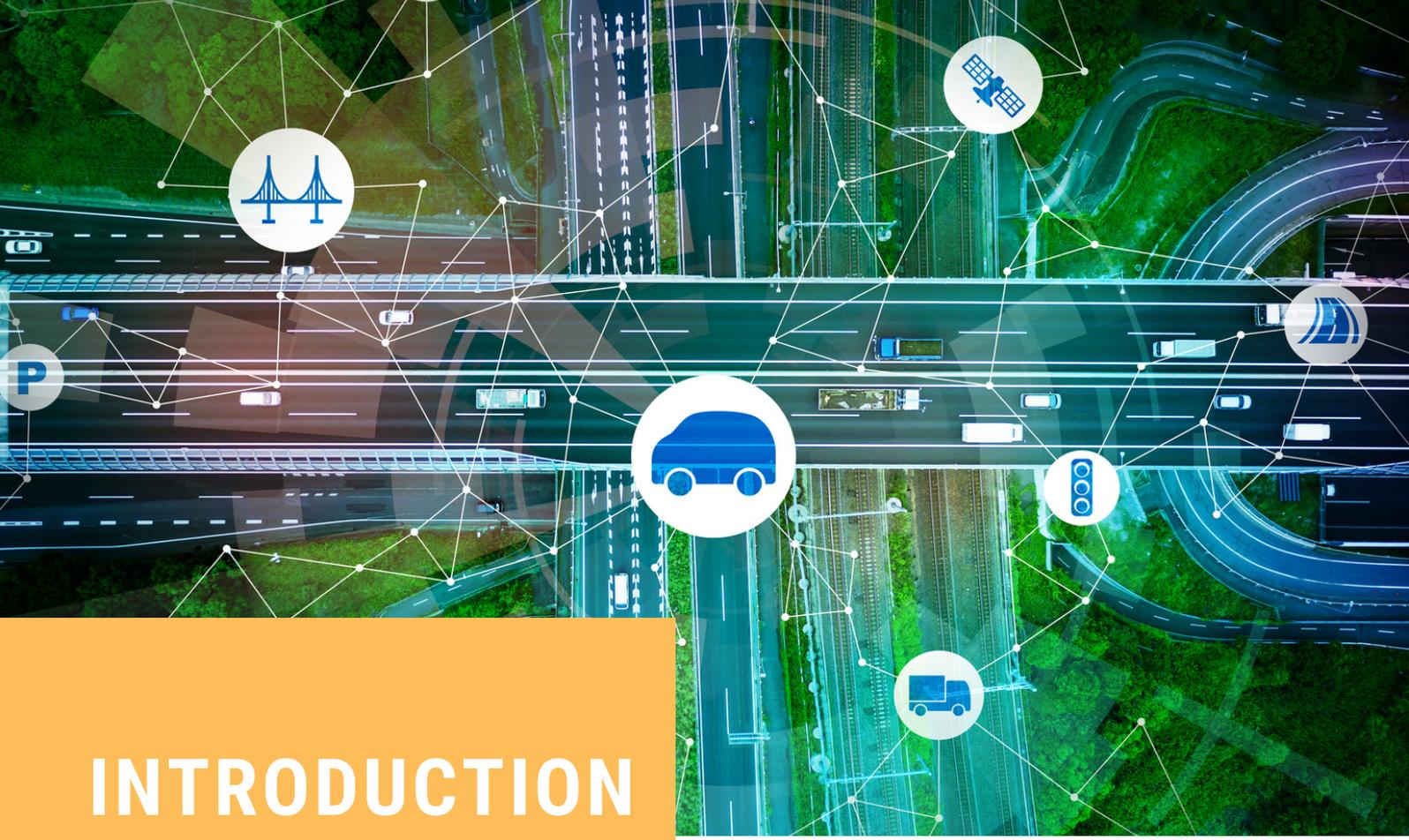


TRANSPORT & LOGISTICS: CORE SKILLS FOR DEPLOYING 5G



**UK
5G**

**Innovation
Network**



INTRODUCTION

5G and the potential for private networks open up new opportunities for the transport and logistics sector. Organisations can harness control of connectivity and deliver transformative technologies and solutions: enabling smarter operations, supporting sustainability imperatives and increasing security and resilience.

A UK5G guide to help the transport and logistics sector with 5G deployment

However, this new approach presents challenges. Deploying a private 5G network, for example, can be tricky and may not align with existing internal skill sets. This guide has been created to highlight the specific skills required to make the most out of 5G and other forms of advanced connectivity, including tips and advice as well as case studies.

We don't claim to have all the answers here, indeed this forms only one part of a wider body of content produced by UK5G to help guide the transport and logistics sector through how to deploy 5G—and, of course, each case is unique. It is also important to note that, though this paper focuses on transport and logistics, this information should be applicable to a range of sectors.



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NON-TECHNICAL SKILLS

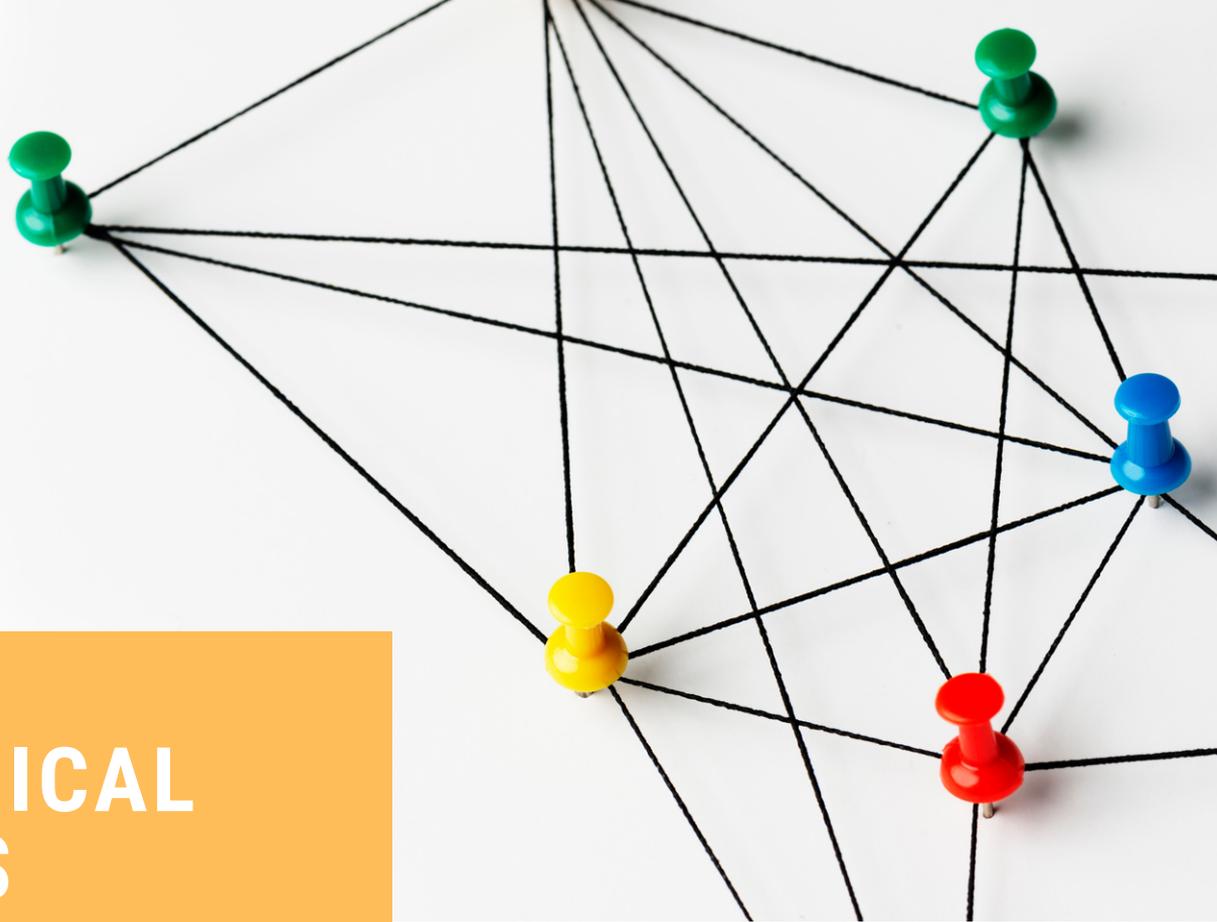
Success depends on more than just people with the right technical skills: cross-disciplinary people who can bridge different fields are just as important.

1/ Project management: An obvious one, but with the complexity associated with 5G deployments it is important to have someone who can confidently manage multiple suppliers and solution providers, and of course, navigate all of this with a degree of agility and flexibility.

2/ Commercial expertise: The ability to clearly articulate specifications, measure deliverables and performance against those specs and negotiate with suppliers if requirements are not met. These skills can also be put to good use in negotiating with land and asset owners when it comes to securing suitable sites for the deployment of infrastructure.

In the 5G CAL project, these skills were provided by a 5G Assurance Lead; they may not be “doing the doing” but they understand exactly what the requirements are and can assess whether things are being done to the standards needed.

3/ Planning expertise: Important at the point of network design, having someone who understands how to work with planning authorities will be critical when it comes to putting in applications for masts and other infrastructure. Of course, with more physical assets in urban areas, there are more opportunities to deploy digital infrastructure, but the data and information that enhanced connectivity offers, for example, can be used to ensure rural communities and passengers are not left behind. Familiarising yourself with the work being done by the Digital Connectivity Infrastructure Accelerator (DCIA) project can also help in these efforts.



TECHNICAL SKILLS

1/ Networking planning: The ability to understand spectrum, the implications of, and processes for, working with Ofcom and pushing applications through. This may also include things like negotiating for power on licences, whether for connecting autonomous vehicles or limited geographic areas such as a port. Some organisations may find it helpful to bring in an independent entity to perform this role and arbitrate. Those unsure about spectrum may find our Introduction to Shared Access Spectrum guidance useful.

2/ Solution architect: Having someone who is very technical but can have broad oversight, understand the overall problem you're trying to solve, and the solutions that are available to do that, is particularly important when you're deploying small, bespoke networks with specific needs.

These can play a key role in helping identify where a technical “gold standard” is required versus when lesser solutions can comfortably meet your requirements.

3/ Radio engineers: A no-brainer, specialised telecom professionals who can provide the technical expertise and support needed for radio access networks (useful, for example, for monitoring and controlling traffic per slice).

4/ Device and/or radio access network engineers: People with device and air interface skills who can understand how to use appropriate tools to monitor air tracing, messaging, and understand what devices are trying to do and how they're trying to communicate with the network. These engineers can help not only troubleshoot, but also build an overall picture of network performance.



TIPS & ADVICE

1/ Do not assume that your teams will understand 5G: not all engineers are radio engineers and existing talent may not be familiar with deploying a 5G network

2/ Taking the time to explore and delve into capabilities upfront can help to minimise the potential for skills gaps cropping up at crucial stages of rollout

3/ Motivation is just as important as skills; a sentiment expressed by many projects involved in the 5G Testbeds & Trials programme. People with a willingness to learn and develop can be a vital part of your team.

4/ Collaboration can be a useful way to plug internal gaps: tapping into your networks on an informal basis, or engaging with local universities/colleges can be a great way to build local skill sets and support the local community

5/ Certain skills may be transitory. Identifying your skills roadmap upfront can ensure you don't employ skills that you will only need for a short period of time

6/ Purchasing end-to-end solutions or hiring systems integrators will take the pressure off internal teams

7/ It is safe to assume that any 5G deployment will require telecoms engineers and 5G specialists, but it is highly likely that you will also require more traditional IT skills, especially when it comes to things like IP addressing, port configuration and firewalls

8/ It's likely that there will be a certain degree of troubleshooting or snagging involved and it is important to have strong cross-discipline capabilities within your project team to manage that

Public Transport

Smart Junctions 5G deployed a private 5G network to deliver an AI-based traffic signal optimisation system, in Manchester. This has already been shown to cut waiting times at traffic signals, prioritise traffic by class, and respond dynamically in emerging situations. By using a 5G small cell network, the project is decreasing the infrastructure cost for the connection of the sensors at every junction. Critically, the system requires low-latency communications to achieve its goal-making 5G the perfect connectivity solution.

Tests conducted by the project across key junctions along the A6—a major transport corridor in and out of the city centre—reported a 1% journey time improvement at a four-arm urban junction controlled by 5G connected systems. This might not sound like a lot, but with the average journey time across that junction being 100 seconds and 16m journeys taking place across that junction each year, this equates to an impressive £45k yearly road user cost saving.



CASE STUDY



Logistics

In the northeast of England, the 5G Connected Automated Logistics (5G CAL) opted for public procurement of 5G infrastructure to provide driverless 'last mile' HGV deliveries to a Nissan factory in a live industrial setting. The project team included Nissan, Sunderland Council, the North East Motor Manufacturers Group and Three, and used 5G-connected, autonomous 40-tonne trucks to distribute parts and assemblies across the Nissan plant, linking with many SMEs in their supply chain.

They had a very broad specification and were not interested in 'tinkering' with 5G. Initially, they did not know what exact features of 5G they would need bar high latency (sub 10 milliseconds) and a massive uplink ratio to cover the wealth of data to be transmitted from the vehicle that included 10+ cameras and lidar units, stereo radar and a range of other sensors providing drive by wire capabilities. For them, purchasing an end-to-end solution ensured they did not have to worry about technical skills gaps and could focus on ensuring they had strong, experienced project and commercial managers.

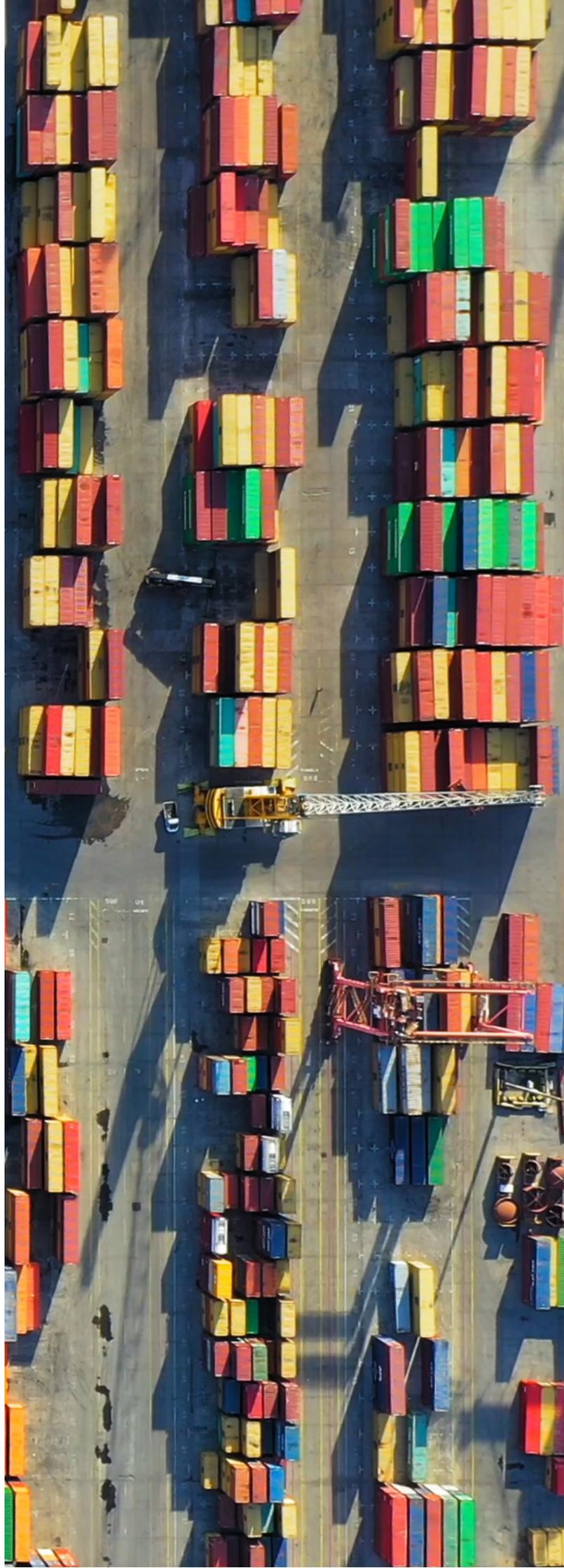
Considering there are hundreds of HGV movements a day to 'feed' the Nissan plant, automating last-mile journeys reduced costs significantly, facilitating unloading before the next truck. In an environment where multiple vehicles are run from the teleops rig, the time savings also proved to be huge. As the issues around the recent shortage of HGV drivers have shown, automation could help 'last-mile' deliveries and repetitive tasks, making the specialised role of HGV drivers more valued, and higher paid, in the long run.



CASE STUDY

Looking for more?

Hopefully, this simple guide to 5G has been useful. For more information, please visit our UK5G hub, where you can find more examples of deployment and if you'd like to be connected to companies currently using 5G, feel free to get in touch at hello@uk5g.org.





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