

Executive Summary

Private Networks for Port Authorities

Connecting assets and people.
Delivering transformation.



Putting Private Networks to work

Increasing safety, boosting security and accelerating digital transformation.

With digital transformation and ever-smarter operations promising new levels of efficiency, business performance and competitive advantage, the need for guaranteed connectivity across your port is critical.

While it's the applications that ultimately deliver the business value – the automated processes, remote control operations and smart sensor data feeding advanced analytics engines – it's the communications infrastructure that enables operational continuity and helps ports serve the needs of ship owners and operators, cargo terminal customers and logistics partners.

To drive this transformation, the right coverage and capacity is required to ensure round-the-clock real-time connectivity. Cellnex UK's resilient and built-for-purpose 4G and 5G Private Networks deliver your use cases by connecting your applications, assets and people.

As one of the largest telecommunications providers in Europe, and a market leader for Private Network deployment, Cellnex offers an assured, end-to-end solution.



Why Private Networks?

The scale and complexity of many of today's sea port operations means that conventional public network and WiFi options struggle to meet the connectivity needs of port authorities.

Many are situated in locations where public mobile coverage is limited, while others are forced to compete with many thousands of consumers for wireless bandwidth.

WiFi networks offer an alternative. However, these are less secure, less able to support seamless mobility of connected devices, and can often be prone to interference or contention problems caused by other systems using the same radio frequencies. Added to which, deploying WiFi networks at scale requires extensive cabling and device infrastructure that can be costly to install and difficult to maintain.

In contrast, a purpose-built, dedicated 4G or 5G private network – designed and optimised for the specific requirements of your assets, equipment and people – overcomes the coverage, capacity and contention limitations common to both public mobile and WiFi networks.

In short, a Private Network will deliver the low latency, high bandwidth connectivity that today's industrial applications need.





Key features of a Private Network for port operations

Purpose-built 4G/5G network
delivering the coverage and capacity
you need, where you need it

Enables automation, AI and robotics
to increase efficiency, streamline
operations and reduce cost

Guaranteed, always-on connectivity
eliminates service outages and
assures continuity of operations

**Delivers the ability to track and
monitor assets** and employees to
increase site and worker safety

**Secure, private spectrum restricts
access** from outside and delivers
data protection and compliance as
standard

**Managed by a single, experienced
partner** to cut through the complexity,
deliver a bespoke solution and
eliminate investment risk

Eight business critical applications

Private networks enable a vast range of performance-enhancing applications and use cases across ports by guaranteeing connectivity. Typical use cases in port environments include:

- 1 Data analytics.** Monitor operations in real-time and utilise smart sensor data – increasingly in combination with artificial intelligence and machine learning – to make fast and well-informed decisions.
- 2 Digital twins.** Enhance port operations through the creation and analysis of real time digital twins.
- 3 Video analytics and geolocation.** Secure sites and show the location of workers. 'Wrong place' alerts can be sent to keep people away from dangerous operations.
- 4 Tracking moving assets.** Efficiently and automatically manage truck queues to speed loading/unloading.
- 5 Automation and remote-control.** Automate processes and remotely control and monitor loading equipment, machinery and vehicles.
- 6 Predictive maintenance.** Ensure the operational continuity of key assets such as cranes through assisted and proactive maintenance.
- 7 Remote inspections.** Deploy aerial and marine drones for remote inspections and measurements.
- 8 Workforce health.** Deliver data back from in-vehicle cameras and personal health devices to continually 'health check' workers in hazardous or high-stress environments.

¹ The future of port automation, McKinsey & Company, (November 2018)

In the next five years, at least half of all greenfield port projects will be semi- or fully automated¹.

Collaborating to achieve the desired outcomes

Against a background of growing competitive threats, increasing regulatory compliance and the need to streamline operations and reduce costs, port authorities are investing in Private Networks to ensure operational continuity through a new generation of digital services and applications.

Cellnex specialists will work with you to build your Private Networks business case based on your specific operating environments, locations and use cases – and offer flexible commercial solutions to suit your financial model.



Our experienced team will work with you to understand your business objectives, conduct detailed site surveys then deliver back a Private Network blueprint tailored to your specific sites and use cases – considering both coverage and capacity needs.

As a technology-neutral provider, we partner with appropriate third-party equipment and applications providers to deliver a complete lifecycle of services to drive continuity of operations and maximum business value.





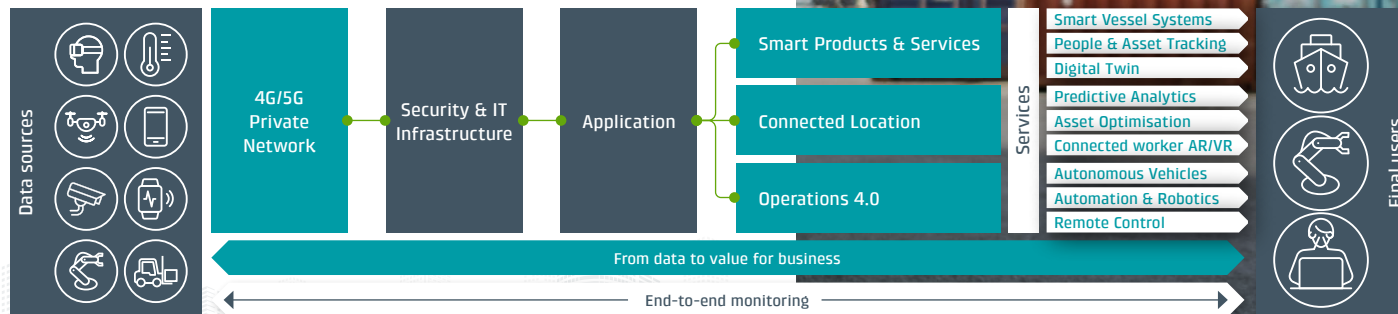
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Collaborating to achieve the desired outcomes

From project design and engineering, through coverage and capacity planning to operational monitoring and ongoing performance optimisation, we're with you all the way.

The criticality of continuous operations

90% of port authorities suffer from unscheduled downtime at their facility – costing at least £100,000 per year²



² Trelleborg Barometer Report, 2013



Business impact of automation

From reducing operating expenses and boosting productivity to improving berth planning, a recent study by McKinsey illustrates the value of a private network-powered automation strategy.

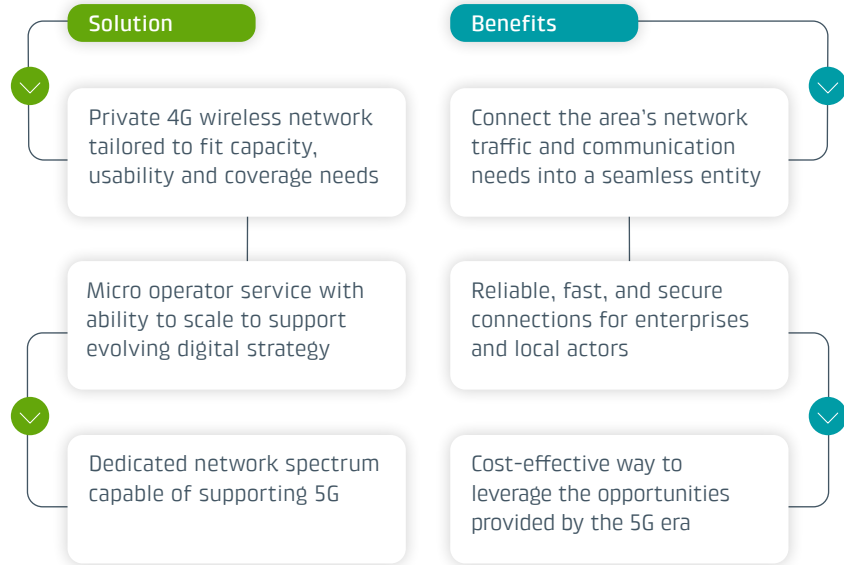
	Description	Example	Impact
Automated equipment	• Consistent operations with low variability • No downtime	Operating expenses could fall by	25-55%
		Productivity could rise by	10-35%
Equipment control systems	• Control over systems and processes makes operations smoother and provides more information on decision making	Predictive maintenance (Cranes & Vehicles)	30-50% reduction in downtime
Terminal control tower	• Includes terminal operating system, decision making tools, advanced analytics, digital platform and interface to the port community and customers • Handles demand forecasting, workflow management, scheduling, optimisation, monitoring and control	Real-time berth planning (48% of container ships arrive more than 12 hours behind schedule)	Up to 8% increase in EBITDA
Human machine interaction	• Technologies such as augmented reality, virtual reality, direct robots, automated guided vehicles • Augmented reality can speed up complex tasks such as maintenance	Major use cases for virtualisation of operations	Training
			Expert support
Interaction with port community	• Seamless exchange of data along the supply chain making systems more efficient • Real-time connectivity and digitisation are key for collaboration between stakeholders	Terminal operators proportion of automation value pool	Maintenance
			Collaboration
		Other ecosystem parties share of automation value pool	~20%
			~80%

Source: McKinsey & Company: Container shipping: The next 50 years (October 2017), and The future of automated ports (November 2018)

Evidence of success #1

Powering the port ecosystem with 5G-ready digital opportunities.

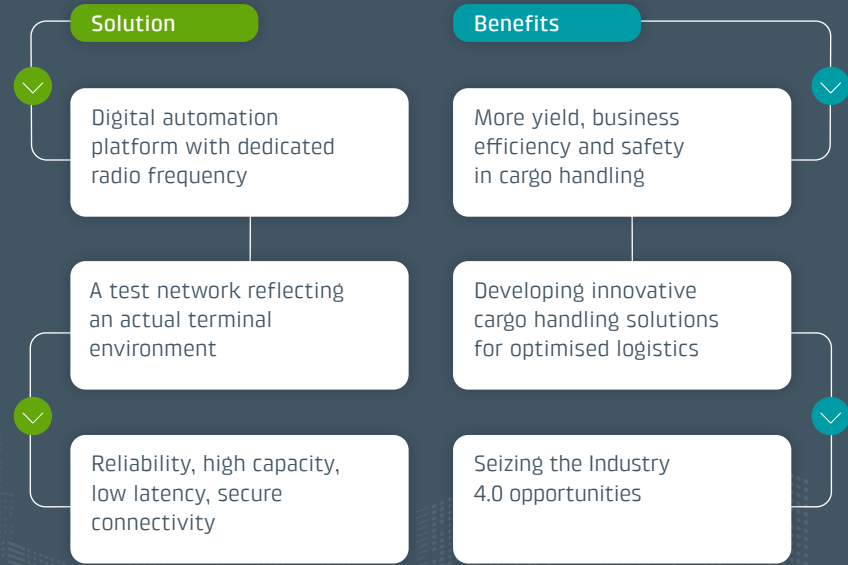
With Finland's Port of Oulu embarking on a multi-year smarter digitalisation project, the port needed to transform its connectivity environment.



Evidence of success #2

Building intelligent cargo handling solutions through connected R&D.

With robust and wireless infrastructure needed to drive port and terminal R&D, Kalmar turned to Cellnex for the solution.



No one knows Private Networks better

Together with market-leading provider Edzcom, a wholly owned subsidiary of Cellnex, we have deployed more Private Networks in more places than anyone else – supporting the mission-critical operations of major industrial customers across Europe.

As a UK Critical National Infrastructure Provider and one of Europe's leading telecommunication companies with annual revenues of more than €1.5Bn, and drawing on our extensive 5G, public safety and smart city expertise, you can count on us to be with you for the long term.

1995

Mission critical Private Network deployed in Catalonia for public safety and emergency services

2007

Private Network delivered for the Barcelona underground's train operating company

2018

4G Private Networks deployed in Finland for Boliden Mining and Port of Oulu

2020

Edzcom became a wholly owned subsidiary of Cellnex

2020

5G Private Network deployed at BASF's chemical plant in Tarragona, Spain

2021

Cellnex UK secured an agreement to deploy a 5G Private Network at Bristol Port



For more information,
contact our specialist team at:

PrivateNetworks@cellnextelecom.co.uk

www.cellnextelecom.co.uk