

A vertical photograph on the left side of the page showing a large railway yard at sunset. The sky is filled with large, dramatic clouds illuminated by the low sun, creating a warm orange and yellow glow. In the foreground, several long freight trains are parked on parallel tracks. The trains consist of various types of cargo, including large cylindrical tanks and rectangular containers. The tracks recede into the distance, leading towards a city skyline visible on the horizon under the twilight sky.

*The next 'Big Thing' for your supply chain*

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**The New Silk Road:**  
*A modern rail transportation  
option for cargo transport  
between China and Europe*

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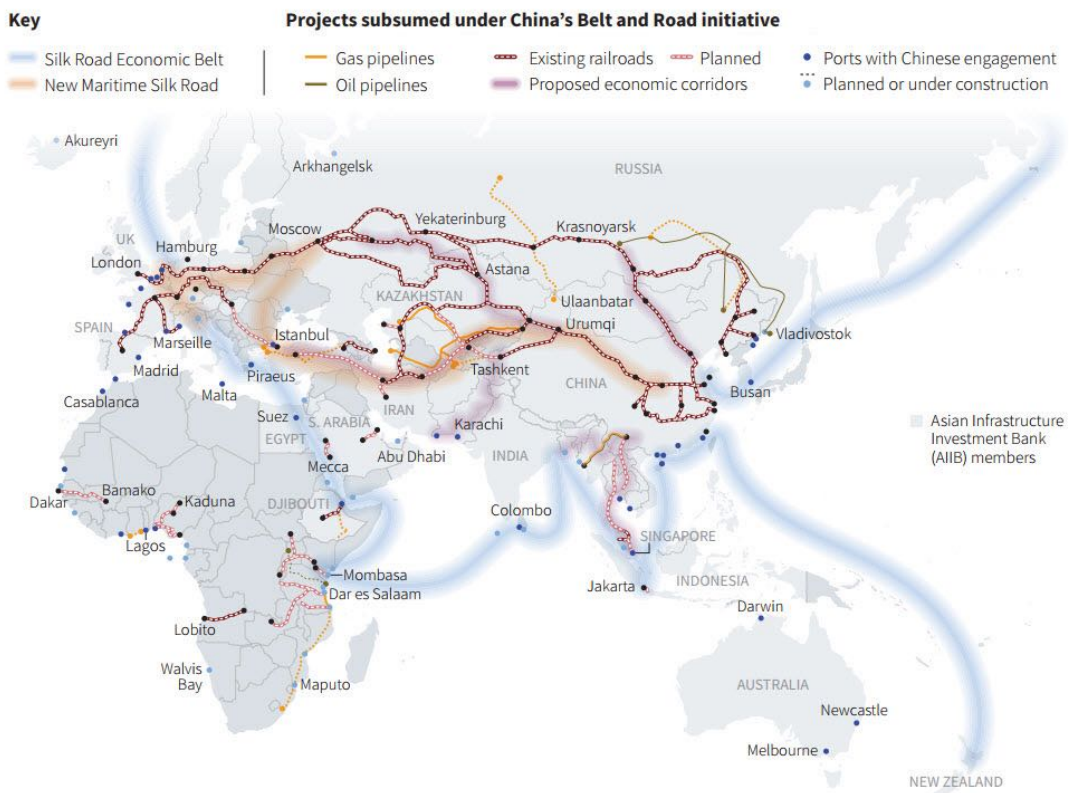
# The New Silk Road

## An extensive rail network to transport goods from China to Europe

The New Silk Road is the resurrection of the ancient one called to action by President Xi Jinping. Its purpose is to reinvigorate the once ancient commerce relationship between the 'East' and the 'West'. The initiation of this double trade corridor covering both land and sea routes is intended to open up and facilitate trade between the two regions through investment in infrastructural development. China's Belt and Road initiative is one of the largest economic developments ever planned. Covering more than two third of the world's trade, across 60 countries and 30% of the global economy, it is a key pillar of the country's Going Global strategy. The multi-billion-dollar project is projected to encompass over 60 countries benefitting a large chunk of the population and affecting the global GDP.

The belt and road initiative, as it is otherwise termed, covers both the land going Silk Road (railway) and the Maritime Silk Road. Already, the demand for rail have been increasing, especially for use by the automotive industry to move vehicles and parts is astonishing. The market dynamics are slowly bowing to the promising prospects of the new direct China to Europe trains as seen in the steady growth in the number of the China-Europe express trains. As the result of the COVID-19 pandemic, the importance of the rail transport between China and Europe increased. When global air and ocean shipping lines went down during the pandemic, businesses turned to rail to keep supply chains between China and Europe open.

**FIGURE 1. REVIVING THE SILK ROAD**



Source: Mercator Institute for China Studies.

C. Inton, 23/04/2018

# Freight railway network across Europe and Asia

## Two major routes to connect China to Europe

There are **two major routes to the New Silk Road**; the first is called **the Northern Route**. The northern route through Siberia is ideal for container transport for the northern regions around Beijing, Dalian, Suzhou and Shenyang. This route connects to the Trans-Siberian railways in Russia. The middle corridor has multiple variations, but all run from China through Kazakhstan. Another route is the **Southern Route** that passes through Kazakhstan into Russia before ending in Europe. The southern route through Kazakhstan to Russia is most suited for freight to and from central China, e.g. the regions surrounding Chengdu, Chongqing and Zhengzhou.

In Europe, the most important terminals are Duisburg and Hamburg in Germany, and Warsaw in Poland. Several European terminals are connected to the Silk Road rail system. A few of them are:

- Moscow
- Brest
- Warsaw
- Hamburg
- Milan
- Madrid
- London



Ref: <https://www.csis.org/analysis/rise-china-europe-railways>





# China-Europe freight train steady pillar for cross-border transport in hard times

## Explosion in volume throughout the COVID-19 pandemic

The New Silk Road with its rail connections is a popular alternative to maritime and air to transport goods from the East to the West. It is faster than marine transport and cheaper than air transport; appeals especially to customers who have time-sensitive goods, such as merchandise to be sold as part of special promotions in the apparel industry or capital-intensive goods such as automotive parts or electronics. The surplus costs of rail transportation compared to the marine routes can be offset by the reduction in inventory costs and timely delivery. On average, the transit from China to Europe on the New Silk Road is about 14 to 18 days for block-trains and 18 to 21 days for single container shipments.

China-Europe rail services, experienced an explosion in volume throughout the COVID-19 pandemic. The reasons for this boom in trans-Eurasian rail are directly related to other modes of transport being hamstrung by issues resulting from the COVID-19 pandemic. As shipping freight rates have largely increased due to a container shortage created by a backlog at foreign ports, the transport time and fees of the train remain relatively stable.

A record **12,400 trains** were deployed in 2020 on the New Silk Road, up 50 percent year over year, with volume up 56 percent compared with 2019 at **1.13 million TEU**, according to data from China Railway Express, the state-owned operator of the rail network.

*“Compared to ocean freight, the shipment process of the computers [via the Silk Road] is significantly reduced, which increases the throughput rate, reduces the financing of stock and hence frees up cash for HP. As a result, the total cost of operations is impacted positively, which is why companies like HP have shifted to the rail.”*

*(Karl Gheysen; CEO of Khorgos Gateway)*



# New services on the Silk Road to capture rising demand

## Freight forwarders have recently introduced multiple services

In the past few months, **DHL Global Forwarding** had launched five new direct train connections, as well as dedicated customer block trains, from Chinese rail terminals to Europe. Six new less-than-container-load (LCL) services have also been introduced by DHL into Italy, Belgium, France, Germany, Sweden, Baltics, and Poland. The services cater to larger concentrated volume of rail cargo in China, which enables DHL to fill both block trains or LCL boxes, and to identify new routings able to bypass congested borders.

**Nippon Express** launched a new weekly service from Suzhou, near Shanghai, in early February, using the northern route via Moscow and Malaszewicze, connecting to Hamburg and Duisburg. The Japanese service provider already operates regular train services from Xi'an, Denmark on March 6 became the latest Scandinavian country to be connected to the network, taking the China to Kaliningrad route through Russia and short-sea connection to Copenhagen. Finland is already linked by rail to China.

**DB Cargo Eurasia** launched a new rail-sea service from Xi'an to Oslo via the Russian port of Kaliningrad in November, eliminating a stopover previously required in Rostock, which the Deutsche Bahn subsidiary said allowed for a transport time of about 17 days. Cargo is transported by ocean for the short hop from Kaliningrad to Oslo. DB Cargo Eurasia now runs nine trains per week between China to Europe in both directions.

**CEVA Logistics** in November launched a new rail service from Xi'an to Dourges in France via Kazakhstan, Russia, Belarus, and Germany with an 18-day transit time. The CMA CGM subsidiary already operates block train, FCL, and LCL rail services from Xi'an to Duisburg.

**Dachser** deployed a westbound block train from China to Ludwigshafen in Germany in late December carrying 50 FEU via Erenhot in Mongolia, Russia, Belarus, and Poland. The logistics company operates regular Europe to China block trains carrying chemicals, but this was the first on the headhaul route.

**Davies Turner** launched its own direct weekly fixed-day rail import service from China to the UK in November 2018, starting with just two containers per week, but has grown the service in the past year to seven 40-foot high cube containers a week.

With demand rising sharply on Russia's trans-Siberian rail network, **Maersk** in November last year doubled its AE19 short-sea and intercontinental rail product between Asia and Northern Europe to twice a week, with plans under way to scale up to daily services.

**DSV** operates multiple rail services from China to several destinations in Europe for both FCL and LCL cargo, and has been running block trains since February last year.

In addition to the host of new rail services, the heavy demand has also brought **road transport into the China-Europe picture**. DHL operates 50 trucks per week with daily departures from China in a road service that takes 15 to 20 days, while DSV last year launched its Silkway Express, offering transit times of 14 to 18 days and rates "much lower than air freight," the logistics provider said.

# Benefits of rail freight transport via the Silk Road

A popular alternative to maritime and air transport



## Reduction of transport time

Sea transport has been conveniently leveraged for transportation for the majority of the cargo from China to Europe and back. However, that notion is changing. While the maritime Silk Road takes about 35 days for cargo to arrive, it takes the rail freight just about 18 days to hit the UK from China. Offering a slash of almost half the time that was before needed, rail freight is thus gaining popularity. Thus, rail freight has taken a medial position between sea and air letting air handle the very perishable products like agricultural produce while the rest are moving away from shipping to rail transport. Additionally, as deep-sea shipping became congested and unreliable during the pandemic, transporting goods via rail is becoming more predictable for shippers.



## Reduction of transport costs compared to air freight

Forwarders are registering an increasing number of inquiries from shippers into the China-Europe rail route as an alternative to the costly air freight services. The onset of the financial crisis put air freight at an unaffordable level, and so shippers opted for ocean transportation which was extremely cheaper but slow. To make matters worse, slow streaming made the journey even slower. This fragmented a luxurious market niche for rail transportation; not as expensive as the air freight option and not as slow as the shipping route.

Customers are thus passionately pushing shippers to include the China-Europe rail in their catalogue. A comparison done by a forwarder stationed in Hong Kong and Shanghai considered a 40-foot container. The chargeable weight for such a container is approximately 9600 kilograms. On the rail transit, it would cost \$8000 per FEU while the charges for the same FEU would be \$5000 less on ocean freight (at prices before the pandemic). On air freight, charges would soar to over ten times that charged on ocean transit. It is thus conclusive to say that rail transit averages the two: offering a cut down on air freight service prices while also cutting down on transportation time from the maritime route.



# Benefits of rail freight transport via the Silk Road

A popular alternative to maritime and air transport



## Reduction of CO2 emissions

Greencarrier Freight services, a Scandinavian Freight Forwarder operates container services out of China via the north corridor destined for Warsaw in Poland. It has adopted the China-Europe rail route as part of their green transport solutions towards their goal of reducing CO2 emissions by 15%. The reduction of the mileage the cargo covers being transported on the roads has helped cut down on carbon emissions.

Though not the most environmentally-friendly mode of freight transportation, rail freight transport beats air transport. If a 12-meter container with cargo weighing 20 tons was to be ferried via rail freight, it would account for about 4% of CO2 that would result from the use of air transport. In the case of ocean transport, the level of emissions would be cut in half again. Additionally, according to Far East Land Bridge Ltd., the New Silk Road train journey also saves 75% of the carbon footprint of the ocean route while running only 11,000 km instead 22,000 km on the sea route. It reduces the severe congestion which exists in and around the seaports involved in the east-west container trade, by moving containers from truck to rail.



## Option for full and less-than-container-load services

Another advantage offered by the China-Europe rail system is the availability of options to utilize full container load or less than container load shipping solutions. Less than container load refers to small shipments that do not have to meet the full capacity required for a container sailing through the ocean. The less than container load service is intended to be a cheaper alternative to air freight for lower capacity shipments. The option saves time as shippers do not have to wait for a container to be filled before they can send it through the rail system.





Good to know:

# Comparison of different transport modes for shipping goods from the East to the West



**Air**



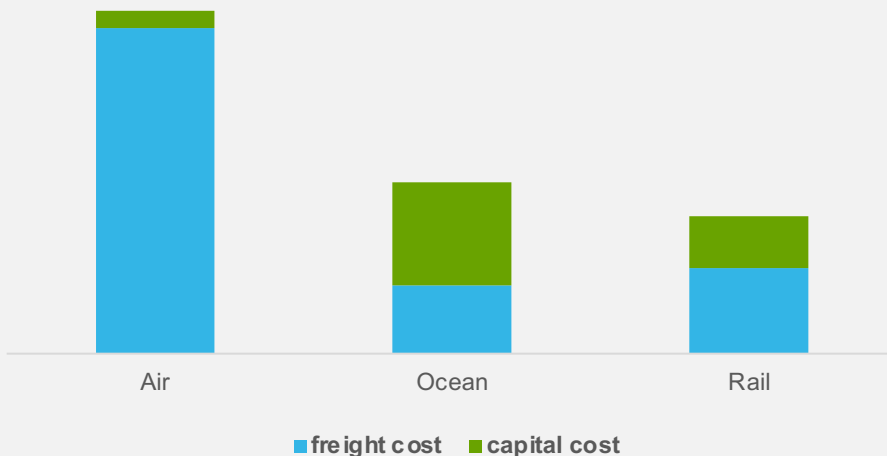
**Ocean**



**Intermodal Rail**

Volume / Capacity		
<p><b>Limited</b></p> <p>Max payload: 100 t.</p>	<p><b>Outstanding</b></p> <p>Capacity: 18.000 20'containers Max payload: &gt;195.000 t.</p>	<p><b>Increasing</b></p> <p>Capacity: 40-50 40' containers Max payload: 2000 t.</p>
Lead Times		
<p>1 day Shanghai – European air terminals</p>	<p>35 - 40 days between Shanghai and Rotterdam</p>	<p>14 – 18 days rail terminal 'East' to rail terminal 'West'</p>
Loading Units		
<p>ULD (Unit load device)</p>	<p>40' sea container</p>	<p>40' high cube container</p>
Price		

Considering capital and freight costs, rail can be the most economic option for capitalized goods



# Multiple risk to mitigate when transporting goods via the Silk Road railway

Pay attention to temperature fluctuations, shocks and cargo security

As the New Silk Road railway transverses several countries, political atmospheres vary from one to the other. Some countries are burdened with sanctions from European countries thus movement of goods across the borders can at times be slowed down because of prohibitions set by various governments.

The level of investment in the project also varies from one country to another. While China has greatly invested in the infrastructure, the Russian infrastructure, on the other hand, is very old. This is disadvantageous because it slows down movement of goods along the rail system.

There are quite **severe temperature and humidity variations along the route** as the train passes through the warm climate of China to the super freezing environment of Russia. Bearing in mind that cargo ferried along the railway is often temperature sensitive, manufacturers are putting in place mechanisms to monitor their goods ensuring the correct temperature is being maintained and mitigating the risks of disruptions.

**Security** is another major concern along the rail route. The main bottleneck on the New Silk Road remains the border crossing Malaszewicze-Brest, the main border point between Poland and Belarus. In Malaszewicze, trains are bound to queue up for the transshipment procedure. The long waiting time and the standstill trains are more lucrative to unauthorized door openings and cargo thefts.

Additionally, there is a variation in the shipment requirements for containers used across the various countries along the China-Europe rail route. It may necessitate cargo offloading and loading along the route to meet the required specifications. This could further increase the transportation time and thus further affect the costs upward. Geopolitical challenges further inhibit tracking of movement of goods along the rail.



# Keeping your rail freight on track with clearer visibility

## Get the most out of the new Silk Road without running into obstacles

The New Silk Road offers shippers significant opportunities to build more resilient supply chains and, ultimately, ensure that the cargo reaches its customers on a timely manner. However, to use it successfully demands that shippers fully integrate the new with the old – in this case, harnessing the power of digital tracking tools with a thousand-year-old trading route. Here are 4 steps to take to get most out of the New Silk Road:

**Building resilience:** Continued disruption demands more resilient supply chains. Putting all your cargo on one route may be a fast way to disaster. Even as the New Silk Road enjoys its moment, shippers should avoid going all-in on the latest innovation. Instead, deploy rail freight as part of a multimodal mix that meets the wider business's requirements, transportation, and supply chain strategies.

**Track everything:** Supply chains have long suffered from the 'black box' of shipping – cargo leaves a warehouse at one end of the globe, and a few weeks later appears at the other. If businesses want to be agile, they need to be able to know where their shipments are and in what condition at any given moment be it on sea, road or rail.

**Analyze in real-time:** Collecting real time data about the whereabouts of shipment in transit by sensor devices is important. But to use it effectively, its important to have a platform that can analyze information in real-time and deliver actionable insights for all the stakeholders.

**Understand the Working Capital implications:** The New Silk Road's faster transit times mean better cash flow for many businesses. If shippers can combine real-time data capture and analysis with faster delivery, they could unlock new financing models and free up cash that would otherwise be tied up in inventory-in-transit.







## **Monitor your cargo**

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To ensure the security of their cargo shipments as well as the resilience of their supply chain, shippers who are utilizing the Silk Road railway can rely on Arviem's real-time cargo tracking and monitoring service. Arviem eliminates milestone-based visibility solutions that only record data about the status & condition of assets when goods reach or leave certain checkpoints. Arviem provides real-time, trustworthy, carrier independent data about the whole journey of the goods from the point of manufacture to the point of delivery uncovering supply chain blind spots. Arviem's cloud-based, easy to use cargo monitoring and analytics platform provides business intelligence for decision makers.

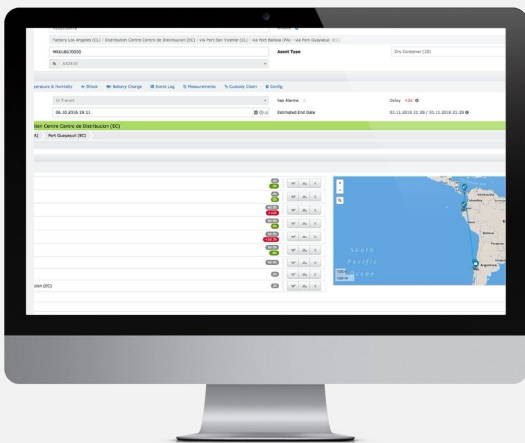
# Supply chain visibility solutions by Arviem

Protect your cargo while it is in transit

Arviem's supply chain visibility solutions support their users in the efficient management of strategic, operative and financial supply chains via supporting real-time data-driven decision making. Arviem ensures the continuity of its monitoring service even on remote locations, such as the steppes of Central Asia, by equipping containers with tracking devices that can transmit data both via satellite and GSM. Thanks to this offering, tracking devices are able to automatically switch to satellite communication whenever the GSM network is not accessible ensuring the elimination of logistics blind spots. Arviem offers a wide array of services that are transforming supply chains by combining the latest sensor technology, big data, and clever data analytics methodology. Arviem's pay-as-you-use cargo tracking and monitoring services are enabling its customers to efficiently manage and optimize their operative and financial supply chains without the need for investing in assets or technology.

*"Monitoring the location and environmental conditions of our shipments is a very important component of our stewardship efforts. Arviem provides us this capability."*

*Dow Chemicals on Arviem's Services*



## Parameters Monitored by Arviem

Arviem's cloud-based, easy to use cargo monitoring and analytics platform provides business intelligence for decision makers.



Door opening



Temperature fluctuations



Geo location



Position based ETA



Intrusion detection



Humidity fluctuations



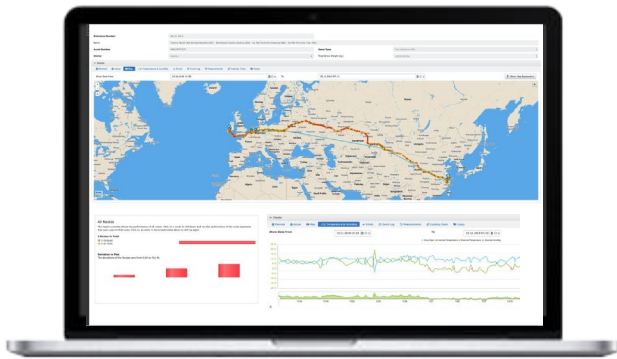
Shock detection



Performance reports



# Access to real-time data on the location of your shipment at any time while also recording any intrusion to your cargo

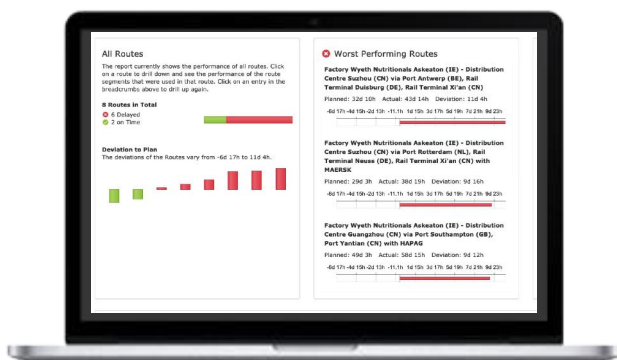
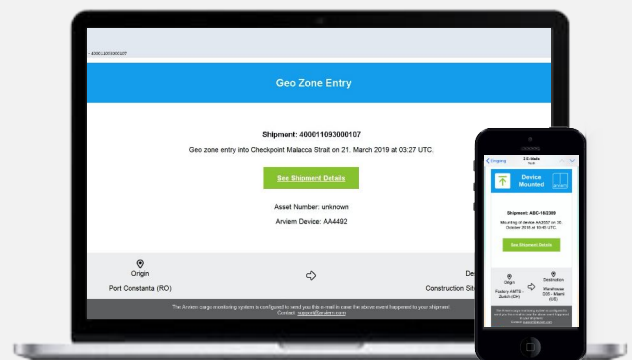


## Overview of ongoing shipments

Based on the constant data stream on the location and condition of cargo, all ongoing shipments can be followed in real-time and they are visualized on a shipment map. This helps to know where shipments are exactly at any given time, their condition, ETA as well as their security status.

## Automated notifications and alerts

Whenever an unexpected event happens (door opening or intrusion, shock, humidity, temperature fluctuation) or the cargo reaches a pre-specified location, automated notifications and alerts are sent. This enables stakeholders to reveal risks and inefficiencies and plan corrective actions and emergency response.



## Data analytics to identify risk hotspots, patterns and optimize routes and packaging

By relying on historical data to reveal optimization potential, clients can identify risk hotspots and analyze the performance of various transport routes. Based on the analytics and Arviem Risk Management Services, customers can proactively optimize their global transportation networks according to the various factors to minimize and mitigate risks.

# Why Arviem?

We operate **worldwide** and offer a **full service**

We provide **multimodal** cargo monitoring solutions

We offer '**pay-as-you-use**' service, no investment needed

We guarantee **24/7** customer service

We have **long established expertise** in the industry

We operate from and develop our software in **Switzerland**

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*"We have eliminated waste,  
reduced demurrage costs  
substantially and achieved timely  
product availability and product  
freshness."*

*Nestlé on Arviem's Services*





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