Building Britain's

5G Future

Introduction

The world faces an ever-growing demand for data. By the end of 2023, total mobile data traffic is expected to increase almost eightfold, while **other projections show** it will likely account for 20% of total Internet traffic by 2021 – up from just 8% in 2016. With no sign of this abating, 4G is at the limits of its capabilities. Fortunately, the 5G future of higher bandwidths, lower latencies and faster speeds is soon set to become a reality.

The opportunity is huge. Whether facilitating high-speed comms or powering the adoption of the **Internet of Things** (IoT), 5G offers many new use cases. But without access to suitable network infrastructure, **Mobile Network Operators** (MNOs) face a costly and complex task when it comes to actually providing **widespread 5G coverage**. Developing the relevant infrastructure, networks and visibility tools requires a significant financial investment. And this cost can't realistically be passed on to the consumer, with end-users (both enterprise and consumers) unlikely to want to pay significantly more, despite the vastly improved service they'll be experiencing.

Building profit will become ever more difficult. Set alongside the need to continually maintain and upgrade 4G infrastructure, it's clear the coming years bring a number of serious challenges. This means, to thrive in the 5G future, MNOs, service providers and other key parties need to work together effectively to deliver essential capabilities.

SSE Enterprise Telecoms' 5G plans

To tackle the **challenges of 5G**, MNOs need resilient strategic partners – which is why SSE Enterprise Telecoms has been working hard to ensure it can support the 5G rollout. In this document, you can learn about our vision for **building Britain's 5G future**, including an expected timeline, details of the infrastructure we're delivering, and information on how we plan to work with MNOs to make 5G a reality. Because together, we can deliver the next generation connectivity Britain needs.

Using this document
This document is a navigable, interactive PDF. That means certain sections are clickable and can be expanded, while others are linked for quick access to the information you require. Clickable content is highlighted throughout and every page has the option to return to this screen, symbolised by the home icon. Select one of the sections below, or scroll to get started.

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Timeline:
what needs to happen to make 5G a reality?

5G is a vast evolution from where mobile connectivity is today, as such collaboration and innovation will be required to transform the networks to make 5G a reality. To deploy 5G, a combination of existing and new infrastructure will be required. This includes 5G Radio Access Network (RAN) swap-outs, a virtualised 5G core that's closer to the edge of the network, and increased front, mid, and backhaul capacity from RAN sites to the core. Greater network densification will be required, which will demand more sites per km^2 and the use of street furniture for closer device connectivity. It will also need eco-systems for user equipment that connects to the 5G network.

The 5G timeline

Discussion around the **5G rollout** has been somewhat **confusing** over the last few years – but the expected timeline has recently become much clearer, with many major manufacturers set to release **5G-compatible devices in 2019 and 2020**. The first deployments will be Fixed Wireless Access (FWA) devices, with mobiles set to follow.

But what about MNOs? It isn't just a case of **'turning on the 5G network switch'**, after all. **5G requires a major transition** to high speed fibre or 10/100Gbps services, to meet the demands of C-RAN and D-RAN architectures both for fronthual and backhaul services from RAN sites. SSE Enterprise Telecoms is ready to support MNOs in their 5G journey by providing access through our existing high capacity fibre network. **Here's our predicted timeline for 5G deployment.**

2

Use cases for 5G:

5G is a technology framework which will provide a **variety of improvements** on 4G. It's anticipated the peak data rate will be **20 times faster**, with connection density multiplied by 10 and latency significantly reduced. Network energy efficiency and area traffic capacity, meanwhile, will be up to 100 times better. Together, this will help to deliver a number of **key innovations** – click on the icons below to discover more.

'The peak data rate will be 20 times faster, with connection density multiplied by 10 and latency significantly reduced.'

Ultrafast mobile

Mass machine communications

Reliability or consistently low latencies

3

Mobile as the fourth utility:
the opportunity and challenges for MNOs

Gas, water and electricity have long been considered essential utilities. With the advent of 5G, mobile Internet will complete its journey to becoming the fourth. And not just for mobile devices, either. 5G can also deliver FWA, providing Internet via wireless technology, rather than fixed lines.

This creates another huge opportunity for MNOs, as FWA could be significantly more convenient and better performing in homes and businesses that need flexible connectivity, without a broadband line.

Fast, low-latency, ubiquitous mobile Internet will soon underpin every aspect of our lives. So, the opportunity for MNOs to capitalise is significant – provided they can deploy and harness the power of 5G in the right way, and work with the right partners to get there. MNOs will need to tackle to challenges of making 5G economically viable, as well as ensuring the limited spectrum available works effectively.
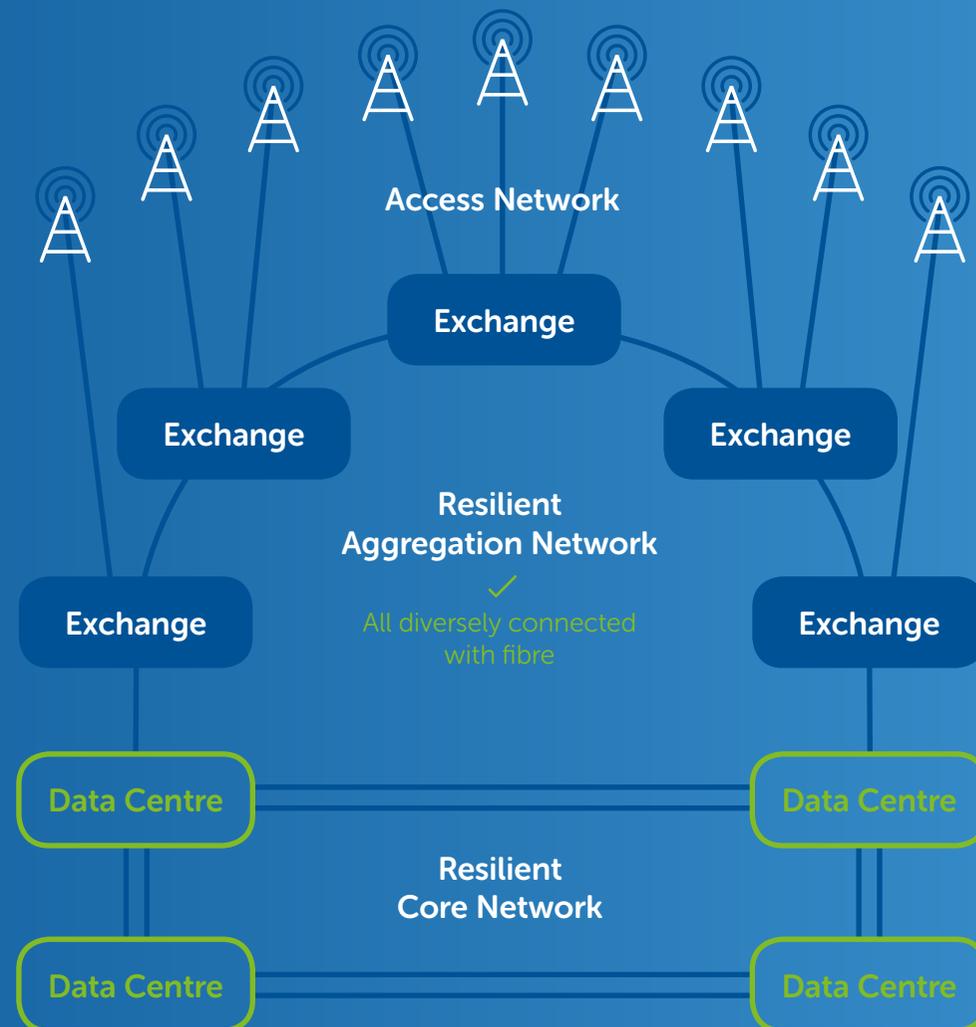
Here's how SSE can help:
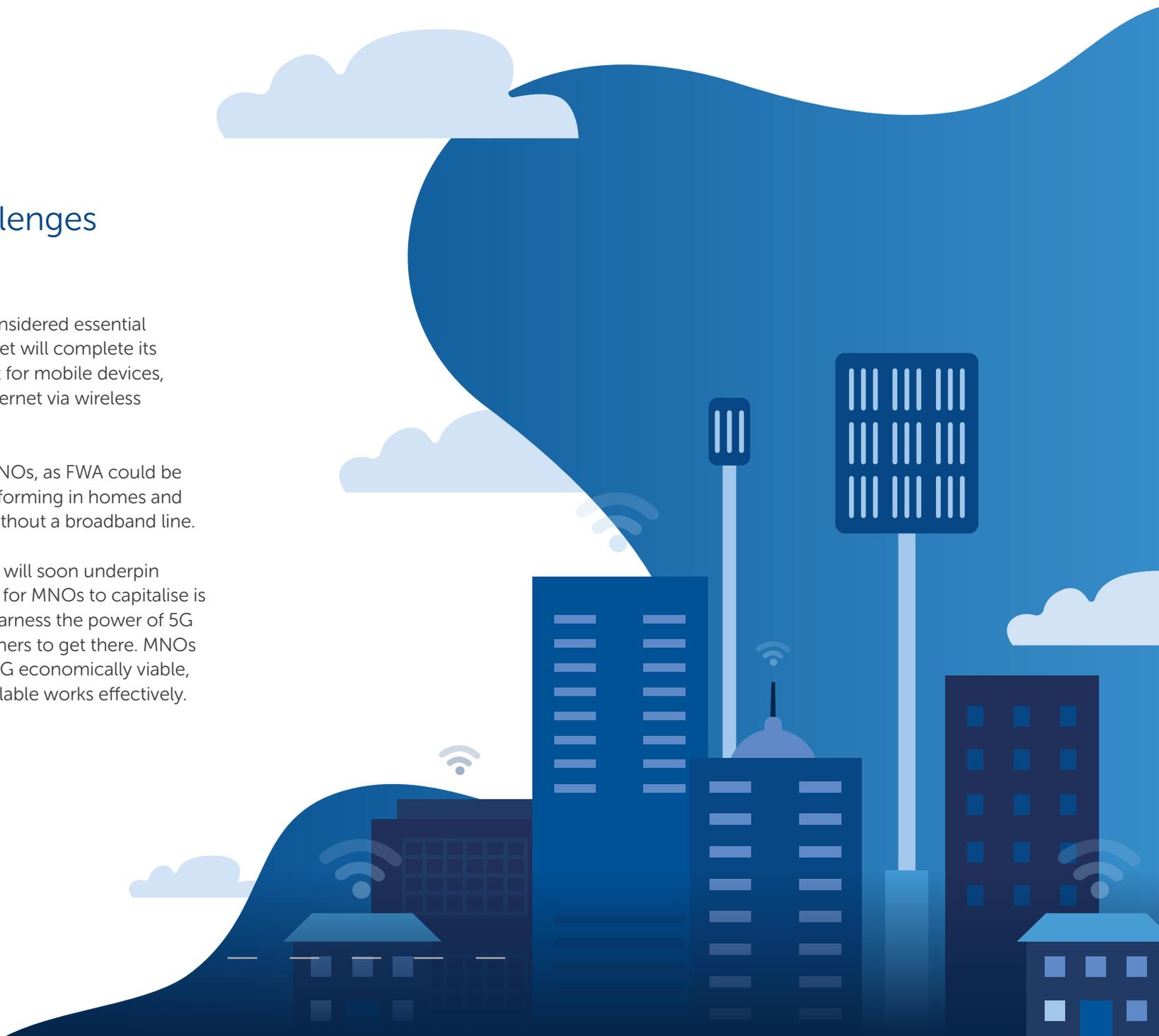
The SSE core network:
explained

The SSE Enterprise Telecoms MNO architecture consists of data centres distributed around the UK, on a high-speed resilient optical transmission network. These are ideal locations for a distributed virtualised EPC and 5G core deployments.

Connected to these data centres are strings of exchanges which provide high-speed aggregation nodes that have resilient and highly scalable capacity back into the distributed core.

These exchange aggregation nodes provide localised hubs for RAN sites to connect into, and can also form part of a BBU hotel (LTE) or gNB-DU edge cloud function.

Access Network

Exchange

Exchange

Exchange

Resilient Aggregation Network

✓ All diversely connected with fibre

Exchange

Exchange

Data Centre

Data Centre

Resilient Core Network

Data Centre

Data Centre

4

5G ubiquity:
from dense urban deployment to rural rollout

The 5G conversation is frequently dominated by metropolitan areas and major cities, and SSE Enterprise Telecoms can certainly support with this: in the London Underground Circle Line area alone, we will have over 100Km of fibre, presented at some 500 access chambers, to enable 5G across front, mid and backhaul.

However, suburban and **rural areas should also benefit** from the use cases of 5G rollout, although the network solution will understandably be different depending on the area. We presently have 177 unbundled exchanges in urban and suburban locations, which will be expanded to nearly 500 across the country in the next three years. These are all connected by fibre to a high-speed optical transmission network and MPLS overlay.

In rural locations, dark fibre may not be realistic across the board. So, we can provide a mix of dark fibre and 1/10/100Gbps services as a leading network aggregator, all delivered as a managed Ethernet service.

Obviously, there'll be an order of priority: the economics of deployment mean MNOs will focus on dense urban and urban areas first, as that's where the bulk of the customers are. But the MNO which can provide 5G in dense urban, urban, suburban and rural areas will be at a distinct competitive advantage – and we have both the existing infrastructure and the plans to help our partners facilitate this.

Dense Urban

Urban

Semi-rural

Rural

sse Enterprise | Telecoms

5
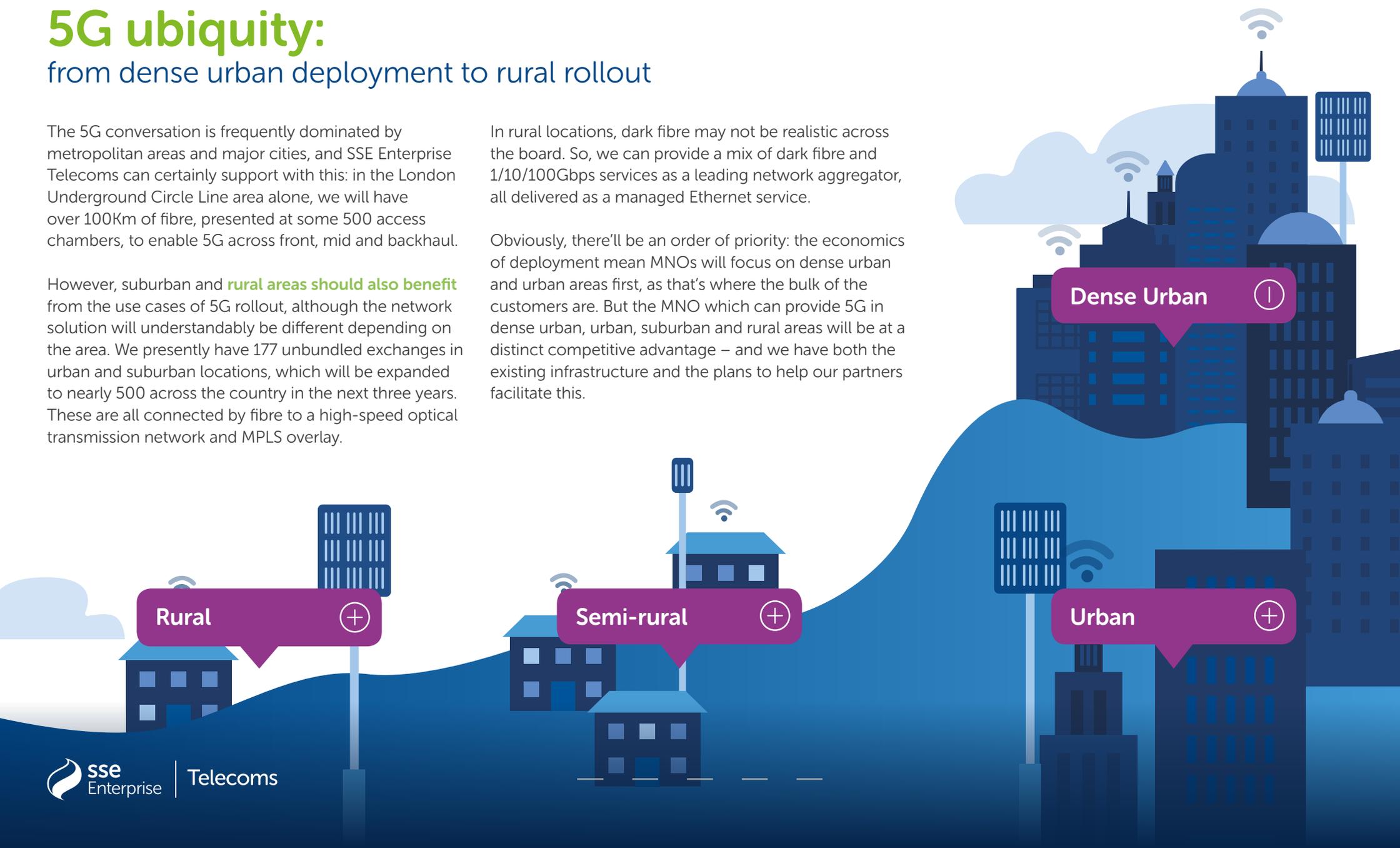
A 5G partner for British MNOs

To rollout 5G successfully, **MNOs need a 5G partner** with both the **vital infrastructure** and the **right attitude** to support this endeavour. With the backing of SSE Group, this is exactly what SSE Enterprise Telecoms can provide, leaning on our existing and planned fibre network. We can **provide the critical infrastructure** layer, the access layer via fibre, and then the long-term strategic value of **network maintenance** and **troubleshooting**.

Furthermore, 2019 saw **M&G Prudential's infrastructure** equity investment arm, Infracapital, buy a **50 per cent stake** in SSE Enterprise Telecoms, for a total consideration of up to **£380 million**. This continued investment will only strengthen our ability to **support the 5G rollout**. SSE Enterprise Telecoms is therefore a partner capable of supporting the network and consumer demands faced by MNOs.

But it's not just about infrastructure and financial backing. In the quest to deliver 5G, MNOs require partners who can **offer delivery excellence**: on time, to target and in an organised way. We've demonstrated this on **multiple fronts**, from our history of excellence in aggregating suppliers to our planning and delivery of a fibre in the sewers programme. And we intend to keep demonstrating this through our commitment to our partners.

Get ready for 5G

Britain's 5G future is on the horizon, but there's plenty more planning and innovation to be done before it can be successfully realised. With both its existing infrastructure and its planned investment, SSE Enterprise Telecoms has the resilience and the attitude necessary to work with MNOs and deliver 5G to the country.

Get in touch to find out more:

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