



5G connectivity in the real estate market

December 2022

Introduction: wireless connectivity in the real estate market

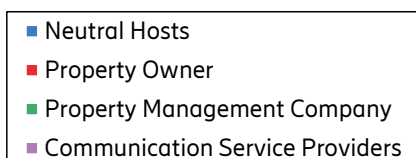
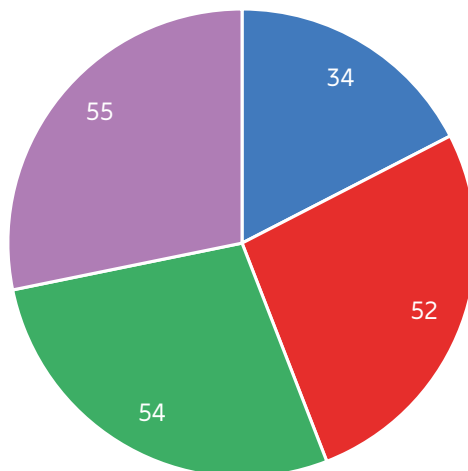
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Across the globe, enterprise digitization has picked up rapidly in the last few years. What was already a strong trend was accelerated by the global COVID-19 pandemic, and preventive measurements to try and limit the number of infections increased demand for high-quality connectivity as employees started to work from home, but still needed access to secure communication within their workplace. In response, enterprises across all different verticals (including for example healthcare facilities and manufacturing establishments) continue to demand higher quality connectivity – be it either in terms reliability and availability, latency, or enhanced broadband capabilities. Real estate managers and building owners see need for higher capacity to satisfy ever growing demand for bandwidth as well as high availability of reliable connectivity to support other business critical applications.

To understand key developments within the real estate market, telco infrastructure vendor Ericsson and tech consultancy ABI Research have surveyed a total of 195 respondents (real estate owners, building managers and commercial executives within Communication Service Providers (CSP) across North America, Europe, the Middle East, and Northeast Asia.

Number of Respondents by Type of Company



Number of Respondents by Job Function

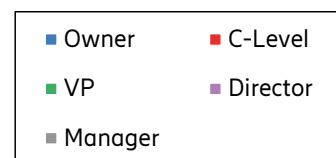
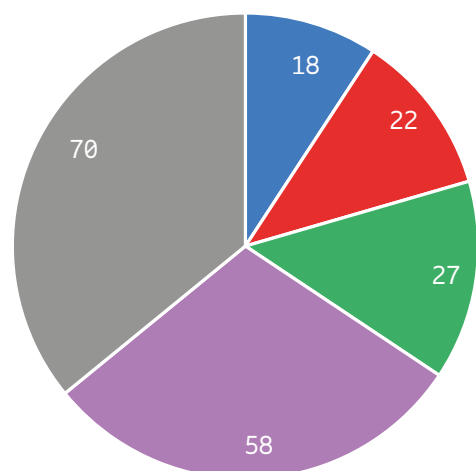


Figure 1: Background Demographics of the Survey

In response to increased connectivity demands discussed earlier on, the real estate market is actively looking towards cellular technologies for their in-building connectivity, as figure 2 shows.

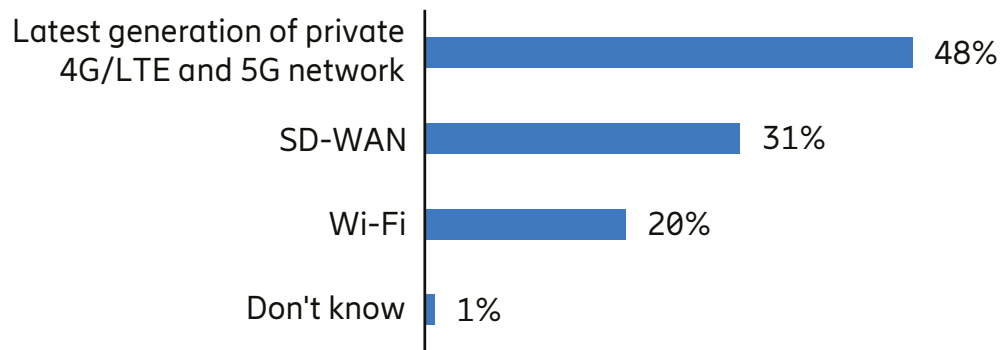


Figure 2: Q: Which connectivity technology will meet your requirements in the best way?

While interest in using 5G for in-building connectivity in the real estate market is there, more education is needed to ensure real estate owners, managers and commercial building tenants have a clear understanding of 5G capabilities and form realistic expectations. At the same time, potential suppliers of cellular connectivity need to understand key pain points of the sector, as well as budgetary constraints and financial abilities to design appealing offerings for the commercial real estate market.

This paper will therefore focus on the 5G opportunity in the real estate market. It starts by looking at the supply side, i.e., what is available today and how this can address key pain points of current in-building wireless connectivity, followed by the underlying business case and offering a blueprint for successful 5G deployments for in-building wireless.



01

The role of 5G connectivity for in-building wireless

What is available today?

To understand why 5G matters for real estate in-building connectivity pain points, it is important to look at what 5G will ultimately offer enterprises, building owners and real estate managers. Figure 3 gives an overview of the three main characteristics of 5G connectivity for enterprise verticals.

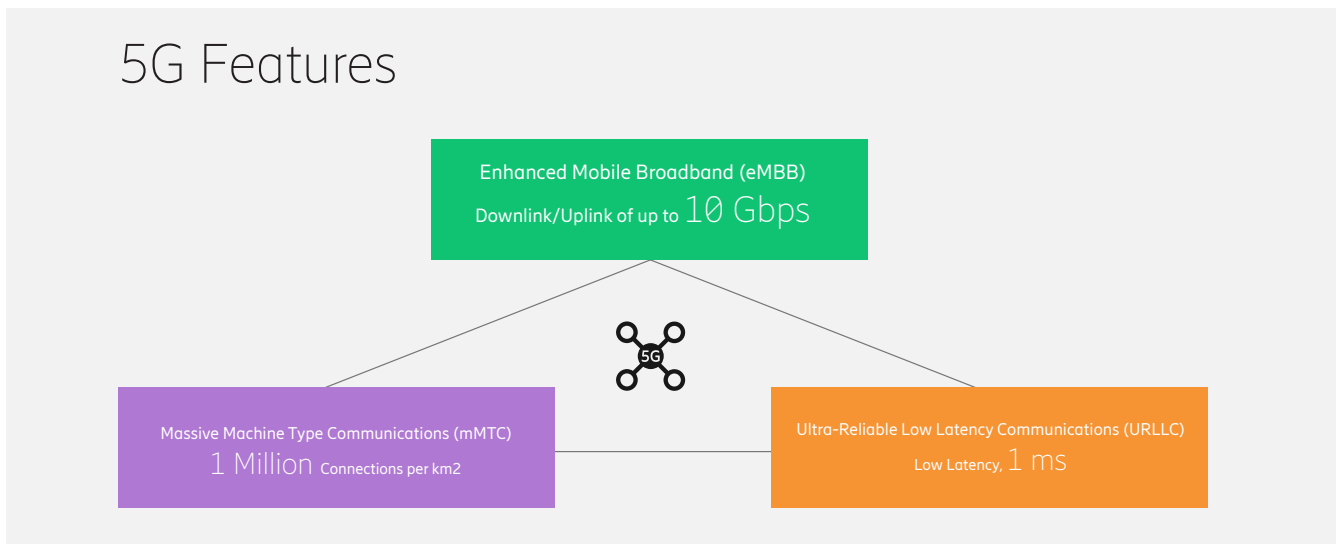


Figure 3: Overview of 5G capabilities

To accelerate the rollout of 5G connectivity, the 3rd Generation Partnership Project (3GPP) decided to introduce each of these features one after the other. Consequentially, 5G connectivity today is perfectly capable of offering particularly high data rates as part of the enhanced mobile broadband (eMBB) capabilities – 20 Gb/s in the downlink and 10 Gb/s in the uplink. These are particularly important to provide high-capacity connectivity to sites with

multiple offices and tenants, which all use connectivity for data intensive applications, such as video streaming, conference calling or remote presentations. Remaining features like the provision of particularly low latencies for highly time critical applications or a high density of connected devices (up to 1 million devices per square kilometer) will be commercially available at a later stage – currently expected towards the end of 2023.

Why should we care?

Enterprises across the globe are rapidly advancing their digitization initiatives. As a result, not only does the demand for connectivity increase, but the quality of connectivity will become an increasingly important factor that will influence tenants' decision when selecting a certain building or site. As figure 3 highlights, the most important pain point with in-building wireless connectivity is that legacy Wi-Fi network infrastructure cannot cope with the increased demand. Extending existing public connectivity proves to be a challenge, which 5G can seamlessly

address with its enhanced mobile broadband (eMBB) capabilities. In addition, maintaining multiple indoor connectivity networks for different use cases simultaneously can become very complex and therefore highly costly and resource intensive. By providing the opportunity to slice a network and dedicate different slices to individual use cases, 5G can unite all heterogeneous use-cases under one connectivity umbrella and therefore deliver important savings in terms of Total Cost of Ownership (TCO) – both from a CAPEX as well as OPEX perspective.

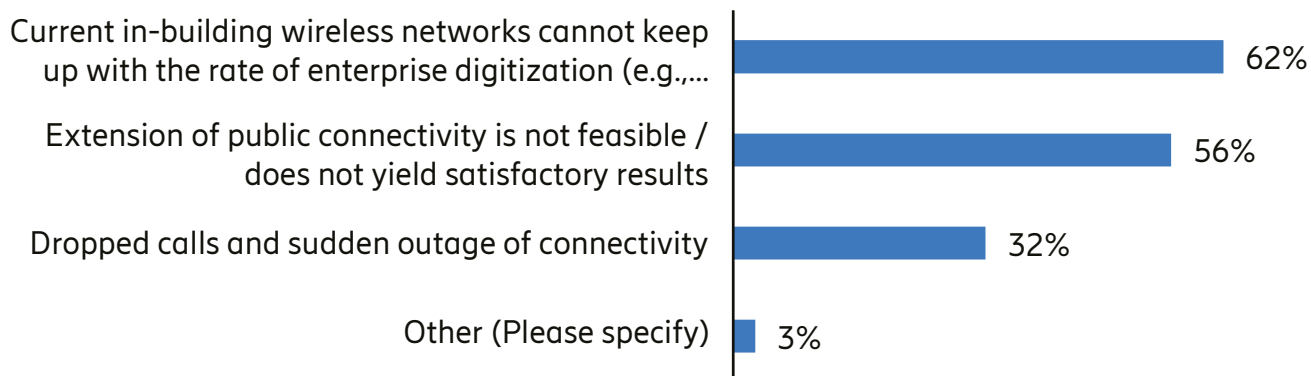


Figure 4: Q: What are the biggest pain points that you currently face with regards to connectivity?

At the same time there is widespread agreement across the industry that Wi-Fi connectivity does not satisfy the stringent demands for state-of-the-art connectivity. When asked about the reasons for considering 5G for in-building connectivity use cases, 65% of respondents highlight a cost advantage of cellular over other connectivity technologies, while 40% mention that Wi-Fi in

its current form is not fit to keep up with the rising requirements for in-building connectivity, as discussed in the introduction. As even Wi-Fi will operate in unlicensed bands, 5G will remain the best fit for particularly critical use cases requiring highly reliable, low-latency connectivity and/or wide-area deployments.

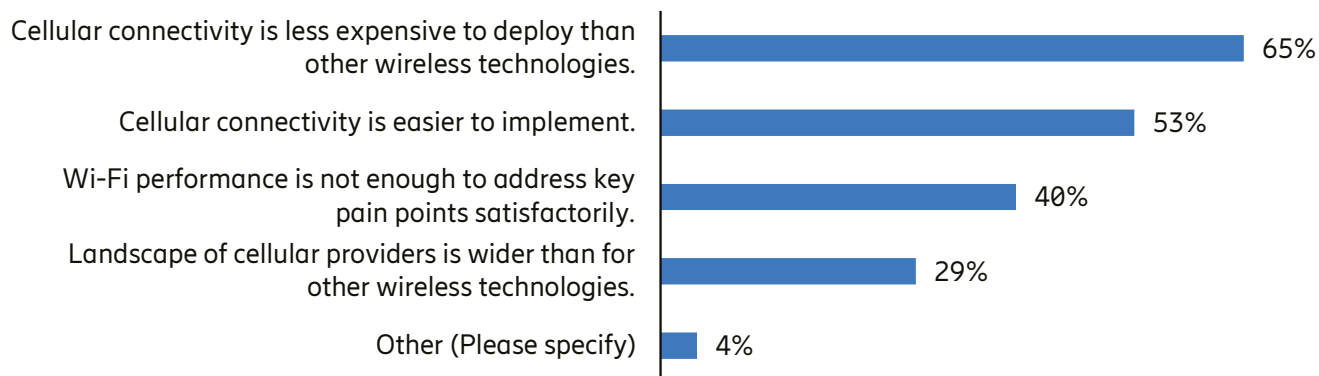


Figure 5: Q: What are the main reasons for you to consider cellular for in-building wireless?

In-depth discussions with real estate companies underline this and highlight that network outages have become an increasingly important problem to address.

We face outages of Wi-Fi all the time. At this rate it becomes increasingly impossible for us to attend to all these outages in a timely matter.

(Tier-1 Commercial Real Estate Service Provider, United Kingdom)

02

Let's talk about money: making the business case for 5G for in-building wireless

Above all, these technology-related decisions beg the question: where does the money come from for 5G deployments? Certainly, as the device ecosystem is maturing and competition is increasing, costs of network infrastructure and devices will inevitably reduce. But building operators will need to justify spending and investment, especially in the current macroeconomic climate – which is sending production costs for many enterprises and the cost of living for consumers soaring – spending will remain scarce

for the time being and any investment in telecommunications infrastructure will need to be carefully assessed. In bringing 5G connectivity to the real estate market, CSPs and neutral hosts predominantly hear about high investment barriers as well as an immature device ecosystem, which ultimately leads to higher deployment costs. Making the business case for 5G connectivity in the real estate market is therefore arguably more important than ever before.

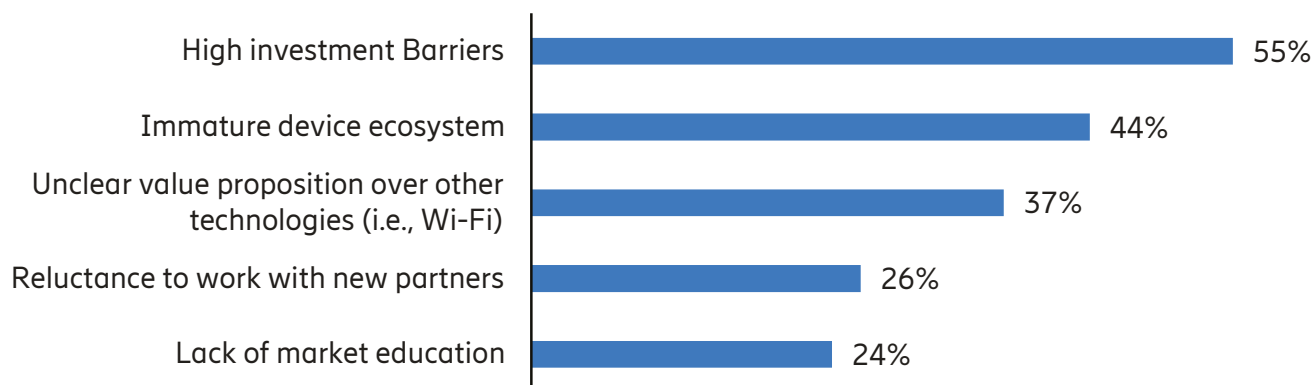


Figure 6: Q: What are the main challenges you encounter in bringing 5G connectivity to building owners / managers?

Somewhat related to perceived high investment barriers is the missing clarity of 5G's value proposition over legacy connectivity technologies – most importantly Wi-Fi. Here, more market education is necessary about how cellular connectivity requires significantly less infrastructure deployments to cover a similarly large area, the higher degree of deterministic networking and more predictable latencies by providing robust handovers of signals between access points or base stations. While these factors lead to more economical deployments and therefore lower TCO, in-depth discussions with tenants of commercial buildings have highlighted that they would certainly be prepared to pay a somewhat higher rent in return for better in-building connectivity.

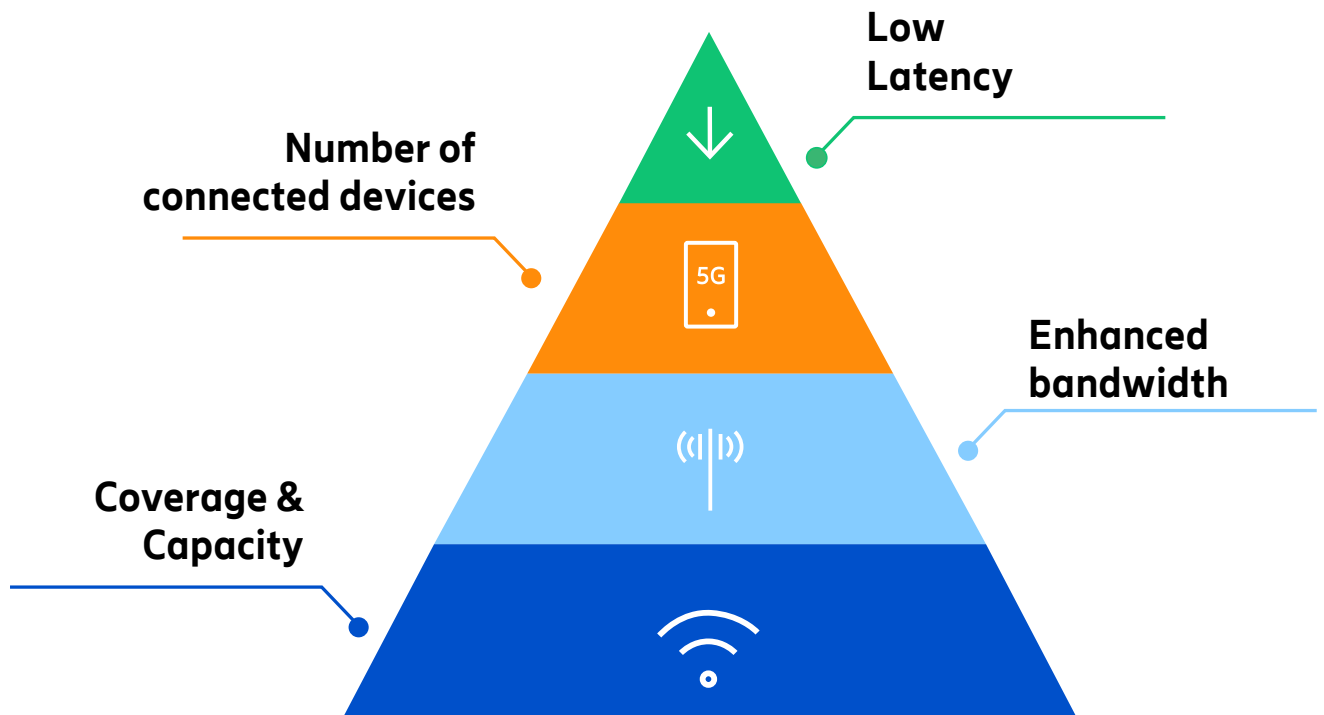
At the heart of successful 5G service monetization lies careful management of customer expectations. After all, commercial entities must justify their investments (in terms of return on investment) and guarantee certain services to their tenants.

As a result, any supplier of 5G connectivity – be it a traditional CSP or a neutral host - will have to design service level agreements (SLAs) that align with requirements from the real estate world. The design of SLAs for building owners and property managers should follow a pyramid shape – very similar to the so-called Hierarchy of Needs by American psychologist Abraham Maslow. An adaptation of this concept could look like the depiction in figure 6: coverage and capacity of connectivity need to be provided continuously as a base for all different use cases. The service level of other capabilities like enhanced bandwidth, the opportunity to connect an extremely large number of devices, or the provision of particularly low latencies shall be agreed so that these are provided for different use cases when required. Furthermore, network slicing could be provided as an additional high-tech service level for those customers who has a need to change the configurations/characteristics in their traffic profile on a more regular basis.

We do not have the necessary financial capabilities for a large upfront investment into communication infrastructure. Therefore, we prefer to pay a monthly fee for connectivity services that can either be raised against us or our tenants directly.

(Tier-1 Commercial Real Estate Service Provider, United Kingdom)

Service level agreements (SLA)



These KPIs should be considered as binary, rather than continuous variables

Figure 7: Possible SLA design for 5G Real Estate Offerings



03

A blueprint to a successful 5G deployment for in-building wireless

The real estate market's digitization is only taking off now, therefore use cases discussions and the exact value proposition of 5G still needs to adjust to real estate owners' and managers' pain points. In addition, most cellular devices today run on 4G LTE, the upgrade to a 5G network will therefore also translate into an upgrade of devices, which will need to be carefully managed. To

successfully embark on this journey now, real estate companies – as well as enterprises from different verticals – need a blueprint of successful 5G deployments help guide building managers and property owners on how they could deploy 5G technology for their in-building connectivity.

Different deployment models for different use cases

As figure 8 shows, in the commercial real estate market – which to a large extent consists of office buildings and other so-called carpeted space – 5G is predominantly interesting for its enhanced

bandwidth capabilities to provide commercial customers and tenants with increased levels of connectivity.

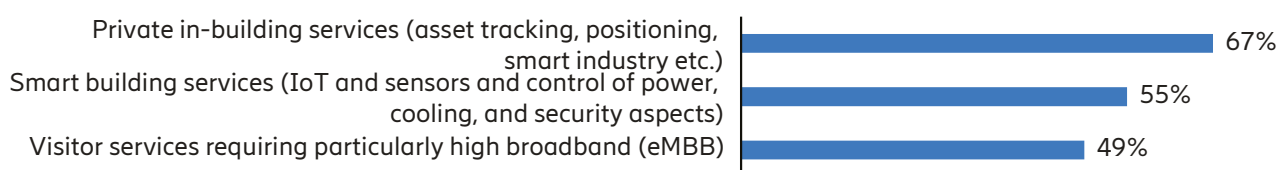


Figure 8: Q: What are the key use cases that you will be realizing with cellular connectivity?

As commercial real estate tenants often deal with highly sensitive data, integrity and security of the network and its data are at the forefront of every building owner / manager when deciding about a new connectivity technology. A fully isolated private network deployment is particularly cost-intensive, as every network requires its own dedicated telco infrastructure. Furthermore, it would require real estate owners and managers to build up their own team dedicated to providing the network itself as well as any additional service.

TCO, building managers and property owners should therefore explore combining assets from the public telco infrastructure (from

the macro network) with dedicated infrastructure elements, that can be deployed on premise and guarantee that user data will not under any circumstances leave the perimeters of the office / commercial site. With the rising importance of the cloud as a place for data storage, analysis and processing, a hybrid cloud solution – combining public and private cloud elements – becomes an increasingly popular choice for commercial real estate companies. In these cases, the connectivity would be provided by a CSP or neutral host. Careful design of SLAs could specify exactly which incidents could be addressed on-site and which would be referred to the CSP, neutral host, or – in the case of a hybrid cloud solution – the cloud service provider.

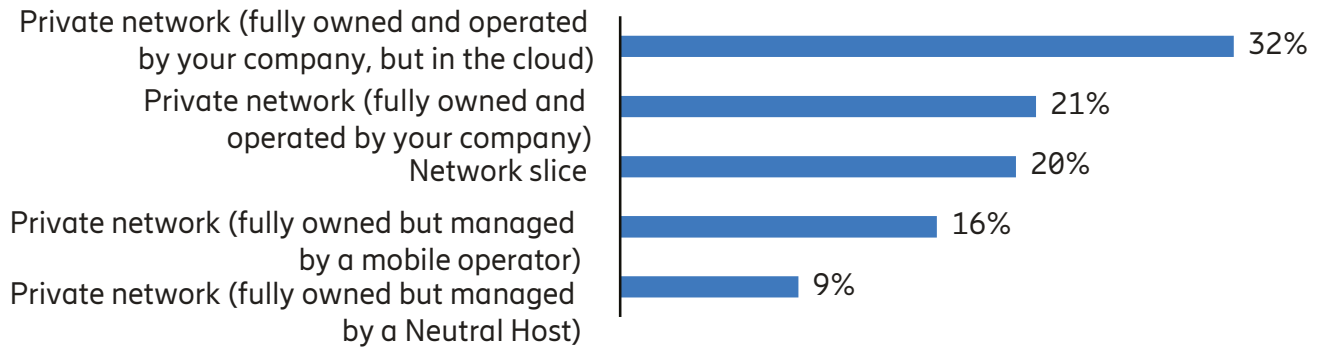


Figure 9: Q: How do you envision deploying the network?

Industrial enterprises (the so-called uncarpeted verticals like manufacturing, mining, oil and gas, logistics, or transportation for example) will need to factor in the higher criticality of the use cases, they look to address. They will consequentially be more inclined to look at a fully on-premise private network deployment. Commercial real estate owners and building managers of carpeted office spaces on the other hand, would be open to utilize public

macro network infrastructure, explaining why renting a dedicated network slice from a public network is the second most popular deployment model. While relying on the public cellular network alone would be the most cost-efficient possibility, enterprises will require some dedicated infrastructure that can store and process their user data and ensure full data integrity.

Finding the ideal partner for 5G connectivity

As important as defining the right deployment model is finding the right partner for cellular network provision. Not surprisingly, there is a considerable incumbent advantage, as most commercial real estate managers and property owners prefer to introduce new connectivity technology through existing supplier relationships.

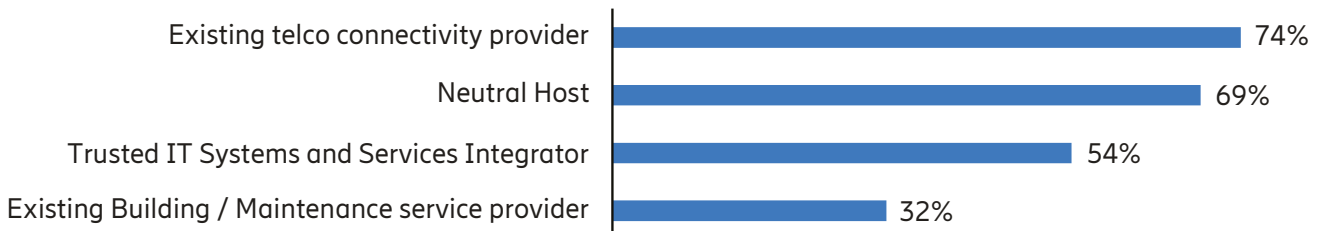


Figure 8: Q: What are the key use cases that you will be realizing with cellular connectivity?

Extensive discussions with property owners, building managers and tenants highlight a certain openness to working with new service providers in the telecommunications industry, particularly so-called neutral hosts. Defined as a company that invests in telecommunications infrastructure such as cell towers, real estate and fiber-optic networks, and leases this infrastructure to multiple communication service providers (CSPs) on a shared-tenant basis, these neutral hosts offer not only connectivity (in the form of access to spectrum) but also network management and operation capabilities as a managed service - with a recurring fee instead of a large upfront investment.

Neutral hosts tend to concentrate in countries where the national

regulator has made mobile network spectrum available to enterprises, either through shared spectrum (as is the case in the United States with the Citizen Broadband Radio Service, CBRS, or the United Kingdom with its Spectrum Sharing initiative) or setting aside licensed spectrum for direct-to-enterprise allocation (as is the case in France, Germany and a growing number of other European countries), as they do not need to partner for access to (licensed) spectrum. Globally speaking, however, CSPs still hold most licensed spectrum assets. They will inevitably continue to play an important role for providing 5G connectivity to the real estate market. To be most successful in doing so, a look at the neutral host model can be useful to try and adjust the business model accordingly.

The managed service approach from neutral hosts allows us to avoid unnecessary cost as it allows us to pay for only those services that we use. We do not need to own all connectivity infrastructure ourselves, so being able to use the infrastructure provided by a neutral host is a considerable cost advantage for us.

(Tier-1 Commercial Real Estate Service Provider, United Kingdom)

04 The road ahead – key considerations for building owners & managers to deploy 5G within their buildings

As this paper has shown, the deployment of 5G should be the result of a carefully carved out digitization strategy, that should follow distinct steps of conceptualizing use cases and determining the investment value to decide on the most appropriate deployment model and which channel partners to engage with, as figure 11 describes.

Digitization strategy considerations



Figure 10: Decision-making process for real estate companies to deploy 5G for in-building connectivity

As enterprise digitization increases even further, the demand for smart and connected buildings – that can handle the increased amount of data that is generated by more digitized enterprises and offices – will rise. Deciding about the right deployment model will inevitably take some time, so property owners and building managers should start exploring these considerations now to have a solid digitization strategy in place sooner rather than later. To support real estate enterprises in their digitization journey, a strong network of ecosystem partnerships and alliances between the telco industry and implementers will be fundamentally

important. Not only will this provide real estate companies with the necessary expert partners for connectivity, but – more importantly – it will ensure that the telco industry gains an in-depth understanding of specific pain points and connectivity requirements. The formation of such alliances (similar to for example the 5G Alliance for Connected Industries and Automation, 5G ACIA for industrial manufacturing) would be an important win-win situation for both telco connectivity suppliers and implementers. Consequentially, real estate companies should open up to these partnerships and foster exchange.

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