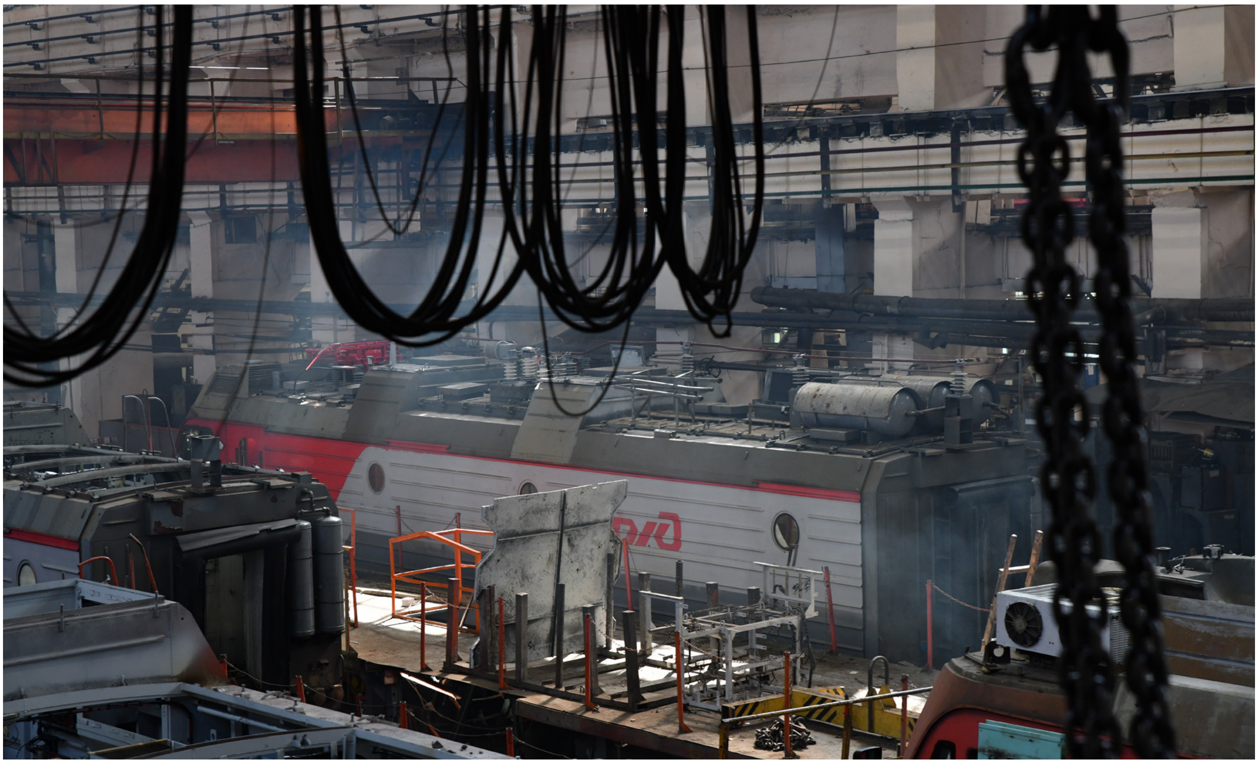
Russia and Eurasia Studies Programme

# Perspectives on Russian Railway Resilience
## A Strategic Outlook for 2025 and Beyond

*Maria Engqvist*



Ulan-Ude Locomotive Car Repair Plant in Russia. August 6, 2024. Alexander Manzyuk / Anadolu

**Ukraine, and in a broader sense NATO, have a mutual problem: the Russian railways. Without its rail network, Russia loses its territorial cohesion and its ability to conduct large-scale military operations. Even before the war, Russia's railway system faced massive structural issues. Western sanctions, along with Ukrainian kinetic and cyber warfare, have further disrupted its operations. Nonetheless, the impact has been temporary, and Russia has repeatedly recovered its most vital logistical capabilities. This memo assesses the strengths and weaknesses of Russia's railway system and outlines the challenges the sector will face in 2025 and beyond.**

In the Russian Federation, railways serve four functions with strategic implications. First, they connect the Russian landmass from west to east, reinforcing Moscow's political control over a vast nation. Second, they function as an instrument of influence within Russia's "sphere of interest," particularly in countries that also use 1,520 mm gauge tracks, such as in Central Asia and the Baltics. Third, they drive economic growth through trade.[1] Lastly, rail transport is central to Russian military capability due to its capacity and relative reliability.[2] These four factors make railways inherently geopolitical in nature.

Russia's invasions of Ukraine in 2014 and 2022 have altered the logic of the fundamentally Western-oriented Russian market and, consequently, the basic operational logic of the fully state-owned Russian railway giant, *Rossiiskie Zheleznye Dorogi* (RZhD).[3] The RZhD not only dominates the Russian railway sector—it is the Russian railway sector. The company's organisational structure is intertwined with Russia's

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political and military elites, as well as the state and military apparatus.[4]

When President Vladimir Putin opted for a civilizational war against Ukraine and the West in February 2022, existing frictions in the railway sector intensified due to expanded Western sanctions, while the war itself exposed both the strengths and weaknesses of Russia's railways. This memo analyses these strengths and weaknesses and examines their implications for the sector beyond 2025. It also addresses the paradoxical question: Why are Russia's railways still running despite corruption, inefficiency, Western sanctions, and kinetic and cyberattacks by the Ukrainian Armed Forces?

## A Giant with Structural Challenges

Prior to the wars, RZhD faced four main structural challenges: corruption, budgetary imbalances, congested rails, and insufficient industrial output capacity. None of these issues are new. RZhD is the corporate heir of the Soviet Ministry of Railways (*Ministerstvo Putei Soobshcheniia*, MPS) and inherited key assets of the Russian railway sector when it was established in 2003.[5] As of 2018, approximately 122,000 km of railroad stretched across Russia, of which about 87,000 were operated by RZhD.[6] RZhD is Russia's largest employer, with roughly 701,000 personnel in 2022.[7] It owns hundreds of subsidiaries, either fully or in part. These, in turn, fulfil a plethora of functions and tasks, from manufacturing locomotives to investing in rail construction projects.

RZhD effectively holds a monopoly on both civilian and military transport. Due to Russia's geography, the Armed Forces are especially reliant on rail transport. This grants RZhD exclusive power and makes it a stakeholder of strategic significance, both for the coherence of the Russian Federation and its military capability. The existence of the Russian Railway Troops, a highly specialised auxiliary branch of the Armed Forces, unique in both size and function, illustrates this. The force played an important role in Russia's wars in Chechnya and Georgia and has been observed in active service on the battlefield in Ukraine, where it continues to fulfil its highly specialised task.[8]

## A Self-Mutilating Rent Machine

RZhD is a prime example of a "rent-seeking" actor within the Russian state and economy, one that that seeks to maximise its own profits while minimising value to the national economy.[9] It is a textbook example of how corruption operates in the Russian Federation. For instance, in the 2010s, RZhD's former CEO, Vladimir Yakunin, an old KGB colleague of President Putin, made himself and RZhD infamous for embezzling assets on such a vast scale that he became untenable as a credible leader of the company. Yakunin was likely forced to resign after these embezzlement schemes were exposed in 2015.[10] Such corrupt practices have a long history dating back to when railways were first laid in the Russian Empire in the 1800s. Today, they epitomise RZhD, with their effects reverberating throughout the organisation.

Corruption and bad management have led to inefficient practices that undermine RZhD's operations. This practice inevitably damages the RZhD's reputation as a reliable cargo transporter, the result of which resonates far wider than in the Russian Federation itself, for example reaching one of Russia's most important strategic partners, China. RZhD's monopoly allows the company to manipulate the transport market. By increasing rail tariffs to compensate for budgetary imbalances, RZhD applies pressure on Russian domestic and international cargo operators.[11] This, in turn, affects the supply and demand balance of freight cars, fuelling uncertainty in the transport market.

This long-term practice, in combination with Russian import-export imbalances that have arisen as a result of Western sanctions, has severely affected other sectors of Russia's basic industries, such as coal-mining companies, which have been impeded from transporting their own products to their Chinese costumers. As China is a major coal producer in its own right, this may prompt it to increase its own coal production in the short and medium term.[12] If this trend continues, it will inevitably become a point of friction in the Russo-Chinese relationship in the years to come.

## The Post-Soviet Industrial Bottleneck

The Russian railway industry and military industrial complex are merely two sides of the same post-Soviet coin. They intertwine for historical reasons and share similar structural issues. Long before Russia's invasion of Ukraine in 2022, both sectors struggled to meet Moscow's political demands on industrial output. One reason was the conflict of interest between civilian and military industrial production in today's Russian Federation; another was the long-term effects of severe underfunding and de facto political neglect during the 1990s.[13]

After the dissolution of the Soviet Union, the modernisation of Russian rolling stock has been so slow that the fleet has become obsolete compared to Western standards. From 2014 onwards, Russia's loss of control or ownership over certain manufacturing plants in Ukraine played a critical role in its domestic industrial development. However, political measures aimed at strengthening its domestic industrial production and output have not stabilised the situation—quite the opposite.

Instead, increased shortages of products critical for operating rail transport, such as rail cars and wagon wheels, have been observed.[14] This has left RZhD and other cargo operators with no choice but to use their available hardware far beyond its life cycle. This practice has led to higher derailment and damage rates, which in turn have increased the costs of repairs and delays.[15] The situation has not improved since 2022, when Western sanctions hit the already strained Russian railway industry with full force.

## The Railway and the War

While Western sanctions have inflicted structural economic damage on the Russian railway sector that will take years to remedy, Ukrainian kinetic and cyber warfare against Russia's railway system has caused more acute but localised damage. However, Russian railway operators, both civilian and military, have demonstrated the capacity to manage the fallout from both sanctions and direct attacks in order to keep the railways operating, albeit far from perfectly.

### Western Sanctions: Trade Flows, Spare Parts, and Evasions

When the Russian political leadership chose to invade Ukraine in 2022, the US, UK, and EU imposed sanctions on RZhD due to its direct involvement in the same onslaught.[16] The sanctions regimes against RZhD restrict its economic operations with companies in the West and, consequently, its ability to raise capital in Western financial markets. As a result, the company defaulted as early as April 2022.[17] In theory, RZhD is unable to finance its business through Western markets, which would increase the strain on the domestic Russian market. This has brought a multitude of consequences, one of them being a continuously worsening negative cash flow, which has left RZhD in a persistent state of crisis.[18]

One paradoxical result of this development is that, in order to keep its day-to-day rail operations running, RZhD has been forced to cut funding for its strategic investment programmes in its already ill-maintained eastern rail infrastructure.[19] At the same time, while trade between the Russian Federation and EU countries has decreased dramatically, trade flows between Russia and China have increased, driven by both the COVID-19 pandemic and the 2022 invasion. This has placed additional strain on Russia's east-west rail artery, the Trans-Siberian Railway, a route that has already been in desperate need of overhaul and modernisation for many years.[20]

Between 2022 and 2025, Russian rail traffic saw an unprecedented increase in delays and suspensions. By the end of 2023, they reached nearly 50,000.[21] One of many plausible causes is the shortage of Western-made critical components, spare parts, lubricants, and other equipment vital to railway operations, all of which are required in bulk for regular maintenance and repair of the rail fleet.[22] To mitigate sanctions-related shortages, RZhD's many subsidiaries have been facilitating imports via third countries, effectively evading Western sanctions.[23] Judging by the fact that Russian trains remain operational, albeit not at a pace that benefits RZhD's financial model, the relative effect of the Russian method of relying on commonplace ad hoc solutions should not be underestimated.

### Targeted: Kinetic and Cyber Warfare

Events in the war itself have also affected RZhD operations—not only in the westernmost parts of Russia adjacent to Ukraine. When the Ukrainian Armed Forces (AFU) launched its incursion into the Kursk region in August 2024, it soon became clear that they had succeeded in accessing RZhD's computer systems and had acted to disrupt rail operations, especially military transports, across the Russian Federation.[24]

A significant impact of the Ukrainian incursion in Kursk, however, has been the halted railway traffic between Belarus and multiple bordering Russian regions. According to the Union of Belarusian Railway Workers, RZhD ordered its Belarusian counterpart, BZhD, to halt railway operations between Belarus, Moscow, and Bryansk on August 12, 2024, primarily affecting the Smolensk region. The main reason, according to the statement, was the "lack of locomotives" and "abandoned trains"—that is, trains without locomotives to transport them. Simultaneously, the Russian Armed Forces amassed echelons in the regions bordering Kursk oblast in order to counter the Ukrainian incursion.[25] This significantly disrupted regular trade flows between Belarus and the Russian Federation.

Another type of interference with RZhD operations that has occurred as a direct result of the war is sabotage. Since the Russian Federation launched its invasion, multiple acts of sabotage against RZhD's rail infrastructure have taken place inside Russia itself. Actors responsible for sabotaging RZhD infrastructure include domestic Russian anarchist partisan groups and other anti-war groups that have taken matters into their own hands to halt the Russian war effort.[26] The Ukrainian Military Intelligence service (HUR) and the Ukrainian Security Service (SBU) have also carried out sabotage against RZhD infrastructure in various locations inside the Russian Federation.[27] Geographically, acts of sabotage have occurred across the country, from the Far East to Chita, Samara, and Rostov-on-Don, much closer to the battlefield in Ukraine.

## A Railway That Keeps Grinding On

The Russian railway sector's problems are plentiful. Structural issues that hampered development and operations in the years before the war have only accelerated as a consequence of it. Due to Russian dependencies on specific Western technologies and goods, Western sanctions have considerably increased friction for Russian railway operations since 2022. This may have resulted in vastly increased expenses for RZhD to maintain railway operations—but it has not yet stopped Russian trains from rolling on a large scale. Neither have Ukrainian, Belarusian, or domestic Russian efforts in that direction, whether by sabotaging railway bridges or hacking RZhD's computer systems, the effects of which have proved temporary.

Despite the above-mentioned frictions, all which are serious, sensationalist speculations on the imminent collapse of the RZhD, or Russian railway operations, are not helpful.[28] On the contrary, they promote wishful thinking about a desired scenario, rather than contributing to a deeper understanding of the actual strengths and weaknesses of Russian railways. To return to the question posed at the beginning of this memo: Why are Russia's railways still running, despite all these problems?

First, there are strong economic, military, and political incentives—coming from more than one party, to keep trains moving. This pushes the limits of what would normally be considered desirable or optimal for maintenance and operations among actors across the entire sector. For this reason, Russia's railway capabilities should not be measured by Western standards when analysed. From a Russian perspective, it is better to keep rail operations running with a fleet of lower technological standards—moving and on the verge of breaking—than not at all.[29] Second, the Russian rail network is naturally dispersed over vast areas. The sheer size of the railway system allows for manoeuvrability, both regionally and locally, if operations come to a halt in any given location. This is particularly true in western Russia, where the rail network is denser—less so in the east.

## Russia and its Railways Beyond 2025

Given the context presented in this memo, it is clear that the effects of an inefficiently run state monopoly, corruption, and international sanctions dimensions the preconditions for future development of Russia's railways. As development of strategically important routes halts due to insufficient funding, particularly in the Far East, the potential decrease in transport capacity that inevitably will follow as a direct result will affect Russia's trade relations with China and India in a longer perspective. Against this background, it is again important to point out the interdependency between the overall state of Russia's economy and that of its railways.

If the perspective on the instrumentality of Russia's railways is widened, much of Russia's influence in what its political leadership calls "its sphere of interest" or "near abroad" is, in fact, economic. If Russia becomes increasingly unable to cope with the pressure, it risks losing influence in, for example, Central Asia—to none other than its strategic partner China.[30]

The prospects for Russia's development and the creation of other functioning railway routes, which it is currently building together with Iran and Kazakhstan, must also be considered. The geopolitically consequential North-South Transport Corridor, a project that has been underway for many years but has become ever more relevant since the start of the war in 2022, is also a testament to Russia's long-term strategic ambitions in this geographical direction.

Given the extent of existing frictions on the Russian railway network, and if the current trend continues, increased competition with various forms of sea transport should be anticipated beyond 2025, both in the North and the South. Yet, 2025 has begun as a dynamic year in global politics. Even if US sanctions against Russia were lifted (which would have an invigorating effect on the overall development), it remains uncertain whether key European companies that were previously active in the Russian market, in both industry and transport, would chose to re-establish their presence. This would still be crucial for the long-overdue modernisation of Russia's railway system, which has yet to take place on a larger scale. ■

***Maria Engqvist,*** Analyst, M.A., Deputy Project Manager. Maria is a Historian and a Slavist. She follows the development of Russian security and domestic policy, as well as military related questions.

## Endnotes


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Swedish Defence Research Agency
SE-164 90 Stockholm

Tel: +46 8 5550 3000
www.foi.se

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SE-164 90 Stockholm

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