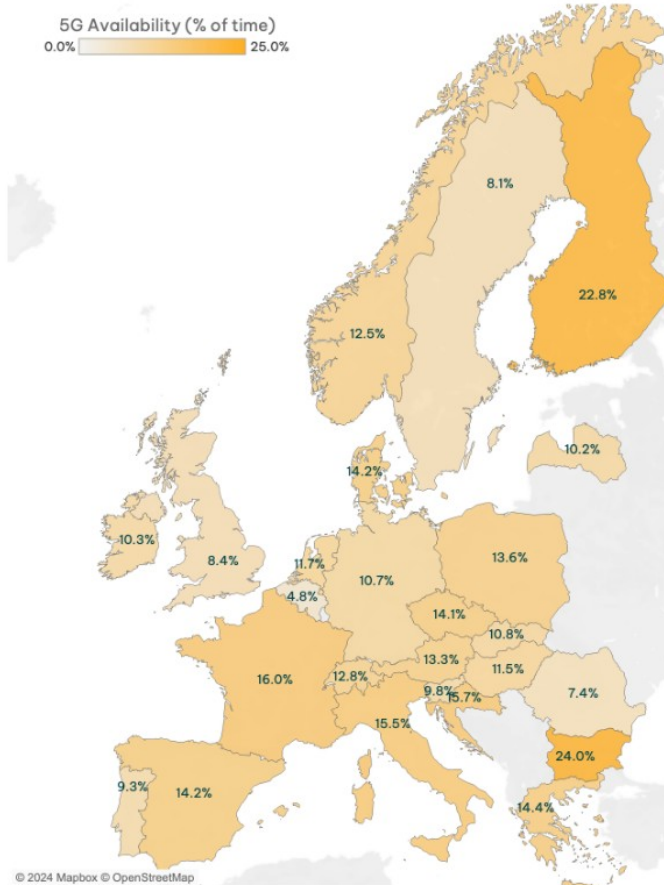
# Variation across Europe

## 5G Network Availability

### 5G Availability across European markets

Proportion of time our 5G enabled users had an active 5G connection: Oct-Dec 2023

5G Availability (% of time)  
0.0% 25.0%



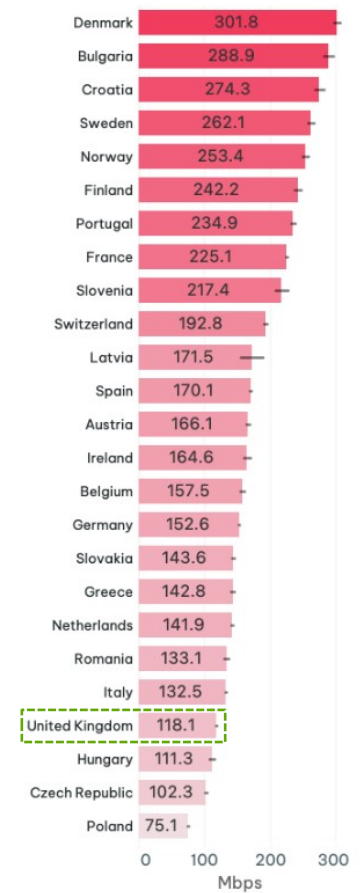
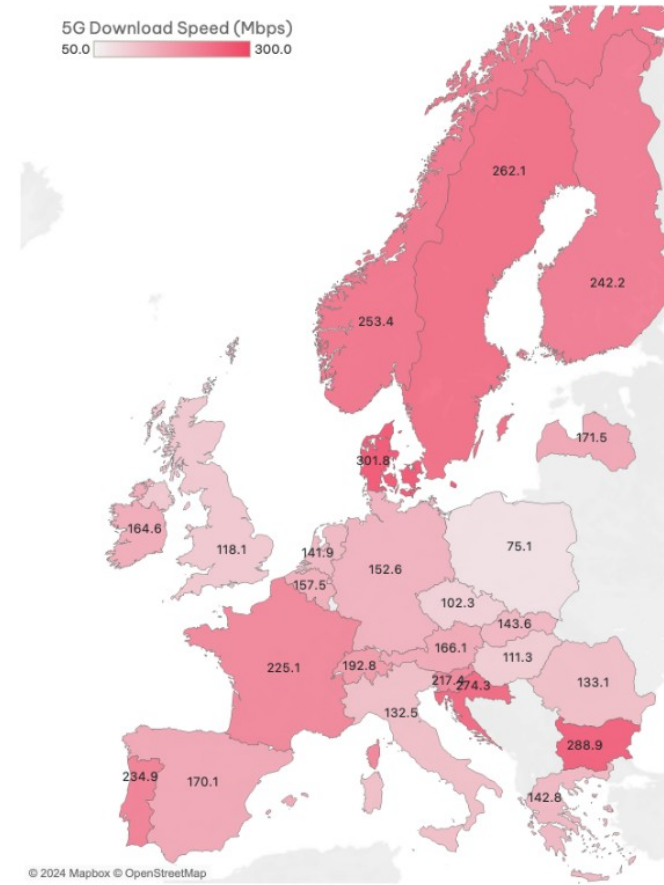
90-day data collection period 01 October - 29 December 2023 | © Opensignal Limited

## 5G Peak Download Speeds

### 5G Download Speed across European markets

Download speeds measured by our users on 5G networks: Oct-Dec 2023

5G Download Speed (Mbps)  
50.0 300.0

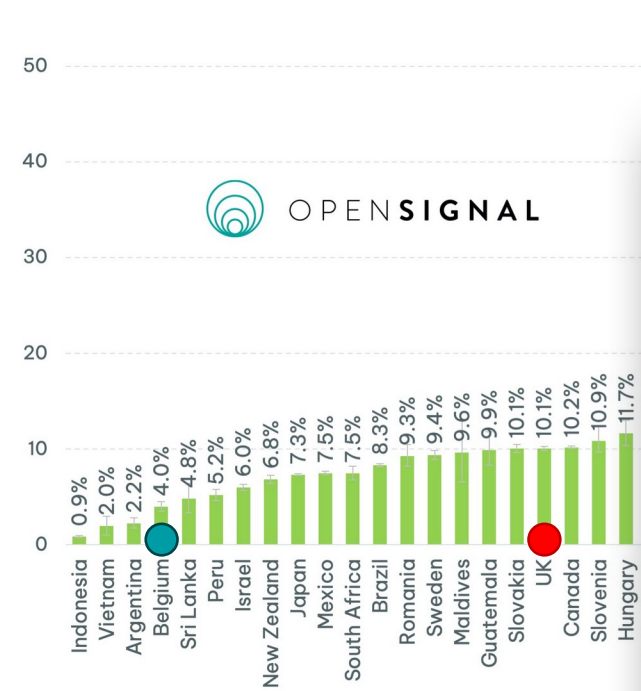


90-day data collection period 01 October - 29 December 2023 | © Opensignal Limited



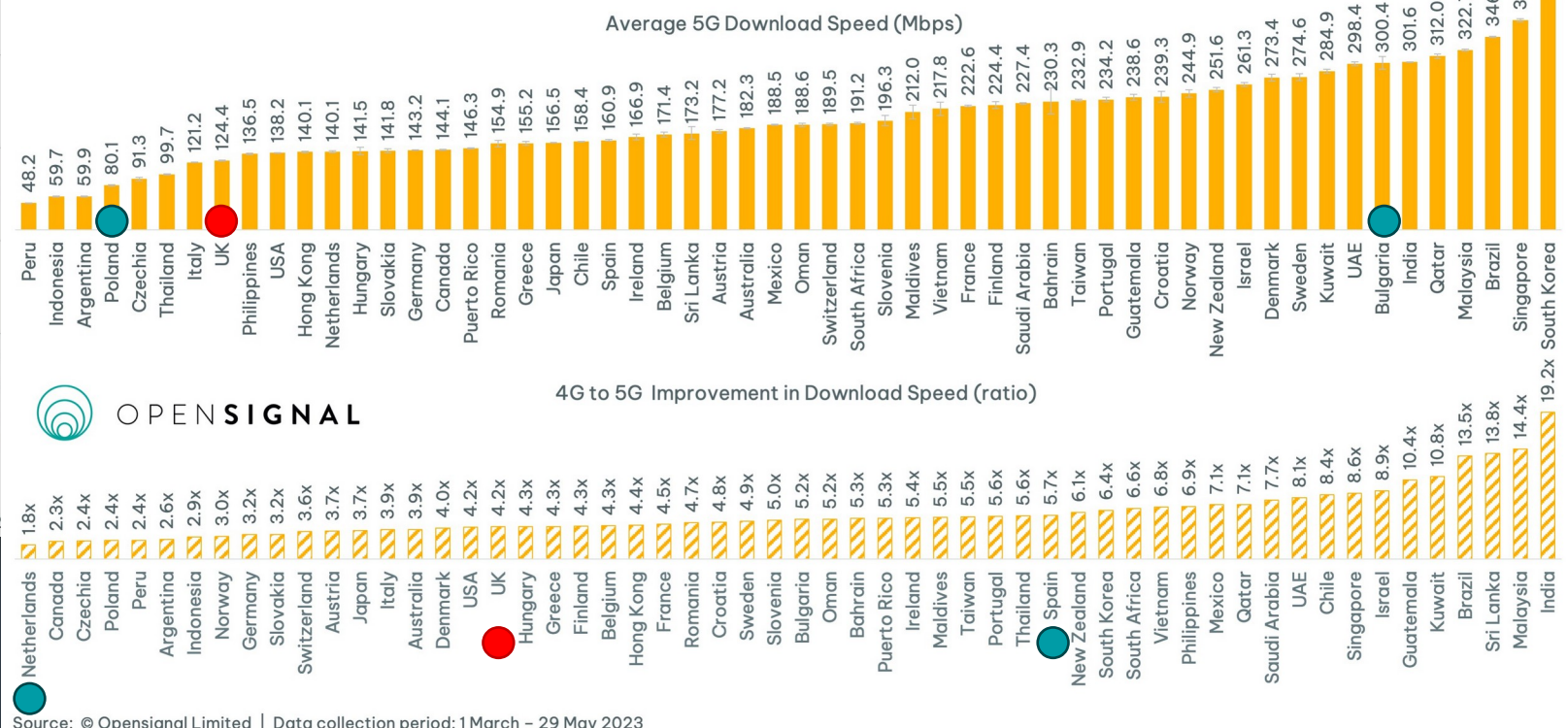
# And comparison globally

## 5G Availability – Global



Source: © Opensignal Limited | Data collection period: 1 March – 29 May 2023

## 5G Download Speed & Uplift – Global



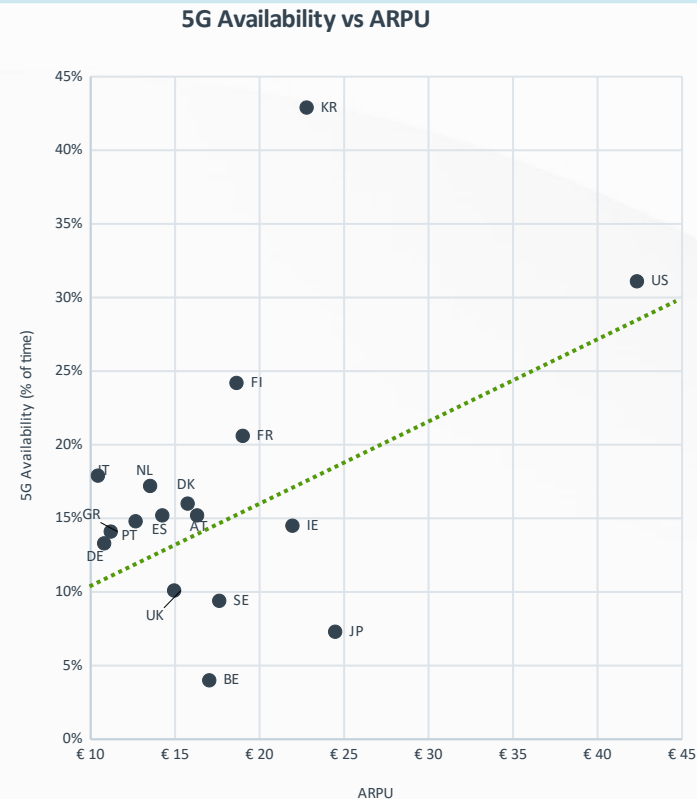
Source: © Opensignal Limited | Data collection period: 1 March – 29 May 2023

- UK
- European outliers

# UK vs International Benchmarks

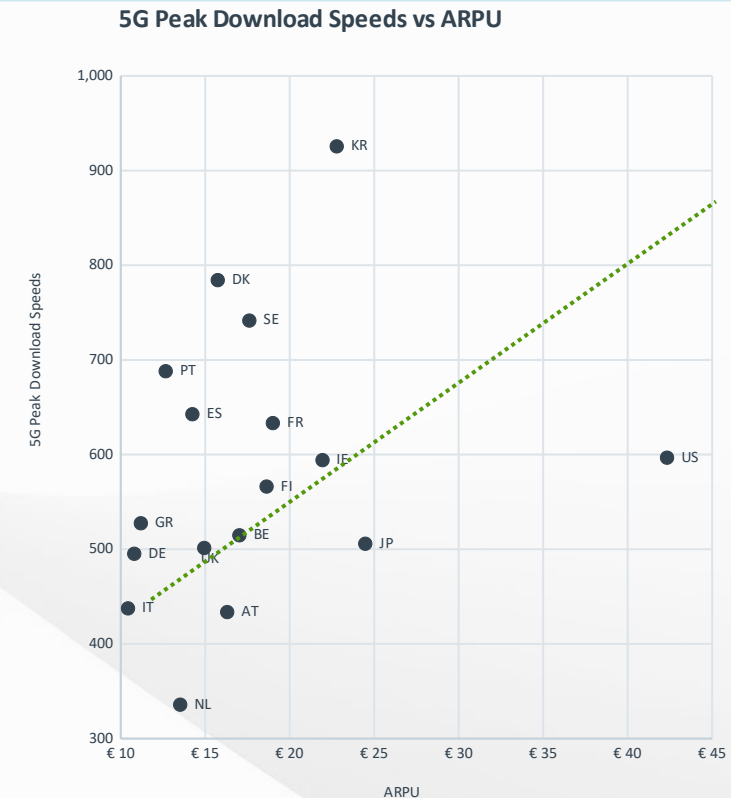
## 5G Network Availability

- UK & majority of EU countries have low availability vs international benchmarks
- South Korea, US and Finland leading



## 5G Peak Download Speeds

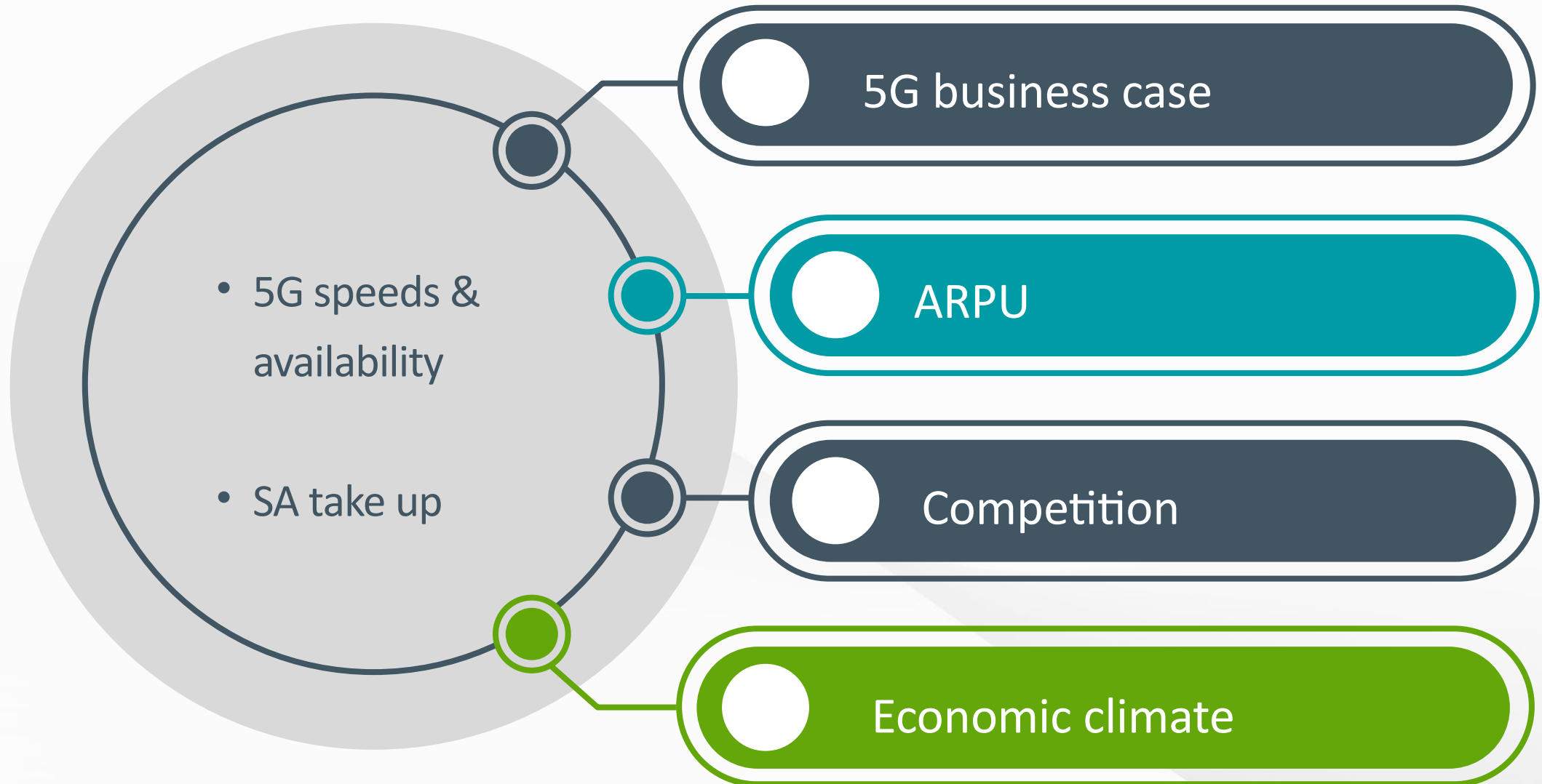
- 5G download speeds vary more widely
- UK, GR, IT, DE, NL, AT lagging on speeds
- South Korea, Denmark and Sweden leading



Sources: (1) Opensignal Benchmarking the Global 5G Experience — June 2023 (2) GSMA Intelligence ARPU Data

Country Key: AT Austria; BE Belgium; DE Germany; DK Denmark; ES Spain; FI Finland; FR France; GR Greece; IE Ireland; IT Italy; JP Japan; KR South Korea; NL Netherlands; PT Portugal; SE Sweden; UK United Kingdom; US USA

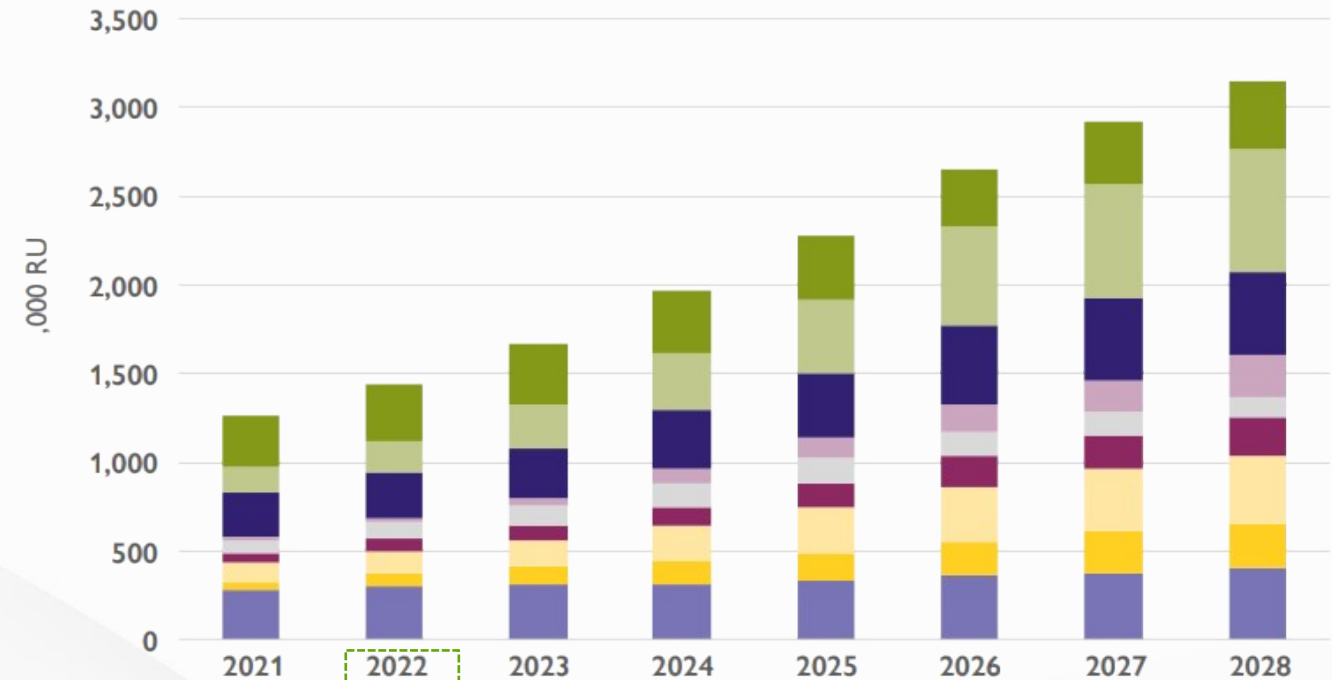
# Financial factors





## Small Cell Densification By region

- Europe lags behind North America and Asia
- 5G only a quarter of deployment



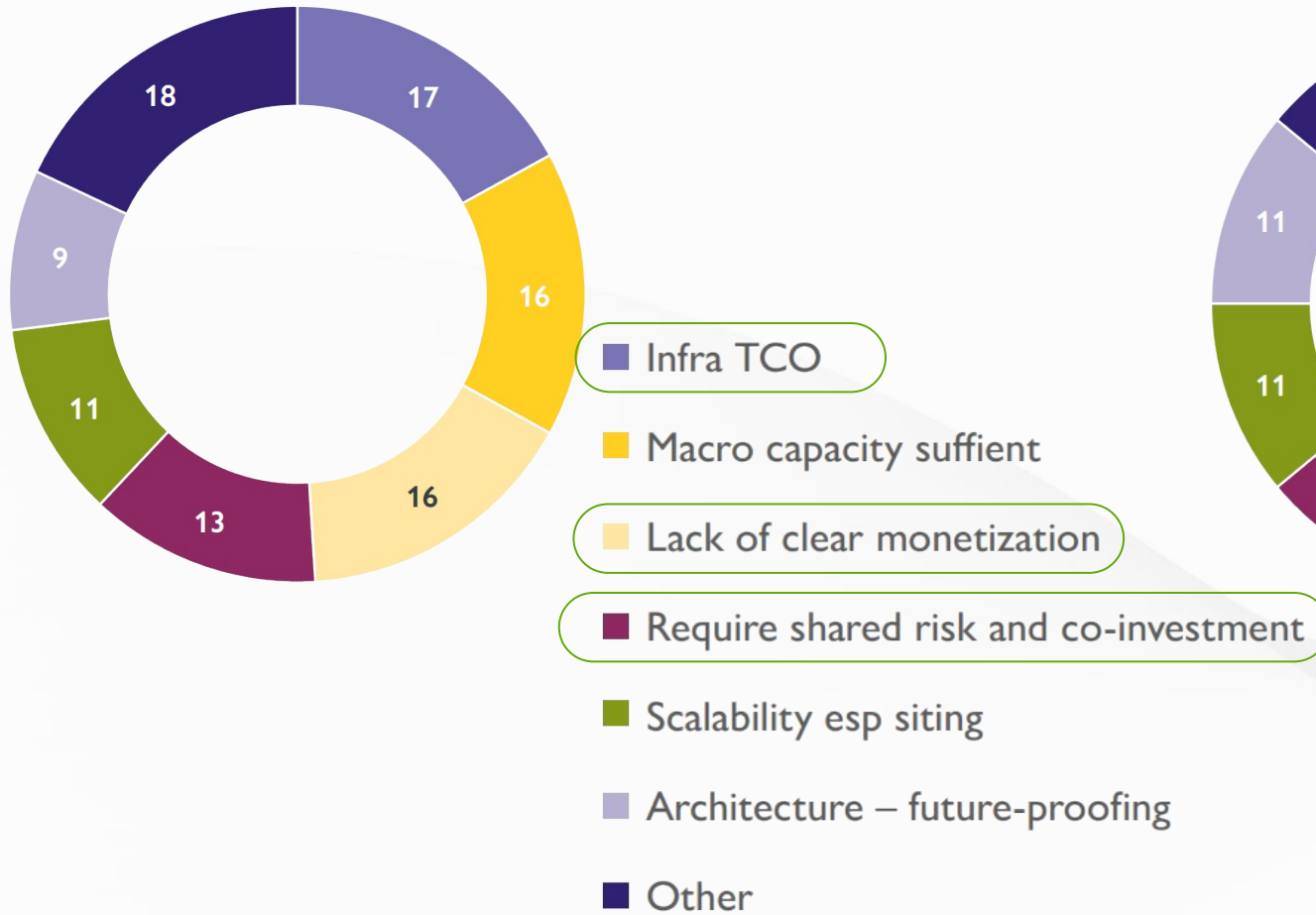
### Source

SCF market forecast report JULY 2023

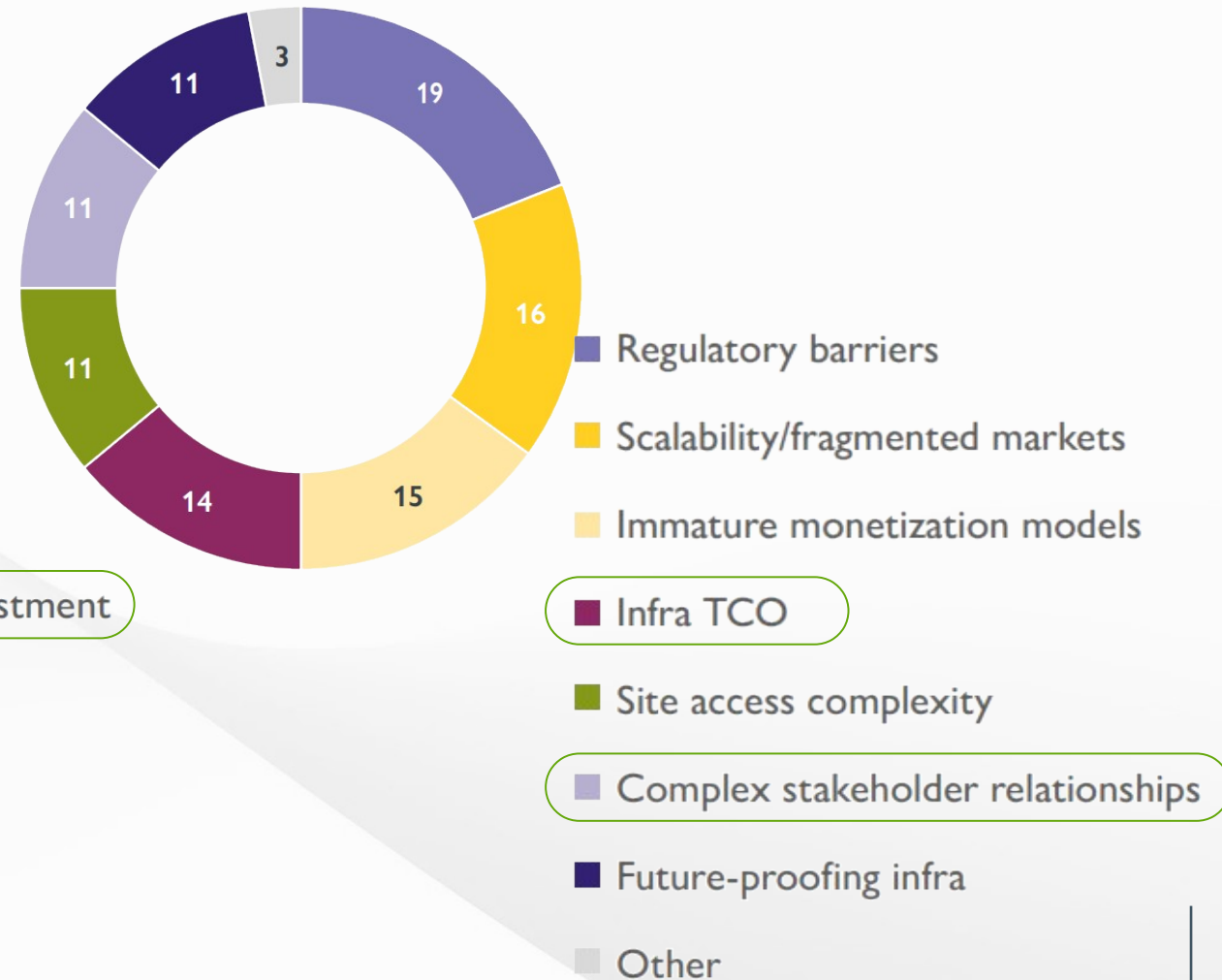
- Public outdoor and venue small cell cumulative deployments, urban and rural, 2021-2028 by region

# Barriers to deployment

## MNOs



## Neutral Hosts



## Driving further shared economics through RAN as a Service

- Operation of RAN by Neutral host – RANaaS
- Incremental value is achieved by Active sharing
- MNO retains full control of the Network strategy and its evolution



## Enhancing connectivity in crowded city centres across Europe



London



Erice



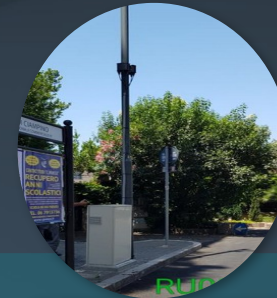
Barcelona



Milan



Dublin

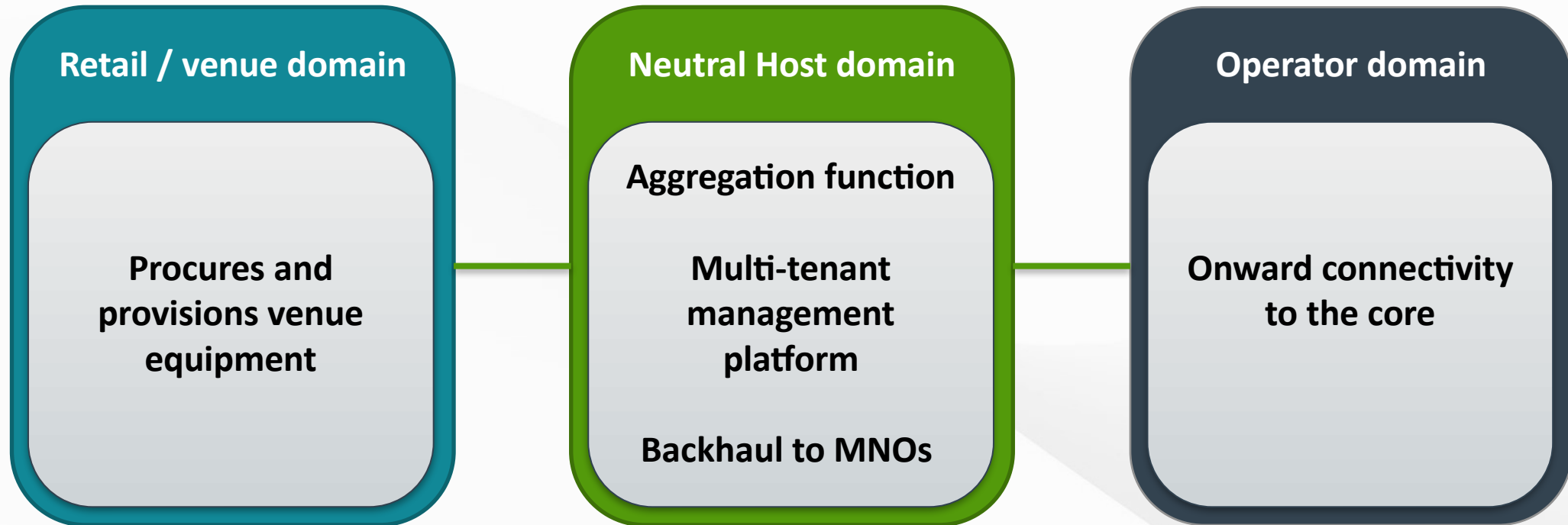


Ciampino



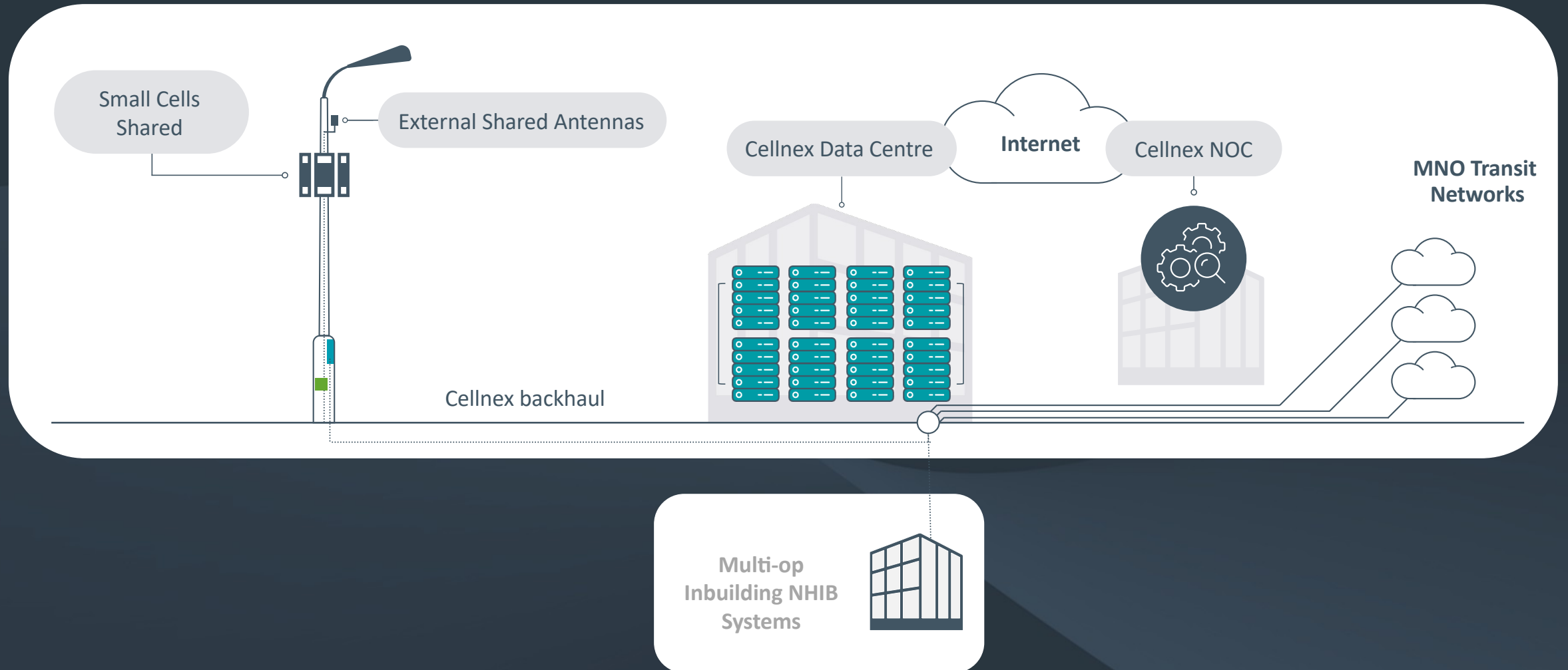
Switzerland

## NHIB / NHOD high level architecture



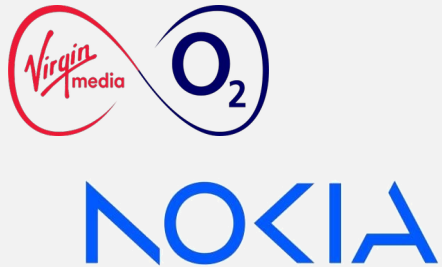


# Neutral Host Outdoor – NHOD



*Similar architecture and platform requirement as NHIB (Neutral Host In-Building)*

## Partners



### Trial objectives include:

- NH operation of RAN in outdoor environment
- Interoperability with existing (macro) network
- Prove platform for both indoor and outdoor
- Reaffirm Cellnex capability to manage active networks
- Develop collaboration to underpin build of scale solution
- Test re-aligned responsibilities

## Proof of Concept - London

- ✓ Trial agreed with VMO2 – Hammersmith & Fulham
- ✓ Vendor selected – Nokia BBU / RRU
- ✓ Equipment capable of supporting multiple bands for multiple MNOs
- ✓ Backhaul circuit ordered back to Cellnex Data Centre
- ✓ VMO2 Core integration in place

### Deployment in progress

- Commission and NMS Integration planned for Q2
- VMO2 live – Q2

### And then:

- Secure and integrate second MNO
- Develop further and plan for scale

# Operator small cell v NHOD at a glance

## Standard Deployment

## NHOD

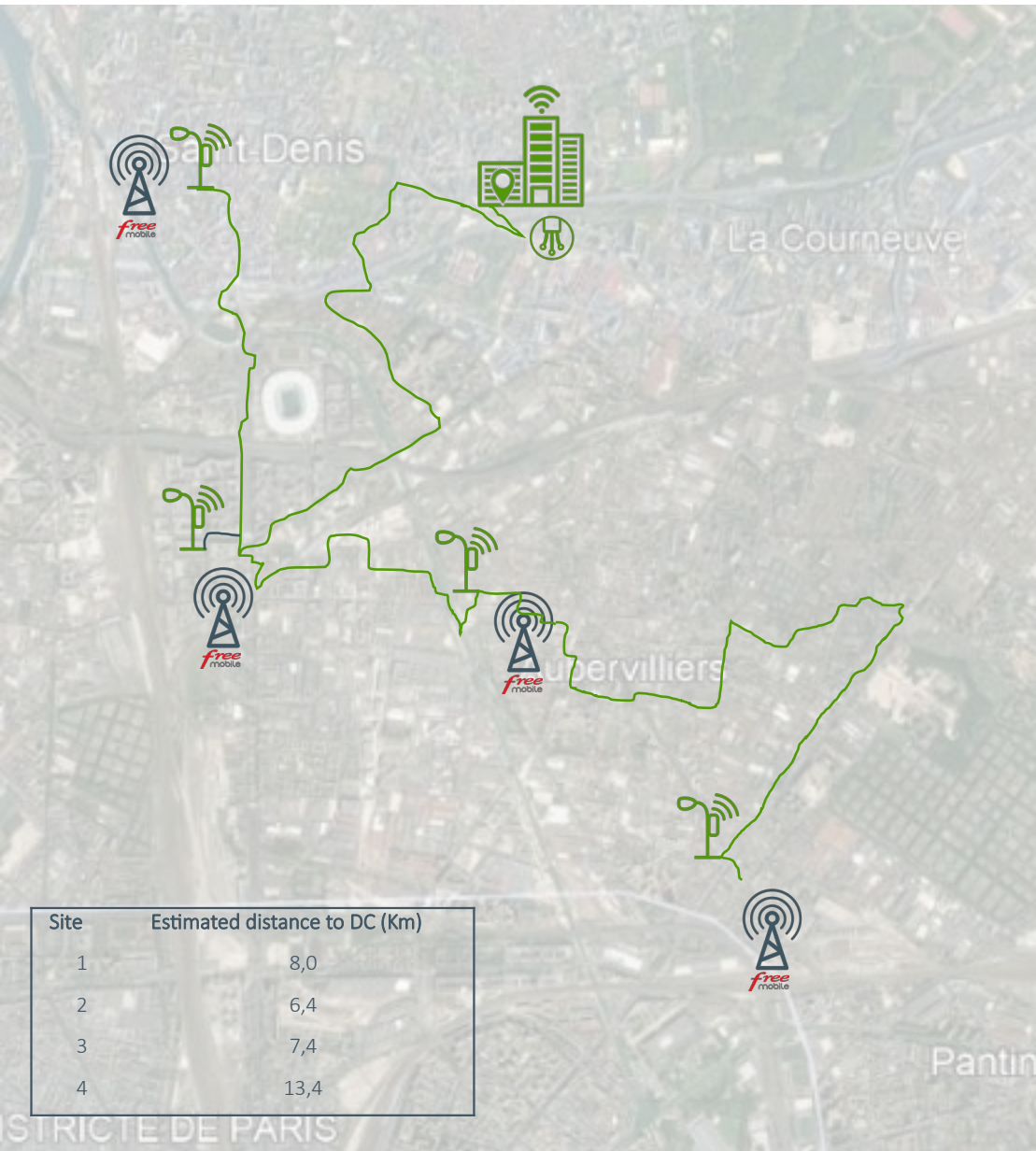
## Expected Benefits

Cellnex	Asset	Asset
	Power	Power
	Install	Install
	Site Maintenance	Site Maintenance
Mobile Operator	Backhaul (Ethernet)	Backhaul
	Small Cell equipment	Small Cell equipment
	SC integration	SC integration
	Active management, optimisation, maintenance & KPI reporting	Active management, optimisation, maintenance & KPI reporting
	Spectrum	Spectrum
		Core Integration*

- ✓ One set of infrastructure
- ✓ Lower TCO for operator versus standard single operator installation
- ✓ Reduced power consumption
- ✓ Enables strategic deployment
- ✓ Time to market

\* One time activity

# Open RAN Small Cells Free Mobile



Small Cell Open RAN proof of concept in a very densely populated area of northern Paris (Saint Denis and Aubervilliers)

HW and SW from different manufacturers

Delivering traffic to Free's core

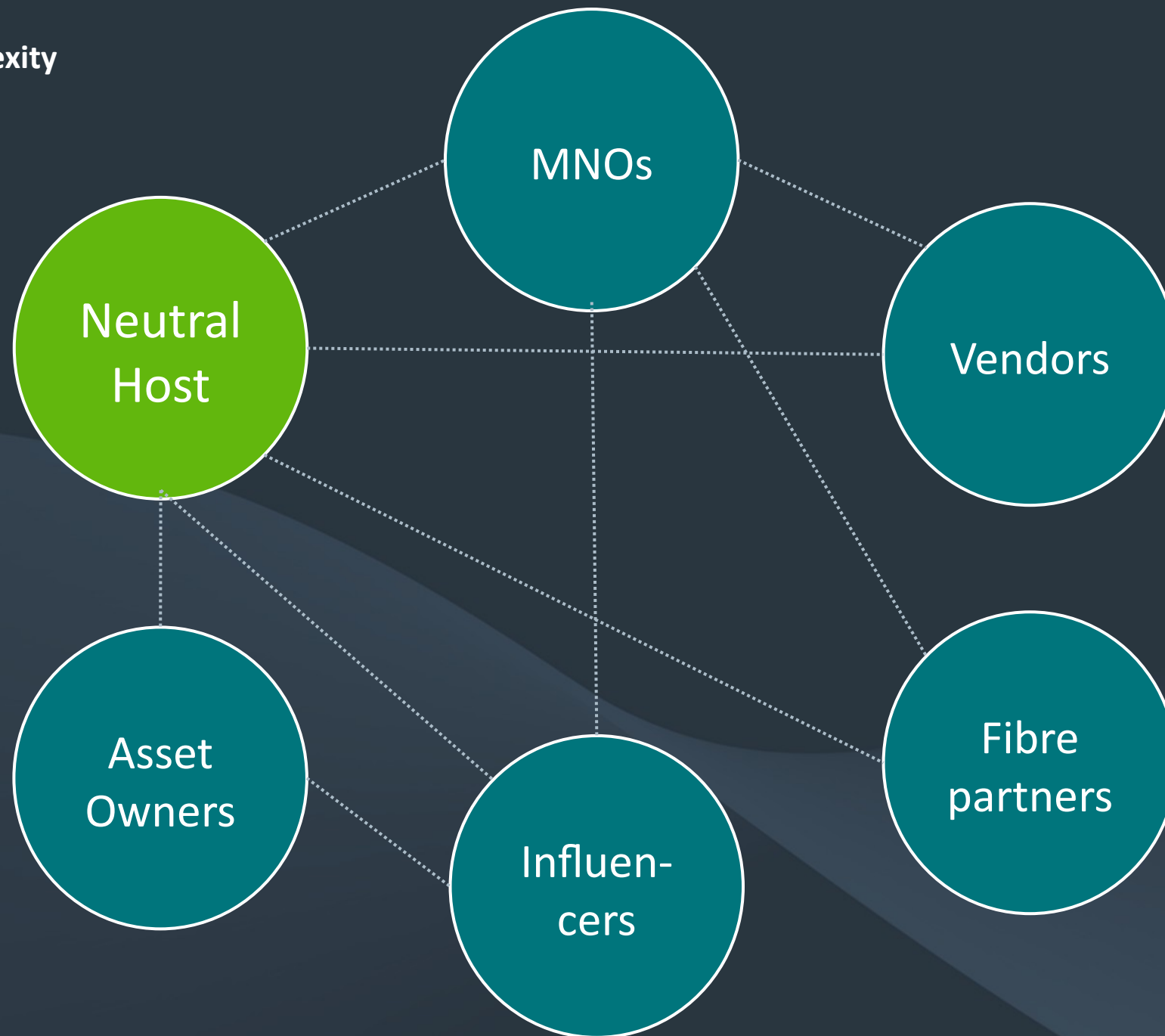
1 **Urban Infra**  
(new poles & existing lampposts)

 **Open RAN** Small Cells  
in C-RAN topology (Open RAN)

 **Fibre optics** (dark fibre)

 **Data Centre** + Core connection





We'll continue to spread the word...



Flexible deployment options

Ultra-fast fibre connectivity

Trusted service delivery

Flexible deployment options

Extended portfolio of local authority-owned street furniture, digital kiosks and dedicated Small Cell Street Poles.

Small Cells for smarter cities

Growing urban populations are demanding ultra-fast, ultra-reliable mobile connectivity. Small Cells deliver, supporting social inclusion, economic growth and smart city innovations.

[WATCH THE VIDEO](#)

The need for change at street level

Demand for high bandwidth mobile services is outstripping supply in many UK town and cities. Uncover the issues, the impact on communities and the case for Small Cell connectivity at street level.

[READ THE SMALL CELLS EXECUTIVE SUMMARY](#)

Making it happen in urban communities

Cellnex is helping MNO customers, partners and communities across the UK connect to new opportunities at street level. As the UK's Small Cell leader, and having deployed more Small Cells than anyone else, we're closing the coverage gaps, enhancing experiences and supporting local economies.

[FIND OUT MORE](#)



cellnex

driving telecom connectivity

Executive briefing: Small Cells

Creating connections that matter

Uncovering the opportunities of Small Cell infrastructure in these urban areas

Creating connections that matter

Small Cells for smarter cities

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Use QR codes or visit:

[www.cellnex.com/gb-en/small-cells-lpi](http://www.cellnex.com/gb-en/small-cells-lpi)

cellnex

driving telecom connectivity



Scan the code to access the resource centre



# Thank you

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