



Getting ready for 5G

The big role of small cells



Email clientreception@bt.com
or call 0800 671 045

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Mobile connectivity is the way forward. Just take a look at the market. 4G deployment continues and the dawn of 5G is rising. But questions of capacity and coverage are still hot spots for us to talk about. Can the industry cope? What about rural black spots in the network? The concerns are genuine but the solution is right in front of us.

Small cells.

The rapid adoption of small cells

We've seen mobile operators taking up small cell deployments with the number set to grow. In fact, the SCF forecasts that by 2025 we could have almost 8.5 million small cell deployments. But why are they the way forward? Traditional methods of adding capacity are reaching an end and it's a constant battle to stay ahead of data demand for your customers. That's why we saw a record number of small cells deployed in 2018, with the demand set to grow.

As small cells become a necessity, we make them easier to incorporate into your portfolio. With turnkey solutions that combine backhaul, sites and managed delivery, you'll be able to be the MNO your customers need you to be. And it'll be even simpler and more cost-effective to do so when working with us.

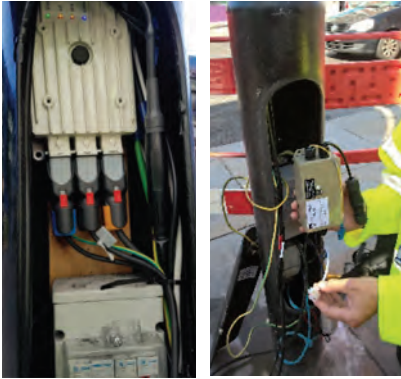


Delivering success

In 18/19 we saw a 500% growth in small cells through our portfolio that capitalises on a small footprint access into existing infrastructure. We expect this to grow a further 300% in 19/20.

Street Access & Street Connect

Compact IP rated NTE designed to fit most structures.



Payphone small cells

A UK-wide asset ideally located in areas of high footfall.



Street column small cells

Ideal height and available in almost every town and city.



Telegraph / bespoke pole

Nationwide, feeding suburban, hamlets and ideal for rural demand.



How we can help you

Our managed site propositions include:

- a portfolio of assets to assist large scale small cell deployments
- bespoke poles to add further depth
- engagement with external parties, such as local government and landlords
- standardised templates to assist rapid deployment
- ability to circumvent onerous planning processes.

Deployment made easy with turnkey solutions that combine backhaul, sites and managed delivery.

Rural infill

- Coverage infill for smaller rural and suburban ‘not spots’.
- We provide design, installation, commissioning and in-life management.
- Excellent track record of planning approval in conservation areas.

Urban capacity

- Visually unobtrusive in high footfall areas.
- A range of asset types to meet demand.
- De minimis planning approval confirmed for phone box design.

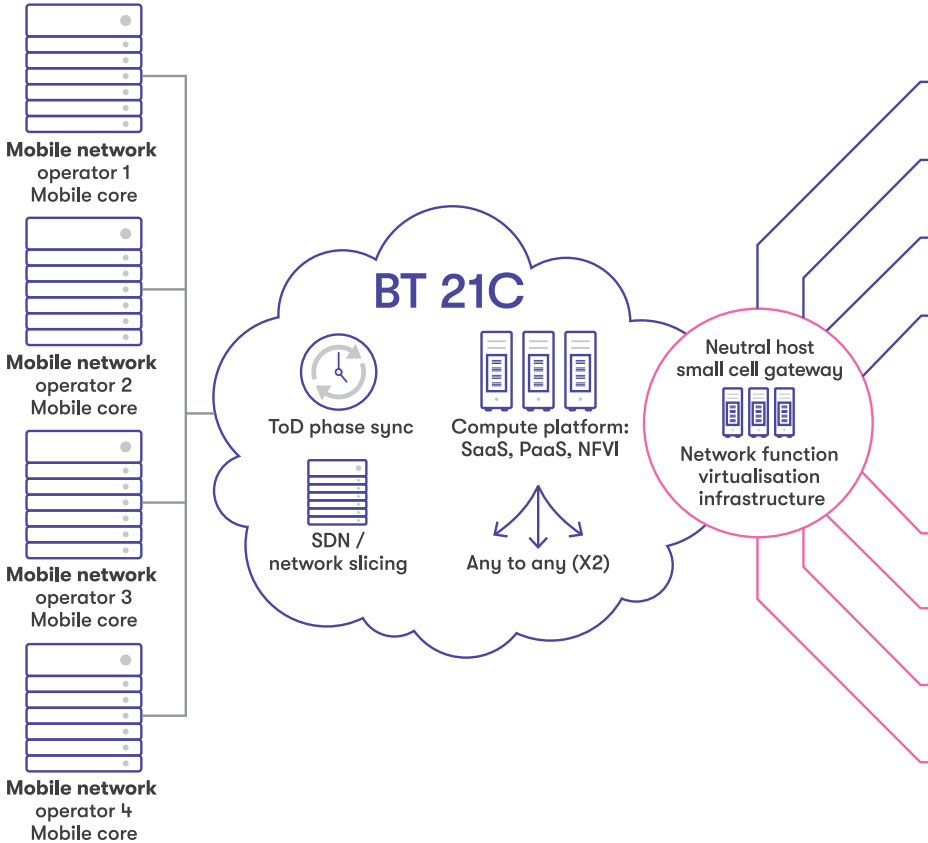
Small cell backhaul

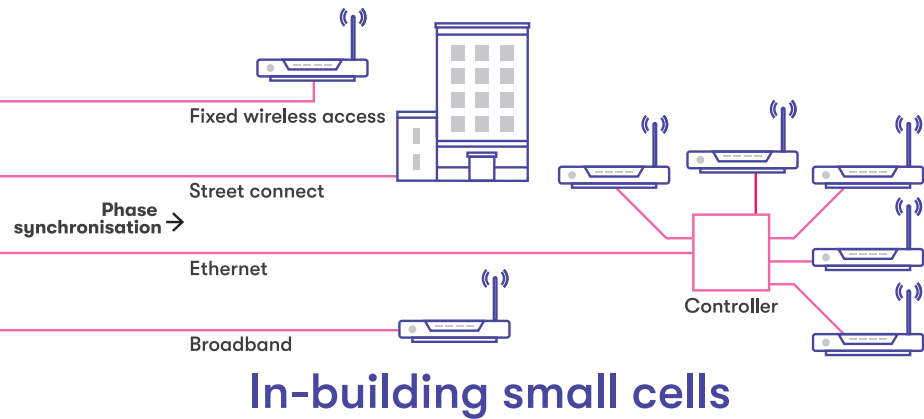
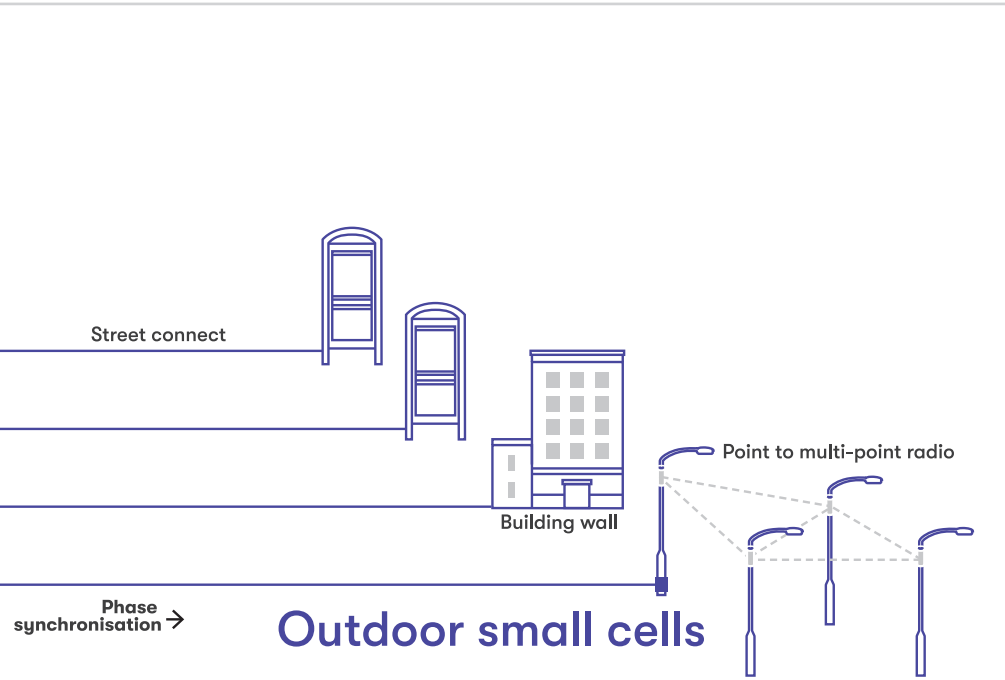
- SA100 and Street Connect 1G deliver capacity where you need it.
- Street Connect 10G and new fronthaul solutions planned for 5G.
- Multi-point radio and neutral host deliver best unit economics.

Uniquely positioned to create a leading customer experience



Neutral host small cells







Our innovation for the future

In order to simplify deployment and maximise benefits to you, we continue to invest and innovate.

UK's first powered underground cabinet

- Enables asset sharing in central urban and conservation areas.
- Removes street clutter so councils are more likely to partner with us.

Smallest phase synch capable 1G NTE

- Lowest cost option for any 1Gbps street level deployment.
- Enables phase and opens up TDD small cell options on the radio.

Global first vRAN neutral host small cells trial

- Opens up multi-operator in-building solutions to a whole new customer base.
- Single architecture for in-building and outdoor spearheads the move towards NFV.

Case study one

Revolutionising the deployment of in-building small cells



As mobile networks grow, so too does the challenge to provide in-building coverage. While large premises, such as arenas, stadiums and shopping centres can invest in Distributed Antenna Systems (DAS), the smaller premises such as retailers, libraries, hotels and restaurants can suffer. Especially when they need to serve customers who can be on any network. That's why we are working with the UK mobile operators (MNOs), to trial new technology and architecture for neutral host, such as virtualised RAN (vRAN).

Our aim is to ensure mobile operators are free to evolve their network independently over a shared platform, while at the same time also make the end-to-end solution affordable for the mass market. Our new virtualised architecture and technology helps in the mid-market segment, providing a combined solution which addresses the challenges of hardware-based network sharing.

For our initial trial, we operated two mobile networks independently to prove the concept. But the solution can easily be scaled up to support four mobile networks. Our roadmap to a radio that will support bands for all four UK MNOs in a single box makes the solution even more compelling for the enterprise in-building market, as it'll reduce deployment complexity.

The physical design has the security gateways and baseband functions hosted centrally in local serving exchanges with radio traffic aggregated and fronthauled over a single transmission link. Each operator's traffic

is backhauled unilaterally through single operator security gateways back to each of the mobile cores using our dedicated IP VPN mobile backhaul network. In the mobile core, each of the operators has a RAN intelligent controller (RIC) which provides the visibility and control they need over the network.

The benefits for our MNO partners include:

- independent plug and play
- ability to use mutually opposing QoS strategies
- ease of IP design and deployment
- independent network evolution and scaling
- independent design and testing.

Neutral host will be the fastest-growing area for enterprise in-building small cells. Our new software-based architecture enables small cell sharing with best unit economics. And while it encompasses mobile RAN and core configuration, transport and aggregation, compute /NFV, security, end-to-end OSS, system orchestration and in-life management – for our customers, it's simple and painless to deploy.

Our trial was the first of its kind and is a game-changer for the small cell market. Ultimately, any sized business will be able to buy an off-the-shelf multi-operator small cell system in the most cost-effective way.

Case study two

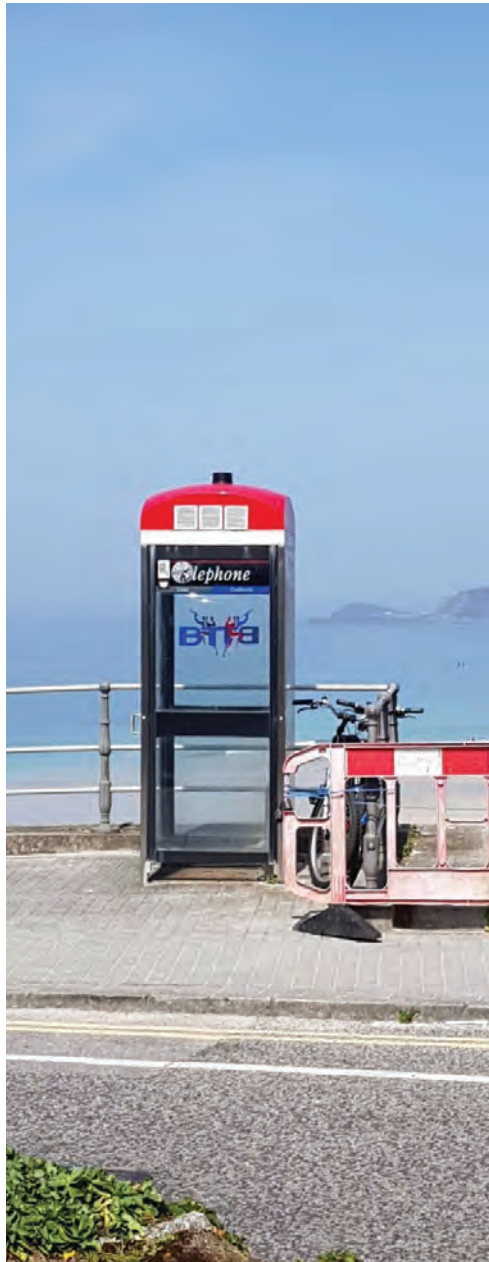
A phone box for the new generation

Our UK mobile operator customers had exhausted their macro cell capacity in some of the densest footfall areas in the UK. They needed to improve their customer experience, fast. By using our existing assets, we successfully installed multiple small cells in these high demand areas.

We used one of London's best loved attractions – the BT phone box! Despite years of wear and tear, with some engineering excellence we were able to install small cells in the roof dome of the phone box, connecting it to a BT managed antenna. We kept the aesthetics of the design, so at first glance the kiosks don't look like they've been altered.

The cells were connected to our Street Connect 1G fibre service, which connects the phone boxes to an aggregation point in a local serving exchange. Mobile traffic is then backhauled using an IP VPN connectivity product to the respective mobile core. Street Connect 1G has been developed specifically for outdoor small cells, has market-leading packet loss, delay and jitter performance, making it ideal as a dedicated small cell backhaul product.

With each successfully delivered site for our mobile customers, we're one step closer to delivering significant outdoor small cell volume for the UK.



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