Resilience by Rail

Making the European rail system fit for climate, transport and security

Executive Summary

Rail transport provides safe, affordable, and clean mobility, while supporting economic opportunity and social cohesion across Europe. Reliable access to rail services improves people's well-being, freedom, and dignity – values that are essential to the EU. Compared to road and air transport, rail is up to 13 times more energy-efficient and up to 11 times less carbon-intensive. With Russia's full-scale war against Ukraine, and the United States' unwavering role of security guarantor of the continent being put into question, the European peace and defence strategy receives increased attention and investments. For this strategy, rail transport also plays a significant role: according to military experts, a harmonised, high-capacity, electrified rail transport system can contribute to the prevention of further military escalation by deterring aggression, as it enables swift movement of personnel and equipment in the event of a crisis. Rail is best suited for heavy, oversized, and dangerous load and mass transport.

However, in its present overstrained and fragmented status, it cannot realise its potential for civilian and defensive transport in peacetime and times of crisis: currently, in some cases, it takes up to several weeks to move personnel and equipment from West to East by rail due to long and overcomplicated procedures and lack of capacity, and the share of rail in freight traffic is declining despite political goals to shift to rail.

In this paper, Germanwatch summarises key constraints and policy recommendations to enable benefits of the European rail system for climate, transport, and security. The insights are based on research and a high-level workshop titled "European Military Mobility on Rails: Recommendations from the Defence, Rail, and Climate Sector in the EU and the Green Weimar Triangle", organised by Germanwatch on 5 February 2026. The workshop brought together rail, climate, and military experts from Poland, Germany, and France – the Green Weimar Triangle countries spanning from the Atlantic to the Baltic states. Participants included high-ranking experts from NATO's Joint Support and Enabling Command, PESCO, the United States Army Europe, Ministries of Defence, the Warsaw Security Forum, the national rail and infrastructure companies PKP, DB, and SNCF, Transport & Environment, the Community of European Railway and Infrastructure Companies (CER), and the European Rail Freight Association (ERFA).

Key policy recommendations for the European Commission and national governments are:

1. Simplifying governance and rulebooks: a stronger European Rail Agency and harmonised simplified regulation
2. Accelerating the harmonisation of technical and operational standards: a centrally coordinated ERTMS roll-out and digitised procedures
3. Investing in well-steered network maintenance and expansion: increasing capacity to shift civilian and military transport to robust rail
4. Scaling up freight rolling stock and supporting a resilient rail workforce
5. Institutionalising a structured, continuous, and results-oriented dialogue between governments, rail sector, defence actors, and civil society to ensure fast benefits for civilian, commercial, and defence needs alike.

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Authors:
Jacob Rohm, Cornelia von Nieding

Contributors:
Sylwia Andralojc-Bodych, Marion Guénard

Published by:
Germanwatch e. V.
Office Bonn:
Kaiserstr. 201
D-53113 Bonn
Phone +49 (0)228 / 60 492-0, Fax -19

Office Berlin:
Stresemannstr. 72
D-10963 Berlin
Phone +49 (0)30 / 57 71 328-0, Fax -11

Internet: www.germanwatch.org
E-mail: info@germanwatch.org

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Context: Goals, Challenges, and Political Initiatives

Europe's geopolitical environment has fundamentally changed. The Russian war against Ukraine and a number of hybrid war activities by Russia against different EU Member States including Poland and Germany have increased the risk awareness. Additionally, the shrinking military and political support from the US are a wake-up call for more European sovereignty in energy, IT, and military terms. In this context, the resilience of EU transport and energy systems has become a strategic priority. This shift also led to massive increases in European defence expenditures: NATO states committed to investing 1.5 percent of GDP in defence-supporting infrastructure. The Commission proposed a ten-fold increase of the budget for dual-use transport infrastructure in the Connecting Europe Facility to €17.65 billion in the EU-Budget 2028–2034, additional funds are expected from national budgets and private capital.

The EU and its Member States must coordinate their peace and defence strategy well to save resources such as investments, personnel, and long-term costs. They must ensure that these activities do not exacerbate other escalating security risks – including those arising from the climate crisis – but instead help to mitigate them. The planned investments have long-term impact and must maximise benefits for the whole of society. Europe's approach to security investments must integrate climate goals, civilian freedom of movement, economic security, energy security, and social cohesion. In this context, the role of rail is more important than ever: it is a backbone of Europe's climate transition, a critical element of infrastructure modernisation, and a key component of European security and deterrence.

From a climate and energy-efficiency perspective, electrified rail reduces emissions, lowers energy demand, and strengthens Europe's energy sovereignty. Europe cannot meet its climate goals without a major shift to rail. The rail system must be renovated, expanded, and simplified so it can provide the capacity, speed, and reliability needed for a climate-neutral transport system.

From an infrastructure and resilience perspective, expanding the rail network compared to the ramified road network increases redundancy and thus resilience. Rail tracks made of steel and cement (or carbon fibre) are more resistant to the strain of heavy loads than roads, making them ideal for oversized freight and military equipment. Rail can transport three times the load per area compared to road, relieving roads from congestion. Rail is also the safest way to transport dangerous goods for industrial freight and military purposes, while requiring far less personnel compared to road transport. An electrified rail network with a reserve of hybrid locomotives can switch between propulsion technologies in case of disruptions.

From a security perspective, in light of Russia's aggression against Ukraine, military experts stress that Europe must be able to move significant numbers of personnel and equipment quickly across borders, e.g. to the Suwałki Gap between Poland and the Baltic states – to deter further escalation. Acts of sabotage and border violations underline the need for a transport system that is robust, redundant, and interoperable. According to experts, rail plays a central role in credible deterrence.

The goals of those perspectives can be largely served with the same measures. As one rail expert put it: "Dual use is not a compromise, but a multiplier," especially when planned primarily with civilian and peacetime needs in mind. Another estimate suggests that "90 to 95 per cent of what works for military mobility on rail works for rail freight."[1] Increasing rail capacity is therefore a no-regret investment: it benefits freight, mobility, climate goals, energy independence, and overall system resilience. To achieve this, Europe should not wait for crisis conditions. It must enable a true Single European Rail Area for fast and high-capacity transport and an immediate increase in rail's share of transport.

The challenge is that most required measures depend on coordinated action by EU institutions and the Member States within the complex field of European rail governance. The European Commission presented a Military Mobility Package to "create an EU-wide military mobility area by 2027." It includes streamlined rules to reduce cross-border processing to three days, fast-track emergency procedures, infrastructure cyber and energy security, capability pooling, and implementation coordinators. 500 infrastructure hotspots are eligible for short-term investment. In February 2026, the Weimar Triangle Transport Ministers signed a cooperation agreement[2] that includes improving rail connections for both civilian and defensive purposes. For these declarations and initiatives to translate into fast cross-European rail transport and a shift to rail within a few years, the four challenges listed below need to be addressed.

1. Simplified governance and reduced regulation

According to military and rail experts, cross-border movements remain highly complex due to fragmented responsibilities across national and institutional levels. Experts therefore recommend establishing a **single point of contact each on the military and the rail side, alongside a clear division of competencies** between Member States, the EU, and NATO. Rail companies must know who makes decisions and the military representatives must know who to address for each need. The role of the **European Union Agency for Railways (ERA)[3] should be strengthened** to accelerate processes and reduce costs, as stated by a supranational military transport expert. Civilian transport could also strongly profit from a strengthened ERA[4] accelerating the harmonisation of standards, overseeing infrastructure improvements, and coordinating the introduction of a European train network. As the bottlenecks not only lie in infrastructure funding, but indeed in governance, the European Commission and Member States should take this into account in the upcoming revision of the ERA mandate.[5]

Further, **European and national rules for the operation of trains should be harmonised and reduced.** Rail freight currently suffers from significant delays at border crossings due to avoidable regulatory barriers. For example, at the Innsbruck–Franzensfeste border crossing, trains must change their train number, triggering repeated technical checks due to differing rules for brake tests, staffing, and train composition. This causes a delay of about thirty minutes per freight train, in total almost 10,000 hours per year.[6] Another example is border clearances for transported goods. Currently, authorisations for military transport differ by Member State with some requiring up to 45 days[7] advance notice. These are only two examples of thousands of national specificities resulting in increased delays and costs in train production, homologation, operation, and maintenance. Harmonising and removing redundant or obsolete rules would improve the competitiveness of train production and operation, as well as accelerate trains across Europe. For military transport, customs form 302 offers a simplification. With the Military Schengen initiative, the European Commission aims to streamline procedures to achieve a three-day processing time. However, such simplifications should also apply to civilian rail transport, accelerating cross-border rail traffic in peacetime and realising the Single European Railway Area from which both civilian and military transport would benefit. Rules that can be removed or harmonised have already been identified and catalogued. The Commissions initiative for "A Simpler, Clearer and Better Enforced EU Rulebook" – while it should not lead to a reduction of protection standards – therefore should prioritise the rail sector.

2. Harmonisation and digitalisation of the rail system

Harmonisation, as one form of simplification, is not only necessary for rules but also for **operation systems**. Different systems across Member States, for example approximately 20 different signalling systems that force trains to carry expensive multi-system equipment or changing trains at borders, remain one of the most significant obstacles to fast cross-European rail transport. There are historic examples for the need for harmonisation, such as signalling systems and track gauges, as well as harmonisation initiatives themselves, such as the European Rail Traffic Management System (ERTMS), which includes European Train Control System (ETCS), that need unified standards. Further examples include train path application and allocation, as well as procurement. Military transport is a good example of cross-border transport under time pressure. Reforms should be guided by their need to achieve harmonised systems within a few years, so that the benefits for freight and passenger transport are maximised. The following principles are key to harmonisation: existing systems must be harmonised on paper as soon as possible and physically aligned at the next feasible opportunity, to enable cost-efficient migration paths. New systems must be standardised before they are introduced to save costs and optimise the benefits of rail transport.

Often this requires coordination. For example, the ERTMS coordinator[8] has suggested establishing a central coordination unit within the European Commission's DG MOVE, supported by a dedicated deployment manager – underlining the need for unified governance (see above). The lack of such central European coordination is one of the reasons – alongside a lack of funding – that ERTMS is installed on less than 20% of the trans-European transport network corridors. Resilience against increasing physical sabotage and cyberattacks is essential for digitalised systems. Different **track gauges**, especially on both sides of the border of Poland and the Baltic states, in Finland, and Moldova, are a challenge. Member States transition plans are due in July 2026. Cost-efficiency, a focus on central corridors, such as Rail Baltica, and flexible transition solutions such as polyvalent sleepers (offering two gauges on one track) might be a quicker solution for highly security-relevant tracks. Applications for **cross-border train paths** should be fully digitalised and harmonised, ideally transitioning before the 2030 deadlines set by the capacity regulation. During the workshop, one expert pointed out that **frameworks for procurement** have overly long planning horizons of five to ten years and still often are strictly national, while we need faster procurement and simplified technical requirements.

3. Capacious and resilient dual-use infrastructure

The European rail network is in very diverse shape. Civilian and military experts agreed that **the maintenance and upgrade of existing infrastructure should be prioritised over new projects**, making sure that the existing infrastructure offers enough capacity and can carry the load. For example, more than 1,000 of the 25,000 rail bridges in Germany need an overhaul, and the renovation backlog amounts to approximately 130 bn Euro. At the same time, **expansion is needed** due to the rising demand for cross-border rail transport of both passengers and freight. Expansion also increases the resilience of the rail system through the growing availability of possible alternative routes. Military experts cautioned that sufficient routes with enough clearance for very broad and high transport should be ensured. To achieve the necessary improvements with targeted actions, both investments (see Introduction) and good governance (see Point 1) are key. Rail as a lead market for climate-neutral and recycled steel and concrete[9] can support the competitiveness of the

European industry. The European shift to a circular economy opens a door for this, e.g. the German action programme for the circular economy strategy[10] calling for state-owned companies increasing their share of recycled products. A special focus should be placed on border crossings and their electrification. For example, only two of the ten Polish-German and five of the French-German crossings are electrified.[11] Electrification of infrastructure makes civilian transport faster, cheaper, and climate-neutral and – combined with a reserve of hybrid locomotives – increases redundancy and resilience against interruptions. Improving **infrastructure protection**, such as signalling systems, against physical and cyber sabotage as seen in Poland in 2025[12] is necessary, even if it requires higher costs. From an economic, climate, and strategic independence perspective, the European Union and governments must ensure that the extensive investments planned for infrastructure benefit civilian transport, climate goals, and energy independence by contributing to the electrification of transport volumes.

4. Dual-use rolling stock and societal resilience

Applying a rail-sector estimate[13] on NATO's requirements for the first 30 days of a crisis, Germany would need 7,000 flatbed wagons, yet DB Cargo currently has only 343 reserved for military purposes. The critically low number of wagons available for military transport points to a need to **scale up rolling stock**. As civilian and military freight needs the same wagon types, this could be done in cooperation with rolling stock lessors. One expert cautioned that **solidarity pools** of rolling stock, as foreseen by the Military Mobility Package, might not work as states in crisis tend to use their own resources. This underlines the need for a shift to a European solution in political and public opinion and defence projects. Some experts see a European solution as the only path to sovereignty in the medium term. **Multinational storage** for civilian and military emergency supplies could also save resources. A compromise might be at least an EU reserve as buffer. **Fast** intervention capability could supplement well-coordinated, in part complementary, in part redundant national logistics capabilities. Two experts cautioned that the **rail labour force** including their families must also be prepared so they can be counted on in times of crisis, and recommended a whole-of-society approach[14] that some EU Member States have experience with.

5. A structured, continuous, and results-oriented dialogue

Finally, the exchange of climate, rail, and military experts and practitioners in the workshop showed strong potential for synergies on the one hand. On the other hand, these synergies can only be realised if the actors of those sectors integrate each other's perspectives. The fact that the Ministries for Transport and Climate are not yet part of the German National Security Council[15] is an example of the lack of such an integration even within one government. Importantly, the synergies can only be realised in time if the sectors develop and implement integrated solutions on the governance, rules, infrastructure, and rolling stock level in the next years, as recommended above. To enable this, the European Commission and Member States should **institutionalise a structured and continuous dialogue** between governments, rail sector, defence actors, and civil society to ensure fast benefits for civilian, commercial, and defence needs alike.

Ultimately, rail is one of the areas where Europe's climate ambitions, security needs, and quest for greater strategic infrastructure meet. Investing in a modern, interoperable rail system strengthens European resilience, connects societies, and reduces our dependence on volatile fossil energy sources.

The Germanwatch approach to security

Germanwatch, as an independent environmental, development, and human rights organisation, defines human security as the well-being, dignity, freedom, and self-determination of people globally across all dimensions of life. We support peace-focused, preventive, and comprehensive security policy approaches, including climate and environmental security perspectives, and civil as well as military crisis prevention. We underline that climate change is both directly and indirectly one of the most comprehensive security threats of our century.

We urge to prioritise civilian peace policy to resolve conflicts in a sustainable manner through dialogue, development aid, and human rights work, rather than through military means. In the long term, this strengthens stability and prevents spirals of violence. Against this backdrop, the EU must act as a force for peace. For almost 70 years, the project of the EU has been essential in establishing lasting peace on the European continent. The French-German and the Polish-German reconciliation exemplify the historic significance of this European idea in an unprecedented way.

It is in this context that we see the respectful cooperation between states, as well as security and integrity of states and systems, as necessary, though not in itself sufficient preconditions of human security and national and economic resilience. Defence policy needs to be embedded in a credible strategy to prevent and end wars, coherent national and EU policies, multilateral frameworks, and country partnerships, for example on energy security, climate mitigation, and adaptation. Democracy and societal cohesion are essential for security and resilience, and vice versa.

In the current geopolitical situation – amid Russia's full-scale war against Ukraine, conflicts in the Middle East, and transatlantic developments – policies on war prevention, defence, military strength, and sovereignty of Germany and the EU have moved centre stage. This is underpinned by large-scale public investments. Such investments must have a defensive character and maximise peacetime and civilian benefits. In this context, this paper and the preceding workshop take a narrow focus on one important aspect of this development: the intersection between the European rail system and military resilience. Our considerations on this intersection are based on our basic principles on security concerns, as spelled out above.

The purpose of this paper is to explore dynamics between the policy goals. Particularly,

1. to help identify bottlenecks, as well as financial and regulatory constraints hampering both a stronger European rail network and defence transport capabilities,
2. to identify and analyse synergies and trade-offs in strengthening the rail system for civil versus military purposes,
3. and to develop solutions benefitting the civilian, peacetime, and defensive use of rail.

Our proposition: Military investments must be limited to the necessary extent for deterrence. They should follow a European, not a national agenda, and they should not undermine other existential policy areas. Investment decisions should maximise civilian and peacetime benefits, including climate mitigation. To this end, investments must enable the European rail system to cater for necessary defensive transport and for climate-neutral mobility of European citizens and freight. This will help to reduce greenhouse gas emissions to net zero and decrease dependence on energy imports and fossil fuels.

Notes

1. Alberto Mazzola, Executive Director of the Community of European Railway and Infrastructure Companies (CER), quoted in RailFreight.com, 2026, Industry Leaders Highlight Importance of Military Mobility Readiness. https://www.railfreight.com/policy/2026/03/12/should-rail-embrace-military-mobility-investments-are-not-wasted-in-times-of-peace/.

2. Minister of Infrastructure of the Republic of Poland, Minister of Transport of the French Republic, Minister of Transport of the Federal Republic of Germany, 2026, Joint Statement on the Occasion of the First Meeting of the Weimar Triangle Transport Ministers. https://www.bmv.de/SharedDocs/DE/Anlage/K/013-2026-gemeinsame-erklaerung.pdf?__blob=publicationFile.

3. European Commission, 2026, Revision of the Mandate of the European Union Agency for Railways (ERA). https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14686-Revision-of-the-mandate-of-the-European-Union-Agency-for-Railways-ERA-_en.

4. European Commission, 2026, Feedback from: Europe on Rail | Germanwatch. https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14686-Revision-of-the-mandate-of-the-European-Union-Agency-for-Railways-ERA-/F33376260_en.

5. European Commission, 2026, Revision of the Mandate of the European Union Agency for Railways (ERA). https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14686-Revision-of-the-mandate-of-the-European-Union-Agency-for-Railways-ERA-_en.

6. European Union Agency for Railways, 2022, Cross-Border Rail Transport Potential. https://www.era.europa.eu/system/files/2022-12/20225455_PDFA2A_TR0522377ENA_002.pdf?t=1777405186.

7. European Commission, 2025, Joint Communication to the European Parliament and the Council on Military Mobility. https://defence-industry-space.ec.europa.eu/system/files/2022-11/Action%20plan%20on%20military%20mobility%202.0.pdf.

8. Publications Office of the European Union, 2026, ERTMS – Third Work Plan of the European Coordinator Matthias Ruete. https://data.europa.eu/doi/10.2832/9894936.

9. Germanwatch, 2024, Lead markets for a Resilient and Climate-Neutral Steel Industry. https://www.germanwatch.org/sites/default/files/germanwatch_lead_markets_for_a_resilient_and_climate-neutral_steel_industry.pdf.

10. The Federal Government, 2026, Increasing the Potential of the Circular Economy. https://www.bundesregierung.de/breg-en/news/cabinet-circular-economy-2437102.

11. Allianz pro Schiene, 2023, Grenzüberschreitende Eisenbahnstrecken. https://www.allianz-pro-schiene.de/wp-content/uploads/2023/06/230522_Karte-Elektrifizierte-Grenzuebergaenge.pdf.

12. The New York Times, 2025, Poland Blames Russian-Backed Ukrainians for Railway Sabotage. https://www.nytimes.com/2025/11/18/world/europe/poland-railway-sabotage-russia-ukraine.html.

13. CER, 2025, Dual-use, Resilient and Interconnected, Cross-Border Military Mobility on Rail – Readiness 2030 and Beyond. https://www.cer.be/cer-positions/dual-use-resilient-and-interconnected-cross-border-military-mobility-on-rail-readiness-2030-and-beyond.

14. European Parliamentary Research Service, 2021, Best Practices in the Whole-of-Society Approach in Countering Hybrid Threats. https://www.europarl.europa.eu/thinktank/en/document/EXPO_STU(2021)653632.

15. Die Bundesregierung, 2026, Der Nationale Sicherheitsrat. https://www.bundesregierung.de/breg-de/bundesregierung/nationaler-sicherheitsrat.

Further Reading

European Commission and High Representative for Foreign Affairs and Security Policy, 2025, Military Mobility Package, https://transport.ec.europa.eu/transport-themes/military-mobility_en (accessed on 17 June 2026)

European Commission and Directorate-General for Mobility and Transport, 2026, ERTMS – Third Work Plan of the European Coordinator Matthias Ruete, Publications Office of the European Union, https://data.europa.eu/doi/10.2832/9894936 (accessed on 17 June 2026)

Community of European Railway and Infrastructure Companies, 2025, Dual-Use, Resilient and Interconnected: Cross-Border Military Mobility on Rail – Readiness 2030 and Beyond, https://www.cer.be/cer-positions/dual-use-resilient-and-interconnected-cross-border-military-mobility-on-rail-readiness-2030-and-beyond (accessed on 17 June 2026)

European Rail Freight Association (ERFA), 2025, Military Mobility Increases Pressure to Develop Single European Railway Area, https://erfarail.eu/news/military-mobility-increases-pressure-to-develop-single-european-railway-area (accessed on 17 June 2026)

German Council on Foreign Relations and Jannik Hartmann, 2024, Military Mobility: Getting Germany's -Transportation Infrastructure Up to Speed, https://dgap.org/en/research/publications/military-mobility (accessed on 17 June 2026)

Arkadiusz Pierzak, 2024, Rail Transport in the Aspect of Military Mobility, in Kwartalnik Bellona 2024 (1): p. 59–74, https://www.researchgate.net/publication/383961781_Rail_Transport_in_the_Aspect_of_Military_Mobility (accessed on 17 June 2026)

14 German rail sector organisations Relaunch on Rails: Broad rail alliance calls for a new start for rail in Europe, 14. 05. 2024, https://www.germanwatch.org/en/93035 (accessed on 17 June 2026)

Transport & Environment, 2025, The State of the EU's Rail Infrastructure, https://www.transportenvironment.org/articles/the-state-of-the-eus-rail-infrastructure (accessed on 17 June 2026)

Knaus, G., Knaus, F., 2025, Welches Europa brauchen wir?, Piper Verlag

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Following the motto of *Observing. Analysing. Acting.* Germanwatch has been actively promoting global equity and livelihood preservation since 1991. We focus on the politics and economics of the Global North and their worldwide consequences. The situation of marginalised people in the Global South is the starting point for our work. Together with our members and supporters, and with other actors in civil society, we strive to serve as a strong lobbying force for sustainable development. We aim at our goals by advocating for prevention of dangerous climate change and its negative impacts, for guaranteeing food security, and for corporate compliance with human rights standards.

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Bank für Sozialwirtschaft AG
BIC/Swift: BFSWDE33XXX
IBAN: DE95 3702 0500 0003 2123 23

Germanwatch – Bonn Office
Kaiserstr. 201
D-53113 Bonn, Germany
Phone: +49 (0)228 / 60492-0
Fax: +49 (0)228 / 60492-19

Germanwatch – Berlin Office
Stresemannstr. 72
D-10963 Berlin, Germany
Phone: +49 (0)30 / 5771328-0
Fax: +49 (0)30 / 5771328-11

Email: info@germanwatch.org

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