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# Charting the course to smarter port connectivity

LTE/5G wireless private networks accelerating digitization in ports

## Introduction

# Navigating a new normal: boosting productivity through transformed port connectivity

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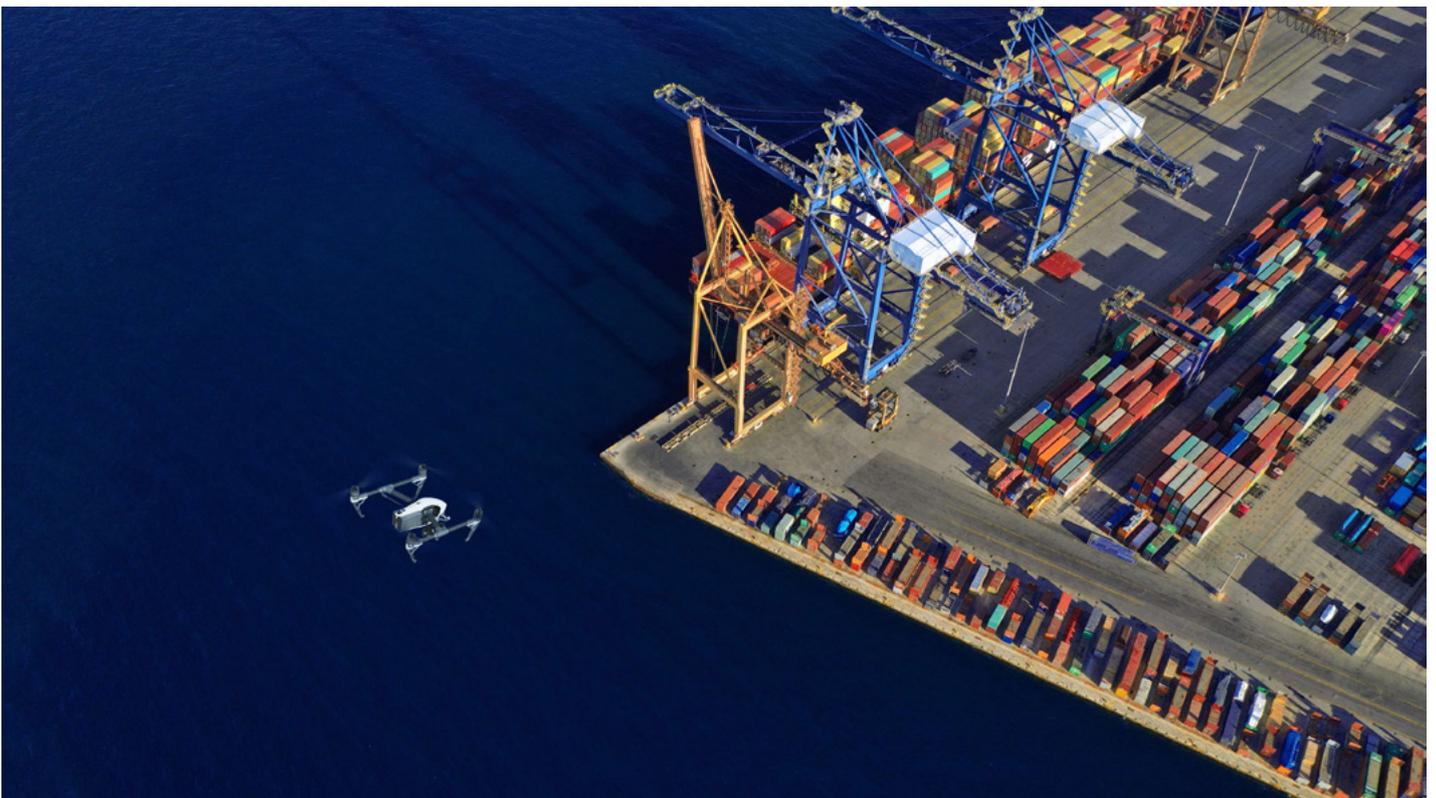
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The maritime industry is under immense pressure. While the global economy relies heavily on ports for the transport of goods and materials, terminal operators are struggling to improve operational efficiencies, increase productivity, ensure worker safety and maintain overall security.

To solve these challenges, ports are embracing large scale modernization through digital transformation. With the implementation of 5G cellular network solutions, ports are adopting use cases, such as smart condition monitoring of assets, automated guided vehicles for smoother operations, and digital twin for security surveillance and deliveries.

According to [Deloitte's Global Port Trends Report](#), ports that invest in technological advancements and their security to keep data and operations safe will be the most successful by 2030.<sup>1</sup>

Ericsson's private cellular network solutions for the ports industry are enabling major productivity and safety improvements while uncovering business value.



1. <https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/consumer-business/deloitte-nl-cb-global-port-trends-2030.pdf>

## Ericsson's private cellular technology empowers port and terminal operators to:

**Achieve greater efficiencies**—monitor conditions and performance of assets in real time; reduce maintenance, reduce operational costs; drive autonomous guided vehicles and drones in remote and dangerous areas; and support self-management, maintenance and optimization of productivity.

**Boost productivity**—unlock a new level of intelligence to solve crucial issues, such as on-site safety, tightened port security, and increased sustainability.

**Perform operations remotely**—decrease downtime and reduce vessel completion times.

**Improve safety for workers and assets**—monitor irregularities and protect port personnel through intelligent video surveillance while replacing time-consuming and dangerous manual site inspections with remote sensors and secure and reliable wireless connections to assets in the field or in dangerous areas.

The following case studies showcase modernized port operations through Ericsson's private cellular network solutions. Each example delivers enhanced business outcomes, ultimately driving growth, revenue and profit.





“I would say 5G connectivity will be of paramount importance in connected ports because 5G enables fast and high bandwidth communication.”

— Dr. Paolo Pagano,  
Director of Innovation Service Center, CNIT and Livorno Port Authority

## Port of Livorno: Port of the future addresses efficiency and sustainability with 5G

### The situation:

Located in the upper Tyrrhenian Sea in northern Tuscany, the Port of Livorno is one of the largest and most important Italian seaports. Operating with an annual traffic capacity of around 36 million tons of cargo, it employs more than 15,000 individuals and provides services to almost 9,000 ships every year.

### The business need:

The Port of Livorno plays a pivotal, transportational role by providing a major gateway for both import and export flows from the Americas and the Mediterranean. It also supports new car imports from the Far East as well as ferry and cruise passengers, mainly from Europe.

Given its required functionality, the Port aims to speed processes and data exchange within its terminal operations.

### The solution:

Used as a test bed for new technological solutions, the Port began digitizing operations with 5G and IoT in 2016. Working together, Ericsson Research in Italy and the Italian Consortium for Telecommunication (CNIT) began developing unique "Port of the Future" use cases. By creating an inventive test-bed, such as a port-focused digital twin prototype along with an innovation lab to attract numerous public and private players, they jointly tested and verified the cutting-edge solutions, ultimately transforming the port's processes.

### The results:

By leveraging the enhanced connectivity of Ericsson's private networks and advancing numerous ground breaking activities, the implementation of 5G solutions transformed the port's processes. Through the enablement of flexibly deployed 5G high bandwidth communication, the Port of Livorno uses digital twin technology, augmented reality (AR) and AI-based use cases to decrease the transit time of goods, maintain safety conditions, reduce environmental impact, control system automation, and ease service flow. Today, 5G is being tested to speed data exchange within the terminal operations, increasing reliability and delivering greater capacity, all to support sustainable port development.

[Learn more](#)



Rotterdam World Gateway experienced interference using Wi-Fi, causing outages and expensive delays. With the implementation of private cellular networks, costs were reduced, and the terminal operated more efficiently and effectively.

## Rotterdam World Gateway: Enabling digitization with private cellular networks

### The company:

Rotterdam World Gateway (RWG) is a modern, highly automated container terminal located in the "Tweede Maasvlakte" area of the port of Rotterdam. Providing container storage with maximum efficiency and sustainability, RWG has been called the "most automated and innovative container terminal in the world."<sup>2</sup>

### The business need:

Rotterdam World Gateway needed to increase the ability to service the number of ships from China while digitizing operations and providing a fully redundant solution. They also required rapid, secure and uninterrupted data communications to their Automated Guided Vehicles (AGVs), terminal trucks and tablets. Wi-Fi, their current solution, was not reliable, did not provide secure communications and was costly to operate.

### The solution:

Using a private cellular network, Ericsson delivered an end-to-end alternative through a fully redundant, highly reliable and secure solution. Based on privately owned spectrum in the 3.5Ghz range, Ericsson placed antennas and base stations in addition to a redundant core network.

Some of the supported use cases include:

- Data communication between customer application server and Automated Guided Vehicle (AGV)
- Data communication via ruggedized tablets between container stacks and reefer areas
- Connected MIFI devices with private 4G sim cards to laptops

### The results:

Today, the automated terminal handles more than two million containers a year, with roughly 15 workers on site. With the new network infrastructure, RWG provides improved performance, reliability and data security. It also offers secure remote access for monitoring and control while ensuring scalability for additional capacity and use cases when applicable.

[Learn more.](#)

2. <https://www.wired.co.uk/article/rotterdam-port-ships-automation>



Belfast Harbour is a best-in-class port and key economic hub, accelerating digital transformation and increasing efficiencies and overall productivity.

## Belfast Harbor: Becoming the world's best regional smart port

### **The company:**

Located in Belfast, Ireland, Belfast Harbor is a major maritime hub and the port authority operating in Northern Ireland's principal maritime gateway. It handles 70% of Northern Ireland's seaborne trade and almost 25% of the maritime trade of Ireland in its entirety. Spanning 2,000 acres, the port services 1.75 million people and 0.5 million freight vehicles every year. It also ensures 24 million tons of goods are managed, whether carried by ferries or serviced by cargo ships. As one of only two ports on Ireland handling a full range of cargos, Belfast Harbor accommodates freight vehicles and containers as well as passenger services and cruise calls.

### **The business need:**

Belfast Harbor aims to become the world's best regional smart port by providing a best-in-class experience to meet current and emerging market requirements. Belfast Harbor's vision is to create an attractive and vibrant area in which people want to work, live, and relax.

### **The solution:**

Working together, British Telecom and Ericsson incorporated private 5G network solutions across 35 acres of operational port. Using pragmatic methodology, BT and Ericsson identified multiple 5G use cases including tele-operation of heavy

plant machinery, artificial reality (AR) for remote maintenance and enhanced video AI analytics, as well as drones for surveillance and inspections, to calculate overall costs and associated benefits.

### **The results:**

The installation of private 5G networks optimizes processes across Belfast Harbor's transport, logistics, supply chain and shipping mechanisms, while boosting productivity and operational efficiencies through the smooth running of the port's operations. [Learn more](#)

## Conclusion

# Why choose Ericsson wireless solutions?

For port and terminal operators, digitalization powered by Ericsson private networks is an investment that delivers a substantial triple bottom line:

- improved safety for workers
- increased productivity and financial benefits and
- a more responsible environmental impact.

A 5G-ready, private cellular network not only supports smart ports from a backwards compatibility perspective, but it can easily be upgraded as new generations of cellular connectivity emerge. Many smart ports today are implementing use cases, such as automated guided vehicles, condition monitoring, and drones for surveillance and deliveries. These entities see immense financial benefits -- an ROI of 178% in five years when deployed together.<sup>3</sup>

The customer case studies recounted here showcase Ericsson's ability to meet the needs of your business. Ericsson is leading the way in the specialized world of connectivity for port and terminal operators and the port industry as a whole.

Our market-leading private cellular networks' solutions are based on 3GPP standards that align with large ecosystem players among device manufacturers. By utilizing the same radio and baseband portfolio as larger providers, our Private Network portfolio enables a broad reach that can help fit solutions to the needs of more advanced ports and terminal operators.

Our ecosystem includes a wide range of industrial partners, enabling us to address our ports customers' unique issues. With extensive

relationships with many of the world's service providers, we can easily facilitate hybrid solution offerings in partnership with local providers. We put all our resources at your service to find the exact, right solution for your unique needs.

### How can we help you?

Bringing about change is never simple. But the advances of automation enabled by private networks have the potential to solve many of the industry's ongoing challenges—and even shape the future of the industry.

Find out more about wireless connectivity and let us help you on your digitalization journey.

Visit our website:

[www.ericsson.com/en/industries/ports](http://www.ericsson.com/en/industries/ports)



3. <https://www.ericsson.com/en/blog/2021/2/connecting-future-ports-with-private-cellular-networks>

## About Ericsson

Ericsson enables communications service providers and enterprises to capture the full value of connectivity. The company's portfolio spans the following business areas: Networks, Cloud Software and Services, Enterprise Wireless Solutions, Global Communications Platform, and Technologies and New Businesses. It is designed to help our customers go digital, increase efficiency and find new revenue streams. Ericsson's innovation investments have delivered the benefits of mobility and mobile broadband to billions of people globally. Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York.

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