Managing and tracking deliveries, end-to-end

SUPPLY CHAIN IOT USE CASES

IoT is now essential for efficient, sustainable supply chains

CONNECTIVITY AT ALL POINTS ENABLES REMOTE MONITORING AND EXPEDITES BORDER TRANSFERS

Global supply chains are essential to ensuring the smooth flow of trade and enabling access to key goods – across all sectors. They have become increasingly complex in recent years, driven by globalisation and the adoption of 'just in time' manufacturing techniques, among other factors.

So, it's important to eliminate all points of friction, so that goods and shipments can be delivered on time, to budget and in saleable condition. To achieve this, timely flows of information and data are required – which is why IoT connectivity is fundamental to the future efficiency of complex global supply chains because it enables the smooth transfer of remote data.

Supply chains span multiple routes. While seaways are critical, and road remains important many long-distance routes span rail and inland waterways. Indeed, multimodal intercontinental transport is a key element of any lengthy supply chain, so the end-to-end journey needs to be considered as a whole.

That's also because there's growing pressure on the logistics industry. Customers want value for money, but they also want resilience, the ability to monitor goods in transit – and are increasingly concerned about sustainability.

One common problem is that these lengthy supply chains span multiple countries, so in order to ensure that the right information can be collected, at the right time, connectivity to remote networks and systems is required. That sounds easy – just use mobile or satellite connections. In practice, this can be a significant challenge.

For one thing, satellite communications, while ubiquitous, is costly. For another, there are – literally – hundreds of mobile network operators. Dealing with these and securing connectivity that has the coverage to serve a global delivery path and to meet any eventuality, is yet another logistical nightmare. So, in this context, what's the right way to obtain connectivity for the global supply chain, across sea, rail, road and inland waterway routes?

In this briefing paper we explore the key domains in the supply chain, as well as common issues that need to be resolved to provide the connectivity demanded by the global supply chain and the customers that depend on it.

Multimodal transportation

RESILIENCE AND DIVERSIFICATION IN THE SUPPLY CHAIN

Multimodal transport, defined by the UN as “the carriage of goods by at least two different modes of transport on the basis of a multimodal transport contract from a place in one country…to a place designated for delivery situation in a different country”[1] has become increasingly important in recent years – and is likely to be critical in the next decades. The carrier is responsible for securing the transport, while the organisation that enters into such a contract needs to understand progress.

As such, communication across these split transport routes is essential. Freight forwarders and carriers need up-to-the-minute information throughout the journey, while their customers need access to reports. Multimodal journeys also need resilience, allowing for rerouting in the event of blockages – something that was highlighted during the COVID crisis.

It will also be important for supporting sustainability goals. IoT connectivity is thus a critical enabler for multimodal transport, but this needs to be consistently available, regardless of the route taken and irrespective of the countries through which goods pass.

Maritime IoT

CONNECTIVITY FOR THE SUPPLY VOYAGE

According to the OECD[2], around 90% of traded goods are carried by sea – and, while this proportion may change, the total number of sea voyages and the total volume of goods continues to rise.

The maritime environment is therefore crucial to global supply chains – and connectivity is a key enabler for obtaining valuable information that can keep stakeholders informed and, increasingly, to support the exchange of information required to expedite customs procedures.

This data concerns everything from information about goods in transit – monitoring conditions under which perishable goods are stored, as well as location data that can enable effective tracking, for example – as well as cargo and lading information. Regardless of the use case in question, cellular IoT connectivity provides a wider range of options than satellite – and, given the fact that most vessels spend a significant proportion of their journeys within range of land-based cellular networks, it's more widely accessible and available than you might think.

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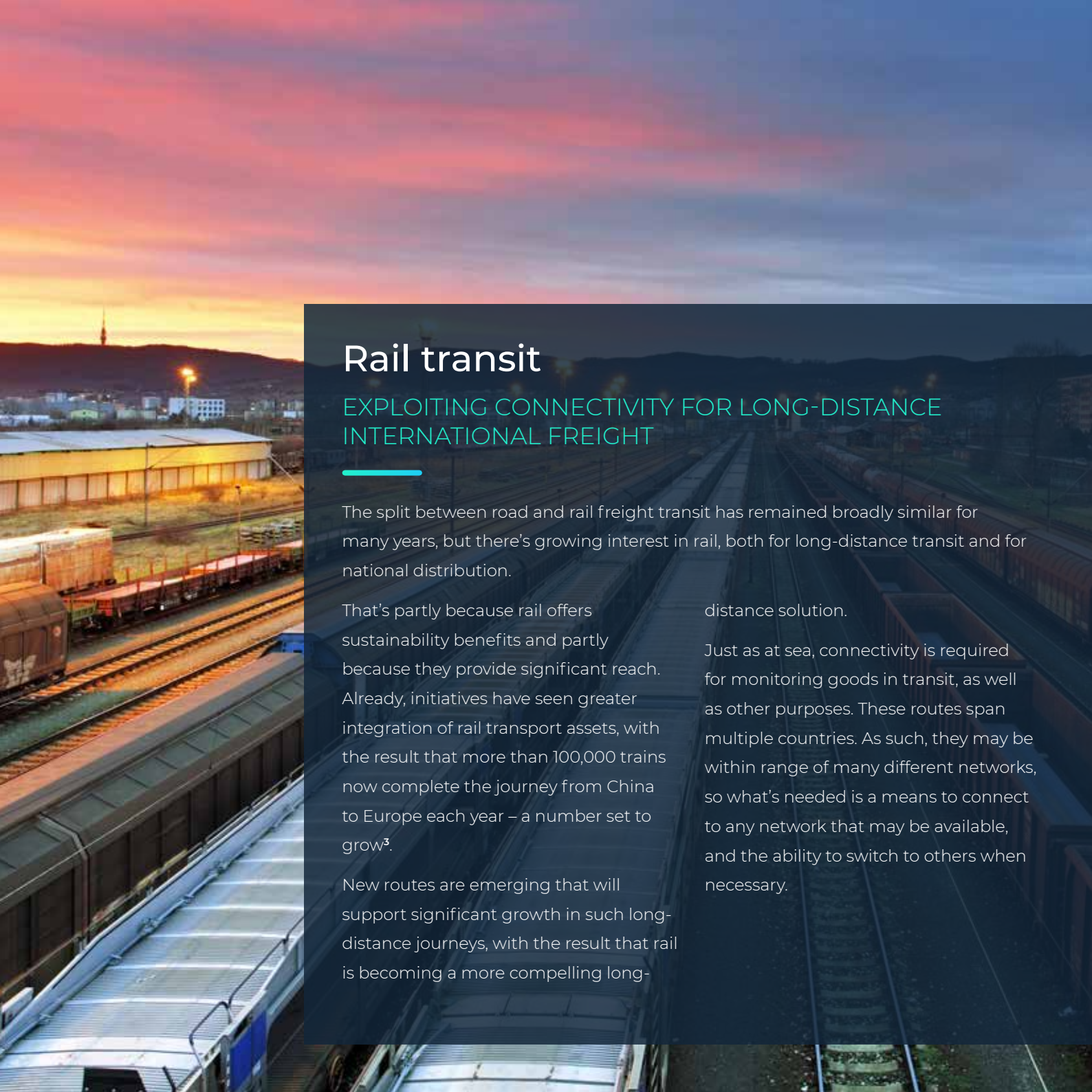


Rail transit

EXPLOITING CONNECTIVITY FOR LONG-DISTANCE INTERNATIONAL FREIGHT

The split between road and rail freight transit has remained broadly similar for many years, but there's growing interest in rail, both for long-distance transit and for national distribution.

That's partly because rail offers sustainability benefits and partly because they provide significant reach. Already, initiatives have seen greater integration of rail transport assets, with the result that more than 100,000 trains now complete the journey from China to Europe each year – a number set to grow[3].

New routes are emerging that will support significant growth in such long-distance journeys, with the result that rail is becoming a more compelling long-distance solution.

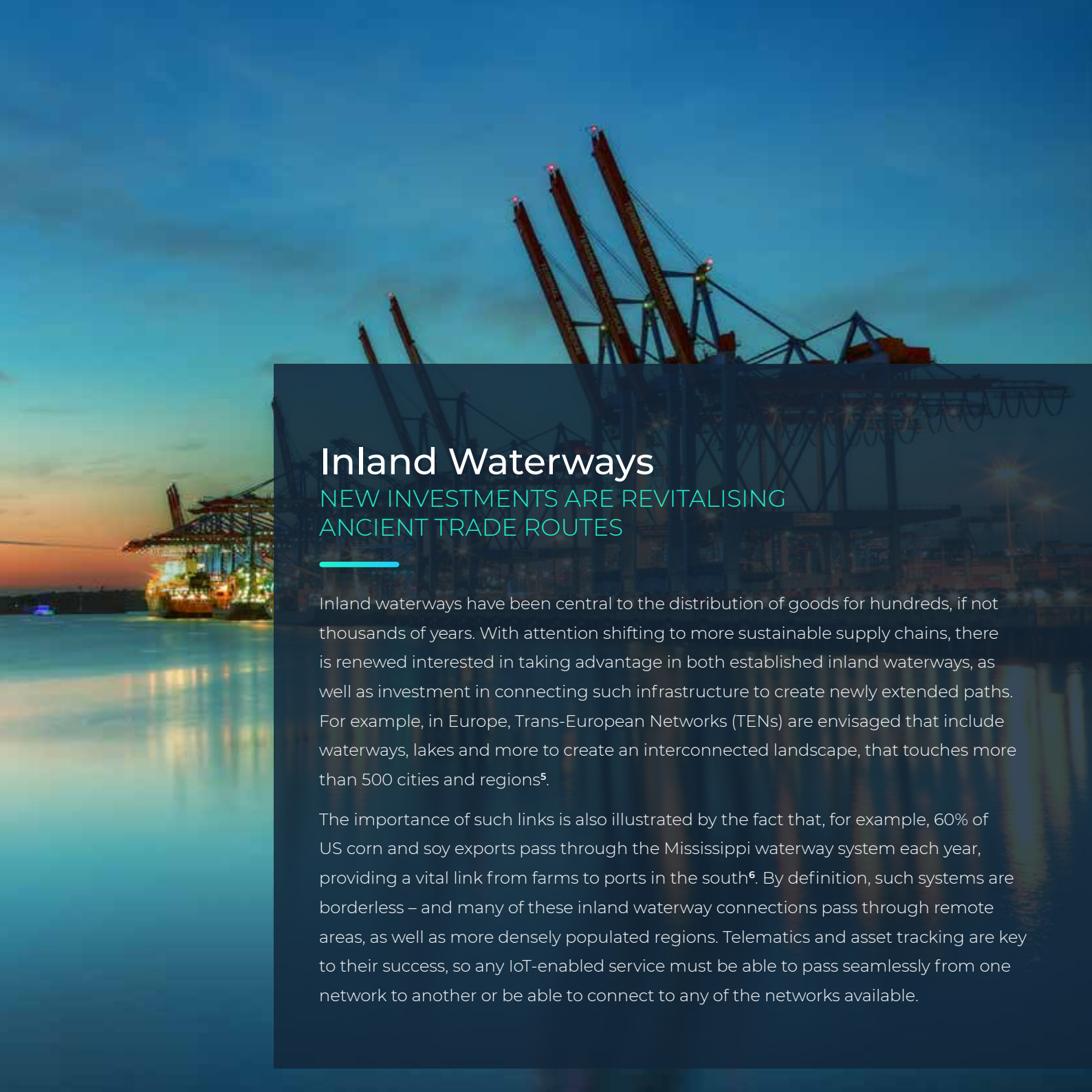
Just as at sea, connectivity is required for monitoring goods in transit, as well as other purposes. These routes span multiple countries. As such, they may be within range of many different networks, so what's needed is a means to connect to any network that may be available, and the ability to switch to others when necessary.

Road and the last mile

CROSS-BORDER AND THE CRUCIAL LAST LINK IN THE DELIVERY CHAIN

For inland transportation, road freight still largely dominates. Even in regions with extensive alternative routes, the majority of goods are delivered by road. Eurostat data, for example, shows that road transport consistently carried more than 70% of goods for the period 2008 – 2019[4]. Despite growing interest in alternative modes of delivery, this is likely to continue – particularly in countries without the rail or inland waterway infrastructure enjoyed in the European region, for example.

While road is critical in the last mile, providing vital supply chain connections to reach individual premises, it's also essential for cross-border routes, as investment in new long distance road corridors confirms. So, goods that need to be tracked by IoT devices and vehicles that need to be monitored for fuel consumption and other processes, true cross-border connectivity is critical. Solutions that are unable to roam seamlessly across a patchwork of networks are not fit for purpose and cannot provide the benefits the connected supply chain demands.



Inland Waterways

NEW INVESTMENTS ARE REVITALISING ANCIENT TRADE ROUTES

Inland waterways have been central to the distribution of goods for hundreds, if not thousands of years. With attention shifting to more sustainable supply chains, there is renewed interested in taking advantage in both established inland waterways, as well as investment in connecting such infrastructure to create newly extended paths. For example, in Europe, Trans-European Networks (TENs) are envisaged that include waterways, lakes and more to create an interconnected landscape, that touches more than 500 cities and regions[5].

The importance of such links is also illustrated by the fact that, for example, 60% of US corn and soy exports pass through the Mississippi waterway system each year, providing a vital link from farms to ports in the south[6]. By definition, such systems are borderless – and many of these inland waterway connections pass through remote areas, as well as more densely populated regions. Telematics and asset tracking are key to their success, so any IoT-enabled service must be able to pass seamlessly from one network to another or be able to connect to any of the networks available.

Digitalisation

OPERATIONAL AND PROCESS TRANSFORMATION IN THE SUPPLY CHAIN

Not only is digital connectivity essential for connecting containers and goods in transit, it's also necessary to enable digitalisation of operations, as vessels adopt solutions that support digital transformation of on-board processes and to enhance efficiency[7]. This growing trend can be observed at all levels in the supply chain, as logistics operators and transportation companies – across sea, rail, road and waterways – integrate new technology into their vehicles and vessels.

These onboard processes and systems, as well as goods and containers that require monitoring need to be able to connect to remote data processing centres - which, in turn, requires the ability to connect to the mobile networks that are available, across the full extent of the supply chain. With the increasing growth of multimodal transportation, this needs solutions that offer the flexibility to connect to any network, as well as to switch to backups when cellular access is no longer available.

Data Collection

MANAGING THE NEEDS AND PROIRITIES OF DIFFERENT DEVICES

Data needs to be collected from onboard sensors and monitors, as well as operational systems and from devices that are used to track goods, packages and containers. Some of this data is critical, while other is less time sensitive. Regardless, all of these devices – under the control of the crew or associated with freight – need to be able to connect to wireless network infrastructure.

That's why cellular connectivity, enabled by logical eSIM or physical SIM devices is essential. But, these need to be able to connect to any of the networks available throughout the entire duration of the journey – end-to-end, so that secure connectivity can be obtained, when needed. SIM connectivity can also be supplemented with devices that manage offload and onload of traffic, providing the prioritisation and control mechanisms that some applications may need.

Roaming

GLOBAL CONNECTIVITY MEANS JUST THAT

Global trade depends on long-distance corridors and multimodal transport chains that can span the globe. As a result, goods and the vessels that convey them will pass through multiple countries and encounter many different mobile cellular networks. Any device or system that needs to connect to such networks must be able to do so, without restriction and without incurring undue costs.

That's why roaming is a prerequisite for any device equipped with the ability to connect to cellular networks. They must be able to access any network that's available, seamlessly and for the right price – wherever they are, across the entire length of the supply chain.

Telecom26

SUPPORTING THE GLOBAL SUPPLY CHAIN WITH UNIVERSAL CONNECTIVITY

Cellular IoT connectivity, based on the GSM family of RATs is essential for supporting IoT applications and remote monitoring for the supply chain. Since goods can be delivered across different modes of transportation, they must be able to obtain universal connectivity. Similarly, for the vehicles and vessels that convey them, the ability to connect wherever possible to any cellular network is now mandatory.

Telecom26 provides solutions to support any IoT application in the supply chain, from basic SIMs with global coverage, eSIMs for integration with specialised devices, routers to provide local and macro connectivity, all the way to complete private cellular networks that can be assembled quickly, and which can meet the needs of all stakeholders. We help logistics companies, fleet operators, manufacturers, producers and wholesales to track goods, optimise processes and connect – wherever they are.

We offer the universal connectivity, backed by competitive offers and advanced network that the supply chain needs – for 5G, 4G, 3G and 2G networks, with full integration to supplementary satellite backup. Together, we help eliminate friction and enable data to be transferred, supporting your operations and smoothing the path of freight. Whatever your requirement, we can help. Telecom26 – across sea, rail, road and inland waterways.

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