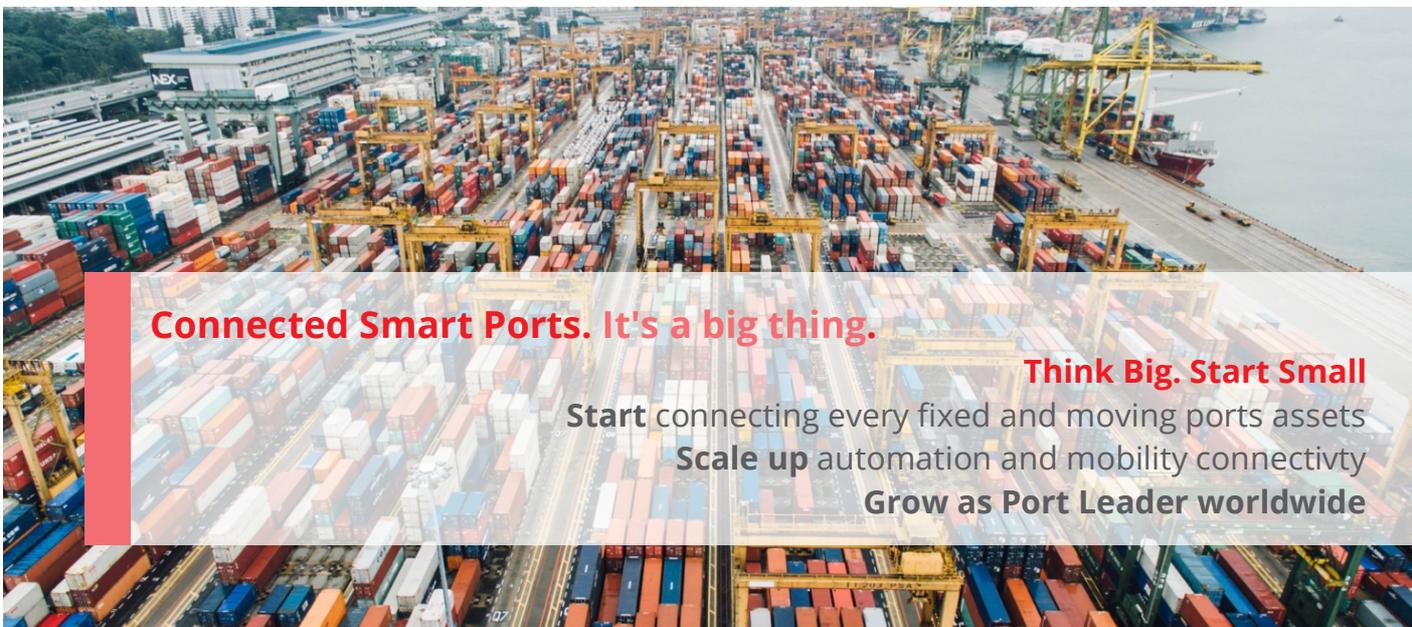




## SOLUTION NOTE **CONNECTED PORTS**



**Connected Smart Ports. It's a big thing.**

**Think Big. Start Small**

**Start** connecting every fixed and moving ports assets

**Scale up** automation and mobility connectivity

**Grow as Port Leader worldwide**

### The **Challenges** at Terminals and Ports

Ports play an important role in promoting international trade and regional development, some findings giving about 90% of global trade relies on maritime transportation that drives port transformation and upgrading to **digital and automated operation to build efficient and environment-friendly smart ports.**

Ports worldwide face common challenges such as increased labour costs with heavy labour volume, labour shortage and harsh working environment. Inefficiencies with port and carriers cost the industry as much as \$17 billion a year! This is addressed with more automation in the terminal and that can also reduce the workforce by up to 45%, studies conclude. Cost reduction and improved operational efficiency through increased automation is the key priority for the industry.

**Intelligent Automation** is crucial to manage the complexity and optimizing operational efficiency and port security but requires powerful and reliable connectivity, and this is in many situations the real bottleneck. Providing a reliable 24/7 IT network infrastructure in the highly dynamic port environment with moving cranes, trucks, and other vehicles, as well as access control, perimeter protection, and video surveillance is a true challenge.

But the investment in an automated terminal pays off to become a truly **Connected Smart Port.**

#### **Container, Vessel Crane Management**

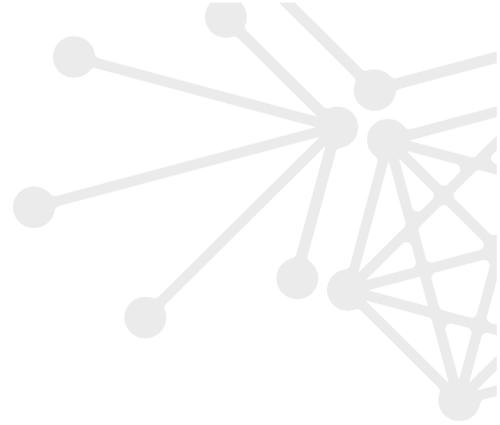
- Autonomous Operations
- Remote Controlling
- Terminal Automation
- Container Code Recognition (OCR)
- Asset Monitoring
- Predictive Maintenance

#### **Safety & Security**

- Anti-collision
- Video Surveillance
- RFID Tracking / Identification

#### **Fleet Management**

- Traffic Management
- Trailer Positioning
- Telemetry from Onboard Sensors
- Real-Time Location Tracking

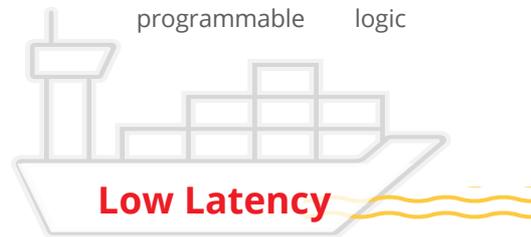


### The **Connected** Things of Future Ports

#### **Autonomous Operations Connectivity**

##### Intelligent Guided Vehicles (IGV)

In the terminal area, everything becomes automated. In order to facilitate port traffic, **Intelligent Automation** is not only important but crucial to the terminal operation. Taking the main services unit of cargo handling at the terminal, from the container loading in the vessel to cargo loading area, via horizontal transport across container yard, to uploading the containers exit through the gateways to the destination, the **Smart Wireless Mesh** network from **Anywhere Networks** connects vessels, containers, quayside container cranes, gantry cranes, Automated Guided Vehicles (AGVs), inner and outer container trucks, cameras, IoT devices and controllers (PLCs) throughout the entire cargo handling operations. **Anywhere Networks** can simplify equipment structures as it doesn't suffer from the limitations of traditional wired fibre communication networks. **The Smart Wireless Mesh Network reduces operation and maintenance costs and is many times faster to deploy. With the help of digital and automation technology, all cranes load and move containers efficiently.**



#### **Remote Control Connectivity**

##### Overhead Cranes, Gantry Cranes, Port and Container Cranes

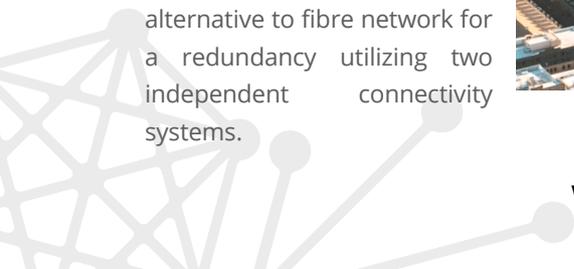
Smart IoT Solutions widely implemented at the major seaports and terminals power up the drive towards automation and **remote controlling**. In an automated port it is no longer appropriate neither to have crane operators working gantry cranes over 30 meters high nor quayside container crane about 70 meters.

In a typical scenario, tens of cameras and PLCs are mounted on a single crane. With many cranes deployed in a dense and busy environment, the **IT network infrastructure** has to be both powerful and robust. It has to support multiple HD surveillance video streams from onboard cameras and sensitive IoT devices and remotely controlled PLCs, demanding high bandwidth, low latency and zero downtime.

The **Smart Wireless Mesh** from **Anywhere Networks** meets the highest demands for such remotely controlled and monitored cranes. The Smart Wireless Mesh **is designed to give redundant connectivity and load balancing, for optimal performance under any condition.** The wireless network can be used both as the only or primary network connectivity or as an alternative to fibre network for a redundancy utilizing two independent connectivity systems.



**Automated and Remotely Controlled Terminals and Ports**





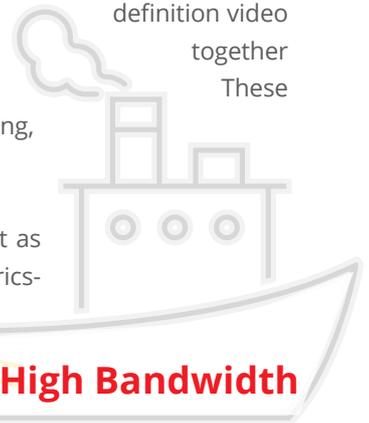
INTELLIGENT CONNECTIVITY



### Port Surveillance Connectivity

Video Surveillance | Perimeter Protection | Staff and Asset Safety | Access Control

**Video Surveillance** is one of the most critical operations of the port for both staff safety and security, and asset protection. To protect the many millions of dollars worth of goods, a massive number of high-definition video surveillance cameras are installed around the perimeter and throughout the yard, with advanced video analytics and AI systems to detect and alert for suspicious behaviour. These video surveillance systems demand the highest possible bandwidth for real-time monitoring, detection and alert. A network that never fails.



The systems for Access Control is equally demanding. Less on bandwidth and latency but as high on the reliable fail-safe connectivity. **Anywhere Networks** completely links biometrics-enabled technologies and devices such as ID cards, fingerprint scanners and wireless handheld devices to the integrated **Access Control and Port Security System** to staff and vehicle credentials. This addresses unescorted access to protected port areas and improves employee access control.

The **Smart Wireless Mesh** network from **Anywhere Networks** is specifically made for connecting the demanding video surveillance and access control systems. Its dual-radio design ensures a network infrastructure with a near-zero latency while maintaining the highest bandwidth in any environment, even over wide range networks connecting hundreds of cameras or more.

### Asset Tracking Connectivity

Fleet Management | Asset Tracking | Real-Time Mobile Communication

Managing a major container port is the ultimate logistical challenge. The planning and operation involve a vast footprint, a myriad of activities, a host of workers, cargo ships, and containers and a wide range of trucks, trains, and vessels. All tightly synchronized to optimize the flow of goods into and out of the port.

There are video systems for predictive and preventive **Collision Detection**, and others for logistics. Anywhere Networks connects all the systems for **Asset Tracking** across the connected containers, the port and terminal facilities, as well as remotely controlled self-driving vehicles. This minimizes human intervention and secures the container and yard areas for smooth logistics.

Across our **Smart Wireless Mesh** network, all security and operations staff are always connected through the port-wide **Real-Time Mobile Communication** network. Operators can receive and identify warnings and alerts while on the move, and relay them to the nearest team and first responders. The connectivity everywhere providing them with real-time situational awareness that secures a safer and more efficient environment. The Smart Wireless Mesh enables high-speed mobile communications, such as real-time surveillance video streaming with synchronized audio and sensory data. It plays a vital role in bringing effective and collaborative response to address port security issues.

**Anywhere's Mesh Network** connects safety and security applications to secure seaport operations; high-speed wireless end-to-end real-time communication is essential to **port security, safety, and efficiency**.



High-Capacity Throughput • Security • Automatic Load Balancing • Flexible Topology Design

Redundant Smart Routing • Rapid and Easy Deployment

## The Network for the **Connected Smart Ports**

**Low Latency** **High Bandwidth** **High Reliability**

In a port environment with high-density equipment and devices, moving vehicles and machines mounted in ultra-high position or difficult-to-reach areas, a conventional optical fibre network is not a feasible or doable alternative, or too costly. In many cases all three of them. A wireless network overcomes all these obstacles while providing near-fibre data throughput of **up to 1,000 Mbps**.

Large metal containers and equipment generally block wireless RF signals and cause drops in communication especially with the moving vehicles and cranes. This normally inhibits proper functioning and communication. But the **Smart Wireless Network** from **Anywhere Networks** overcomes that limitation with its mesh topology forming a web of connectivity throughout the port. This gives a fully **Redundant** and **Automatic Fail-over Recovery** network connectivity.



Understandably, the data is highly sensitive. Unlike 4G or 5G utilizing standard telco networks where sensitive corporate data is exposed to the broadband operators, the **Smart Wireless Mesh** network offers total end-to-end encryption. All data on the wireless mesh is fully encrypted using AES-256 for maximum **Cybersecurity**. Always!

**Anywhere's high bandwidth, low latency, fully end-to-end encrypted data-transfer designed for large-scale connectivity networks** connects port technologies to develop a sustainable port autonomy for authorities and terminal users. More importantly, the **Smart Wireless Mesh Network** is the building block for any future expansion to connect rail and road transport, **making the daily port operation connected, automated and efficient, driving Smart Port Innovation for Smart City Development.**

## The **Anywhere** Connectivity Solution

