

White Paper: Plant & Construction

Transforming the Tracks. Revolutionising global rail renewal operations for the future.

The global challenge

The global rail industry is facing unprecedented challenges, including recovering from the pandemic, navigating global conflicts, addressing inflationary pressures, contending with labour shortages and managing supply chain disruptions.

There has been a fundamental shift in the cost dynamics of construction work. Whilst there has been a real-term increase in funding, there is no equivalent rise in the availability of resources and materials. Global rail infrastructure is steadily deteriorating with age, exacerbated by the escalating impacts of climate change, and there has been a noticeable shift in commuter patterns worldwide, with fewer regular commuters and an increase in weekend travellers, requiring the railway to be available 24/7/365.

Substantial investment in rail infrastructure across the world demonstrates a shared commitment to the importance of a reliable and safe transportation network. In the UK, Network Rail's £44 billion initiative in CP7 prioritises enhancing reliability, efficiency and sustainability. This trend is also seen in Ireland's joint €35 billion (£29.2 billion) plan to upgrade and build new rail networks, the Biden-Harris administration's \$66 billion investment in rail, Canada's ambitious Go Expansion project revolutionising Toronto's transport network, Australia's 68% increase in rail infrastructure investment, and India's 7 Trillion rupee investment in modernising and expanding their rail network.

These global initiatives collectively highlight the importance of rail and the requirement to deliver rail projects in a safe, efficient and reliable manner.

More for less

The ever-growing demand placed on railways to handle ever-increasing traffic across existing networks is posing substantial challenges for both infrastructure managers and maintenance contractors alike.

With trains becoming more frequent and heavier, the strain on the tracks intensifies, accelerating the rate of wear and tear, which necessitates a meticulous and ongoing maintenance regime to uphold the reliability and safety of railway operations.

Compounding this challenge is the fact that the expanding volume of train operations translates to diminished timeframes for maintenance activities. Demographic changes force mechanisation as the maintenance workforce becomes smaller and as railways strive to keep pace with these increasing traffic demands, the window for essential upkeep tasks shrinks, amplifying the urgency for innovative approaches.

Consequently, there is an undeniable imperative to embrace smarter strategies that optimise the utilisation of available track down-time, while ensuring that infrastructure remains at peak performance levels.

A shift in the way railways are maintained, introducing new working patterns that increase efficiencies and reduce possession times is required.

Consequently, prioritising proactive performance-improving maintenance, infrastructure upgrades and the adoption of advanced monitoring technologies becomes imperative for rail networks worldwide.

The cost of failure

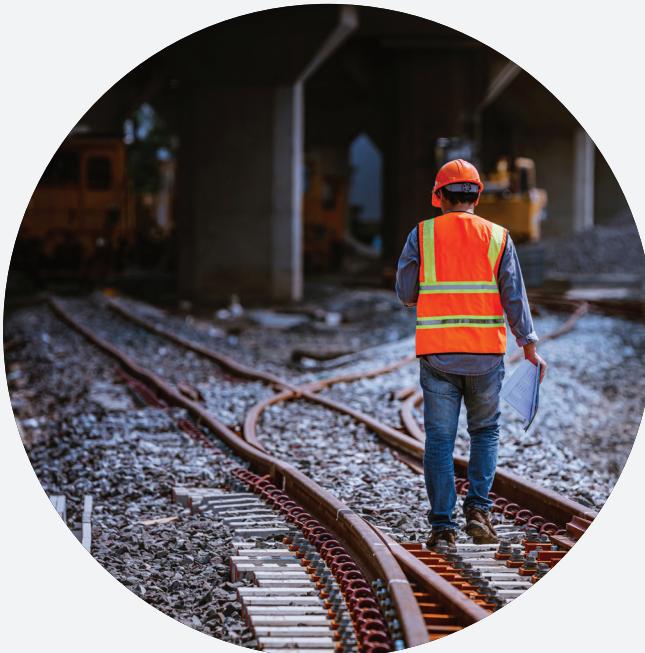
Infrastructure faults not only lead to significant financial losses, but also disrupt the seamless flow of passenger and freight services, impacting commuters, businesses and economies on a global scale. Such disruptions can erode public trust in rail services and undermine the industry's reputation for reliability and efficiency.

The findings from a report by the Rail Delivery Group shed light on a global concern within the rail transportation sector: infrastructure faults incurred delays resulting in a staggering £1 billion in costs for the UK rail industry in 2019 alone.

This revelation underscores the universal importance of maintaining railway tracks in optimal condition worldwide.

The financial repercussions of construction, maintenance and renewal delays extend far beyond immediate costs, encompassing indirect expenses such as compensation claims, loss of productivity and potential damage to brand reputation.

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High Output Methodologies

Over the last decade, rail networks have invested heavily in specialist High Output Plant to deliver rail renewals.

These methods provide higher-quality track installations, improved track stability, and enhanced overall safety and reliability of the railway infrastructure, as well as increased capacity of railway lines.

Additional benefits include speed and efficiency, allowing rapid completion of track renewal projects and reduction in service disruptions; particularly in busy rail corridors and urban areas, where interruptions to service can have significant economic, and social implications. Some techniques also incorporate sustainable practices, including the use of recycled materials and minimisation of waste.

While the benefits of these machines can be demonstrated, they also present some significant challenges.

- **Capital and Operational Costs:** The upfront capital investment for a High Output Train compared to the contract period, often puts it out of the reach of most contractors and infrastructure owners. Substantial investment in maintenance and labour costs is also required.
- **Logistical Implications:** The planning and logistical constraints of moving the High Output Trains around the rail network
- **Lack of Flexibility:** The High Output methodology is not as flexible as traditional track renewal methods because it is designed to replace large sections of track at once. This may limit the ability of rail operators to make small repairs or modifications to the track.
- **Resource and Skills:** A typical High Output train requires at least 30 to 40 skilled workers to operate it and deliver the project. Finding and training these workers can be a challenge for many rail operators.
- **Environmental Impact:** High Output machines can have a greater environmental impact than traditional track renewal methods, because it requires more energy and resources to operate the advanced machinery and technology used in the process.
- **Site access:** High Output track machines are often large and heavy, which poses challenges with accessibility to constricted areas or restricted access points, such as cuttings and tunnels.



A new approach

To meet the growing industry and climate challenges and to deliver to the travelling public efficiency and economy, a new approach is required for rail renewal and maintenance projects.

Both freight and passenger services must adapt to attract more of the market and this requires even greater availability and reliability.

In light of the escalating complexities within the industry landscape and the need to effectively cater to the evolving demands of both the travelling public and the economy, it has become imperative to adopt a distinct and innovative strategy that can address the multifaceted challenges inherent in rail renewal and maintenance projects, thereby ensuring the seamless functionality and sustainable growth of the global rail infrastructure.

Recognising these imperatives, it is crucial to adopt methodologies and equipment which embody the key factors that can optimise rail renewal and maintenance projects, ensuring efficient operations and sustainable growth.

Key factors

Lower Capital Investment: Solutions and equipment that are within the reach of all rail contractors and network managers.

Lower Operational Costs: Equipment that requires a lower operational cost including labour, training and spares.

High Output Performance: Machines that can still deliver high output performance but at a reduced capital and operational cost.

Rapid Machine Deployment: Reduced possession time enables swift transportation and deployment of machines and equipment to the site, facilitating immediate project commencement and enhancing productivity during possession periods.

Modular Approach: Adapting a modular methodology ensures projects can be tailored to their unique needs, optimising efficiency and resource allocation.

Increased Safety: Removing the operator from the machine enhances safety by minimising human involvement and potential hazards.

Use of Digital Technologies and Automation: Implementing digital technologies and automation improves efficiency, minimises downtime and provides valuable insights for proactive decision-making.

Our future vision

Unipart is focused on the challenges faced within the rail industry and understands the critical need for innovative solutions to address them.

Creating pioneering strategies that meet current demands as well as anticipating future needs is at the core of our vision, ensuring sustainable progress within the sector.

To drive the changes required, we have forged a strategic partnership with Thomson Engineering Design Ltd and together we are developing cutting-edge propositions tailored to the evolving needs of the market.

In line with our vision and agenda we are excited to unveil a game-changing innovation set to reshape the landscape of rail maintenance and renewal, which will revolutionise the way in which projects are executed.

Your Performance Improvement Partner

Unipart, in partnership with Thomson Engineering Design Ltd, supports the complete lifecycle of global rail assets by delivering transformative performance-improving plant technologies for rail construction, renewal, maintenance and repair projects.

At the heart of our mission is the pursuit of safety, productivity and efficiency in every aspect of rail construction, maintenance, and renewal projects.

By harnessing modern technologies, advanced engineering principles, and unparalleled expertise, Unipart empowers rail operators and contractors worldwide to achieve unprecedented levels of performance and reliability.

Revolutionary innovations

Our solutions are designed to revolutionise traditional methodologies, streamline processes, and optimise resources to accelerate project timelines, whilst ensuring uncompromised safety standards.

From innovative track-laying systems to state-of-the-art sleeper placement machines, our portfolio of solutions enables seamless execution of projects with precision and efficiency.

We also deliver a range of material handling solutions to enhance traditional rail project activities, reduce downtime, and optimise maintenance schedules across the lifecycle of rail infrastructure. Whether it's automated unloading rail at the port or seamlessly unloading and threading rail with the same attachment, we equip rail operators and contractors with the tools they need to proactively address maintenance challenges and maximise operational uptime.

Based on our wealth of knowledge and expertise, we can deliver transformative supply chain, manufacturing and digital solutions that rejuvenate ageing rail infrastructure and extend its life cycle; driving a paradigm shift in how rail assets are renewed and revitalised for future generations.

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