

# What could a 5G private network do for your business?

The game-changing capabilities of 5G make digital transformation possible for industrial sites where it had been unfeasible before



# An introduction to 5G private networks

Immersive training for your field engineers without gathering all the experts in a room. Remote monitoring of expensive equipment to reduce your maintenance. Automation and robotics in every area of your plant. The list of potential applications for 5G private networks goes on and on.

## But what is a private network?

Private networks have been around for a while. Single and multi-plant operations rely on them for the added security and more reliable connections in tricky industrial environments. That's because anything kept inside the private network stays inside. And anything kept outside the private network stays outside.

Think of a 5G private network as an ultra-secure mobile network built just for your business. One that now gives you ultra-fast connectivity between industrial machines, robots and people. And the near-zero delays that will enable you to automate operations and deliver true digital transformation.

## Secure private networks

Private networks can deliver up to military grade security for your data. Ensuring data is protected within your network and not accessible externally.

## And why 5G?

5G connectivity is unlike anything that has come before. It isn't just an upgrade on 4G. It's the step-change in networking that will finally deliver Industry 4.0.

With your own 5G private network you can add another layer of control and security compared to the public 5G network. You're getting your own 5G mobile core and radio equipment. And this allows you to access your own dedicated slice of the 5G spectrum, wherever you are in the country.

### A working example

A German Tier 1 automotive manufacturer implemented a 5G private network across its operations with significant results.<sup>1</sup>



**\$500m** in savings



**20%** increase in margin



**10x** return on investment

## Has this been done before?

5G private networks have been around for a few years. In Europe, German industrial operators have proved the concept and are running production facilities entirely covered by 5G private networks.

5G private networks have the potential to transform entire sectors. The opportunities for revolutionising workflows and creating new revenue streams are particularly applicable for businesses within high-investment/high-value sectors, including:

- Manufacturing or production line operators
- Oil or gas production
- Utility companies
- Defence contractors
- Airport and seaport operators
- Transport and logistics firms
- Major infrastructure projects

1. <https://resources.enterprisetalk.com/ebook/Nokia-2.pdf>



# Why choose a 5G private network?

There are three characteristics of a 5G private network that add value to large-scale or remote facilities.



## Ultra-fast connectivity

Industrial environments are known for connectivity dead zones. Those places where 4G wifi signals cannot penetrate and it's harder to operate autonomous machines or robots. In some cases, you'll need an expensive, rarely-used backup option in case the wifi doesn't reach. This often means going back to all those kilometres of wires that you hoped to get rid of. In these environments, asset tracking can be a major issue. If you don't know where a key component is then it can lead to a costly shutdown.

If you're trying to manage dispersed operations – like hard-to-reach power plant or a fleet of vehicles – you probably need to send teams of people out to maintain your equipment. Whether it needs it or not.

With a 5G private network, you can rely on ultra-fast and uninterrupted connectivity in every location you need it to be. Whether that's warehouse robots moving between levels, tracking components on a production line or monitoring IoT sensors in remote areas. And you can start to add new capabilities like predictive maintenance. That way you can cut costs from outages and still maintain your mission-critical equipment.

## Enhanced security and safety

Controlling access to physical sites or sensitive data is a daily challenge for most businesses. Yet it's even more critical for strategically important infrastructure. Creating robust security protocol without imposing stringent systems is a difficult balance.

Meanwhile, in fast-paced packing or production sites, humans and robots are expected to work together. While workflows may define the different roles and keep people and machines separate there is always a chance of a health and safety incident.

A 5G private network gives you the ultra-low latency to automatically stop a machine in its tracks instantly. So if an autonomous forklift and human do cross paths, there is no danger of the two getting close enough thanks to real-time sensors.

This instant relay of information is also the basis for strategic site security. A 5G private network is not only safer from external cyber attacks. It's also secure within itself as access to buildings or data are monitored in real-time. With access controls baked into security operations, there is no chance of anyone gaining unauthorised access without being detected immediately.

## Rapid digitalisation

Digitisation is not true digital transformation. Even digitalising workflows to incorporate automation is just the beginning. Replacing certain aspects of a two-week outage with digital technology may save some costs or speed things up. But the true transformation comes with being able to decide whether you need that two-week outage at all.

A 5G private network allows you to monitor all mission-critical equipment and predict maintenance requirements. This also means you can reduce that two-week window to just a few hours. By continually checking on the state of a component, you can plan ahead. You'll know when it is likely to need replacing and can order the part ahead of time. That way, you just need to swap it out and you're back online.

As you start to introduce these new capabilities, you will quickly spot new opportunities. Instead of attaching sensors to every part in every location, you could perform drone inspections at any time. For example, as soon as a plane lands on your runway or a ship docks at your port. And with the low latency of 5G, you could instruct engineers in the field via augmented or virtual reality so specialists do not have to travel.

With these game-changing capabilities, 5G private networks offer clear advantages for industrial settings. Not just in terms of faster decision-making or security and control but also much higher levels of productivity and workplace efficiency.

On the ground, you will start to see the prevalence of new applications and each with their own advantages in different settings. And, you might be wondering if these applications need a 5G private network. The simple answer is that if you want to take advantage of these applications at scale then you will need a network that is not only ultra-fast but also ultra-low latency and hyper secure. You can only get this with 5G. Especially if you're scaling from just a couple of cobots to a whole factory full of them.

And if you make the investment in any kind of private network then future-proofing that investment will help you build a better business case. While no one can predict the next wave of useful technological advances with any certainty, what is clear is that digital transformation is an ongoing activity and connectivity will continue to be mission-critical. There will be new technologies that can improve what you do. And so a 5G private network puts you in the best possible position to take advantage of them.



# Real-world applications

Digital transformation. Security. Cost reduction. Productivity gains. Health and safety. Whatever your starting point, these aren't mutually exclusive benefits of a 5G private network.

They aren't time-limited investments. Implemented correctly, they offer you the opportunity to build for the future without doing everything at once at the beginning.

You may be looking ahead to a 'dark factory' that is fully automated 24/7 or thousands of remote IoT devices feeding back predictive data. But before reaching these goals, there are plenty of applications you can start with to prove the value of a 5G private network in your setting.



What could a 5G private network do for your business?



# Example A: A 5G private network in use at a seaport

See how a 5G private network can support port operators from the moment a ship arrives to unloading, data logging and security checks.

## Network data security

Ensures all data stays within your network with no access to critical data externally

## Asset management & analytics

Monitoring vehicles, loads, locations and item condition to see maintenance requirements and quality of goods

## Surveillance & inspection

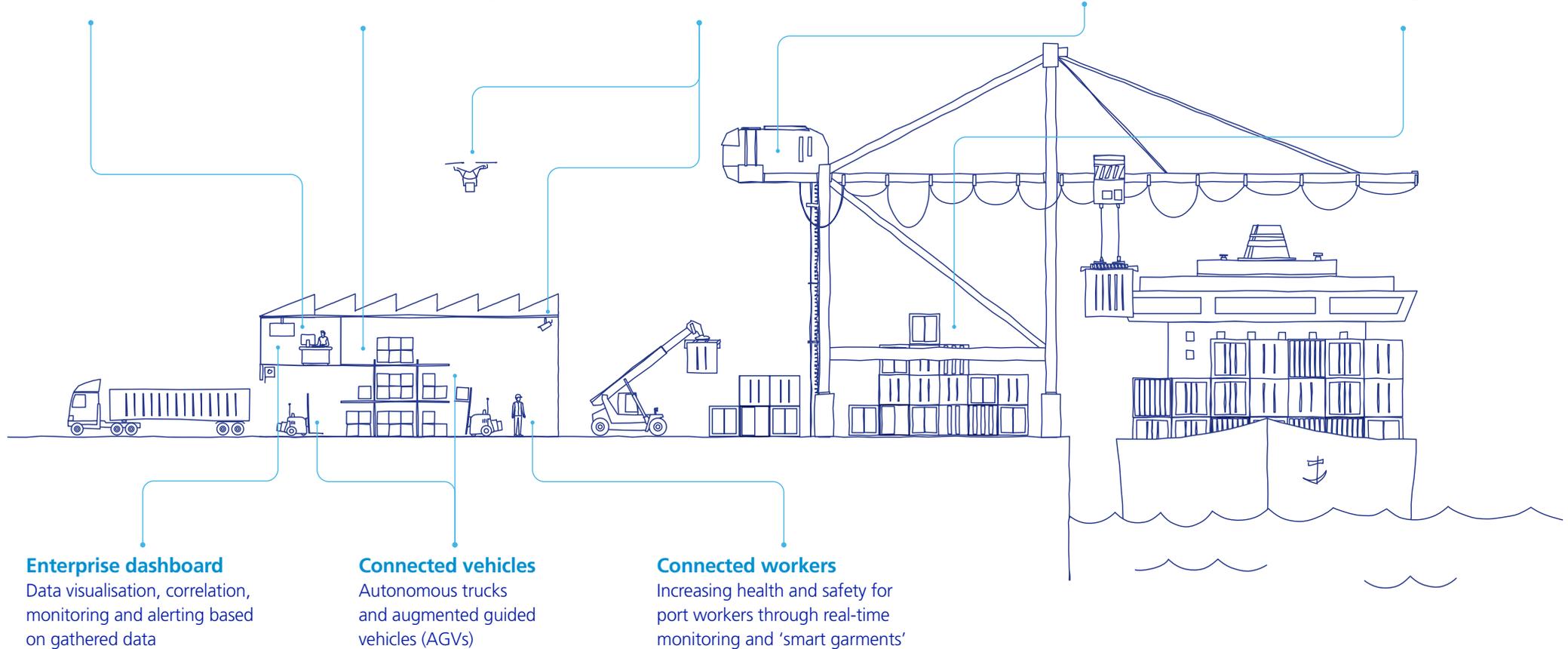
Controlling drones and security, including intelligent video surveillance

## Remote operations

Remote control of cranes (ship to shore, rail mounted / rubber tired gantries, ASCs)

## Indoor & outdoor positioning

Locating, tracking and managing items, people and any kind of asset across the entire logistics chain



# Example B: A 5G private network at work for a manufacturer

Follow the enhanced operations within a large-scale manufacturer using a 5G private network to increase efficiency, health and safety and visibility.

## Energy management

Optimising energy consumption based on occupancy and actual energy usage

## Network data security

Ensures all data stays within your network with no access to critical data externally

## Enterprise dashboard

Data visualisation, correlation, monitoring and alerting based on gathered data

## Training

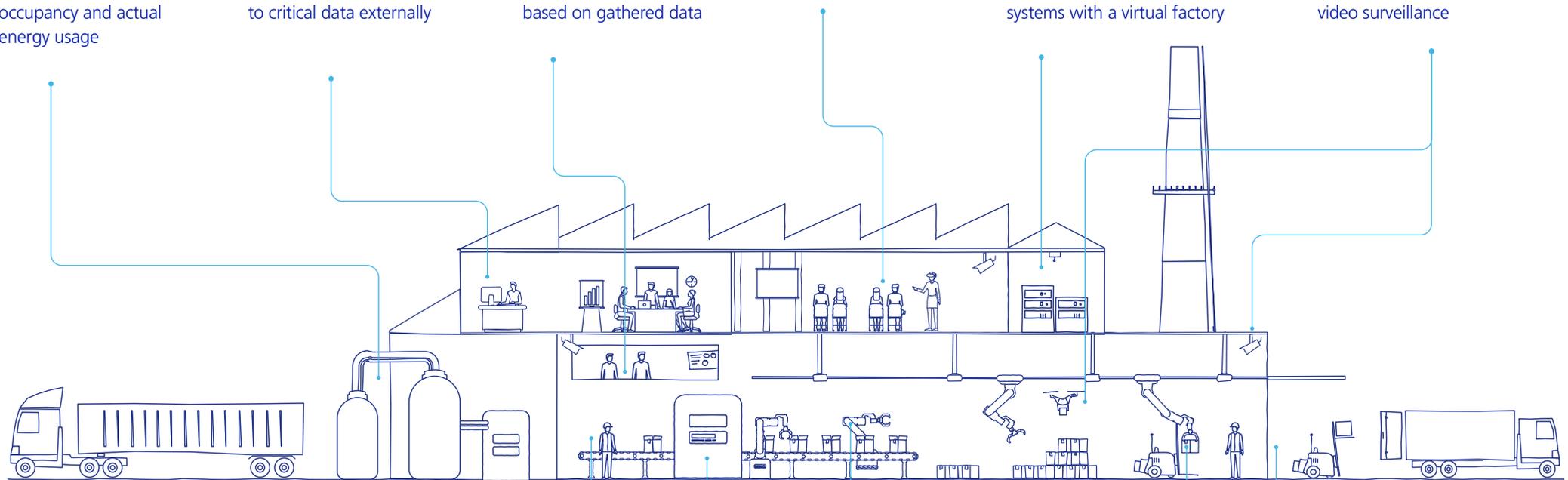
Virtual reality training

## Digital twin

Simulating, training and optimising physical assets, processes and systems with a virtual factory

## Surveillance & inspection

Controlling drones and security, including intelligent video surveillance



## Connected workers

Increasing health and safety for production line operators through real-time monitoring and 'smart garments'

## Asset management & analytics

Monitoring machines, tools, locations and item condition to see maintenance requirements and quality of goods

## Cloud robotics

Move intelligence from the shop floor to the cloud for easier machine communication

## Smart product

Embedding IoT functionality into products to go beyond factory footprint

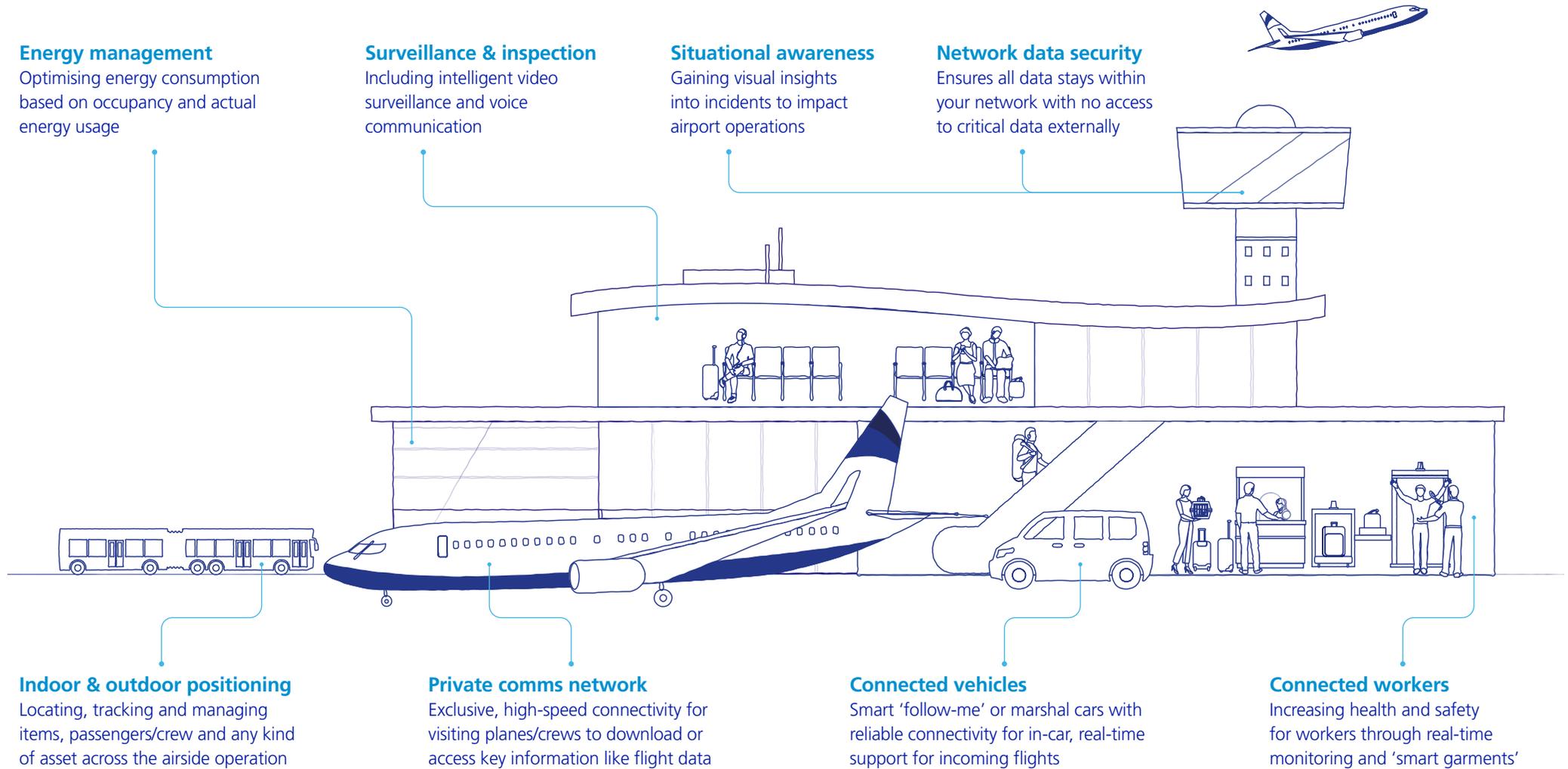
## Indoor & outdoor positioning

Locating, tracking and managing items, production line operators and any kind of asset across the whole supply chain



# Example C: A 5G private network in action at an airport

Compare how a 5G private network can provide additional passenger safety, flight support and faster operations during a typical day at an international airport.



# The O<sub>2</sub> pathway to your 5G private network

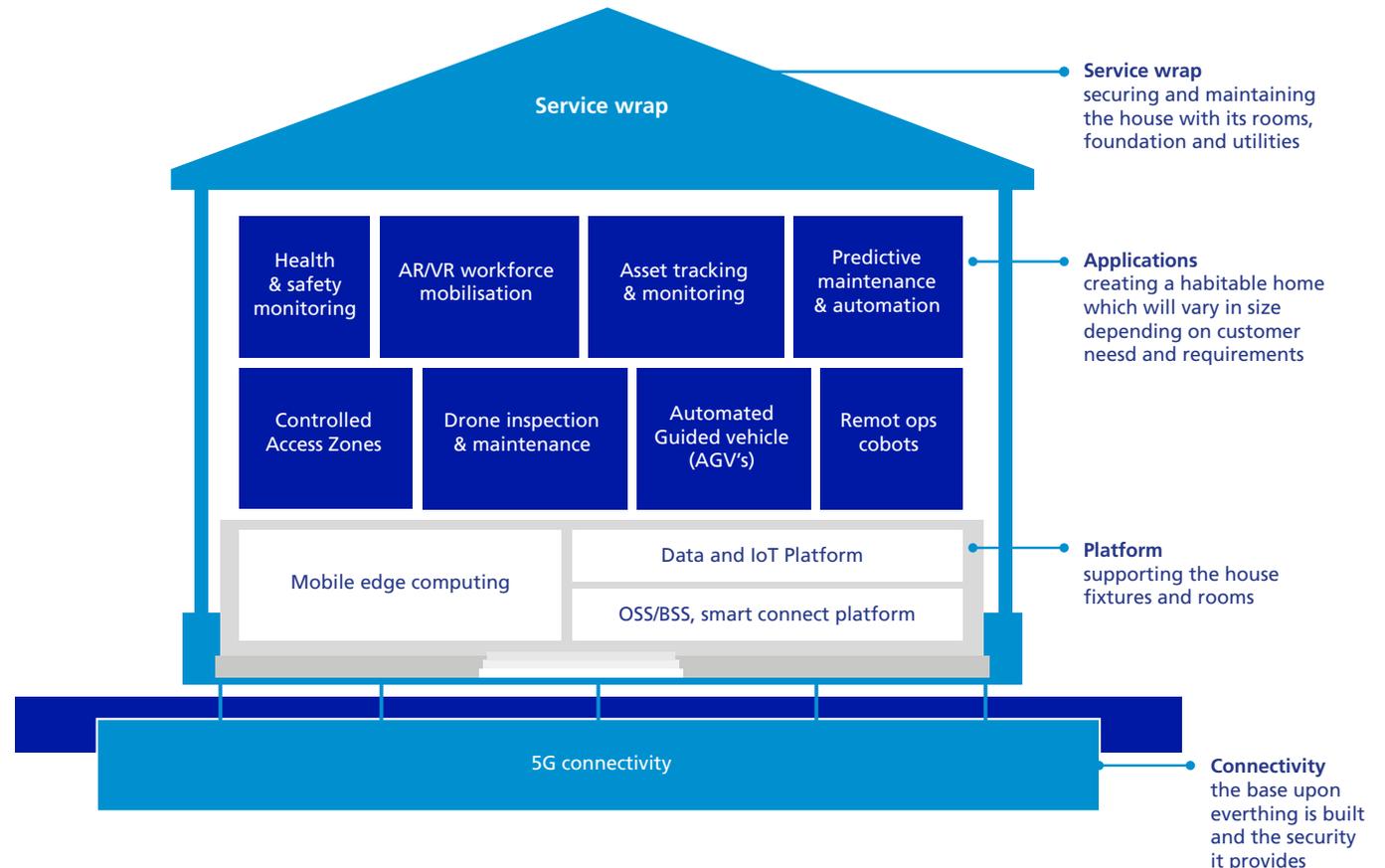
We get that every industrial setting is different. So every 5G private network should be too. Your 5G private network should be built around both your specific business priorities. Not just your immediate goals but your longer-term ambitions too. That's why O2 takes a more customer-led approach for 5G private networks.

## The O2 difference

For us, it isn't about spectrum. Or bandwidth. Or how many devices you need. It's about what you can do with all of that technology. In particular, how it could transform your business so you can stay ahead of your competitors while finding better ways to run your operations, support your people and serve your customers.

We do this through an ecosystem that incorporates our own expertise in connectivity, platforms and service with state-of-the-art 5G products and solutions from trusted suppliers. This saves our customers the hassle and costs of finding, vetting and integrating these third party technologies by themselves.

With guaranteed quality of service from O2 and our partners, you receive our full support from design of your 5G private network to implementation and then management.



# The O<sub>2</sub> pathway

Instead of talking theoretically, we look to find the quickest practical route to implementation.

We start by understanding your digital transformation strategy to determine how you will benefit from a 5G private network. Unlike others, we won't force you to give up the technologies you already have in place. O2's 5G private networks are designed to integrate with these systems and applications so you can optimise your existing investments.

We also look at the cultural impact on your workforce. We'll talk you through new roles that might be required. And the impact of re-skilling or redeploying your staff on your day-to-day operations.

Then we create your proof of concept – a co-innovation project to demonstrate the value from phase one of your private network.

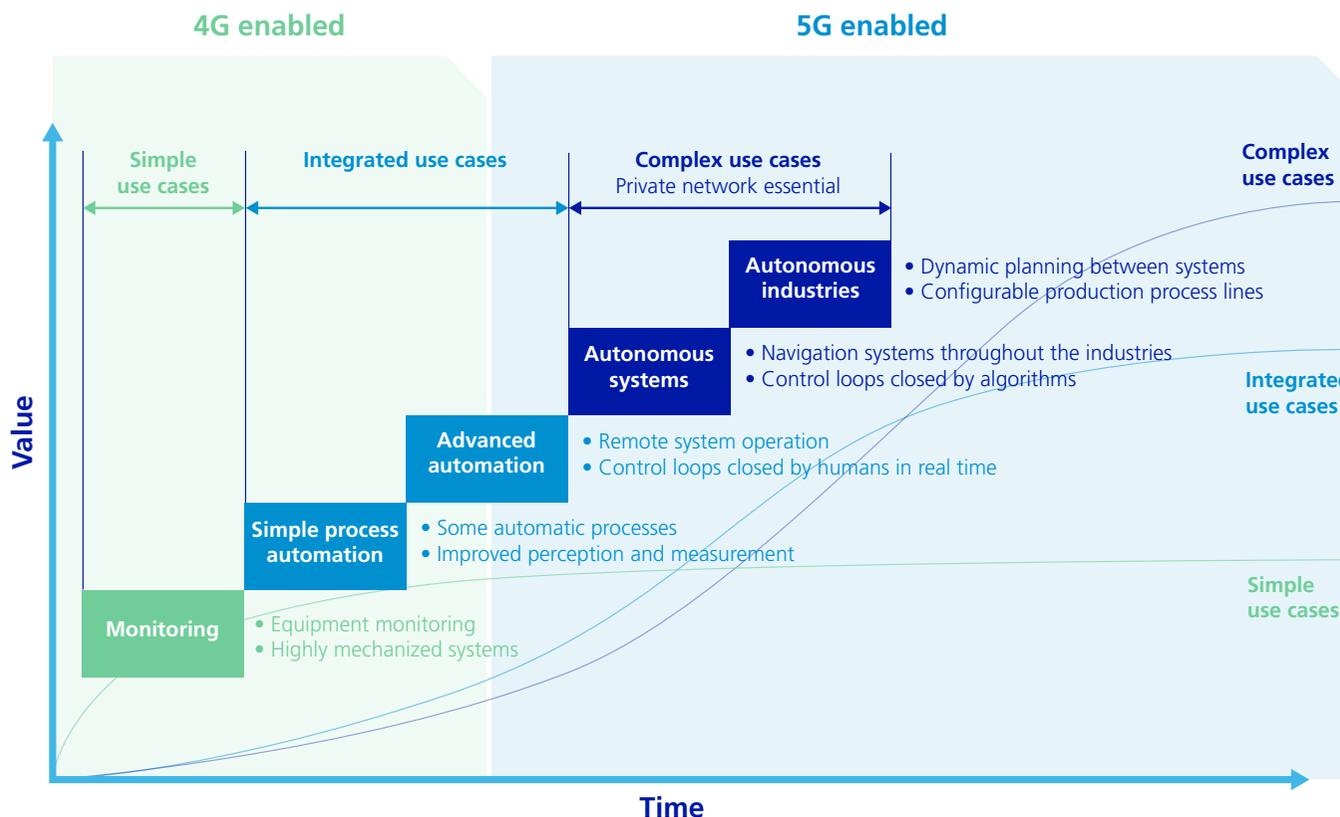


# Creating your proof of concept

For some enterprises, introducing a 5G private network has been under discussion for some time. For many others though, it's completely new. Yet it's already proven in countries like Japan, China, the U.S. and Germany, among others.

In each instance, there is a clear pathway to value. It all starts with the 5G connectivity layer. This provides the underlying connectivity to introduce automation, analytics and more advanced services.

As you can see, during each phase of your private network deployment there are new points of value. Simple use cases can be done first but have a lower value. Integrated use cases take longer to implement and builds on the simple use cases. These will unlock more value over a longer period. And complex use cases build on the simple and integrated use cases and will unlock the highest value over the longer term.



Category	Use cases	4G	5G
Connectivity	Sitewide connectivity	✓	✓
	Mobile, connected worker	✓	✓
	Mobile Internet access	✓	✓
	Internal data sharing	✓	✓
	Dynamic manufacturing	✗	✓
Asset tracking	Stores/Inventory management	✓	✓
	3D asset tracking	✓	✓
	Asset geo-boundary tracking/Geo-fencing	✓	✓
Augmented and virtual reality (AR/VR)	AR digital twins/Visualisation	✓*	✓
	AR remote expert	✓*	✓
	VR training	✗	✓
Monitoring (assets, processes and people)	Predictive maintenance	✓*	✓
	Plant monitoring; drones/AI	✗	✓
	Computervision CCTV (process and security)	✗	✓
Robotics	Warehouse and production management	✗	✓
	Remote operations/Teleoperation	✗	✓
	Collaborative robots	✗	✓
AGVs	Warehouse and production management	✗	✓
	Remote operations/Teleoperation	✗	✓
	Collaborative robots	✗	✓

\* If limited

While 4G may meet the needs of individual use cases, it may not meet the demand of multiple use cases working at scale in a single operation. A 5G private network is uniquely placed to future-proof any business looking to scale their operations in the future to include more complex use cases.



The 5G private networks already in operation around the world prove that this is not a conceptual technology. The Volkswagen (VW) Group is using its 5G private network to print the tools to manufacture new cars. This is reducing downtime on the production line. But it's also being built into future product roadmaps. For example, mass-customized parts to provide a new point of differentiation.<sup>2</sup>

Aircraft manufacturer Lockheed Martin uses its 5G private network for AR-assisted parts assembly. Live remote support provides assembly line workers with step-by-step guidance on fitting parts. This approach has led to a 30% reduction in assembly times and increased accuracy to 96%.

And O2 is already implementing 5G private networks here in the UK too.

#### Example A

### The agricultural manufacturer

This producer of thousands of food products has multiple sites in remote locations in the UK. Its digital transformation strategy includes embracing Industry 4.0 and moving to the factory of the future. The company came to O2 to support highly efficient, automated processes across 15 different applications. Our proof of concept for this 5G private network includes testing AR, remote workers, inventory management and secure data transfer. Following a successful trial, the company will introduce predictive maintenance, drone surveys and robotics in phase 2.



#### Example B

### The defence contractor

This major defence manufacturer also has a number of sites dotted across the UK. It needed O2 to create a proof of concept that would the business case for establishing more efficient processes through automation. But also by improving the security of information flow. A 5G private network creates the low latency and high bandwidth for remote operations, inventory management and AR. Plus it adds richer security features for safe data transfer between sites. This proof of concept is scheduled to start in early 2021 and will run for six months.



In both cases, these are traditional businesses with a cutting-edge outlook. Their boards have invested in a 5G private network proof of concept to uncover the value. They are then planning future business activities around these new capabilities to stay one step ahead of their competitors.

2. Enterprise Digital Transformation Through Industry 4.0, ABI Research for Nokia: <https://onestore.nokia.com/asset/207305>

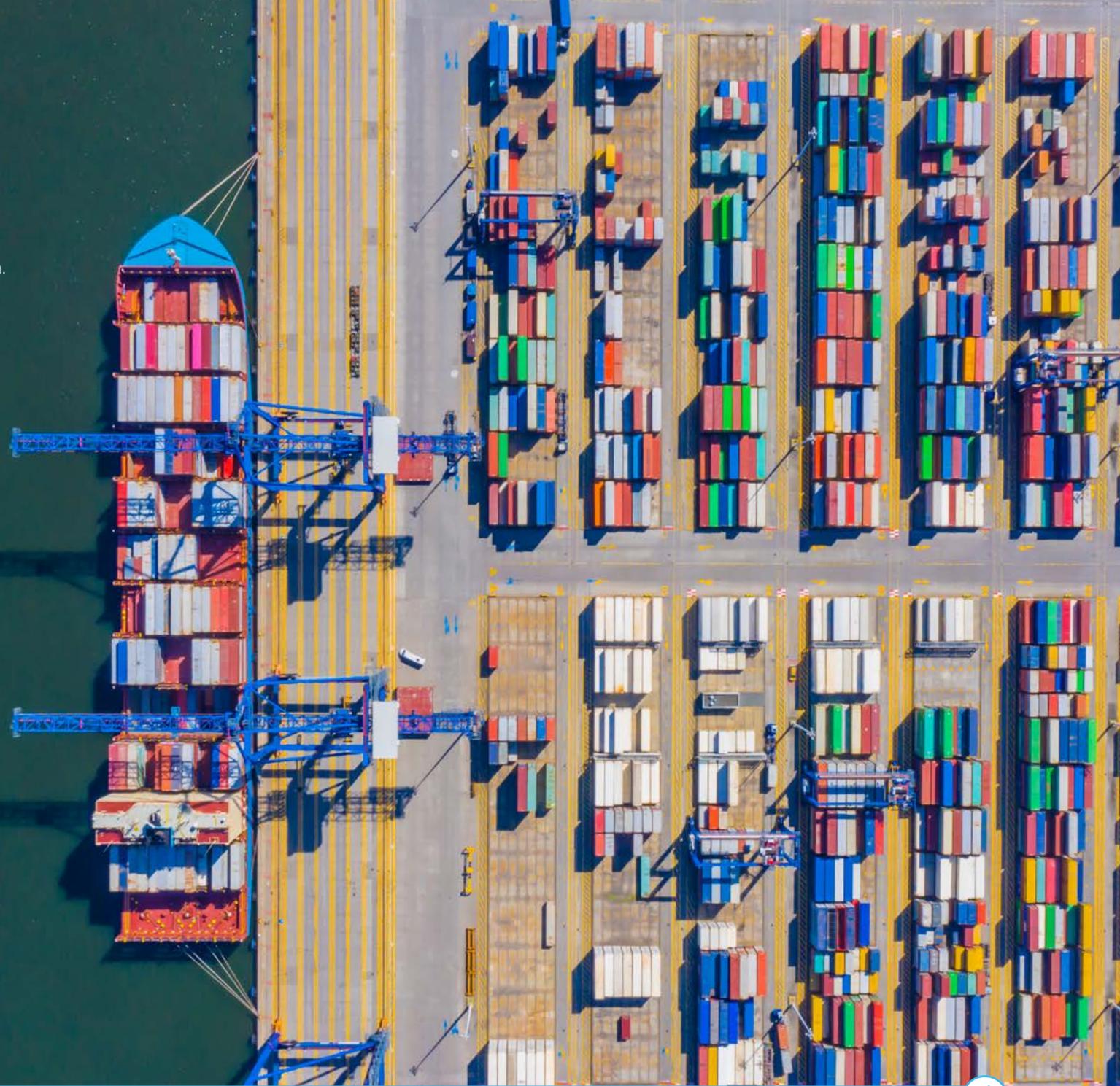


# Why O<sub>2</sub>

Whether you're an enterprise mobile customer or a business exploring the benefits of a 5G private network, with O2 everything starts with a conversation. We get to know you and your strategic objectives. Then we start to unpack the communications technologies that can help you achieve them.

When it comes to 5G, you can depend on us. We're fully invested in 5G because it's our future too. We're one of the few companies in the UK with our own 5G spectrum allocation. So we're best placed to advise you on 5G.

We're known for what we do for our customers. You can also rely on our ecosystem of 5G partners. Together, we provide a carrier-grade 5G private network experience that no one else can.



# Talk to us today

When we speak, we'll get straight to the point. We'll show you what you can do with your own 5G private network. Not just the value you will see once the proof of concept is up-and-running but what you can expect over the coming years too.

You can **contact** our team or call us on **0800 955 5590**

Find our more about **5G and business**