



Department  
for Transport

# **Rail Environment Policy Statement**

## On Track for a Cleaner, Greener Railway

July 2021

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# 1 Purpose

The Williams-Shapps Plan for Rail, published 20 May 2021, called for a 30-year strategy to ‘provide clear, long-term plans for transforming the railways’. The 30-year strategy will incorporate a ‘comprehensive environment plan for the rail network’, to be published in 2022, which will ‘establish rail as the backbone of a cleaner future transport system’.<sup>1</sup>

Work on this environment plan, the Sustainable Rail Strategy (SRS), has been commissioned and is underway. It will build on the commitments for rail set out in the UK’s revolutionary new plan to decarbonise transport called ‘[Decarbonising transport: a better, greener Britain](#)’, in addition to addressing a range of environmental sustainability issues on the railway, including the topics covered by this document.

The purpose of this Rail Environment Policy Statement (REPS) is to set a clear direction for the rail industry on environmental sustainability and to outline policy priorities for the SRS. By setting the direction of travel for environmental policy on the railway now, we are building the foundations that will allow us to achieve a cleaner, greener railway that is fit for the future.

## 2 Introduction

**The rail network plays a vital role in our transport system.** It is a fast, safe and reliable way of moving people and goods over long distances, in and around our city centres and internationally. It enables people to get to work, visit friends and family, and do business. It enables the efficient movement of goods from ports, quarries, and distribution centres to urban centres, and helps avoid the need for lorries on roads.

**Rail is lower carbon than other long-distance transport and becoming even less carbon intensive as the National Grid decarbonises.** In 2019, greenhouse gas emissions from rail made up just 1.4% of the UK's domestic transport emissions<sup>2</sup>, while 9% of passenger miles travelled in Great Britain were by rail<sup>3</sup>. On average, rail freight trains emit around a quarter of the CO<sub>2</sub> equivalent (CO<sub>2</sub>e) emissions of HGVs, per tonne mile travelled.<sup>4</sup> In 2019/20, carbon emissions per passenger kilometre were at their lowest level since comparable data began in 2011/12<sup>5</sup>.

**Businesses across the rail industry are taking action.** The Railway Industry Association has been working with Network Rail to learn lessons from past electrification projects to reduce the cost of future projects, improving value for money. The rail industry has incorporated goals for advancing low-carbon technologies to reduce emissions through its Rail Technical Strategy.<sup>6</sup> Operators, rolling stock companies and manufacturers are collaborating with small and medium enterprises to develop new technologies, like battery and hydrogen trains, taking advantage of DfT's 'First of a Kind (FoaK)' programme to demonstrate innovations on the railway.

**Recent progress has been strong.** In the last three years, we have completed almost 700 track miles of rail electrification in England and Wales<sup>7</sup>, and since the start of 2019 we have contributed over £9 million to 26 FoaK projects that will help decarbonise the railway or reduce harmful emissions. We are investing £4.5 million to establish a network of air quality monitors in stations across the country. Last year, Network Rail published an Environmental Sustainability Strategy, a Biodiversity Action Plan, and became the world's first railway company to sign up to the most ambitious targets in the United Nations' Science Based Targets initiative.

**But there is more work to be done.** This document sets the direction of travel for environmental sustainability on the railway over the next 30 years. It marks the beginning of a process that we will continue to develop in further detail through SRS and which Great British Railways will work hard to implement, in line with its mission to make the railway the 'backbone of a cleaner, greener public transport network'.<sup>8</sup>

## 3 Scope

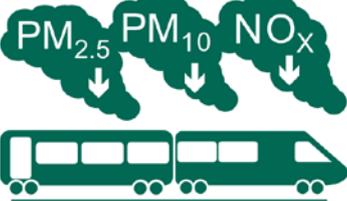
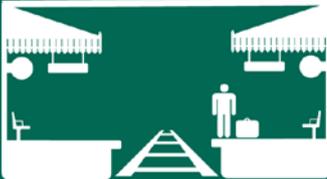
This document sets out environmental priorities for the mainline railway. The Williams-Shapps Plan for Rail focused on railways within Great Britain, as transport is a devolved area in Northern Ireland. The devolved authorities in Scotland and Wales have a range of powers in relation to rail which they will continue to exercise, as will TfL and other metropolitan authorities, in relation to rail and light rail in their areas. As now, they and Great British Railways will need to work together to deliver a co-ordinated network across Great Britain. Collaboration across borders will be vital to achieve a sustainable railway.

New railway projects, such as HS2, are guided by the same principles and high standards of sustainability as we expect for our mainline railway but are not explicitly included within the scope of this document. HS2, for example, has its own biodiversity and noise commitments set out in its sustainability policy and the environmental minimum requirements which accompany the legislation for each phase.

Climate change adaptation is outside the scope of this policy. Our detailed plans to enhance resilience to climate change risks across rail and other modes of transport are contained in the UK's National Adaptation Programme.

Additionally, Network Rail reports on the steps it is taking to prepare for climate change under the Adaption Reporting Power. The government is in discussions regarding additional organisations to include under the next round of adaptation reporting. The rail industry should ensure that it is taking proactive steps to mitigate any potential disruption or safety risks that occur due to increased severe weather events, which are likely to increase in frequency, severity, and cost impact, due to climate change.

## 4 Rail Environment Priorities on a Page

<p>We will achieve <b>net zero greenhouse gas</b> emissions from trains by <b>2050</b>.</p> 	 <p>Our ambition is to <b>remove</b> all <b>diesel-only trains</b> from the rail network by <b>2040</b>.</p>	<p>We are committed to a sustainable, deliverable programme of <b>electrification</b> that delivers a higher performing, <b>net zero railway</b>.</p> 
<p><b>Air quality targets</b> will be set for all parts of the railway that the public can access in <b>2022</b>, with the ambition of meeting those targets by the end of <b>2030</b>.</p> 	 <p>The rail industry will be required to develop <b>air quality improvement plans</b> for all <b>stations</b> identified as having poor air quality.</p>	<p>Network Rail will achieve <b>net zero biodiversity</b> by <b>2024</b> and <b>biodiversity net gain</b> by <b>2035</b>.</p> 
<p><b>100%</b> of Network Rail's <b>cars and vans</b> will be <b>zero emission</b> vehicles by <b>2027</b>.</p> 	 <p><b>Zero waste</b> from railway activities and passengers will go to landfill by <b>2025</b>, and increasingly challenging <b>recycling targets</b> will continue to be set across all areas of the railway.</p>	<p><b>Targets</b> will be set for <b>renewable energy generation and use</b> at <b>stations</b>.</p> 

## 5 Rail Reform: An Opportunity to Transform Rail Sustainability

The Williams-Shapps Plan for Rail will overhaul the sector to better meet the needs of passengers, businesses and manufacturers more effectively and affordably, with trains running on time, simple fares, and a railway that is more accessible for all. Making rail travel easier, simpler and better integrated, including through improving journey connectivity with active travel choices such as walking and cycling and other public transport services, will take cars off the road and encourage people to shift to rail, a greener mode of travel.

The establishment of Great British Railways, a single organisation responsible for track, train and stations, will better support the delivery of environmental objectives across the areas addressed in this document. For example, it will be easier to make holistic assessments of the right decarbonisation technologies to remove diesel trains on each part of the network. It will be easier to tackle air quality and the impacts of noise, and there will be new opportunities to invest in solar panels and other greenhouse gas reduction technologies, regardless of payback.

As a public body with responsibility for a major national asset, Great British Railways will have a responsibility to put environmental sustainability at the heart of its operations. A specific duty will be placed on Great British Railways to consider environmental principles in all its operations. It will be accountable for and will lead the sector's delivery of a more environmentally sustainable rail network.

The Plan for Rail will also help drive growth of the rail freight sector, ensuring that we maximise the environmental benefits of moving freight by rail, and Great British Railways will have a statutory duty to promote rail freight. Furthermore, Great British Railways will develop a methodology to better assess the value of rail freight to support decision making, building on the "Value of Rail Freight" report commissioned by the Rail Delivery Group.<sup>9</sup> Future access agreements could also support growth by including more efficient use of train paths and simpler ways of charging, within the context of a rules based access regime which safeguards fair access to the rail network for freight.

## 6 Traction Decarbonisation

Rail is a comparatively low-carbon way of travelling and moving goods. Despite the coronavirus pandemic, 703 million rail journeys were made in 2020<sup>10</sup>, most of which are likely to represent greener choices over more carbon intensive modes of transport. However, the scale of the government's ambition means that comparatively low carbon is no longer good enough. Our legal commitment to achieve net zero greenhouse gas emissions by 2050 and our objective of achieving a net zero transport system are not consistent with rail traction continuing to produce almost 3 megatonnes of CO<sub>2</sub>e, as it did in 2019-20<sup>11</sup>.

The decarbonisation challenge faced by the railway is significant, as it is with other modes of transport, but there are existing proven and near-proven technologies that can be used to decarbonise rail. These technologies present the railway with an opportunity to lead our country's shift to net zero-carbon travel.

### What We Want to Achieve

We will decarbonise the railway to help deliver the UK's net zero emissions by 2050 commitment. In line with [Decarbonising transport: a better, greener Britain](#), we will achieve net zero greenhouse gas emissions from trains by 2050 and we will support transport emission reductions in every carbon budget. Our ambition is to remove all diesel-only trains from the network by 2040.

Work to deliver this has already begun. The [Rail Industry Decarbonisation Taskforce](#) has responded to the government's call for a vision for rail decarbonisation and, over the last year, Network Rail has led work with rail industry representatives to develop a Traction Decarbonisation Network Strategy (TDNS). The [Interim Programme Business Case](#) of TDNS was published in September 2020.

TDNS presents a strategic vision for a decarbonised railway and recommendations for achieving that. It will be our guide for decarbonising the railway. DfT will work with its partners on an affordable and deliverable rail decarbonisation programme. The analysis that informs TDNS will be updated periodically to take into account development of rail decarbonisation technologies and other changes.

Decarbonising rail freight is a challenge that must be overcome because heavy freight trains require higher total outputs of energy and power compared to passenger trains. We will electrify more of the network to enable electric rail freight to run on more routes.

We will also work with the rail freight industry to ensure that the existing electric network can be better used.

Short “infill” electrification projects could quickly deliver benefits and enable rail freight operators to immediately switch services over to electric traction. We will pursue such electrification to maximise the benefits gained from rail freight. By filling in electrification gaps to key ports and terminals, we can open new opportunities for electric, cleaner, greener, rail freight journeys. As freight electrification is rolled out further, additional electric locomotives will be required to supplement those already available.

We will develop further interventions, in partnership with industry, to help freight operating companies have the confidence they need to invest in replacing current rolling stock. Those companies making the early moves will have real commercial opportunities to meet customer demand for lower-carbon services. As we develop potential policy interventions, we will ensure rail freight maintains its competitiveness with road freight, and that interventions represent value for money for the taxpayer.

Recent DfT-funded research conducted for RSSB concluded that, while significant infrastructure and operational changes would be necessary, hydrogen and battery technologies could, in principle, work on a modelled freight route.<sup>12</sup> However, currently, only electric and diesel power are considered suitable for powering freight trains at the speeds required. We will periodically review the technology and policy options for rail freight as rail decarbonisation technologies develop, so we can give a clear path to a future decarbonised rail freight network.

As rail is already a comparatively greener way of transporting goods and materials than other transport modes, we will continue to encourage the shift of freight from more carbon-intensive modes to rail (and in particular from road haulage to rail), and we will introduce a rail freight growth target to help drive growth as we implement the Williams-Shapps Plan for Rail. A national freight co-ordination team will be created within Great British Railways to act as a single point of contact for freight operators and customers across the network, helping to create new opportunities for growth and investment.

## Electrification

Two fifths of the railway are already electrified, allowing people to travel and goods to be transported without the train’s operation creating any greenhouse gases. As the National Grid continues to decarbonise, total greenhouse gas emissions from electric trains will continue to reduce.

The government has delivered extensive electrification over the last decade. In the last three years (for which data is available), Network Rail has completed almost 700 track miles of extra electrification in England and Wales.

International rail services through the electrified Channel Tunnel provide a more environmentally friendly means of international travel for passengers (via Eurostar and

Eurotunnel shuttles) and for rail freight and HGV freight via the electrified Eurotunnel Shuttles.

We are committed to continuing to support the growth and development of these important international services, particularly as part of our recovery from Covid-19, so that their benefits can be maximised, and we will continue to work closely with the sector as we do so.

There is much more to do, however, and we are committed to delivering an ambitious, sustainable, and cost-effective programme of electrification guided by Network Rail's TDNS. This includes pursuing options for electrifying the remaining diesel pockets of the third-rail network.

## What We Want to Achieve

We recognise the challenges faced by some previous electrification schemes. Our aspiration is to achieve a stable, ongoing rail electrification programme that learns from past mistakes. Establishing Great British Railways will be part of the solution, providing a renewed commitment to the environment through a joined-up leadership over track and train.

To decarbonise the railway, electrification must be more efficient than ever before. Work conducted by Network Rail and the Railway Industry Association to identify lessons from past schemes provides a solid foundation but the challenge will be to deliver efficiently in practice.

To achieve this, Great British Railways will lead an efficient electrification programme, working with funders and suppliers to minimise the cost and disruption of further electrification. The affordability and value for money of each electrification scheme will be assessed to ensure rail decarbonisation is achieved as efficiently as possible.

Modern methods of electrification, including discontinuous overhead electrification and safer technology, could help us decarbonise more quickly and cost-effectively. DfT, Network Rail, Office for Rail and Road (ORR), and RSSB are working together to explore options for safer versions of third rail electrification. Great British Railways will continuously review technical developments so they are appropriately and consistently adopted in all projects.

The benefits of electrification will only be delivered as new rolling stock is introduced or where bi-mode trains are used effectively. Future passenger rolling stock procurements will need to consider how to be consistent with the decarbonisation trajectory set out by [Decarbonising transport: a better, greener Britain](#). We will prioritise planning for the zero-carbon replacement of near life-expired diesel vehicles.

## New Traction Technologies

As stated in the Williams-Shapps Plan for Rail, electrification – a proven, existing technology – is likely to be the main way of decarbonising the majority of the network.<sup>13</sup>

However, there will also be a role for battery and hydrogen trains on some lines, where they make economic and operational sense.

Advice from the rail industry is that hydrogen and battery trains may be particularly suitable for deployment on less intensively used parts of the network.

The government has provided over £4 million of funding through Foak competitions for new traction technologies. This includes £750,000 to facilitate trials of the UK's first hydrogen-powered train to run on the mainline, HydroFLEX. The DfT-funded research and development programme, delivered by RSSB, has examined the challenges still to be overcome before these technologies can be used on the operational railway. We will continue to support the development of alternative traction technologies, as well as research into how they can be best deployed on the network.

### What We Want to Achieve

TDNS has indicated parts of the network where battery and hydrogen trains are likely to be the optimum way to decarbonise. Future rolling stock procurements will need to consider how to enable the use of hydrogen and battery trains where they are the best way to deliver our decarbonisation targets. As early deployments are successful, and as battery and hydrogen technology develops, future analysis will provide increasing certainty about the end state division between use of electrification and new traction technologies on a net zero-carbon railway.

A future net zero-carbon railway may make use of discontinuous electrification and may have routes that are partly electrified, where those options are consistent with the effective use of the network for freight traffic. Zero-emission bi-modes may, therefore, have a significant role to play in addition to single-mode battery or hydrogen trains. These, and existing diesel-electric bi-mode trains, will also allow us to make best use of electrification as it is delivered.

The rail sector is using technology, such as hybridisation of diesel engines and Connected Driver Advisory Systems, to incrementally reduce carbon emissions as quickly as possible. In advance of zero-carbon trains, wider deployment of these bridging technologies can provide reductions in carbon emissions more quickly.

Some rail operators are exploring the use of biofuels and sustainable alternative fuels to achieve immediate carbon savings. We recognise the potential value of sustainably sourced biofuels as a transitional technology, where their use is technically feasible and makes commercial and environmental sense.

As part of [Decarbonising transport: a better, greener Britain](#), the government has set out plans to work with stakeholders to develop a longer-term strategy on how the uptake and use of low-carbon fuels, including biodiesel and renewable hydrogen, could support decarbonisation across transport modes to 2050. The strategy is to be published in 2022.

## 7 Air Quality

When the air we breathe is polluted, it can affect people's health, the environment, and the economy, where we live, work, and bring up families. Children, the elderly, and those with pre-existing lung or heart conditions are at greatest risk. Long-term exposure to air pollution in the UK is associated with increased morbidity and mortality from chronic diseases,<sup>14</sup> with the total social cost of adverse health impacts estimated at £20 billion per year.<sup>15</sup> In the short-term, exposure can exacerbate asthma, while long-term exposure can increase the risk of stroke, lung cancer, respiratory conditions, and cardiovascular disease, and may affect unborn children.<sup>16</sup>

In 2019, the government published its Clean Air Strategy (CAS)<sup>17</sup>, which outlined action that will improve air quality and reduce the incidence of serious illness, improving quality of life for tens of thousands of people. The CAS pledged to halve the harm to human health caused by air pollution by 2030 and committed to reduce emissions from rail.

### Sources of Air Pollution on the Railway

Diesel train emissions comprise of several harmful pollutants, including nitrogen oxides (NO<sub>x</sub>) and particulate matter (PM). PM is emitted from diesel engine exhausts, but also result from non-exhaust emissions such as brake and track wear. Further research is needed to understand the relative contribution of non-exhaust emissions from rail. NO<sub>x</sub> is produced by the combustion process of diesel engines. When it reacts with other gases in the air, it can create nitrogen dioxide (NO<sub>2</sub>). Nationally, the railway contributes around 2% of total NO<sub>x</sub> and less than 1% of total PM.<sup>18</sup> In some areas, diesel trains can contribute significantly to air pollution hotspots for various reasons. For example, at enclosed stations, the combination of an enclosed environment and idling diesel trains leads to a build-up of pollutants.

### The Regulatory Landscape

Action to manage and control air pollution is largely driven by national legislation and regulation that sets legally binding limits and objectives for levels of harmful pollutants in outdoor air. This includes NO<sub>2</sub> and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). Under the Local Air Quality Management (LAQM) framework, local authorities are required to review and assess ambient (outdoor) air in their area and designate Air Quality Management Areas (AQMAs) if improvements are necessary to meet the air quality objectives. The LAQM

framework also covers those parts of the GB rail network that are not indoors/enclosed which the public can access.

The air quality part of the government's landmark Environment Bill will strengthen existing legislation and introduce a duty to set a new legally binding ambient target for fine particulate matter (PM<sub>2.5</sub>), the most damaging pollutant to human health, alongside one further long-term air quality target.

There are air quality standards and guidelines that apply to indoor environments, but these do not generally have legal status. This is apart from the protections in place for the occupational health of workers, known as Workplace Exposure Limits. These limits are intended to protect the health of employees (such as railway staff) from exposure to harmful substances. There are limits for NO<sub>2</sub>, but none specifically set for PM<sub>10</sub> or PM<sub>2.5</sub>. The Workplace Exposure Limits for NO<sub>2</sub> are substantially higher than the national limits set for outdoor NO<sub>2</sub> and are not generally aimed at protecting those likely to be susceptible to the health impacts of air pollution, such as children or the elderly.

## What We Want to Achieve

To protect the health of those who travel, live beside and work on the rail network, we need to ensure that the regulatory and standards framework is clear, consistent and recognises the different locations (open and enclosed stations, depots, train carriages) and people (staff and general public) that may be affected by railway emissions.

To achieve this, we are funding a comprehensive review of all the air quality regulations, standards, and guidelines that control air pollution and people's exposure to it on the rail network. The review will be completed in 2022. It will assess UK and EU air quality legislation, World Health Organisation air quality guidelines, indoor and health and safety air quality guidance, national and regional policies/plans. The review will inform the government's decisions on whether new or strengthened railway standards are needed, or further regulation to ensure that air quality is of a suitably high standard on all parts of the network.

Alongside the review, we are also funding research that will develop a set of air quality targets to address air pollution risks in different locations across the railway. We will use this research to set targets for levels of PM<sub>2.5</sub>, PM<sub>10</sub> and NO<sub>2</sub> for all parts of the network that the public can access in 2022, with the ambition of meeting these targets by the end of 2030, consistent with the Clean Air Strategy.

The aim is to significantly reduce people's exposure to air pollution caused by the railway, ensuring that rail remains one of the cleanest forms of transport.

## Improving our Understanding

Building a robust evidence base is fundamental to helping us understand the impact of rail on air quality. Since 2018, we have invested over £2 million in air quality projects delivered by the Clean Air Research (CLEAR) programme. The CLEAR programme, managed by RSSB, is based around three key themes: modelling, monitoring and mitigation. It underpins the development, delivery and implementation of the industry's Air Quality

Strategic Framework published in June 2020<sup>19</sup>, which aims to achieve ‘a rail network with a minimal impact on local air quality’.

The CLEAR Programme has improved the accuracy of national emissions reporting from the railway and provided a better understanding of air quality in areas where passengers are likely to be exposed<sup>20</sup>. This has highlighted that enclosed stations can be air pollution hotspots, primarily due to diesel train emissions but also influenced by other factors such as background pollution from surrounding city streets, particulate emissions from food outlets and station architecture.

## What We Want to Achieve

The government is committed to improving air quality in and around stations, particularly where many people are likely to be exposed to harmful pollutants. To better understand this issue, we are funding a £4.5 million stations air quality monitoring network. This will be rolled out over the next three years, with air quality monitors installed in approximately 100 stations across England and Wales from summer 2021.

The network will initially provide a snapshot of air quality at stations and identify priority locations where improvement measures are needed. Responsible organisations will be required to produce air quality improvement plans for the priority locations identified, with the aim that levels of air pollutants inside these stations meet the targets we will set for PM<sub>2.5</sub>, PM<sub>10</sub> and NO<sub>2</sub>. The air quality monitoring network will show how air pollution changes over time, helping us to understand the effectiveness of different interventions and how other changes on the railway influence air pollution. To ensure transparency, we will publish the stations monitoring data in a single accessible format.

Emissions from diesel trains can also affect air quality inside the trains themselves. We are funding research through the CLEAR programme to better understand this risk and how it can be reduced. The research will assess the air quality inside a range of trains, helping us to establish the levels of air pollution that passengers and staff may be exposed to inside trains and any associated health risks. This research will be used to develop best practice guidance for the industry and set out a range of measures that can be used to improve air quality standards inside trains.

## Intervention Measures

Research, development, and innovation are all essential to find the most effective ways to improve air quality in the short-medium term ahead of delivering a net zero-emission railway by 2050. Since 2019, we have invested around £2.5 million through Foak competitions to fund the development of new technologies that can be retrofitted to existing diesel trains to significantly reduce the levels of harmful pollutants they emit. These include hybridisation with fuel saving technologies such as batteries and the aftertreatment of exhaust gases using catalytic convertor-type technology.

Idling diesel trains are a major source of emissions in areas where high levels of human exposure are likely, for instance in stations. Reducing unnecessary idling is therefore an effective way of reducing air pollution that does not necessitate additional technical changes to existing diesel trains.<sup>21</sup>

## What We Want to Achieve

We will continue to support the development of new emission-reducing technologies, as well as research into how they can best be deployed on the network to support the move towards a cleaner, greener railway.

To ensure the most appropriate technologies are adopted, we are funding research through the CLEAR programme that will assess the emissions benefits of various retrofit options for diesel trains. The project is aiming to develop emissions targets that represent real-world use for each type of retrofit technology.

We welcome the work that the Rail Delivery Group is doing in collaboration with industry to develop and rollout an idling limit which recognises technical and operational requirements for running the railway on a day-to-day basis. Newer trains with start-stop systems and automatic engine shutdown can also help reduce idling times. Where trains do not have these systems, drivers and dispatch teams are key to ensuring engines are turned off.

## 8 Non-Traction Decarbonisation: Decarbonising the Rail Estate

Decarbonising transport: a greener, better Britain sets out our ambitious plans to reduce tailpipe emissions from transport but, to reach net zero carbon emissions across the UK economy, we will need to go further and decarbonise the entire rail estate. This includes emissions from the 2,500 railway stations and more than 500 depots, maintenance and related facilities in Great Britain, as well as the whole-life carbon emissions of maintenance and construction on the rail estate. A joined-up approach led by Great British Railways, with supply chains and retailers, will be vital to help us achieve net zero carbon emissions across the non-traction elements of our railway.

### Stations, Freight Depots, and Terminals

The 2,500 railway stations in Great Britain are important transport hubs, facilitating millions of journeys each year. Our stations will be a key part of our holistic approach towards decarbonising the wider rail estate. The government, Network Rail, and train operators all currently have important roles to play in this. In the future, station management will be integrated within Great British Railways, improving accountability for the long-term investment in stations.

In collaboration with industry, the Rail Delivery Group (RDG) published in April a Sustainable Stations Guide to provide environmental sustainability recommendations that passenger train operators should aspire to. This comprehensive guide sets out recommendations and best practice case studies for everything from station design, energy and water management, and biodiversity, to integrated transport and recycling.

We have built environmental reporting into National Rail Contracts and have set train operators targets to continually reduce energy consumption and carbon emissions in all managed stations. National Rail Contracts also require train operators to develop a strategic approach and roadmap that sets out long-term pathways towards total decarbonisation of both traction and non-traction elements of their operations by 2050. This includes a full set of validated science-based targets; milestones that support this, and giving consideration to assets' lifecycles, rather than contracts, when considering initiatives. Train operators must also demonstrate that they have implemented an effective energy management system to help establish sustainable processes and improve energy performance.

## What We Want to Achieve

To achieve net zero carbon emissions by 2050, we will need to further reduce the environmental impact of stations, terminals and depots. We support the Sustainable Stations Guide and expect those managing stations to use it going forward. We will work with those managing stations to roll successful initiatives out to more stations.

In future, station management will be integrated within Great British Railways to improve accountability and long-term decision-making over how stations and the rail estate are maintained and improved for passengers and local communities. New, aligned incentives across the sector will help to make stations and trains more sustainable by reducing energy consumption and improving efficiency. Great British Railways will also take over the contracting of train services through Passenger Service Contracts, setting required service levels and specifications, including on environmental sustainability. Targets will be set for renewable energy generation and use at stations.

We will work with the rail freight industry and Great British Railways to encourage the freight sector to decarbonise their operations within rail freight terminals and depots. We are currently supporting a research and development project to identify and stimulate innovation of low-emission technologies for use in the rail freight estate.

## Vehicles

Network Rail has a fleet of 9,550 road vehicles to support its functions and train operating companies are likely to own and operate further vehicles. Along with the wider Government Fleet Commitment, Network Rail has committed to transition its cars and vans to zero emission vehicles by 2027.

Network Rail has identified ten potential pilot sites based on their energy capacity and vehicle usage for a major electric vehicle feasibility study. In 2019-20 Network Rail's fleet generated an estimated 48,600 tonnes of CO<sub>2</sub>, equivalent to more than 110,000 barrels of oil. By transitioning to zero emission vehicles, all these emissions could be removed at the tailpipe and by producing or purchasing renewable energy to power these vehicles, Network Rail will ensure that as many of these emissions are removed as possible. Some emissions will remain from the production of the vehicles and batteries.

## What We Want to Achieve

While challenging, we expect Network Rail and Great British Railways to meet or exceed the Government Fleet Commitment targets. We will also ask Network Rail to undertake a study to examine whether this number of road vehicles is necessary.

## Materials, Construction, and Whole Life Carbon

Beyond the emissions produced by the operation of the existing rail estate and passenger emissions, we also need to consider emissions arising from the maintenance, construction, and procurement of new assets, and the disposal of existing assets.

Achieving greener construction on the railway and the rail estate will be crucial to help us deliver net zero carbon emissions by 2050. The whole-life carbon emissions of buildings and infrastructure include heating and cooling, providing power, carbon associated with manufacturing, assembly, deconstruction, and the ultimate disposal of materials. Supply chains will be key to delivering sustainability across the rail network.

In the National Rail Contracts, we have included a requirement that train operators must achieve a BREEAM (Building Research Establishment Environmental Assessment Method) rating of at least 'excellent' for all new major construction projects at both the design and post-construction stage. Great British Railways will adopt this requirement when it takes over the management of all stations.

We welcome recent investment in the construction sector in newer low-carbon materials. Changing the materials used in rail can have a positive impact on our carbon footprint. We can achieve greener construction by reducing material usage through better planning and resource management, and through reusing materials.

Network Rail has produced and published its own Science Based Targets for emissions reductions to support net zero 2050, including a target to ensure 75% of its suppliers also have Science Based Targets by 2025. Network Rail is leading the industry in this respect and Great British Railways will continue this. Each of Network Rail's over 11,000 listed suppliers plays a role in the overall building and maintenance of the rail system, and must play a role in reducing carbon emissions.

Network Rail is pursuing sustainable construction methods and the re-use of key infrastructure materials like track and ballast, and is working proactively on better management of materials (such as scrap metal) on the lineside. Research and development activities are underway, working with other industries, academic institutions and organisations to drive innovation in circular economy and prevent the waste of valuable resources at source.

Network Rail uses in-house processing facilities across the rail network to reuse and recycle materials and has an app to share surplus materials internally rather than buying new. Network Rail's ambition is to reuse, repurpose or redeploy all surplus resources, design out waste and plastic pollution, and embed "circular economy" thinking into the rail industry by 2035. Network Rail will be setting high standards for its supply chain and will work with suppliers to research and develop new, innovative secondary materials that reduce reliance on virgin materials.

The machinery that supports maintenance and construction on the rail network will also need to be decarbonised. Through the Foak programme, the government has provided nearly £400,000 to fund the development of the world's first zero-emission machine for removing and replacing rails. The government will continue to support innovative solutions to help bring new technologies to market.

Train design and manufacture is also important. Manufacturers promoting best practice already use sustainable or recycled materials and adhere to environmental standards. For example, the commuter train Desiro City has been developed using low-weight aluminium materials and has a recycling rate of 97.4%.

## What We Want to Achieve

We will push Great British Railways to go further and faster in these areas in the future. Network Rail has made a good start by setting out its policies in its Environmental Sustainability Strategy and by publishing Science Based Targets. Network Rail and Great British Railways will now need to deliver on these commitments and bring the rest of the rail industry with them.

We will push for whole life carbon to be factored into all infrastructure projects by 2027 at the latest. We will work with the Department for Business, Energy and Industrial Strategy to ensure that Network Rail and Great British Railways are aware of developments in sustainable construction. We will continue to support the development of innovative technologies and materials and to ensure that sustainability and low-carbon materials are considered at all stages of a train's lifecycle. We want Network Rail and Great British Railways to build on positive examples of low-carbon construction from HS2 and others for future projects.

From 1 April 2022, the government will remove the entitlement to use red diesel from most sectors, including in construction. This should strengthen the business case for alternative fuel construction plant and machinery and incentivise the purchase of non-diesel powered (low emission) technology.

## 9 Waste, Litter, and Graffiti

The rail network generates a significant amount of waste each year. We need to reduce waste generated as much as possible and ensure that waste products are reused or recycled. We also need to address litter, fly-tipping and graffiti on the network.

This will be an important part of encouraging passengers to return to rail as now, more than ever, passengers are looking for cleanliness on the railway, to help them to build their confidence to travel.

### Waste

To reduce emissions, make the most of natural resources and reduce the impact to our natural environment, we need to minimise the amount of waste generated, and where waste is generated, make sure that it is reused or recycled.

Network Rail has made good progress on minimising the amount of waste sent to landfill, both from operating and maintaining the railway and from the 20 stations that it currently manages, with 98% of waste diverted from landfill. As set out in the Materials section of this document, Network Rail's ambition is to reuse, repurpose or redeploy all surplus resources, design out waste and plastic pollution, and embed "circular economy" thinking into the rail industry by 2035.

National Rail Contracts require train operators to send zero waste to landfill and recycle a significant proportion (typically 80%) of waste produced by their operations, including by passengers in stations and on trains. Some train operators are currently more advanced than others in meeting these targets, having had recycling targets built into their franchise agreements for longer.

### What We Want to Achieve

It is important that even more focus is given to end of life, reuse and recycling when products and materials are selected in future. Waste should in the first instance be minimised. Where waste cannot be reused it should be recycled and in the very limited cases where waste cannot be recycled it should be diverted from landfill.

We expect a standardised ambitious approach across the network as Great British Railways takes over the running of all stations and the purchasing of train services through Passenger Services Contracts. Zero waste from railway activities and passengers will go to landfill by 2025, and increasingly challenging recycling targets will continue to be set across all areas of the railway.

Network Rail office estate will remove consumable single-use plastics by 2025 and all other areas of the railway will work towards zero single-use plastics, setting challenging targets for consumables and packaging.

## Litter and Fly-tipping

Litter and fly-tipping is unsightly, unsanitary, dangerous, and damaging to land that should be both a natural and transport asset. Fly-tipping has become more prevalent over the last year with waste disposal site closures during the pandemic.

In 2020, Network Rail pledged £2 million to support trackside clean-ups for the Great British Spring Clean. Network Rail is supporting this year's Great British Spring Clean by encouraging staff to contribute, by taking volunteering days to join litter picks in their communities. In May 2021, Grant Shapps challenged Network Rail to do more to tackle litter on the railway.

Network Rail carries out regular litter clearance programmes at all stations and surrounding areas, prioritising busier routes. Network Rail is working closely with neighbours and local councils to address localised litter build-ups, prioritising clear safety risks, or those in high-profile or sensitive areas and also carrying out regular track and cab inspections.

Network Rail is also taking preventative measures to target well-known litter hot spots. This includes upgrading fencing and installing CCTV cameras to monitor activity on rail land and provide clear evidence of criminal activity for use in prosecutions, working closely with the British Transport Police.

## What We Want to Achieve

Network Rail has made good progress in tackling litter and fly-tipping and Great British Railways will need to build on this work. We want a rail network free from litter and waste and will continue to challenge Network Rail and Great British Railways to do more to keep the rail estate clean, safe and welcoming.

Deterrents to fly-tipping will be key, preventing the waste being dumped and the problem materialising. Where waste has been dumped, we want Network Rail or Great British Railways to ensure it is removed and the land cleaned up as quickly and effectively as possible. Where possible and safe to do so, any dumped waste should be reused or recycled in the same way that other waste would be.

## Graffiti

Passengers should be able to feel pride in the rail network. The widespread scourge of graffiti makes this difficult. We want the rail estate to be as safe, clean and welcoming as possible for all passengers, and this includes preventing and removing graffiti across the estate.

In February 2020, DfT challenged Network Rail and train operators to go further than they already had and implement anti-graffiti measures that would produce rapid and visible results. We also requested longer-term plans to promote closer working practices between train operators, Network Rail and the British Transport Police.

Network Rail responded with a 'blitz on graffiti', which began in March 2020. Network Rail estimates that £1.5-2 million has been spent on graffiti clearance since October 2020, with thousands of tags removed and sites cleared of graffiti.

Network Rail has established longer term plans to maintain graffiti clearance at well-known hotspots across all regions. Through these plans, preventative measures are being trialled in the form of anti-graffiti vinyl film, paints and the use of drone technology.

### What We Want to Achieve

Network Rail has made good progress tackling graffiti and Great British Railways will need to build on this work. We want a rail network free from graffiti and will continue to challenge Network Rail and Great British Railways to do more to keep the rail estate clean, safe and welcoming.

Deterrents to graffiti will be key, preventing the damage being done, through preventing access to the railway, deploying new technologies that prevent graffiti, and pursuing prosecutions. Where graffiti has occurred, we want Network Rail or Great British Railways to remove it quickly and effectively.

## 10 Social Value

Increasing the environmental sustainability of the rail network should also increase the social value it contributes to the public, passengers, communities, and those employed in the sector. In 2020, the government published a Guide to using the Social Value Model that all commercial practitioners within government must use throughout the procurement lifecycle.

The Social Value Model sets out government's social value priorities for procurement, including five themes and eight policy outcomes that flow from these themes. The rail network can contribute to these themes.

The Williams-Shapps Plan for Rail strives to embed social value across the rail network, including in relation to environmental sustainability, which is the focus of this chapter. The most relevant themes for environmental sustainability from the model are 'Fighting climate change' and 'Wellbeing'.

All areas covered by this document will improve the environmental sustainability of the rail network and the social value it contributes. Reducing harmful emissions from trains, reducing noise, and increasing the use of active travel, public transport and rail will bring health and wellbeing benefits. Increasing biodiversity on and around the rail estate will benefit the environment and could benefit the health and wellbeing of those using and engaging with the rail estate. Decarbonising trains and the wider network will reduce emissions, help us fight climate change, protect the environment and support the benefits that this will bring for us all.

Network Rail's Social Value Framework embedded into the organisation and procurement processes advocates the UK government's Social Value Model. The framework, along with the Rail Social Value Tool, includes monetised values to identify opportunities and risks and can integrate these qualitatively into decision-making.

The government funds and works closely with the Community Rail Network (CRN), a representative body supporting Community Rail Partnerships and Station Adopters. Around the country, 73 Community Rail Partnerships and 1,000 station friends' groups work with rail partners to build understanding of local needs and enable more people to travel by rail and use their local stations. Local communities act as partners to help develop rail and its place as the backbone of local sustainable transport networks.

Community Rail Partnerships treat stations as vital local centres of social and economic activity, and potential beacons for sustainability. Community rail promotes green and caring credentials, and focuses on connections with bus, community transport, and active travel, to make rail more accessible, and reduce car dependency.

### **What We Want to Achieve**

Great British Railways will build on work done by Network Rail to embed social value into procurement practices and embed social value across the rail network. This will include incorporating wider social objectives that promote environmental sustainability, community and employee wellbeing and equal opportunity into future Passenger Service Contracts with train operating companies. Through National Rail Contracts, we are already seeking to ensure that social value initiatives are built in. We will work with the rail industry and across government to determine how pledges around social value can be measured and monitored.

The Williams-Shapps Plan for Rail sets out the government's vision for the future of Community Rail, recognising the important role that Community Rail Partnerships already play in supporting a thriving rail network across the country. Community Rail Partnerships will be empowered to strengthen rail's social and economic impact, and best practice as evidenced by the work of many Community Rail Partnerships will be supported more widely across the network. These important organisations will continue to enjoy the same level of support and protection that they currently receive.

# 11 Integrated Travel and Modal Shift

To support a green recovery, railways need to encourage a shift away from planes, cars and lorries, become the best option for long-distance travel, and improve the whole journey experience.

This includes making it easier to get to and from stations by walking, cycling or other public transport, supporting green infrastructure outside cities, such as charging points at rural stations, modernising fares to compete with air travel, improving freight connectivity through interchanges and creating better links with freeports.

## Passenger Modal shift, Active Travel and Integrated Transport

The government's vision is for active travel (typically walking or cycling) and public transport to be the natural first choice for our daily activities. As a low-carbon way to travel, rail will play an important role in decarbonising the transport sector and in helping us meet our net zero carbon targets for 2050.

In 2019 in England, 81% of journeys taken by train already included active travel or public transport as well as rail.<sup>22</sup> Station Travel Plans have improved integration with other modes of transport and identified walking and cycling routes to many stations. Many stations provide secure storage for bikes. Bikes are accepted on the vast majority of non-peak trains, though the process for doing this varies according to the route and the train operator and this isn't always clear to cyclists.

Plus Bus already allows rail passengers to purchase onward bus tickets with their rail ticket but this isn't widely used and many passengers may not even be aware of it. Some train operators have already installed electric vehicle charging points at their managed stations, and Network Rail has installed more than 300 at the stations it manages.

The Cycle Rail grant scheme funds the installation of cycle racks, security systems, ramps, and cycle paths at train stations. Through the scheme, we have provided more than £40 million funding since 2012 to create over 22,000 new parking spaces and other features, spread across more than 200 stations UK-wide.

## What We Want to Achieve

Rail offers a low-carbon option for both short and long-distance travel. We want to make rail the first option for suitable journeys in the UK and encourage commuters to cycle, walk or take public transport to and from rail stations, making their journey environmentally sustainable from door to door. By making journeys simpler and more integrated, we want to encourage more people to travel by train.

The Williams-Shapps Plan for Rail sets out how we will reform the rail network to make it more appealing and encourage customers to return in larger numbers than ever.

The government will invest substantial sums on safe cycle routes to stations, particularly in commuter towns such as Guildford and Harrogate, and will increase cycle storage at stations, including at city-centre termini, where it is currently limited. Great British Railways will increase space for bikes on existing trains wherever practicable, including on popular leisure routes. It will also make it easier to reserve bike spaces online.

Future train fleets will include more bike spaces, relevant to the markets served. Operators may continue to restrict bikes on peak-hour commuter trains, where the space is needed for passengers, and due consideration will be given to the accessibility needs of all passengers.

In the future, each Passenger Service Contract will be designed by Great British Railways to support the needs of passengers and the whole network, as part of an integrated system. This will include integration with other transport services to enable more convenient connections between long-distance and local services and joint working during disruption or emergencies. It will also require the operators to support the integration objectives for bus travel and cycling.

New transport services, such as e-bikes and e-scooters, are emerging all the time. As they mature, we will ensure seamless integration, learning from the past to inform decision making and implementation.

## Freight Modal Shift

Although most rail freight is carried by diesel trains, it remains one of the lowest carbon ways of moving goods on land. On average, rail freight trains emit around a quarter of the CO<sub>2</sub>e emissions of HGVs per tonne mile travelled.<sup>23</sup> The government is supportive of modal shift of freight from road to rail, wherever possible, to reduce emissions from the freight sector.

Freight operating companies are already taking significant steps to reduce their own emissions. Freightliner, for example, has fitted stop-start technology in all its Class 66 and Class 70 fleet to reduce carbon, air quality and noise emissions when idling.

They calculate that their locomotive idling hours reduction plan has achieved a 36% average reduction in idling hours over the last six months of 2020, equating to a saving of 3,138 tonnes of CO<sub>2</sub>e since May 2020.

The government provides grants – including through the Mode Shift Revenue Support Scheme – to support the carriage of freight by rail and water on routes where road haulage has a financial advantage. These grants help to remove around 900,000 HGV journeys from roads each year<sup>24</sup>. In 2021/2022, the government allocated up to £20 million for these grants, a 28% increase in funding compared to 2019/20.

The government has continued to invest in the rail network to improve its capability and capacity for freight. These investments support the growth of the rail freight sector and, in turn, modal shift of freight from road to rail. The government invested over £235 million in the Strategic Freight Network between 2014-2019 to improve freight capacity and capability, and further funding is being made available through the Rail Network Enhancements Pipeline.

The government supports the development of the network of Strategic Rail Freight Interchanges (SRFIs) to better enable the environmental and economic benefits that rail freight offers. SRFI's are integral to decarbonisation as they make rail freight more affordable, thereby reducing freight movements on the road networks. We will explore ways to enable future SRFIs to be located more appropriately around the country.

## What We Want to Achieve

As announced in the Williams-Shapps Plan for Rail and [Decarbonising transport: a better, greener Britain](#), the government will introduce a rail freight growth target for all areas of the network that the department oversees, but this target should not become a ceiling. The target will provide a common objective for industry collaboration, help provide private operator investment confidence, and galvanise action across local partners and industry. Further details about the growth target will be confirmed in due course and we will work closely with industry partners to develop the target.

To further grow rail freight for 2021/22, the government is investing £20 million in modal shift grant schemes. We will continue to work with the rail freight industry, Innovate UK, and RSSB to look at how best to progress options on innovation, research and development to reduce emissions from rail freight. Through the 2021 Foak competition, we are providing nearly £2 million in funding for five decarbonisation-focused rail freight projects.

Looking ahead, the government is considering its wider approach to the freight sector through its Future of Freight programme. The strategy will describe the government's long-term vision for the sector across a range of indicators, including decarbonisation, and provide a policy route map to achieve that vision. The government will take forward work on the strategy throughout 2021.

## 12 Land Use

The rail estate is vast, with around 52,000 hectares of land currently managed by Network Rail and in future to be managed by Great British Railways. The extensive estate can be used more effectively to reduce the UK's net greenhouse gas emissions and improve biodiversity. A sustainable, long-term approach to land management on the network will support biodiversity.

Network Rail will publish a comprehensive land use strategy by April 2022 to maximise the potential benefits of the rail estate and ensure that land is prioritised appropriately.

### Clean Energy Generation

Renewable energy offers zero emissions at source and reduced whole life carbon emissions, when compared to traditional energy sources. The rail estate, including many of the network's stations, offers opportunities for renewable energy production to provide energy for direct use on the rail network, or to support the wider grid.

Network Rail's Environmental Sustainability Strategy sets out Network Rail's approach to renewable energy generation, including a commitment to feed-in 100% of non-traction electricity from renewable energy sources by 2030.

Network Rail has undertaken a review of its land to prioritise optimum locations for renewable energy generation and storage. This used the Geographic Information System (GIS) to reveal information such as areas of electricity network stress, areas where Network Rail consumes large amounts of energy, and the renewable energy potential of sites and neighbouring land. A geo-spatial database has been created and will be used to prioritise optimum locations for renewable energy generation and storage.

### What We Want to Achieve

Renewable power generation on the rail estate will be increased to provide more clean energy to stations and local communities. Successful initiatives, such as new technology to power tracks from lineside green energy, will be rolled out more widely across the network as appropriate.

We want the rail estate to support wider generation of renewable energy to support the whole country in decarbonising as we move towards 2050 and our commitment of reaching net zero greenhouse gas emissions.

## Biodiversity

The UK needs to do more to encourage a diverse ecosystem. The State of Nature 2016 report highlighted that between 1970 and 2013, 56% of animal species in the UK have declined in population, with 40% showing strong or moderate declines. Of the nearly 8,000 species assessed using modern Red List criteria, 15% are extinct or threatened with extinction from Great Britain.<sup>25</sup> The Living Planet Index suggests that we are among the most nature-depleted countries in the world.

The rail network is home to a wide variety of plants and animals and includes 200 sites of special scientific interest and an estimated six million trees. In 2018, the government commissioned an independent review led by John Varley to examine Network Rail's approach to lineside vegetation management. The Varley Review (2018) contained six recommendations for Network Rail.

Network Rail published its Biodiversity Action Plan in 2020, setting out a vision of a lineside that is safe, operationally viable and environmentally friendly. The plan responds to each of the Varley recommendations and was developed in line with Defra's 25-Year Environment Plan Network. The plan sets out detailed goals and actions on how biodiversity will be improved across the rail estate in the coming years, including a commitment to deliver net zero biodiversity by 2024 and biodiversity net gain across the network by 2035. This includes: a stocktake of environmental assets, measuring the impacts of rail estate management on biodiversity, route level action plans to turn the vision into practice, and engagement and communication with a wide list of partners, stakeholders and neighbouring landowners.

### What We Want to Achieve

Network Rail has made strong progress to improve its approach to biodiversity. The government will push Network Rail and Great British Railways to achieve or go further than the commitments made in the Biodiversity Action Plan, including in the short term to establish a biodiversity baseline and publish a Habitat Baseline Management Plan by the end of 2021.

We will work with Great British Railways to ensure delivery of biodiversity improvements at least as ambitious as those set out in the government's 25 Year Environment Plan and the Environment Bill.

## Carbon Offsetting, Capture, and Storage

With a large estate that could be used to offset carbon emissions from other sectors, and as a mode of transport where many technologies already exist to help it decarbonise, rail is in a strong position to achieve negative carbon emissions and support other, more difficult to decarbonise, sectors.

Trees are one of nature's best solutions to achieve carbon capture, naturally removing carbon from the atmosphere as they grow. The rail estate already includes an estimated six million trees and is densely populated with trees (20% of land coverage) compared to the rest of the UK (13% of land average). Network Rail is supporting the planting of more than 80,000 further trees and hedgerows across the country through a £1 million, four-year programme.

There is also the potential to use the rail estate for carbon capture by other means. The Net Zero Innovation Portfolio is a £1 billion fund, announced in the Prime Minister's Ten Point Plan for a Green Industrial Revolution, that will accelerate the commercialisation of low-carbon technologies, systems, and business models in power, buildings, and industry, including direct air capture and greenhouse gas removal.

The government set out its approach to carbon capture, usage and storage (CCUS) in its [Clean Growth Strategy](#). The approach is designed to enable the UK to become a global technology leader for CCUS and ensure that the government has the option of deploying CCUS at scale during the 2030s, subject to costs reducing sufficiently.

### **What We Want to Achieve**

We welcome the tree planting initiatives that Network Rail is already undertaking. Great British Railways will continue these and explore further opportunities to support additional tree planting across the country, including considering how neighbouring landowners might be supported to plant additional trees.

We will work closely with colleagues in the Department for Business, Energy, & Industrial Strategy (BEIS) to understand what role the transport sector might play in carbon capture, use and storage from 2030 to 2050 and beyond, and how emerging technologies might be deployed on the rail estate.

## 13 Railway Noise

The provision of railway services causes noise which can be a nuisance to lineside neighbours, passengers, and staff, but may also affect people's health and wellbeing. The World Health Organisation recognises environmental noise as one of the top environmental health risks in Europe. It may cause sleep disturbance, annoyance, and there is growing evidence that long term exposure to high levels of environmental noise is associated with illnesses like heart attack and stroke<sup>26</sup>.

The phenomenon of railway noise is a complex issue, with sources including rolling noise (from train wheel/rail contact); traction noise (from train motors/engines); horns; railway premises (from station platform loudspeakers, plant room, lifts); maintenance and construction (from track upgrade works or major infrastructure projects).

### Work So Far

The government carries out periodic strategic noise mapping to identify the most sensitive areas on and around the rail network that are exposed to railway noise, known as noise Important Areas (IAs). The department, with support from RSSB and Network Rail, is responsible for examining each of the IAs and reporting their location to the relevant local authority. This reporting includes an indication of intervention measures that have recently been taken, or are planned in the near future, that will be acoustically beneficial to the affected population, assisting with the implementation of the government's policy on noise.

Mitigation measures for railway noise are described in the government's Noise Action Plan: Railways<sup>27</sup>, which was last updated in 2019. Reductions in railway noise have been achieved through activities like Network Rail's track grinding programme, which is primarily aimed at protecting railway infrastructure and the trains but also reduces rolling noise. All new trains must adhere to more stringent technical specifications set for external noise and noise within the driver's cab. Furthermore, an increase in the number of electric trains has helped to reduce traction noise. There has also been a reduction in station noise largely through improvements to Public Address system design.

In addition to control measures that tackle noise at its source, mitigations can also include planning controls that consider noise arising from new railway lines and lineside developments, compensation and insulation schemes for affected homes, noise barriers, and façade insulation.

Many of the benefits of developing a more sustainable railway will also help to reduce rail-related noise, for example electrification of the network and the phasing in of low emission technologies, like battery and hydrogen power trains.

The next noise mapping round in 2022 is aiming to provide more detail compared to previous rounds. This will help to determine what the most effective noise mitigations might be in sensitive locations on and around the rail network.

### **What We Want to Achieve**

We will continue to work with Network Rail, then Great British Railways, and train operators to minimise the impact of noise from the railway on its lineside neighbours, passengers, and staff.

We will also continue to evaluate the emerging health risks of environmental noise in order to protect the health and wellbeing of railway lineside neighbours, passengers, and staff, as well as support the development of innovative technologies to reduce the noise caused by the railway.

## 14 Water

Network Rail and train operators use water in their operations and for water supply to customers. Network Rail also owns land across England, Scotland and Wales and its 20,000 miles of infrastructure pass through both urban and rural areas falling within, and crossing over, multiple water bodies. Pollution prevention, drainage and flood protection are key considerations. It is key that Network Rail, Great British Railways and train operators not only use water more efficiently but also enhance the water environment in which they operate. Water is an integral part of the circular economy and biodiversity.

In 2019, Network Rail's water use (not including water used by train operating companies) and wastewater disposal was approximately 2,200 million litres. Water is used vastly at stations, depots and offices and there are other uses, such as dust suppression.

Network Rail is currently rolling out a system to track water use and assess its organisational water footprint. By 2024, Network Rail aims to have a full understanding of water use and environmental interactions across the network, as well as clear regional action and implementation plans aligned to overarching controls.

Network Rail is committed through its environmental policy to taking action to prevent pollution to water which may occur as a result of its operations, to reduce environmental impacts and use resources (including water) sustainably. In an agreement between Network Rail, Water UK, the Environment Agency, and Natural Resources Wales, a pesticide agreement was drawn up in August 2016 that controls the use of certain pesticides within public water supply source protection zones (SPZ), drinking water protected areas (DWPA), and safeguarded zones. The policies are implemented through the prevention of pollution standard and task risk control sheets.

In the National Rail Contracts, we require train operators to monitor and reduce water usage throughout their operations. We require train operators to first identify and address any leaks (if in existence), install automated meter reading water meters at all sites (if not already installed), and set annual targets for reductions in water consumption.

### What We Want to Achieve

Existing commitments in the National Rail Contracts will move into Passenger Service Contracts under Great British Railways. We will continue to set challenging targets for

Great British Railways when it takes over the management of stations and it will need to do the same for train operators running services.

We will push Network Rail and Great British Railways to go further than their current commitments and to publish their commitments and plans to reduce water consumption and the negative impact their estate has on the quality of water bodies it interacts with.

Future water policies will be driven by Defra's 25-Year Environment Plan and the Environment Bill will determine how the UK protects its natural environment, including delivering sustainable water resources.

## 15 Endnotes

- <sup>1</sup> [Great British Railways: the Williams-Shapps Plan for Rail](#), DfT, p. 81
- <sup>2</sup> [Final UK greenhouse gas emissions national statistics: 1990 to 2019](#), BEIS
- <sup>3</sup> [Modal comparisons \(TSGB01\)](#), DfT
- <sup>4</sup> [Greenhouse gas reporting: conversion factors 2020](#), BEIS
- <sup>5</sup> [Rail Emissions: 2019-20](#), ORR
- <sup>6</sup> [Rail Technical Strategy](#)
- <sup>7</sup> Covers period from 2017-2020: this is the most recent electrification data currently available
- <sup>8</sup> [Great British Railways: the Williams-Shapps Plan for Rail](#), DfT, p. 86
- <sup>9</sup> [The role and value of rail freight in the UK](#), Rail Delivery Group
- <sup>10</sup> [Passenger Rail Usage 2020-2021 Quarter](#), ORR (703 million is the total of 2019/20 Q4 and 2021 Qs 1-3)
- <sup>11</sup> [Rail Emissions 2019-20 Annual Statistical Release](#), ORR
- <sup>12</sup> [Decarbonisation and Air Quality Improvement: a Roadmap for the Rail Freight Industry](#), RSSB
- <sup>13</sup> [Great British Railways: the Williams-Shapps Plan for Rail](#), DfT, p. 88
- <sup>14</sup> [Health matters: air pollution](#), PHE
- <sup>15</sup> [Every breath we take: the lifelong impact of air pollution](#), Royal College of Physicians
- <sup>16</sup> [Impact of London's road traffic air and noise pollution on birth weight: retrospective population-based cohort study](#), BMJ
- <sup>17</sup> [Clean Air Strategy 2019](#), Defra
- <sup>18</sup> [2018 National Atmospheric Emissions Inventory \(NAEI\)](#)
- <sup>19</sup> [Air Quality Strategic Framework](#), RSSB
- <sup>20</sup> Green et al., Research into air quality in enclosed railway stations, RSSB, 2019
- <sup>21</sup> [Air Quality Improvement Measures \(AQ0003\)](#), RSSB
- <sup>22</sup> [National Travel Survey: 2019](#), DfT
- <sup>23</sup> [Greenhouse gas reporting: conversion factors 2020](#), BEIS
- <sup>24</sup> Internal DfT analysis
- <sup>25</sup> [State of Nature report 2016](#), National Trust
- <sup>26</sup> [Environmental Noise Guidelines for the European Region \(2018\)](#), World Health Organisation
- <sup>27</sup> [Noise Action Plan: Railways](#), Defra