The rail industry’s ongoing journey towards sustainability

Mark Thomas, Business Development Manager/Project Manager Rail at Fugro explores the how rail can help guide us to a more sustainable future

As the UK navigates the ongoing challenges of the pandemic, the rail industry is continuing to play a leading role when it comes to the idea of ‘building back better’

Not only does the industry have the potential to solve some of these existing challenges, but it also has a role to play in moving towards a more sustainable future. With public transport integral to the future reduction of carbon emissions, there is even greater urgency to make rail as efficient as possible, to help build a sustainable green economy and achieve the UK’s net-zero ambitions.

Achieving the targets will only be possible through sustained reductions in carbon emissions, as well as optimising and maintaining the existing infrastructure and assets. Industry leaders and partners will need to examine the rail eco-system as a whole and identify the areas of improvement as well as looking for opportunities to move towards sustainability.

Future freight movement

Throughout the Covid-19 pandemic, rail passenger numbers plummeted dramatically. While there has been significant recovery, some of these passengers will look to reduce their future travel or simply won’t come back. Looking to the future, the rail industry must consider additional opportunities to sustain itself, as well as support a sustainable future.

One possibility could be an increase in the amount of light freight the rail industry transports. In fact the rail-freight industry recently called for rail to be put at the heart of the government’s plan to decarbonise transport in the UK. Increasingly, challenges relating to the UK’s – as well as the global – supply chain are hitting the headlines. Reports of long wait times, driver shortages and empty supermarket shelves are now an almost daily occurrence, and there’s an increased understanding of the need to invest in a system that will be more resilient to future crises.

By shifting attention to light freight transportation, the UK rail industry could work to elevate some of these challenges in the supply chain, not least reducing some of the demand for HGV drivers. Rail also has the lowest carbon footprint out of all the major means of transport. Cars, vans and HGVs account for 95 per cent of surface transport emissions, with rail contributing less than three per cent.

Indeed, in 2021, Varamis Rail announced its intentions to repurpose electric multiple units to carry light goods between hubs, with last mile delivery by sustainable road vehicles. Should this practice become common place, the Rail industry could well be the key to a long-distance, high-
speed, sustainable solution to supply chain challenges. However, operators need to be aware that with today’s ‘just in time’ logistics and high consumer expectations around deliveries, a railway operating for light freight will need to be every bit as reliable as a passenger railway.

Turning to technology

In order to unlock some of these potential benefits, significant and sustained investment in smart solutions will be essential. With AI and automation becoming ever more advanced and integrated into rail networks – there will also be an increased need for large-scale accurate data and analysis on asset performance to underpin the widespread transformation of the rail industry in 2022 and beyond.

Technology has a significant role to play when it comes to asset management and optimisation in the rail industry, both of which are essential for a long-term sustainable future. There is a huge amount of embodied carbon in the construction and manufacturing of rail assets. Optimising the life cycle of existing assets will reduce the carbon emissions generated by replacements.

To optimise asset life, the industry needs up-to-date Geo-data on asset performance and condition, which can then be analysed and used for maintenance. To address this, at Fugro we’ve developed the ground-breaking RILA monitoring system. The RILA system connects to any in-service passenger trains and surveys the tracks at regular speed to provide accurate track insights with no impact on network capacity or additional fuel consumption.

For example, we recently completed the InnoTamp project in collaboration with Network Rail with funding from Innovate UK and the Department for Transport. A world-first for track maintenance, the project demonstrated how track alignments generated using Geo-data from Fugro’s RILA system can be directly uploaded to a tamper’s computer to optimise tamping of railway lines.

The immediate benefit is improved productivity but over time it will lead to lower annual maintenance costs and extended existing asset and infrastructure lifecycles, which in turn will have the added benefit of reducing embodied carbon emission in rail. These are the emissions produced when new materials and assets are manufactured and transported as well as the energy that is used during the construction of infrastructure.

Additionally, this method of data capture also negates the need for rail workers to go out onto the track. Whilst this offers a clear safety benefit, it also improves overall efficiency and eliminates the hidden environmental impact of the journeys made by operatives to undertake site inspections.

An industry on track to innovation

Although coal and heavy industry drove the original expansion of the railway, now a data driven network could be the key to accelerating decarbonisation. Rail continues to be a vital component of wider society, and despite changing habits and travel needs, passengers and partners will always rely on the industry to deliver. This means continued technological innovation, whether through new technologies or data analytics, will be essential in ensuring the industry can adapt and grow.

There are significant opportunities for rail to adapt, such as shift towards light freight, in a way that ultimately improves maintenance and services, with fewer disruptions. Working to reduce the industry’s overall environmental impact and carbon footprint is essential for cementing rail as a leading sector striving towards a more sustainable future.

For more information contact Mark Thomas on m.thomas@fugro.com