OMNICOMM

RAIL FREIGHT GETS BACK ON TRACK

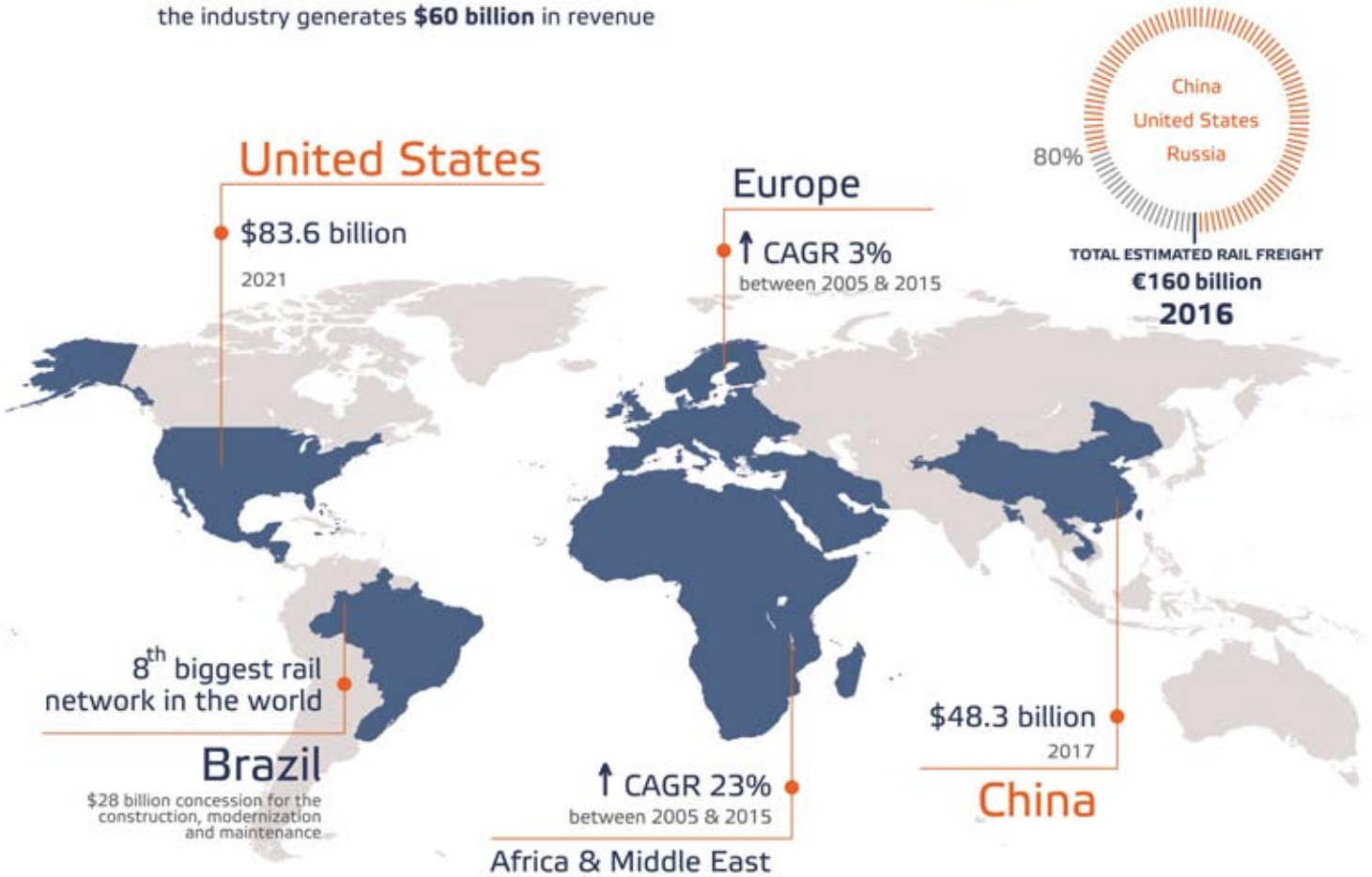
For an industry facing into an exciting future yet confronted by diverse challenges, success will depend on operators' willingness to embrace digital transformation to achieve meaningful efficiency gains. This means complete, flexible solutions that give operators maximum control over their high-value assets.

Turning the corner

In the wake of the economic turndown, the global rail freight sector in most regions slowed. But the industry is now back on track, with varying degrees of growth across all regions. The value of the **global rail freight market** stood at **€160-billion** in 2016[1] with the United States, China and Russia accounting for nearly 80% of total estimated rail freight.[2]

Africa and the Middle East have been consistently strong performers over recent years, with rail freight there growing **23%** between 2005 and 2015. Elsewhere, growth is slower but still positive – in **Europe**, the rail freight market is showing moderate growth, with a **CAGR of almost 3%**[3] while in the US, the industry generates **$60 billion** in revenue annually[4] and this number is set to increase to **$83.6 billion** in 2021[5].

China's rail freight industry is expected to generate **$48.3 billion** in 2017, 5.5% up on 2016. Russia, the second biggest railway cargo market in the world, saw a ton-to-kilometre ratio of 2.34 trillion t/km in 2016[6], a 1.6% increase from 2015[7]. Russia's rail freight ambitions are clear, with $43 billion earmarked to develop a Europe-Asia transport corridor. And in **Brazil**, which has the **8th biggest rail network** in the world, the government has announced a **$28 billion** concession for the construction, modernization and maintenance of 7.500km of railway in that country.



1 - "Global Rail Freight", Marketline, 2017
2 - "Transport Outlook 2017", OECD-International Transport Forum
3 - "Rail Freight Transportation Market in Europe 2017-2021", Technavio
4 - The Association of American Railroads
5 - "Freight by Rail: United States", Freedonia Focus Reports, 2017
6 - "Freight Rail Transport in China", IbisWorld, 2017
7 -"Rail freight in Russia: trends & topics for 2017", ITE Transport&Logistics

Challenges on the line

In a growing market with big ambitions, there are plenty of challenges. Railway operators wanting to consolidate and flourish must deal with a diverse set of issues – from alternative freight sources, increased competition and volatile fuel costs to high stock and operating costs and environmental obligations.

takes this very seriously – for example, in a drive to push rail freight's sustainability benefits, Deutsche Bahn's rail cargo arm DB Cargo has declared its aim to cut specific greenhouse gas emissions by at least half by the year 2030 compared to 2006.

Where there is growth, there is also **competition** – this might mean less market share at first, but there are opportunities to be exploited for operators willing to do what's necessary to streamline processes and unlock efficiency gains and in doing so, set themselves apart.

Security is another issue. Consider the Bulgarian Hitrino disaster of 2016 when a freight train carrying liquid petroleum gas derailed and exploded, killing at least seven people, injuring scores of others and causing major damage to the area. One of the government recommendations following the disaster was the introduction of real-time monitoring on the country's locomotives.

Road freight accounts for **55%** of the overall freight transportation globally[8], and offers strong competition. Yet rail offers many advantages over road and is estimated to be **between 4.5 and 6 times more efficient** overall than truck freight.[9]

Then we come to **fuel costs** and all the challenges associated with them. The cost of fuel is volatile and changes rapidly, while fuel surcharges and base fuel rates add to a constantly changing scenario that can be complex to gauge and manage. While the amount of fuel used by rail freight locomotives varies considerably according to type of locomotive, number of cars and other operating conditions, diesel expenditure in a locomotive fleet accounts for the majority of costs in the segment, as much as **29%** in some cases. Clearly, **monitoring fuel consumption** is vital for business efficiency.

Freight operators in every sector (rail, road, aviation and maritime) must comply with regional and global legislation governing pollution and **carbon emissions**. Rail freight is in a strong position here – it reduces highway gridlock, have lower greenhouse gas emissions, and cut emissions of particulate matter and nitrogen oxides[10]. Generally speaking, industry

8 -"Global Rail Logistics Market 2017-2021", Technavio, 2016
9 - "Global Rail Logistics Market 2017-2021", Technavio, 2016
10 - The Association of American Railroads

Non-standard fuel consumption is a critical issue which is not only about cost. Non-standard consumption may indicate a technical problem or flaw that needs to be investigated – dealing with it effectively can pre-empt serious technical problems down the line and even prevent major incidents.

Other challenges that railway operators are faced with include 'dry', caused by a lack of fuel, which compromises fleet efficiency and causes additional knock-on fuel costs, and human error in handling fleet supply and consumption data. People make mistakes but the cost of human error when spread across multiple areas of a high-cost business can have a serious knock-on effect on overall costs and operations.

Protect your assets and take back control

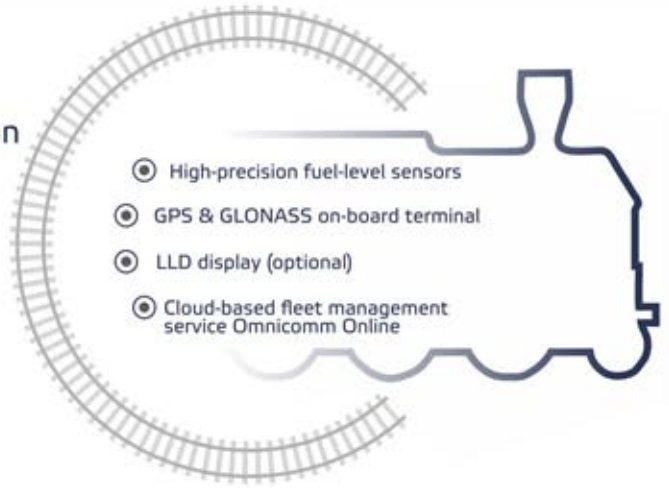
Locomotives are the ultimate high-value moveable assets. They're expensive to buy, expensive to lease, and expensive to run. But if you don't know where your assets are, how can you look after them? Without real-time monitoring, railway operators are not in control and the total cost of risk goes up. A comprehensive real-time management system that monitors the exact location of every locomotive in your fleet – as well as all the crucial parameters – puts operators back in the driving seat.

Real-time location and other data on locomotives also results in lower insurance premiums. In fact, having real-time data of all the crucial parameters– fuel levels, speed, driving direction and so on –delivers a valuable business intelligence resource that can improve railway infrastructure, maximize availability and increase overall operational efficiency.

For an industry facing into an exciting future yet confronted by plenty of challenges, success or failure will depend on operators' willingness to embrace digital transformation to achieve meaningful efficiency gains. This means complete, flexible, state-of-the art solutions that keep track of your high-value company assets: telematics, fuel and fleet management and real-time monitoring with advanced analytics capabilities and asset utilization.

Omnicomm: smart fleet management for your valuable assets

Omnicomm offers a complete software and hardware solution for digital fleet control and smart fleet management, consisting of:



Fuelling your business with a complete fleet management system

Omnicomm is a leading developer and manufacturer of complete fleet and fuel management solutions. Our fleet management solution includes Omnicomm high-precision LLS fuel-level sensors, terminals, displays and fleet management service Omnicomm Online, all underpinned by our unique fuel data processing algorithms which ensure that fuel level data recordings are completely reliable and return exceptionally high **accuracy of 99%**.

A key aspect of the Omnicomm solution is flexibility and third-party integration. We don't lock you in or force you to replace existing equipment if you don't want to – our software and hardware work seamlessly with third-party solutions and kit. Omnicomm works with partners who provide additional services and solutions, from consultancy and analytics to additional sensors and displays. We deliver the best, most appropriate solution for your needs and that includes taking into account what you already have .

Fuel-level monitoring is one of the most critical functions of any fleet management system, delivering significant cost-savings across the board. Fuel is a major cost factor in railway locomotive operations and monitoring and managing it is clearly essential to controlling costs – an effective fleet management solution with fuel-level monitoring can deliver cost controls as well as substantial cost savings*.

*Please refer to the 'Reference cases' section at the end of this document to see what savings our customers have achieved since installing Omnicomm solutions.

Fuel-level monitoring also eliminates dry panes – running out of fuel is not only a scheduling and reputational nightmare; it can cause serious damage to the locomotive too – and alerts to atypical consumption so that discrepancies in consumption can be reviewed and corrected quickly and appropriately.

Real-time monitoring improves the overall safety and reliability of railroad operations. By monitoring all key parameters in real time, such as ignition status, speed (including over-speeding), driving direction, fuel levels and temperature, oil and cooling water temperatures, connection to external power supply and heater status. These parameters are visible on a single dashboard for easy monitoring. If anything irregular shows up, the data is sent to the control center for the appropriate remedial action. It saves on insurance costs too – having real-time location and other data on locomotives results in lowers insurance premiums.

Real-time monitoring also detects when an engine is idling for longer than usual – this may be a result of the driver neglecting to connect to the external power supply, or leaving the engine idling to power a heater or other onboard equipment. Monitoring this kind of behavior helps operators enforce safer and compliant driving habits – not to mention save on unnecessarily engine running costs.

Working with Omnicomm

The project begins with a detailed analysis carried out by the local Omnicomm partner of the customer's existing situation, and what they want to achieve – their specific business criteria, metrics and indicators.

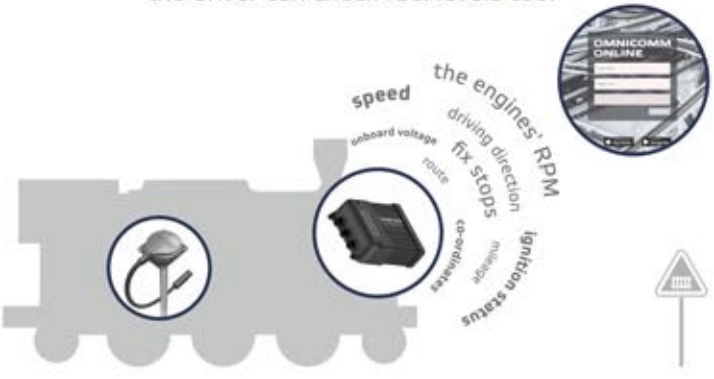
Based on this information, Omnicomm will propose the most appropriate solution. Omnicomm's flexible, modular architecture means this may include certain elements* or a complete, all-inclusive solution that includes sensors, terminals, displays and all the software and services required.

How it works: Simple, reliable, highly accurate

1 Omnicomm sensors are installed in the diesel tanks and calibrated to provide highly precise data on fuel levels at all times. Work is carried out by certified Omnicomm partners.

2 The sensors are connected to the onboard terminals which receive that data as well as data on location (co-ordinates) from satellites and from other sensors, enabling it to track the route, fix stops, set/monitor speed, mileage, driving direction, ignition status, the engines' RPM and onboard voltage.

3 All this information is securely transmitted to the web-based fleet management platform, Omnicomm Online. It can also be displayed on an LLD that can be installed in the locomotive cab so that the driver can check fuel levels too.



*Omnicomm solutions integrate seamlessly with third-party software. Customers who already have sensors installed can still connect to Omnicomm Online and if a customer is using an existing fleet management solution from another vendor, they can also connect our Omnicomm hardware to their existing software. Omnicomm Online can also be integrated with other software systems such as transport management systems and enterprise resource planning systems using web services.

A global presence, local to you

From our headquarters in Estonia, Omnicomm products are distributed to **over 108** countries on five continents via our worldwide dealer network. This global presence means you can find a local partner wherever you are – a partner who will answer your questions and provide installation support to make sure that your installation is trouble-free and successful. And our channel partners are 100% committed to delivering first-class support and maintenance services whenever you need them.

The Omnicomm edge

Because the Omnicomm solution is cloud based, it's **available anytime and anywhere** you're connected, including on mobile apps for iOS and Android. This makes fleet management accessible whenever and wherever you need it.

The **Executive Dashboard** presents all the main parameters clearly in a single screen, including mileage, average fuel consumption per 100km, total fuel consumption and useful stats for the previous three months together with reliable forecasting.

Fully scalable and flexible – just add locomotives to the system as needed and continue to monitor developments in real-time.

Developed in-house by our specialized R&D telemetry experts, our best-in-class data smoothing/filtration algorithm filters out 'data noise' and delivers **meaningful data**.

Advanced reporting with 40+ pre-loaded reports, and custom reports can easily be created.


Executive Dashboard in Omnicomm Online

High-precision fuel-level sensors measure fuel levels and provide fuel data with extreme precision to a rigorous 99% accuracy. Our sensors work reliably in extreme temperatures; no deviations caused by external conditions.

Suitable for all types of locomotive diesel tanks and available in a variety of sizes

Wide application area: Built-in 1500V galvanic isolation for powerlines and communication interfaces protects the sensors and sensor operation in the event of sudden increases in voltage, even in locomotives with no additional galvanic isolation units.

Premium sensor quality ensures a long product life with exceptionally rare failure incidents for uninterrupted operation.

Omnicomm fuel-level sensors

Highly reliable on-board terminals are unaffected by difficult conditions such as vibration, fluctuations in temperature, humidity, etc.

Precise positioning thanks to support for both GPS and GLONASS navigation system.

MODBUS protocol support enables connection to any existing (non-Omnicomm) terminal sensors that may be installed – no need to waste time and money replacing them.

Omnicomm Profi on-board terminal

REFERENCE CASES

Ural Mining and Metallurgical Company

The second largest copper plant in Russia:

25% market share in Russia
50% market share in Europe
70,000 workers

130 locomotives equipped with Omnicomm fuel-level sensors, terminals and monitored by Omnicomm Online

12 tons of fuel-savings savings per month

Locomotive service life increased

by 30,000 motor hours

All key locomotive parameters are monitored 24x7x365 with instant alarms for non-compliance.

Norilsk Nickel

The biggest nickel and palladium plant in the world:

38% palladium market share globally
22% nickel market share globally
5000 vehicles, locomotives and ships

100 locomotives and 2000 vehicles equipped with Omnicomm fuel-level sensors, terminals and monitored by Omnicomm Online

Over 578,000 USD in fuel savings per month

All key locomotive parameters monitored 24x7x365 with immediate alarms for non-compliance, including fuel drains.

Other locomotive projects include:

LLC 'Elektrostahl Industrial Transportation Company':

Seven short-range locomotives equipped with Omnicomm Online

30% fuel savings in under two months.

10 short- and long-rage locomotives equipped with Omnicomm Online

25-30% fuel savings in three months.

Yakutia Railways:

The coldest region in Russia – up to -50C in winter

100+ short- and long-range locomotives equipped with Omnicomm Online

35% fuel savings in under three months

Omnicomm tracks all locomotive parameters and driver status on long runs and responds immediately to any non-standard situations.

OMNICOMM

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