High Level Infrastructure Meeting 2024

Briefing Paper

Panel I – Resilience: How can we maintain the functionality of our infrastructure in times of multiple crises?

In recent years, the railway sector has faced a series of challenges that test its resilience in the face of multiple concurrent crises, often referred to as a polycrisis. As we navigate through the age of digitalisation and climate change, it becomes increasingly vital to explore and implement strategies that enhance the robustness of our railway infrastructure. This briefing paper provides an overview of recent incidents across various risk categories that have had major negative impacts on railway traffic and operations, setting the stage for the upcoming HLIM panel discussion.

Climate Events

Climate change poses a severe threat to railway infrastructure, with extreme weather events becoming more frequent and intense. In summer and late 2024, unprecedented flooding in Germany, Austria, Poland, Italy, Spain, Czech Republic and Switzerland severely disrupted railway traffic. Key routes were submerged, and landslides caused by torrential rains blocked tracks, leading to extensive delays and rerouting of services. As an example, a once-in-a-century flood in Austria in September 2024 caused a massive damage (technical equipment in the tunnel, switches, superstructure, flooded stations) to the western route of ÖBB-Infrastruktur AG. The reconstruction work will take several months, and the costs are estimated to be in the hundreds of millions. These events underscore the critical importance of designing and maintaining climate-resilient infrastructure to withstand such natural calamities.

Sabotage/Vandalism

Sabotage and vandalism remain persistent issues that disrupt railway operations and incur substantial repair costs. In July 2024, a coordinated sabotage act on TGV lines in France targeted crucial signaling equipment and power supply systems. These deliberate acts of destruction caused significant delays and safety concerns, as damaged infrastructure required extensive repairs and manual oversight to ensure safe train operations. This incident highlights the need for enhanced surveillance, rapid response mechanisms, and protective measures to safeguard critical railway infrastructure.

Cybersecurity

According to Directive NIS2 rail is a sector for High Criticality. The digitalisation of railway systems, while offering numerous benefits, also exposes them to cybersecurity threats. Cybersecurity is a transversal risk that affects different areas of the railroad business: operations, telecommunications, ticket sales, maintenance, etc. In 2023, Deutsche Bahn, one of Europe's largest railway operators, experienced a significant cyberattack on its signaling system. The sophisticated malware disrupted communications, leading to widespread delays and cancellations. The operator was forced to revert to manual procedures, which significantly slowed down operations. This incident, among many others in railway highlighted the urgent need for robust cybersecurity measures and resilient digital infrastructure.

Theft

Theft of railway components, particularly metal theft, continues to be a significant issue. In 2023, France experienced a surge in copper theft from railway signaling cables, leading to severe service disruptions. Thieves often target these cables for their high resale value, but their removal compromises the safety and efficiency of railway operations. Effective deterrents and rapid response mechanisms are essential to mitigate the impact of such thefts.

Derailment

Derailments, though less frequent, have catastrophic consequences. In August 2023, a derailment in the Gotthard Base Tunnel (Switzerland), one of the longest and deepest railway tunnels in the world, caused significant disruptions. The incident resulted in extensive damage to the infrastructure and required a prolonged period for repairs, severely affecting freight and passenger services. This tragic incident underscores the necessity for rigorous track maintenance protocols and advanced monitoring systems to detect and address potential hazards proactively.

Other Risks

Additionally, labor strikes and geopolitical tensions can also severely impact railway operations. Labor strikes can halt services entirely, while geopolitical tensions can disrupt cross-border rail traffic and supply chains.

In this High-Level Infrastructure Meeting panel, panellists will have a lively discussion on how to foster a deeper understanding and collaborative approach to building a resilient railway network capable of enduring the multifaceted challenges of our time.