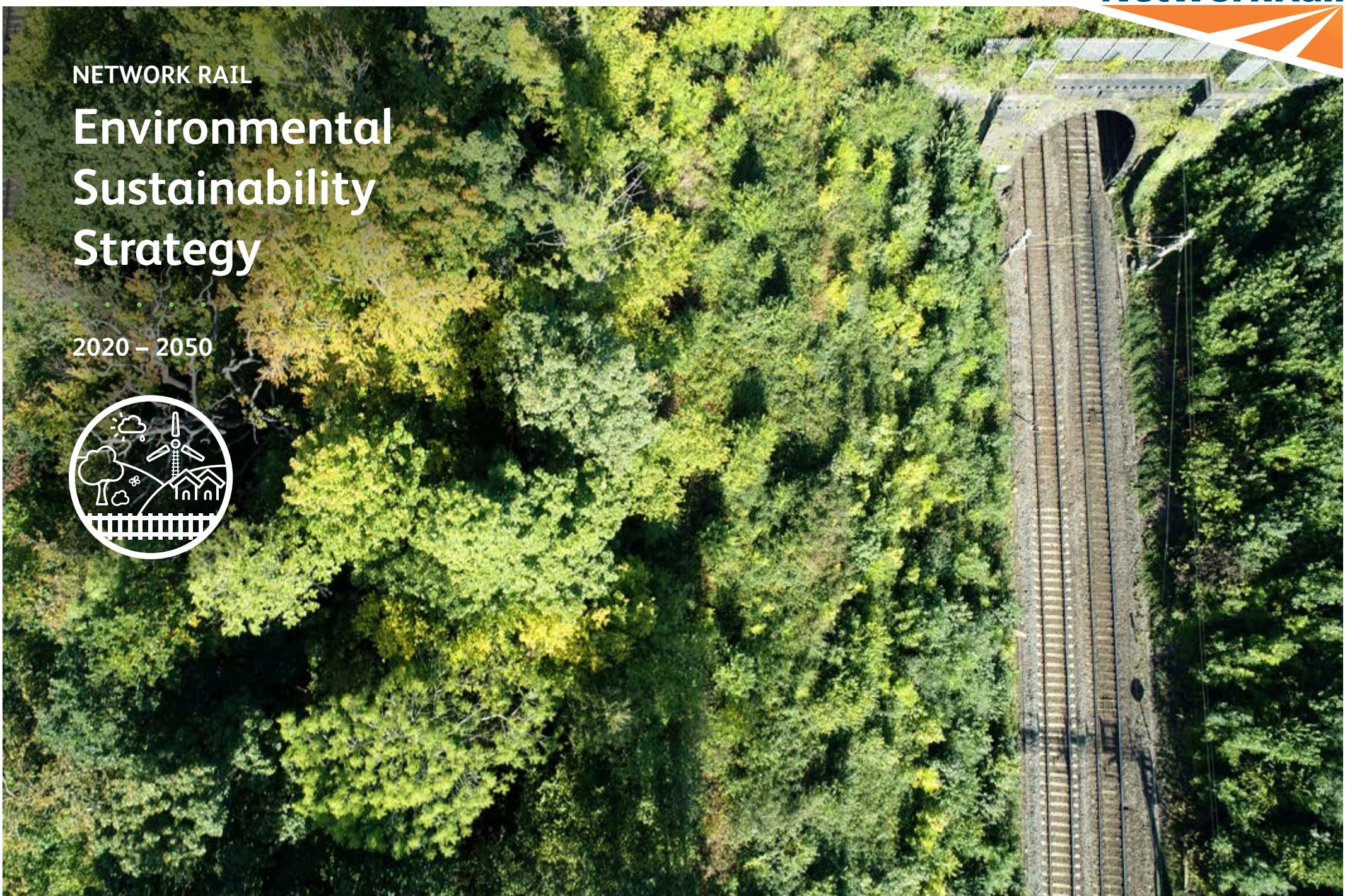


NETWORK RAIL

Environmental Sustainability Strategy

2020 – 2050



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Welcome from our chief executive

Our railway is on a journey to a cleaner, greener future.

Our starting point is strong. Rail is efficient and seen as environmentally sound by the public. The busiest parts of the system have long been electrified. Rail can move millions of people quickly and cleanly over short or long distances, in cities and in the countryside.

Rail freight can move huge loads with a fraction of the impact of road transport. No other form of mass transit can do this.



But this is no time to rest on our laurels. I want to see rail powering Britain's green economic recovery as we build back better from Coronavirus. That is why this strategy matters to me and to everyone at Network Rail. It's a guide to how we should think, plan and manage the way our railway is run.

Some of the steps on this journey are ones we can take now. Others will develop over time. They will lead us towards a railway which cuts its emissions to a minimum, prepares for climate change, protects and strengthens lineside habitats and limits the impact of the waste and plastic pollution we create.

This strategy is not an addition to the goals we have set for the organisation. Nor is it just a piece of dutiful good housekeeping. To me it is central to the way we work. Delivery will be led by our routes and regions, but thinking, planning and operating in an environmentally sustainable way must become part of the DNA of Network Rail as a whole. Acting sustainably should not be a bolt-on but part of what putting passengers first is all about.

Our current position carries with it an opportunity and a risk.

The opportunity for rail is that with the right strategy, investment and personal commitment we can help bear the burden of reducing the environmental impact of transport in Britain. By becoming more sustainable and taking a bigger share of transport use, rail will help the country meet its carbon goals and clean its air.

But there is also a risk for rail. If we fail to improve our environmental performance while cars, lorries and planes clean up their act, then we will stop being a leader and become a mere extra. Instead of being a reason to back rail, environmental performance may become a reason to invest and focus elsewhere. Rail does not have a right to exist and grow regardless of our performance.

I know for a fact that many of you are passionate about making our railway the greenest it can be. We have an opportunity to act now to leave a positive environmental legacy for future generations. Together we can help passengers and freight users make green choices, support communities and be a good neighbour, look after our land well and keep our air clean.

A handwritten signature in black ink, appearing to read "Andrew Haines".



Andrew Haines
Network Rail
Chief executive

Delivering a sustainable railway

Our vision is to serve the nation with the cleanest, greenest mass transport. We want to put passengers first, help passengers and freight users to make green choices, support local communities and be a good neighbour.



To deliver our vision we have four core priorities:

- 1 A low-emission railway
- 2 A reliable railway service that is resilient to climate change
- 3 Improved biodiversity of plants and wildlife
- 4 Minimal waste and sustainable use of materials

Our commitment to wider sustainable development goals, including social value, are also very important to us. There are social benefits to everything we do, and we are committed to supporting our local communities.

Detailed social value plans will be addressed separately. Some wider environmental topics such as noise, vibration and water pollution are not the focus of this strategy but do form part of our wider environmental sustainability plans.



SERVING THE NATION WITH THE CLEANEST, GREENEST MASS TRANSPORT

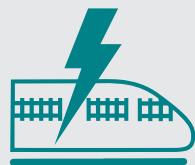
PRIORITIES	A LOW-EMISSION RAILWAY	A RELIABLE RAILWAY SERVICE THAT IS RESILIENT TO CLIMATE CHANGE	IMPROVED BIODIVERSITY OF PLANTS AND WILDLIFE	MINIMAL WASTE AND THE USE OF MATERIALS						
AMBITIONS	We will achieve net zero carbon emissions by 2050 (and 2045 in Scotland) and deliver continual improvements to air quality so that our passengers, neighbours, and employees breathe healthier air	We will prepare the railway infrastructure to minimise the impacts of climate change by 2050.	We will continue to look after nature and protect, maintain and enhance biodiversity across the railway.	We will reuse, repurpose or redeploy all surplus resources, minimise use of resources, design out waste and embed waste life-cycle/circular economy thinking into the rail industry by 2035.						
ROADMAPS	 GREENER TRAINS, HEALTHIER AIR  GREENER ASSETS, HEALTHIER AIR	 CLIMATE CHANGE ADAPTATION	 BIODIVERSITY	 CIRCULAR ECONOMY						
KEY MILESTONES	Traction Decarbonisation Network Strategy completed and discussed with funders and approved by 2020 Science based targets for scope 3 emissions (including traction diesel emissions) approved by 2020 Timetable options for carbon efficiencies developed 2024-2029	Final investment decision for electrification of main line routes by 2029 Widespread trials of bi-mode, hydrogen and battery trains will have begun by 2024 Harmful pollutants will be reduced by 25% in Network Rail managed stations by 2030	Go beyond embodied carbon assessments to whole life carbon assessments, to support infrastructure projects by 2027 All appropriate plant, worksites and depots to have dust suppression in place by 2029 Establish an air quality monitoring regime for worksites and depots by 2024	Transition assets away from use of natural gas by 2029 Update our procurement model by 2022 to reduce value chain emissions by 2032 Achieve agreed science based targets for scope 1 and 2 by 2050 at the latest (Scotland 2045) We will purchase 100% renewable non-traction electricity by 2020, and will aim to feed in 100% of our non-traction electricity from renewable sources by 2030	Asset policies and standards updated to reflect long-term climate change projections by 2024 Review criticality and vulnerability mapping of all assets for climate change across the network by 2024 We will have an air quality improvement plan for all our managed stations and depots in place by 2024	Agree level of service in extreme weather conditions with Government and regulators by 2027 Regions develop long term adaptation pathway strategies and identify level of investment required for different scenarios by 2029 Establish the biodiversity baseline, map all relevant data and make available to our supply chain by 2024	Publish national biodiversity standard by end of 2021 Use the outputs to inform guidance to Network Rail asset managers on optimal habitat management interventions for biodiversity and train performance. Be recognised as a leader in land management by 2030	Increase ecological capability in Network Rail and in our supply chain to 2024 Achieve no net loss of biodiversity across the network by 2024 and net gain by 2035 Adapt standards to include circular economy aspects by 2023	Map and prioritise materials and waste streams within supply chain by 2021 Circular economy policy in place for reducing resource use and waste by 2022 Establish the biodiversity baseline, map all relevant data and make available to our supply chain by 2024	Embed material re-use and redeployment systems and tools into procurement process by 2024 Embed circularity metrics into decision making by 2024 Reuse, recycle, or redeploy all our non-hazardous infrastructure materials by 2029
SD GOALS	   	   	  	 	    					

Delivering a sustainable railway

What people are telling us

We talked to passengers and the public about their views on the railway and environmental sustainability. Nearly a third of the people we spoke to believe the railway is an industry making a positive contribution to society.

Four in 10 people think we could do more. When we asked people about actions we could take to positively contribute to environmental sustainable development, they identified the following priorities:



Use electric trains
to reduce carbon
emissions



Make stations, tracks and
trains more resilient to
extreme weather



Plant more trees
to offset carbon
emissions



Send zero
waste to landfill

We have listened to what people are telling us and considered these alongside our internal risks and high impact areas in developing our four strategic priorities.

At the time of writing this strategy the long-term impacts of the Coronavirus global pandemic are still emerging and being understood.

Whilst this affects the context in which the strategy is presented, it makes environmental topics no less important; over a third of people we spoke to said that the environment – including climate change – was in their top three most important global issues.

Delivering a sustainable railway

Successful delivery of this strategy will rely on integrating environmental sustainability into everything we do. Delivering our commitments against the six key enablers below will help us to make sure our strategy is a success.

People



How we will communicate with our employees, increase their capabilities and create the culture we need to enable change.

Funding and planning



How we will integrate environmental sustainability into the planning and funding process, which is vital for the delivery of our ambitions.

Systems and processes



What changes to company-wide processes and systems need to be made to support change (including procurement and partnerships with our supply chain).

Engagement



Communications, partnerships with external organisations, working with our neighbours and engaging with our stakeholders to support change.

Technology



How we will approach research and innovation to support the delivery and acceleration of our programmes.

Measurement



What information, data and measures need to be in place to monitor and demonstrate change.

This strategy is for the whole organisation and everyone will have a role in its delivery, with tailored aspects to meet local needs. Our regions bring our people closer to the passengers and communities that they serve. Each of our regions is unique with different passenger needs, landscape and environmental challenges. This strategy will provide a framework for all regions and will be complemented by individual plans that reflect their own communities.

The landscape in which we operate is changing and our strategy is designed to be able to respond to this. Our vision, priorities and enablers will remain constant, and we will review our detailed activities regularly.

Whatever the changing landscape of the industry, UK economy or society, it is important that we generate momentum in the early years of this strategy so we can deliver long-term. Our delivery plans are ambitious and we can't deliver this alone.

We want to lead change for the whole rail industry working with passenger and freight operators, funders, rolling stock companies (ROSCO) and businesses who support us (our supply chain) and be quick to respond. Beyond the industry we also want to work in partnership with our neighbours and communities, relevant interest groups and other transport providers. We aim to be easy to engage with and a dependable partner; it is only by taking this approach that we can be regarded as an industry leader in this field.

ENABLERS



OUR ENABLERS

OUR FLAGSHIP COMMITMENTS



PEOPLE

All our executive leaders will have environmental sustainability objectives in their annual performance reviews and we will create a culture where everyone takes responsibility for the environment.

We will support our people by putting in place the resource to deliver the strategy; this means the right people in place, with the right tools, training and skills. Our sustainability experts across the organisation will share information and best practice.

We will deliver engaging internal communications to create interest in the strategy amongst our colleagues as part of wider cultural change across the business, sharing good news stories, highlighting best practice and generating momentum and excitement in our priorities.



FUNDING AND PLANNING

Each priority area will become an objective within the business planning process that sits under the 'strategic ambition statement'.

We will develop the evidence, business case and measurable benefits in a bottom-up approach, to be included in the periodic review process. We will include environmental sustainability considerations into all Strategic Business Plans from the beginning of 2021.

Our financial governance processes (e.g. our investment boards) will consider environmental sustainability issues in the same way they do operational and performance impacts in their decisions.



SYSTEMS AND PROCESSES

We will review our standards to make sure that they reflect our environmental sustainability priorities. We will also work with the Rail Safety and Standards Board (RSSB) to do the same for railway group standards.

We will challenge our supply chain to be more sustainable, working in partnership so our environmental sustainability objectives are addressed early in procurement and embedded throughout. Environmental sustainability will be weighted appropriately in all procurement activities.

We will develop action plans for all parts of the business to deliver activities aligned with the priorities in this strategy and regional contexts.



ENGAGEMENT

We will commit to involving interest groups and community leaders in our activities, fostering innovation and collaboration and actively look for opportunities to partner with our customers and neighbours to deliver environmental sustainability improvements for the whole railway.

We will annually update our website with progress towards our ambitions. We will share our progress with local and national stakeholders.

We will work with passenger and freight train companies, ROSCOs and our supply chain to develop solutions to environmental sustainability challenges together.



TECHNOLOGY

We will create a culture that encourages and supports innovation amongst our workforce including running competitions or creating 'hoppers' where colleagues can suggest new approaches to our challenges.

Working with passenger and freight operators, the supply chain and other industry partners, we will make sure we are able to be innovative and embrace new technologies that are aligned with this strategy.

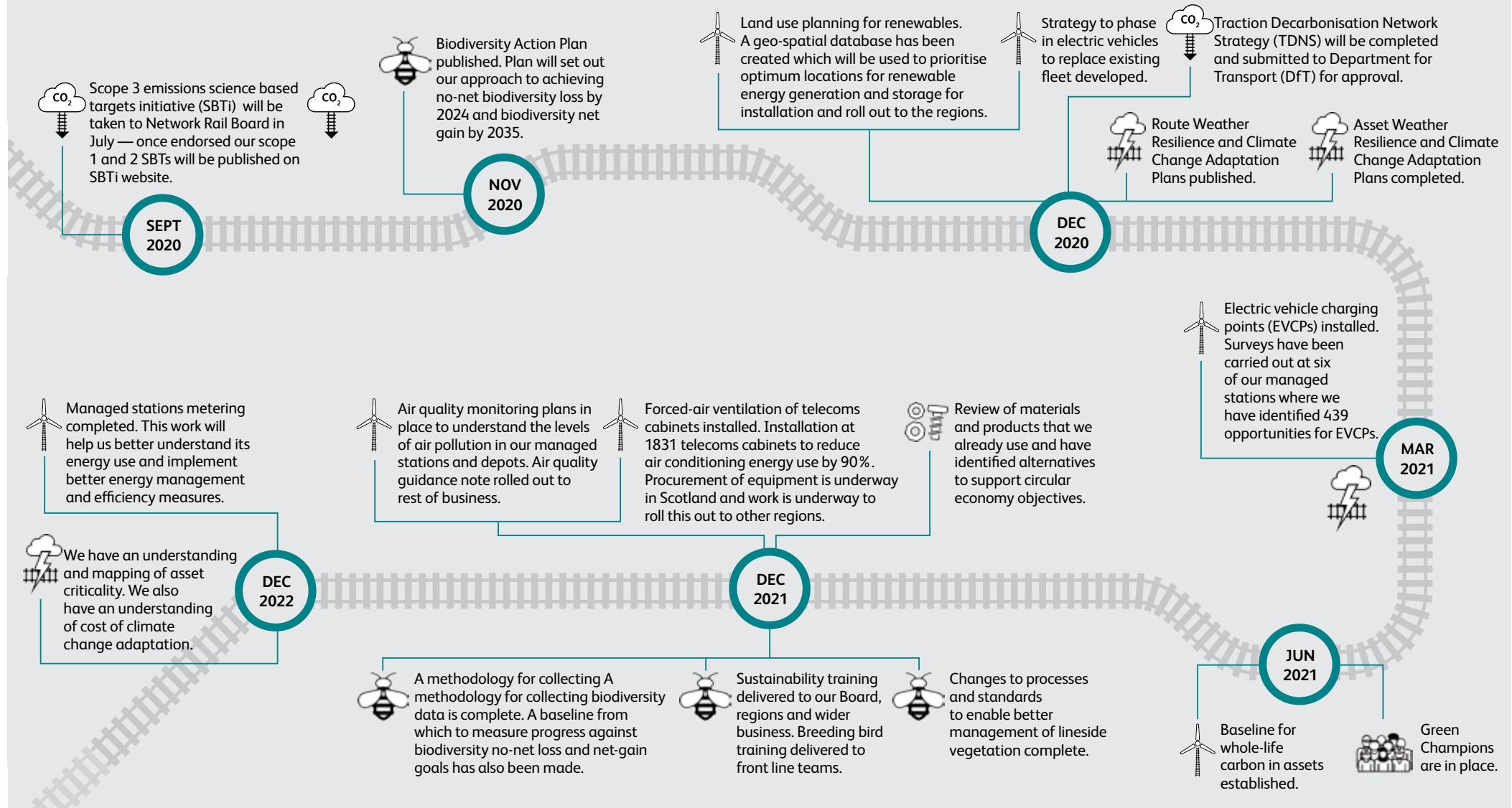


MEASUREMENT

Across our detailed plans we will create stretching and measurable targets, plotting our progress against the baseline. We will make sure our targets are in line with our priorities.

Transparency is important to us; we will share our baseline, targets and current performance annually with the public, and we will actively encourage scrutiny and challenge of our work.

KEEPING MOMENTUM



GREENER TRAINS,
HEALTHIER AIR



GREENER ASSETS,
HEALTHIER AIR



CLIMATE CHANGE
ADAPTATION



BIODIVERSITY



CIRCULAR
ECONOMY



PEOPLE



A low-emission
railway

A low-emission railway

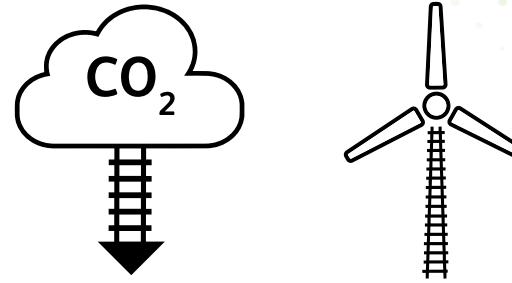
It is crucial that we do everything we can as a business to improve air quality, minimise our use of fossil fuels, and transition to an industry powered by green, renewable, low-carbon energy to play our part in tackling the global climate crisis.



All forms of domestic transport – rail, road, air – contribute more than a quarter of the UK's total carbon emissions.

Although rail is one of the lowest-carbon, greenest ways to travel, only contributing 1.4 % to total UK transport emissions, we can still make a big difference. As well as reducing our own emissions we can also encourage passengers and freight away from more carbon-intensive methods of travel like road and air onto the railway.

Reducing our carbon emissions is just one part of achieving a clean railway – the air quality at our stations, our offices and lineside worksites is very important to us. Combustion engines in our road vehicles, machinery, and diesel trains are key contributors to the release of pollutants into the atmosphere and can have a negative impact for our workforces, station users and on our neighbours and the communities we serve.



Decarbonisation of the rail industry and improvement of air quality will be a team effort. We must work with everyone from our tenants in our stations, to passenger and freight operating companies that run their services on our network and decision-makers and funders in the Department for Transport (DfT), Transport Scotland and the Welsh Government. Whilst we do not purchase or operate the trains that run on our network we can provide infrastructure that supports greener rolling stock and we will work with operators and owners of trains to influence behavioural and technology changes, to reduce the levels of harmful pollutants in stations.

We will achieve net zero emissions in line with Government and devolved nations targets (and 2045 in Scotland) and deliver continual improvements to air quality so that our passengers, neighbours, and employees breathe healthier air. We want to play our part in meeting the Government's air quality targets and reduce harmful pollutants from air pollution across our managed stations by 25 % by 2030. We will achieve this through two overlapping programmes, one addressing carbon emissions and pollutants resulting from powering trains (greener trains), and one looking at other activities which emit carbon and impact air quality (greener assets).

A low-emission railway

Government Decarbonisation Strategies

In March 2020 the Government issued the 'Decarbonising Transport: Setting the Challenge' consultation document. In July 2020, Transport Scotland issued its 'Rail Services Decarbonisation Action Plan'. We have aligned our activities to six strategic priorities which deliver a 'net zero' transport system:

Accelerating modal shift to public and active transport

We will continue to form close partnerships with others to encourage a quicker transition from road to rail.

Decarbonisation of road vehicles

We will achieve a shift to 100 % ultra-low emission vehicle fleet by 2034.

Decarbonising how we get our goods

Rail freight is already one of the lowest carbon means of transporting goods. Our Traction Decarbonisation Network Strategy (TDNS) will help to determine the pace of change and required investment for electrification of the rail network, and opportunities for further decarbonising rail freight.

Place-based solutions

We are improving our understanding of emissions 'hot spots' to make efficiencies in our buildings and stations. Local sourcing of materials and generating renewable energy on our estate is also key to our strategy.

UK as a hub for green transport technology and innovation

Our strategy has a strong focus on technology and innovation, partnering with others and investing in research and development to accelerate the roll-out of new, lower carbon technologies. We also want to engage closely with our supply chain to identify opportunities for innovation.

Reducing carbon in a global economy

We have a set of science based targets for emissions reduction, and our strategy will help us to lead the way in decarbonising how we travel and transport goods in Great Britain. Our ambitions require Government investment, but if supported, could accelerate the rail industry's transition to achieve 'net zero' carbon well before the Governments' targets of 2050 in England and Wales and 2045 in Scotland.



CASE STUDY

Decarbonisation Programme

The Decarbonisation programme is reducing carbon dioxide (CO₂) and energy consumption in Network Rail. The programme has been established to deliver sweeping changes in the way that Network Rail acquires and manages the energy that it needs to carry out the business of running Britain's railways. Consisting of 13 individual workstreams, the Decarbonisation Programme is working to bring large-scale renewable energy into the network, investigate how energy storage can support the needs of the railway, replace our diesel cars, vans and other vehicles with ultra-low emission alternatives and install energy efficiency measures right across the network.

The programme is also working to change the way that we deliver new infrastructure, designing out carbon intensive materials and improving the way that our teams and suppliers carry out building and improvement works so that carbon emissions are minimised.

We have already reaped early rewards in this workstream, switching out traditional station platform components for low-carbon materials. These new components reduce embedded carbon by up to 90% and are now being installed as renewals are carried out across the rail network.



When we spoke to the public, the most popular initiative for the railways to be more sustainable was running electric trains.



A low-emission railway

Greener trains, healthier air

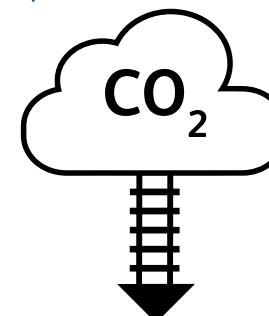
We have already electrified 42 % of the rail network and we are advising Government and setting the future direction of travel through the development of the TDNS. Rail in Britain has kept its carbon emissions relatively stable over the last 30 years, despite experiencing a significant increase of around 35 billion passenger kilometres in the same period.



We are excited to be at the forefront of a complete system-wide change in the rail industry, towards large-scale electrification across the nation, and use of new, innovative energy technologies like hydrogen and battery power for trains that run on our network. We will do this by working with our industry partners as we do not directly control the trains used by the operators, and the decision to electrify lines sits with the DfT, HM Treasury and other funders.

We will work with our funders to provide the business case for lower carbon options such as electrification supplied by renewable sources of energy, and work with train operators (freight and passenger), ROSCOs and wider industry to support and accelerate change towards an even lower carbon railway in the future.

We will support the Government in reaching their goal of having no diesel-only passenger trains which will lead to fewer harmful particulates released into the air from diesel engines and improve air quality for our passengers, colleagues and neighbours.



Our key milestones

1. TDNS completed and discussed with funders and approved by 2020
2. Science based targets for scope 3 emissions (including traction diesel) approved by 2020
3. Timetable options for carbon efficiencies developed 2024-2029
4. Final investment decision for electrification of main line routes by 2029
5. Widespread trials of bi-mode, hydrogen and battery trains will have begun by 2024
6. Harmful pollutants in Network Rail managed stations will be reduced by 25 % by 2030

Measuring our performance

We already measure and report on carbon intensity of powering trains (traction). This is a measure of carbon emissions from powering the train per passenger kilometre travelled.

We will continue to measure carbon intensity of traction and, in addition, we have developed and will report against science based targets for the reduction of scope 3 emissions (which includes traction energy). We will improve our monitoring of air quality across the network, working in partnership with others including RSSB.

A low-emission railway

Air quality

We are committed to improving air quality to protect the safety of our staff, railway users and neighbours from pollutants. Air emissions from human activities like using diesel engines have a huge impact on air quality, especially in local urban areas, and can significantly affect people's health.

Although our work to electrify the network and phasing out diesel trains will go a long way to reduce harmful emissions of pollutants including nitrogen oxides (NO and NO₂, collectively referred to as NO_x) and particulate matter, we need to go further, and urgently act to help improve air quality

in areas where we know it is a problem (for example, specific locations with stations).

Improving air quality will be a whole-industry effort and we will work collaboratively to influence behavioural and technology changes to reduce harmful pollutants. We will work with operators, ROSCOs, our supply chain, and others to make improvements on worksites, stations and lineside.



CASE STUDY

Air quality



The underground nature of Birmingham New Street station combined with the large number of diesel trains using it means that managing air quality at platform level is a complex challenge.

Significant effort has gone into studying air quality at platform level to help inform any actions required to clean the air. Air quality monitors were installed at head height along the platforms to provide accurate measurement on concentrations of nitrogen monoxide (NO), nitrogen dioxide (NO₂) and carbon dioxide (CO₂).

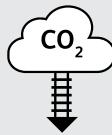
The air quality monitoring showed that, at certain times of day, there were elevated concentrations of NO and NO₂ due to the volume of diesel trains arriving, leaving and idling in the station.

An air quality management system was installed linking the air quality monitors to the station's mechanical ventilation system. The system is made up of 98 fans across 12 platforms split into eight zones. These zones are covered by 100 sensors which constantly measure air quality and switch on the ventilation fans

when pollutant thresholds are reached. This intelligent system ensures that the levels of NO and NO₂ are within legal limits. The information is relayed to the building management system providing live status on air quality at platform level. Carbon Dioxide measurements were observed to be within the applicable legislation threshold for the station.

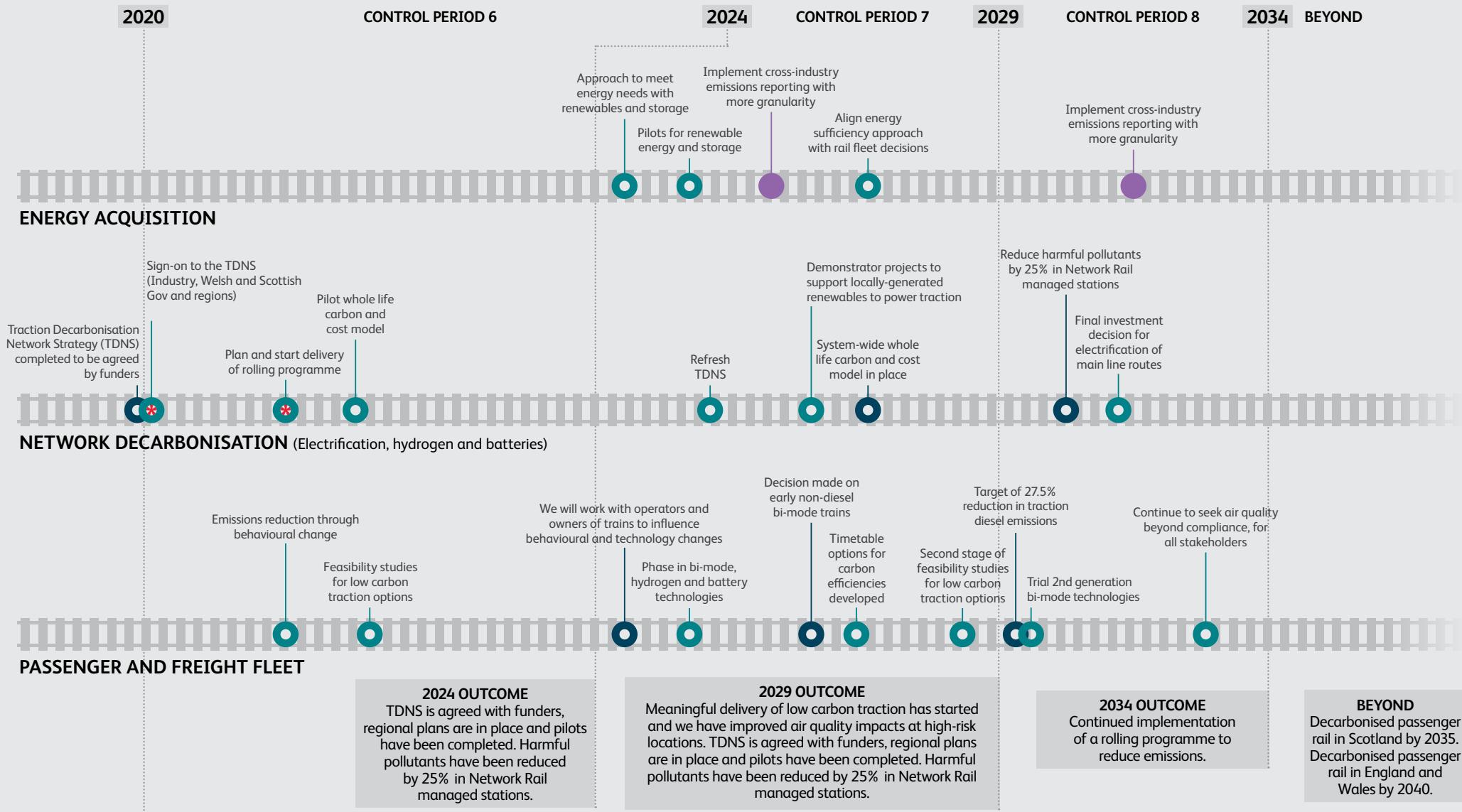
Activity continues at Birmingham New Street to identify further opportunities for enhanced monitoring across more platforms with more pollutants monitored, collation of the recorded data into a central software tool, and linking this data directly to train movements and locomotive details to provide comprehensive information for ensuring safe air levels at all times across the platforms.





GREENER TRAINS, HEALTHIER AIR

We will achieve net zero carbon emissions by 2050 (and 2045 in Scotland) and deliver continual improvements to air quality so that our passengers, neighbours, and employees breathe healthier air.



A low-emission railway

Greener assets, healthier air

We have an opportunity to change the way that we design, build and operate our assets so we can minimise our whole-life carbon and air pollution emissions, make an important contribution to the UK's targets and look after the safety and wellbeing of our employees. Air quality is also a critical issue for communities across Network Rail regions, and one that we expect to continue to become a more important issue for the nation's health.

Besides the emissions from powering trains, our carbon emissions come from a wide range of business activities. These include energy required for our stations and offices to operate (such as lighting, heating and escalators) energy used by our road fleet vehicles, and emissions associated with building and maintaining our infrastructure.



Our infrastructure-related emissions are largely generated by our supply chain.

This includes 'embodied carbon' in products (for example, from energy required to extract raw materials, manufacture the materials into a product, and transport the product to our site), and our staff and contractors on site using machinery and equipment to design, build, maintain and renew our assets and infrastructure

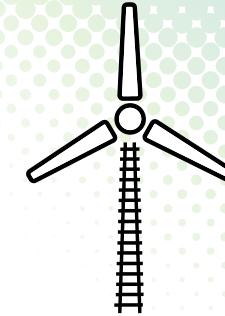
We are already making good progress rolling out energy efficiency measures across our estate and we are working with our employees to share the importance of individual action in reducing carbon emissions. Our project teams are beginning to embed an understanding and evaluation of the carbon impacts in our infrastructure and engineering works. These teams are also identifying where we need to adapt our policies and standards to support this.

Our land also offers a huge opportunity to help reach our net zero target, by offsetting residual emissions where we don't yet have the technology to do so, through planting trees and carbon sequestration.

The safety of our employees is very important to us; we have reduced workplace exposure to air pollutants and put in measures like personal protective equipment (PPE) to keep our staff safe. The rail industry is already making progress in using technologies such as measures to capture emissions from exhausts and putting in policies around idling of passenger trains and road traffic around stations. We want diesel-free worksites to protect our staff. We also have requirements to minimise pollution to the environment for projects and contractors on site, but we want to set our ambitions higher.

We will work with our supply chain to reduce their emissions and improve air quality. We will also minimise emissions and improve the air quality at our own stations and depots increasing the competencies and knowledge within the organisation to improve our own performance. In the future we want to go even further and generate our own renewable energy, have a 100% ultra-low emission vehicle fleet (building on pilot projects such as 'Project Zero' in Wales), and embed whole-life carbon into our decision making.

Active travel is an important part of sustainable end to end journeys. They also help keep the air cleaner by reducing emissions around stations from private vehicles and other diesel engines. We are committed to working with local authorities, operators and at our own managed stations to put in place facilities such as bicycle storage and making sure that access and wayfinding supports passengers who want to walk and cycle to our stations.



A low-emission railway

Our key milestones

1. Go beyond embodied carbon assessments to whole life carbon assessments, to support infrastructure projects by 2027
2. All appropriate plant, worksites and depots to have dust suppression in place by 2029
3. Transition assets away from use of natural gas by 2029
4. Establish an air quality monitoring regime for worksites and depots by 2024
5. Complete electric vehicle charging roll out (sites that Network Rail operate and our managed stations) by 2029 and transition of Network Rail's road vehicle fleet to Ultra Low Emission (ULE) by 2035
6. Update our procurement model by 2022 to reduce value chain emissions by 2032
7. Achieve agreed science based targets for scope 1 and 2 by 2050 at the latest (Scotland 2045)

8. We will purchase 100% renewable non-traction electricity by 2020, and will aim to feed in 100% of our non-traction electricity from renewable sources by 2030
9. We will have an air quality improvement plan for all our managed stations and depots in place by 2024

Measuring our performance

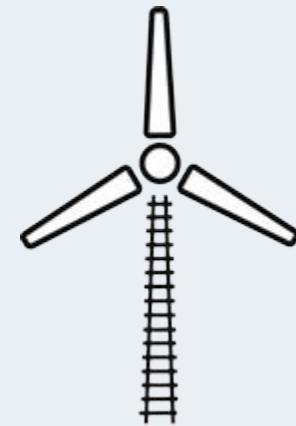
We have metrics and targets in place for reducing our energy use - for example reducing energy consumption in buildings.

We are also measuring the number of large projects that are using the RSSB carbon tool to reduce the carbon impact of infrastructure projects.



We have introduced science based targets for emissions reductions by the end of each control period which complement our whole-life approach to reducing emissions across all areas of our operations.

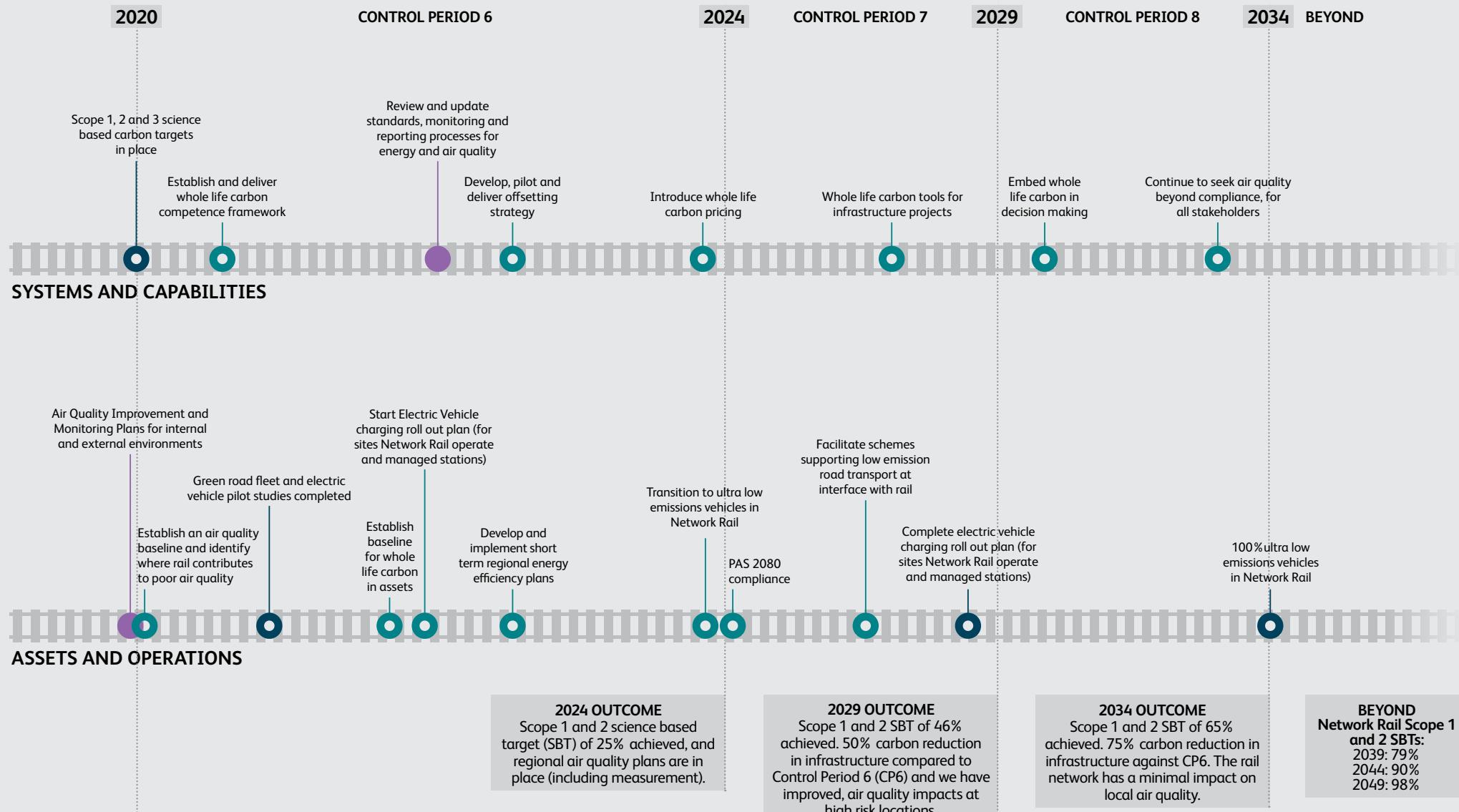
We measure aspects that contribute to better air quality like the number of low emissions vehicles in our fleet and the number of dust suppression systems in place. We will start tracking these more actively to measure our progress towards improving air quality.





GREENER ASSETS, HEALTHIER AIR

We will achieve net zero carbon emissions by 2050 (and 2045 in Scotland) and deliver continual improvements to air quality so that our passengers, neighbours, and employees breathe healthier air.



● One-off or ongoing activity starts

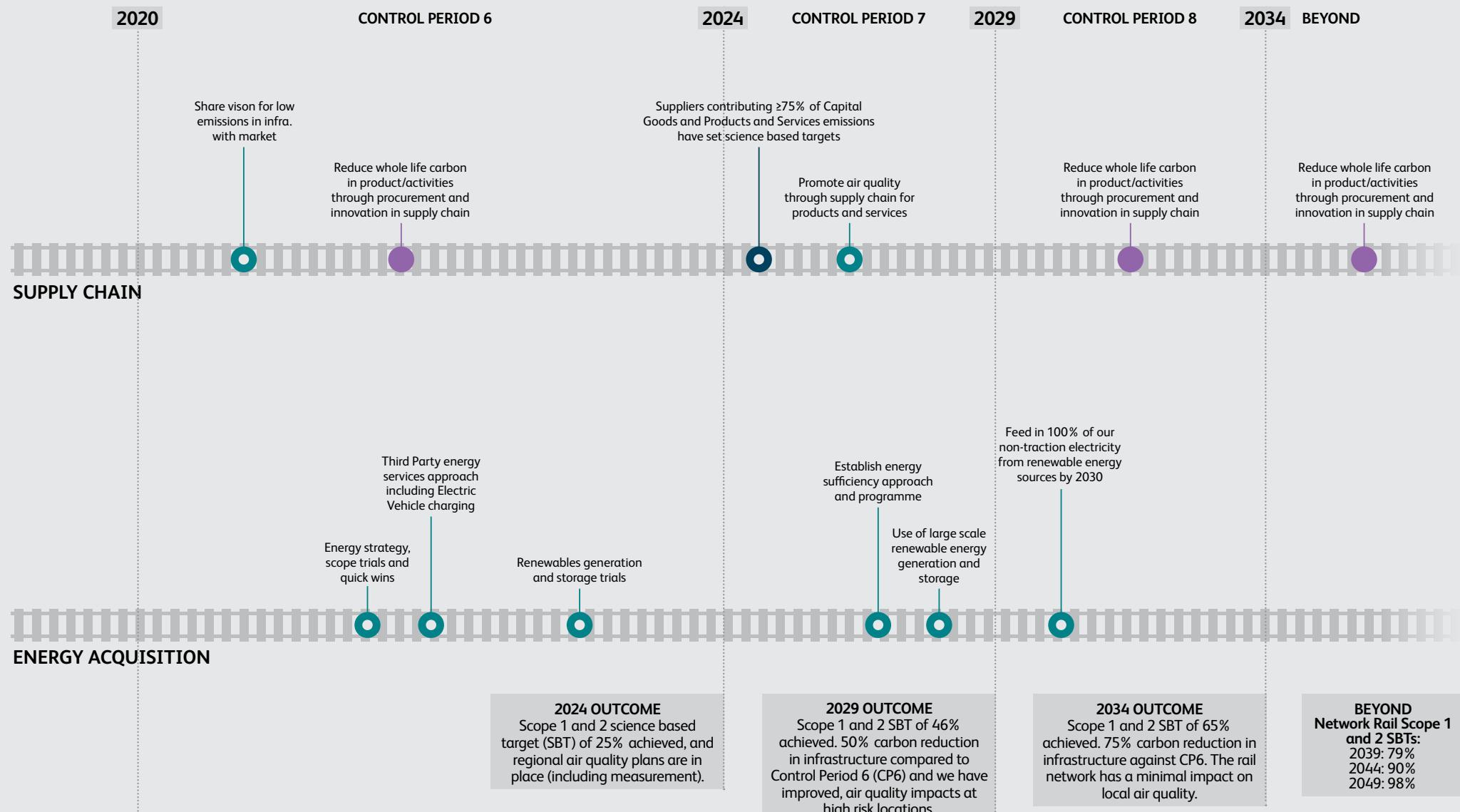
● Outcome achieved by

● Activity that is repeated or regularly updated (e.g. every control period)



GREENER ASSETS, HEALTHIER AIR

We will achieve net zero carbon emissions by 2050 (and 2045 in Scotland) and deliver continual improvements to air quality so that our passengers, neighbours, and employees breathe healthier air.



● One-off or ongoing activity starts

● Outcome achieved by

● Activity that is repeated or regularly updated (e.g. every control period)

Scotland

We are working hard alongside the Scottish Government to decarbonise Scotland's Railway by 2035 – increasing electrification on our network by 25% since 2014.

We are going to deliver even more over the next five years with work already underway on two more electrification projects on routes into Glasgow Central.

We are also examining how new technologies – hybrid, battery-powered and hydrogen trains – could be used to decarbonise lines where electrification may not be a practical option.

And we're looking at how we reduce the carbon footprint of our offices and our worksites, too, including trialling solar-powered generators for our track maintenance works.



A photograph showing a massive, foaming wave crashing onto a set of railway tracks. The tracks run parallel to a coastal road where several houses are visible. The water has inundated the area around the tracks, and the wave itself is a mix of white spray and dark, turbulent water. The sky is overcast.

**A reliable railway
service that is resilient
to climate change**

A reliable railway service that is resilient to climate change

More frequent and more extreme weather conditions caused by climate change have an impact on our ability to run the railway safely and on time. We want to minimise delays and cancellations so we can keep connecting communities and businesses and supporting the UK economy.



Our Weather Resilience and Climate Change Adaptation Strategy has been in place since 2017, and we are making good progress identifying and managing key risks and areas of vulnerability across the Network Rail regions. We're proud of our robust, risk-based approach to adaptation, and so we want to build on this and embed long-term, forward-looking adaptation into the core of what we do.

We want passengers and freight to be able to get to where they need to be on time and our workforce to be safe. As such, our long-term ambition is to have prepared the railway infrastructure to minimise the impacts of climate change by 2050. To maintain today's performance will take effort and investment – to reach our ambition will take significantly more.

Critical to our plans for minimising safety and reliability performance impacts caused by climate change is embedding resilience into the way that we design, build, operate, maintain and replace our railway assets. Our mantra for replacing assets in the future will be 'replace like with better' rather than 'replace like for like'. This change will mean we will continually improve the network, making it more resilient for our customers and passengers. We will also work with a range of partners including environmental regulators and landowners to bring our strategy to life.

Our key milestones

1. Asset policies and standards updated to reflect long-term climate change projections by 2024
2. Review criticality and vulnerability mapping of all assets for climate change across the network by 2024
3. Agree level of service in extreme weather conditions with Government and regulators by 2027
4. Regions develop long-term adaptation pathway strategies and identify level of investment required for different scenarios by 2029

Measuring our performance

Performance indicators are already in place to measure train punctuality on adverse and extreme weather days. We also have a target for all of Route and Asset Weather Resilience and Climate Change Adaptation Plan milestones to be achieved in the next four years.

We recognise the need to introduce a more strategic, leading metric and target to be able to demonstrate overall progress towards a more resilient railway.

CASE STUDY

Conwy Valley flood resilience works

The Conwy Valley line – between Llandudno Junction and Blaenau Ffestiniog, on the Wales and Borders route, has been severely affected by flooding, most recently during Storm Gareth on 16 March 2019 and Ciara on 8-9 February 2020 leading to prolonged line closures. The line has been closed following storms several times over the past few years including in the same location in 2015 and the railway has been previously reinstated on a like for like basis with no thought for resilience.



It was decided to proactively install additional resilience during the reinstatement works to protect against future events which are likely to be greater in magnitude than previously experienced. Due to time constraints, only part of the infrastructure saw this treatment in 2019. Following the 2020 damage, it was decided to install similar protection through this section.

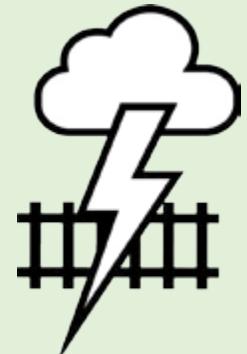
As a result of the Coronavirus pandemic the opportunity was taken to maintain the line closure through the summer months to enable this work to be completed.

The 2019 works took colleagues four months to repair the extensive flood damage – including six miles of track and embankments, nine culverts (large drains/ channels beneath the railway), 10 level crossings and a platform at Dolgarrog station. Six culverts were installed in the space that the embankment used to fill to help dissipate the water rising against the embankment and give protection to the infrastructure from water pressures and reduce flood level impacting adjacent properties.

Protection was installed to dissipate the energy of the fast-flowing water to minimise scour (erosion) at the culvert inlets and outlets. This protection was extended to other areas at risk as well as the section that was rebuilt.

In 2020 the damage was limited to a 1.8km section near Dolgarrog where resilience measures were not installed in 2019. Following reinstatement of the track, a rock embankment is being constructed to dissipate the energy of the overtopping river water and significantly reduce the scour risk to the track and therefore protect the track from washout.

The works provide a more resilient railway for the Conwy Valley and are a good demonstration of how resilience is being considered at every stage of the job. They ensure that vulnerability is not being shifted to the next asset along the section and reduce the chance of these prolonged closures occurring in the future.



CASE STUDY

Collaborating with third-party organisations to manage flood risk

Storm Eva in 2015 flooded 3,355 properties in Leeds including 672 commercial businesses. The railway was closed for three days at Kirkstall costing Network Rail over £33,000 in delay and cancellations. The direct cost to the city of Leeds is estimated at £36.8m, with the cost to the wider city region exceeding £500m.

The area of Kirkstall Bridge in west Leeds has seen flooding impact the safe and efficient operation of the railway 10 times since 2003, and four times in 2015 alone. In any given year there is currently a 35% chance of disruptive flooding affecting the safe performance of the railway.



The root cause of the flooding is thought to be the permeability of the land between the railway corridor and the adjacent River Aire. Areas of privately-owned riverbank have degraded over time, allowing passage of water.

When the river rises to a certain level, water seeps and pipes through areas of unprotected, unconsolidated fill and settles in the railway track, causing track circuit failures and flooding. The risk cannot be effectively mitigated without extensive physical work on private land.

Flooding at Kirkstall is high profile as it severs the network serving West and North Yorkshire to the west of Leeds, causing significant transport challenges for the Leeds area involving thousands of people. The events of Christmas 2015 led to requests for information from local MPs, councillors and residents.



Network Rail formed a partnership with the Environment Agency and Leeds City Council and contributed £1.5m to the £200m second phase of the Leeds Flood Alleviation Scheme to mitigate the problem.

The wider scheme is designed to give a 1 in 200-year (+40% climate change uplift) level of flood protection to the city, including the railway. The project involves: planting up to two million new trees to reduce stream flow in the upper catchment as part of a strong focus on using Natural Flood Management; new infrastructure in the form of flood defence walls and embankments; and flood storage where moveable weir technology will be utilised to allow water to collect and then be released slowly back into the river in a controlled way.

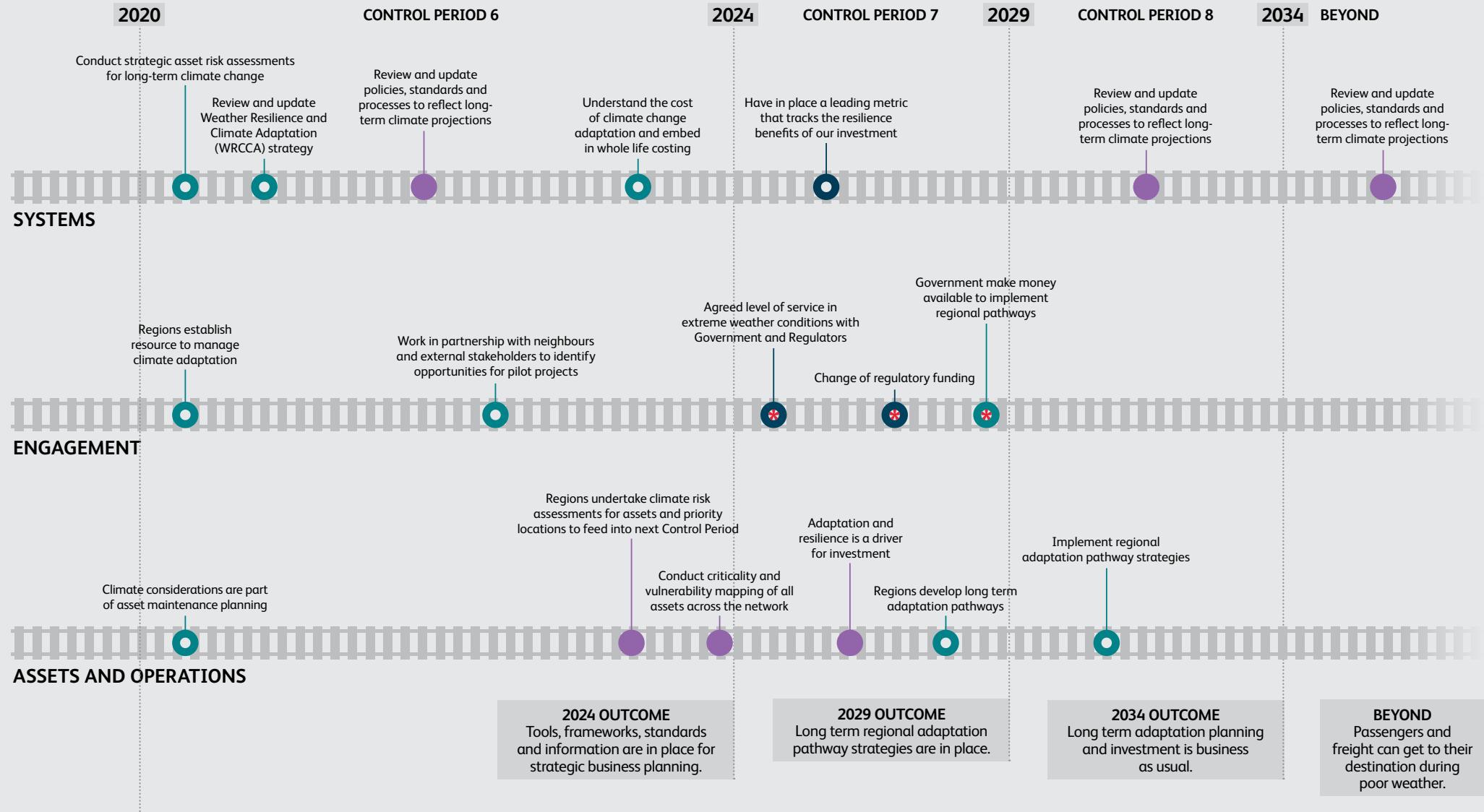


The project is currently in construction and when completed in 2022 will reduce the risk of flooding at Kirkstall from 1 in 3 to 1 in 200-year return period. The partnership has provided a much higher level of resilience than would have been possible if Network Rail acted alone and will provide significant performance, financial and reputational benefits to Network Rail and enhance trust in our ability to keep passengers and freight moving.



CLIMATE CHANGE ADAPTATION

We have prepared the railway infrastructure in order to minimise the impacts of climate change by 2050



Eastern

We will deliver big cuts in energy consumption, reduce our carbon footprint and better protect the wildlife that lives near our railway.

To achieve that, we will build sustainability into everything we do – from taking plastic forks out of our canteens, to making our multi-billion-pound engineering projects more sustainable. We will become better custodians for the trees, plants and animals that live next to the railway to produce a positive effect on biodiversity. And we will waste less and recycle more.

As we emerge from the Coronavirus crisis, it will be more important than ever to look to, and plan for, challenges ahead.

66

51





Improved biodiversity
of plants and wildlife

Improved biodiversity of plants and wildlife

We are fortunate to share our environment with a huge variety of plants, animals and habitats and we must protect this biodiversity. As the owner of more than 52,000 hectares of land with seven million neighbours, we can make a big difference.

We are already making changes to the way that we think about biodiversity and land use planning. We are moving away from just clearing vegetation on our lineside, to assessing the life on our land and on neighbouring plots of land and working out how we can maintain and enhance it, whilst still protecting the railway from risks to safety like falling trees. We are using ground-breaking approaches such as using satellites to measure habitats.

Our Sustainable Land Use Programme is fundamental in helping us to achieve our ambitious targets, and to scale up and extend some of the effective land management practice and pilot programmes that we already see across our regions.

88
Nearly
60%

of people think businesses like Network Rail are responsible for resolving environmental issues such as loss of wildlife.



And we want to do more. We will take a sustainable approach to the management of our land. This will include an appropriate balance between renewable energy generation, biodiversity, carbon offsetting, housing and commercial use.

Our ambition is to look after nature and protect, maintain and enhance biodiversity across the railway landscape by 2035. To do this we will create a railway estate that is lined with species rich grassland, hedges and well-managed trees and work in partnership with our neighbouring landowners and stakeholders. Our ambitions go beyond recommendations in the independent Network Rail Vegetation Management Review (Varley Review) of Network Rail's vegetation management (for England and Wales), as well as stretching beyond the DfT's target of Biodiversity Net Gain by 2040 by achieving it by 2035.

Our work on biodiversity is strongly linked to our other priorities. Nature-based solutions help to reduce the amount of new raw materials we use, reduce our carbon emissions, help to create a more biodiverse environment, and can increase resilience to climate change.

Our key milestones

1. Publish national biodiversity standard by end of 2021. Use the outputs to inform guidance to Network Rail asset managers on optimal habitat management interventions for biodiversity and train performance
2. Establish the biodiversity baseline, map all relevant data and make available to our supply chain by 2024
3. Increase ecological capability in Network Rail and in our supply chain to 2024
4. Achieve no net loss of biodiversity across the network by 2024 and net gain by 2035
5. Recognition as a leader in land management by 2030

Measuring our performance

Our overarching targets are no net loss of biodiversity by 2024, and biodiversity net gain by 2035. We will introduce annual natural capital reporting against a defined baseline by 2024.

We will monitor our performance against metrics in our Biodiversity Action Plan, and this will be delivered by regional and route-based habitat management and vegetation management plans, and progress against these targets will be reported in regional/route state of nature reports annually.

CASE STUDY

Baselining our biodiversity

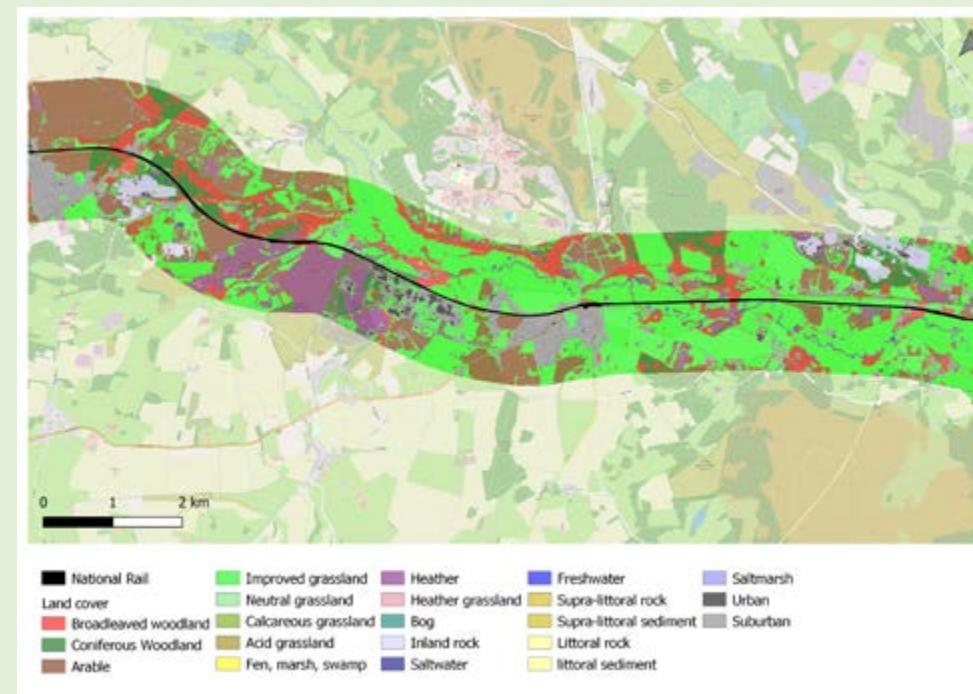
Network Rail is using an innovative approach to establish a baseline of the biodiversity that lives on its estate. The baseline provides information on the range of habitats, plants and species that are currently present and by re-baselining over time will enable us to measure changes in biodiversity on our estate. The baseline is built up from a number of data sources. Firstly, information collected from satellites is used to create a map of habitats on our estate. Surveys are then carried out on selected habitats to build up a picture of the plants and animals that live in them and this information is augmented with biodiversity records from publicly available datasets. Our team of in-house ecologists then use this information to produce local management plans for the habitats and species that live on our estate and improve connectivity across the landscape.

Network Rail is carrying out research into how the information from the baseline can be used to calculate the carbon stored in the trees and other habitats on our land, and the environmental

benefits that they provide for society. This research will help us understand the environmental impacts of our land management activities and what we have to do to improve how we do things.

Network Rail are working in partnership with Natural England and other organisations to support the establishment of Nature Recovery Networks across Britain.

Nature Recovery Networks are joined-up networks of habitats that encourage the movement of plants and animals across the landscape. They are important for connecting isolated and threatened populations of plants and animals and increasing their resilience to environmental and land-use change.



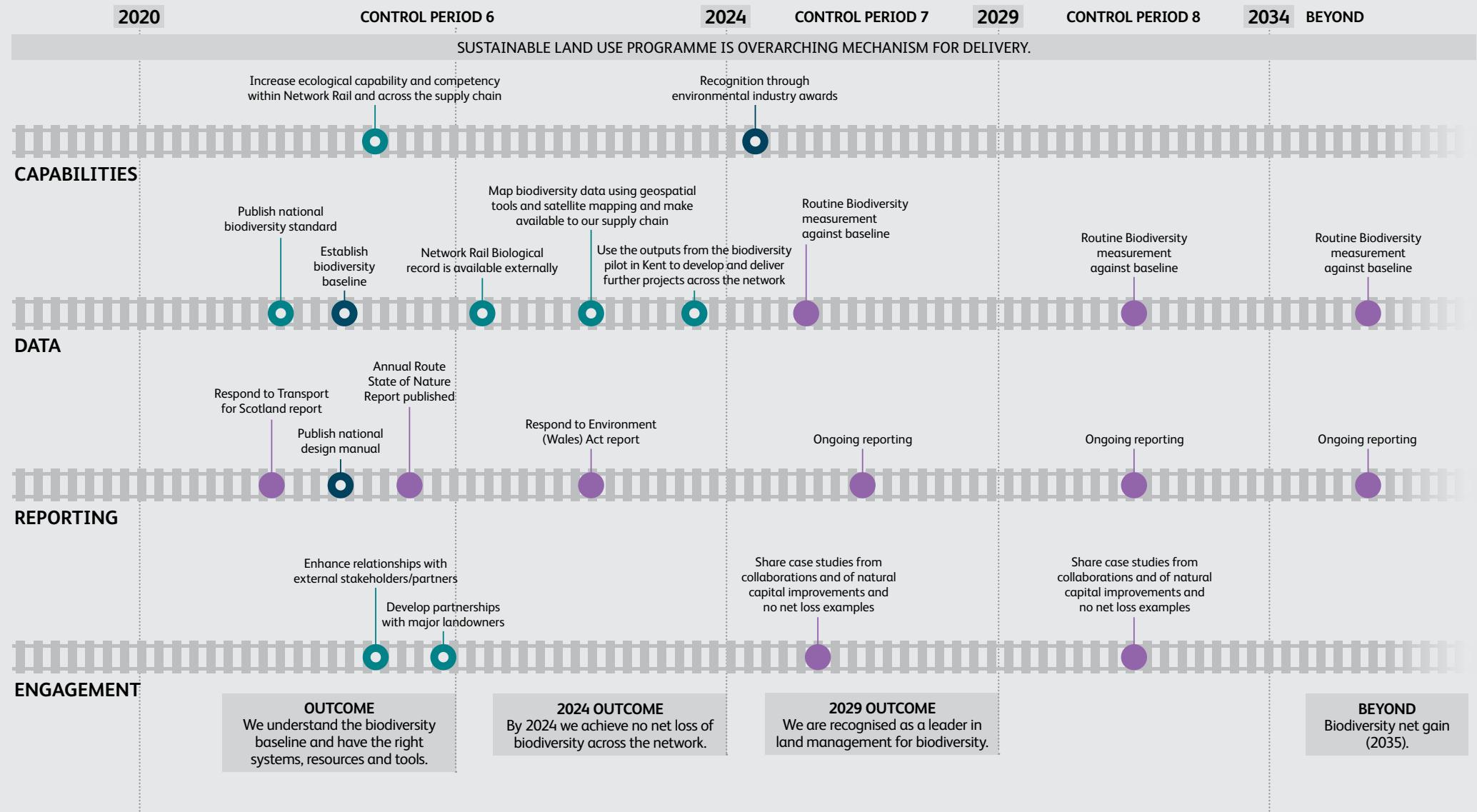
Our network of railway corridors that span the length and breadth of Britain are already important for providing ecological connectivity at a landscape scale but there is more we can do to enhance the habitats on our land to improve conditions for fragmented populations of rare and threatened plants and animals such as the large blue butterfly.

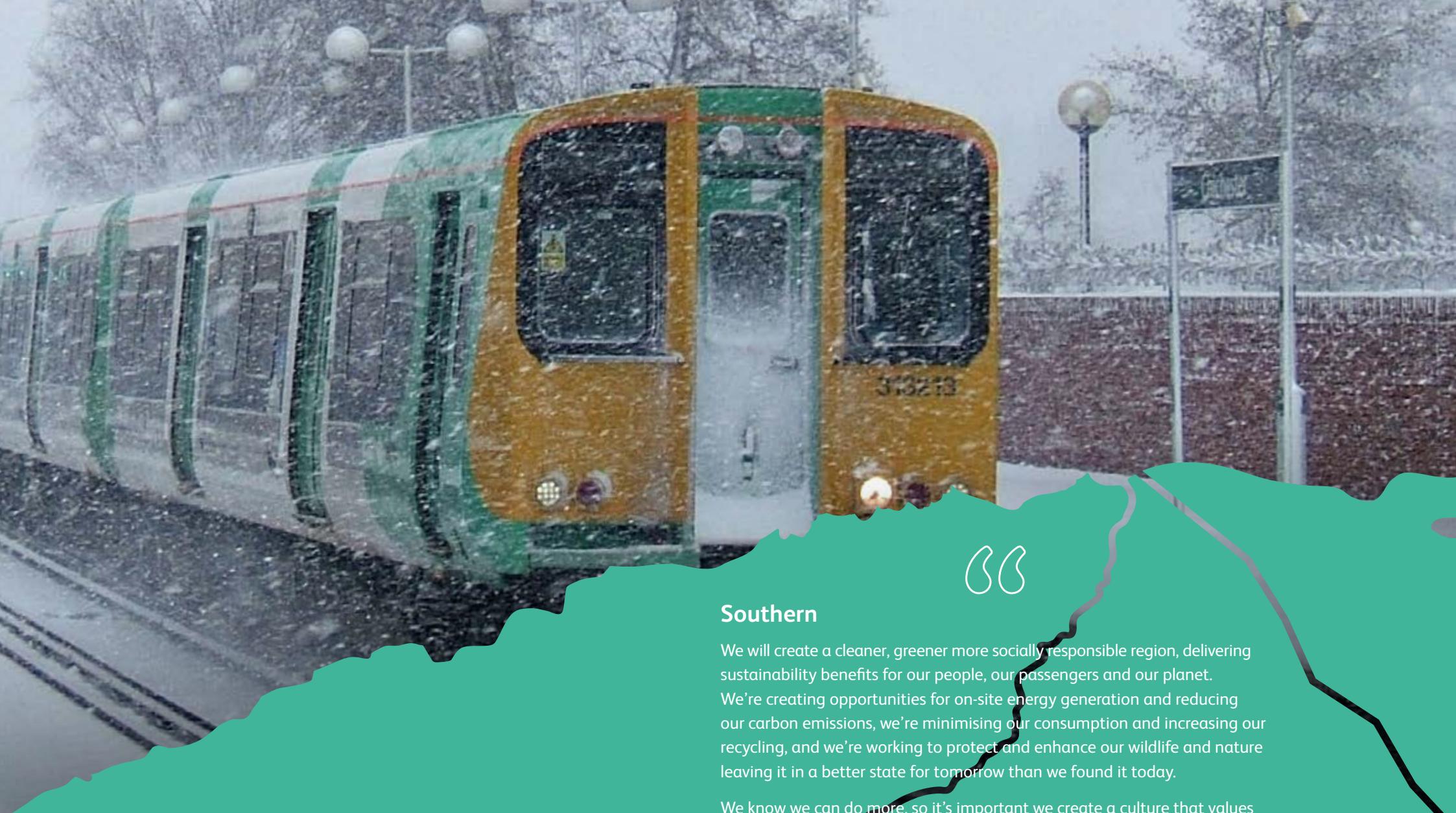




BIODIVERSITY

We look after nature and protect, maintain and enhance biodiversity across the railway landscape





Southern

We will create a cleaner, greener more socially responsible region, delivering sustainability benefits for our people, our passengers and our planet.

We're creating opportunities for on-site energy generation and reducing our carbon emissions, we're minimising our consumption and increasing our recycling, and we're working to protect and enhance our wildlife and nature leaving it in a better state for tomorrow than we found it today.

We know we can do more, so it's important we create a culture that values environmental and social responsibility at every level. To enable this we're getting brilliant at the basics, improving our sustainability training, communication, reporting and leadership.

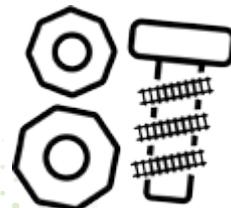


Minimal waste and the
sustainable use of materials

Minimal waste and the sustainable use of materials

We use lots of materials to build and maintain the rail network, spending around £7bn a year on our supply chain. Our activities produce a lot of waste; 2.1 million tonnes in 2018/2019. We have to use less and manage unavoidable waste better. We have a huge opportunity to contribute to a more circular economy, where we extract fewer virgin resources from the planet, keep materials and resources in circulation and waste to an absolute minimum. This action will also help us significantly reduce our carbon emissions.

We have already made good progress minimising the amount of waste sent to landfill but we need to do more about the volume of waste we produce. In 2017/18, 98% of our waste was diverted from landfill. As our assets last for a long time, and are costly to replace, the re-use of key infrastructure materials like track and ballast is already core to how we work.



We have our own in-house processing facilities across the rail network to allow us to reuse and recycle our materials such as ballast and have our own app to share surplus or materials internally rather than buying new. Now is the time to challenge ourselves, reducing our use of resources and set more stretching targets for how we manage unavoidable waste and plastic pollution.

Our ambition is to reuse, repurpose or redeploy all surplus resources, minimise use of resources, design out waste and plastic pollution, and embed circular economy thinking into the rail industry by 2035. To achieve this, we need to bring the whole industry along with us. We will be setting high standards for our supply chain. We will work closely with our suppliers, for example, to research and develop new, innovative secondary materials that reduce our reliance on virgin materials and discover new ways of designing and building assets to keep materials and resources in use for longer.

From big changes on projects to working with retailers and passengers to take small steps to reduce the amount of waste in our stations. We want to form meaningful partnerships across the rail industry and infrastructure sector to share resources, waste streams, and best practice. Our work on sustainable use of materials supports our other priorities. Thinking about the ‘whole life’ of assets and products helps to reduce carbon, minimise waste and use of materials and be more resilient to climate change in the long term.

Our key milestones

1. Map and prioritise materials and waste streams within our supply chain by 2021
2. Circular economy policy in place for reducing resource use and waste by 2022
3. Adapt standards to include circular economy aspects by 2023
4. Embed material re-use and redeployment systems and tools into procurement process by 2024
5. Embed circularity metrics into decision making by 2024
6. Reuse, recycle, or redeploy all our non-hazardous infrastructure materials by 2029

Measuring our performance

Waste sent to landfill is already monitored and reported on, with national and regional targets. However, we know we need to set more ambitious targets for the future, and we are currently developing these.

We will develop leading indicators, for example, proportion of procurement activities which include circular economy requirements are being considered. In addition, we will create an overarching circular economy metric to embed into our reporting.

88
90%
of the public
think it is important
for us to send zero
waste to landfill.

CASE STUDY

Circular economy in practice

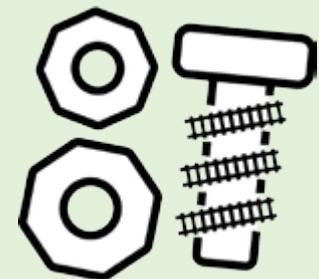


Track ballast is an important aggregate material for Network Rail as it supports the track by keeping it secure, helps with rainwater drainage and prevents vegetation growth that could destabilise the track. Track ballast degrades over time, so Network Rail's High Output Ballast Cleaning System is used across the network to maintain the track bed by cleaning the ballast and recovering good quality aggregate for re-use back onto the track bed. Over the last 10 years, the High Output Ballast Cleaning System recovered 2.6 million tonnes of track ballast for re-use back onto the track, saving Network Rail £9 million in material costs.

Where the used track ballast no longer meets product quality, the rejected ballast is transported by rail to one of Network Rail's nine aggregate handling depots (AHDs).

The AHDs process the used ballast material alongside redundant railway sleepers and rail from maintenance and capital delivery projects to provide opportunities for re-use – either back into the railway, in land reclamation or sold on for re-use in heritage railways or construction.

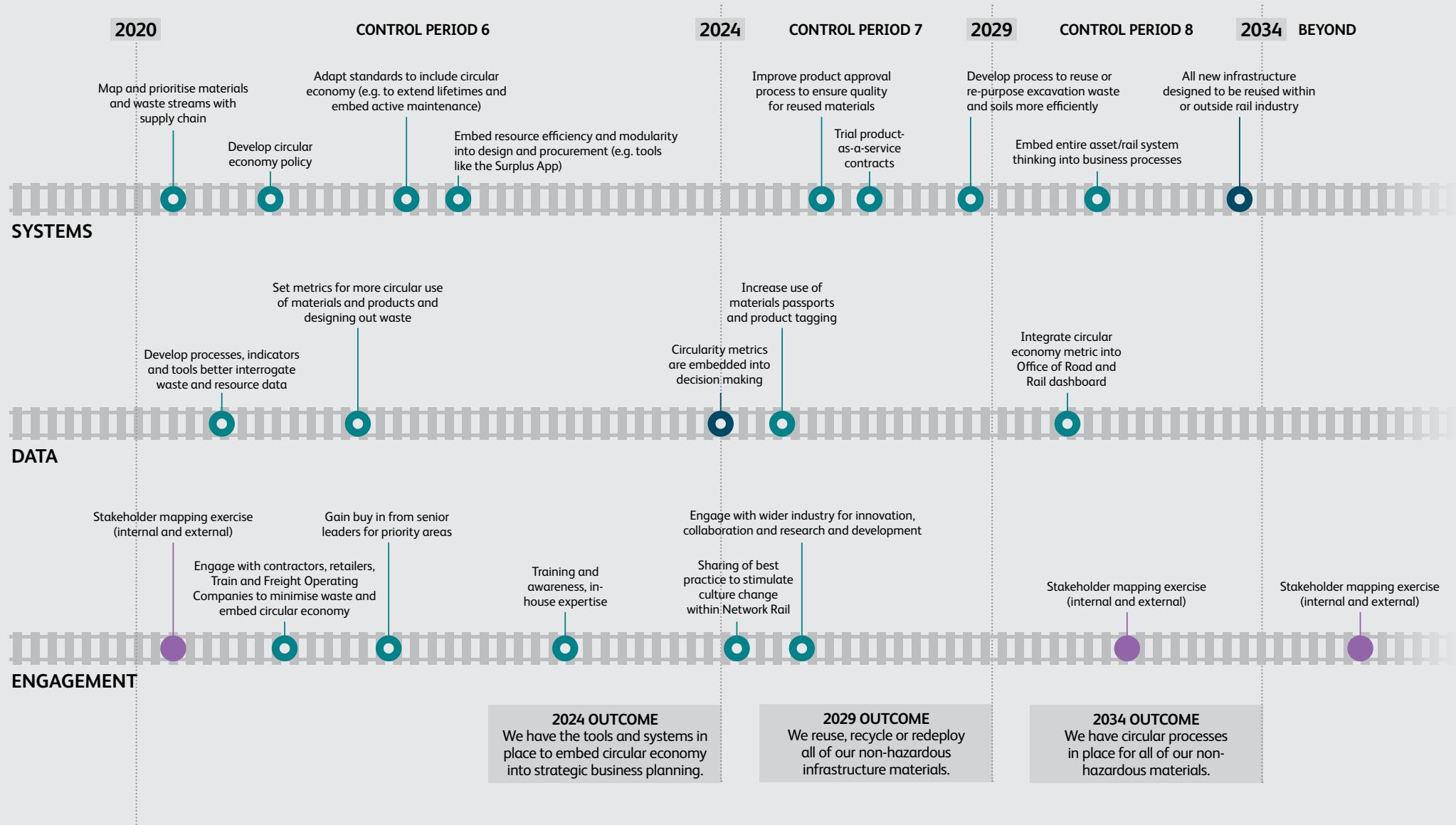
The benefit of this inhouse approach to waste management is that waste is moved up the waste hierarchy wherever possible and the financial returns from selling the redundant materials can be reinvested back into the railway. Applying circular economy principles across all our waste streams will enable Network Rail to better identify waste materials as a resource, adding value beyond its intended purpose.





CIRCULAR ECONOMY ROADMAP

We will reuse, repurpose or redeploy all surplus resources, minimise use of resources, design out waste and embed waste life-cycle/circular economy thinking into the rail industry by 2035.



68

Wales and Western

Rail is fundamental to the solution when it comes to the big challenges of our age: biodiversity loss, carbon reduction and responding to climate change.

In Wales and Western we will lead the way, working with our industry partners to build a sustainable railway for the future that meets the needs of the people, communities and diverse landscapes we serve.





An organisation
enabled to succeed



An organisation enabled to succeed

Our priorities – and the plans supporting them – can only be delivered successfully if we are an organisation enabled to succeed. We have identified six enablers that will run support the delivery of our priorities and ambitions. Each enabler has a few commitments.

Early delivery of the commitments (i.e. before April 2024) will be important to create the right conditions for delivery of our detailed plans. In many cases, the commitments will also accelerate the delivery of our plans, generating efficiencies and benefits.

To ensure the commitments are successful we will make sure they are owned, someone is accountable for them and they are managed and adequately resourced.



An organisation enabled to succeed



1. People

Our people are critical to our success and everyone has a role to play in making sure we meet our ambitions and deliver our priorities; our leaders to drive change, our experts to advise, and our everyone to champion environmental sustainable development. Support through training and effective internal communications is key and these elements of our people plan will help us keep momentum. We need the right culture to deliver the right outcomes.

Our commitments:

1. We will support our own people to manage and reduce their own carbon footprint (for example, through flexible working and reducing unnecessary travel).
2. All our executive leaders will have environmental sustainability objectives in their annual performance reviews and we will create a culture where everyone takes responsibility for the environment.

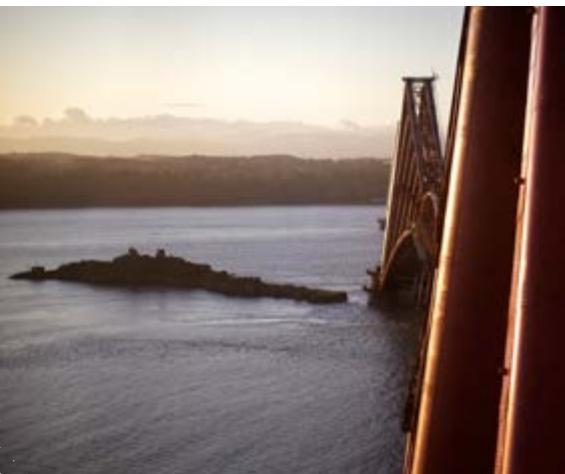
3. We will support our people by putting in place the resource to deliver the strategy; this means the right people in place, with the right tools, training and skills. Our sustainability experts across the organisation will share information and best practice.

4. We will set up a network of Green Champions for our priorities at all levels of the organisation including at a senior level. Green Champions will be able to make a difference to their local communities, share good practice and keep momentum on the delivery of our plans.

5. We will deliver engaging internal communications to create interest in the strategy amongst our colleagues as part of wider cultural change across the business, sharing good news stories, highlighting best practice and generating momentum and excitement in our priorities.



An organisation enabled to succeed



2. Funding and planning

We are funded in five-year cycles known as control periods; we are currently in CP6 which ends in 2024. We have made good progress in previous control periods and need to continue and accelerate the good work we are doing to deliver this strategy.

Integrating environmental sustainability ambitions, priorities and activities into our planning process for Control Period 7 (CP7: 2024-2029) will allow us to secure funding for our activities in the future. To ensure our business can focus on delivery we will include the outcomes of this strategy in our 'strategic ambition statement'.

For large-scale infrastructure projects, called enhancements, the DfT and Transport Scotland use a different funding mechanism, the Rail Network Enhancement Pipeline (RNEP). Finance for projects such as electrification go through this process and it is critical that we put together strong business cases for this work to influence the decision-makers and secure funding.

To show our commitment to delivering everything we do in an environmentally sustainable way we will take into account natural capital when making investments as highlighted in the Government's Green Book. We will also seek a dedicated fund during the negotiations with the DfT, Transport Scotland and the Regulator for our CP7 funding. This will allow us to support new and innovative projects that deliver environmental sustainability.

Our commitments:

1. Each priority area will become an objective within the business planning process that sits under the 'strategic ambition statement'.
2. We will develop the evidence, business case and measurable benefits in a bottom-up approach, to be included in the periodic review process. We will include environmental sustainability considerations into all Strategic Business Plans from the beginning of 2021.
3. Our financial governance processes (e.g. our Investment Boards) will consider environmental sustainability issues in the same way they do operational and performance impacts in their decisions.
4. To secure funding for electrification we will work closely with the Department for Transport, Transport Scotland and the Treasury to get buy-in to provide the evidence for the benefits and the business case.
5. We will put a case to funders to create an Environmental Sustainability Fund to start in 2024.
6. Environmental sustainability will be incorporated into the Whole Industry Strategic Plan (WISP), linking up plans across the industry and providing visibility of our priorities.

An organisation enabled to succeed



3. Systems and processes

Having the right internal systems and processes will help us identify, set up, supply, deliver and govern projects. Our project management tools and standards should make defining and delivering environmental sustainability projects easier, integrating it into the day job rather than acting as an obstacle. Embedding environmental priorities in systems and processes will help us create a ‘line of sight’ between operations and this strategy.

The people who supply materials for our work and projects are critical to us being more environmentally sustainable. We spend billions of pounds each year buying resources, and if our suppliers are green then we can be too. Environmental considerations need to be addressed in early stages of procurement and given a high priority.

We need to be an ‘intelligent client’ specifying our outcomes needs and managing our supply chain to best meet our ambitions and priorities. It is also important that environmental considerations are delivered in practice and not value-engineered out.

Once our projects are up and running, good governance is important. Whilst our regions will be accountable for delivering detailed plans, we will also take a company-wide view of progress at the Environmental Sustainability Advisory Committee (ESAC) and a whole industry approach by incorporating our priorities into the Whole Industry Strategic Plan (WISP).

Our commitments:

1. We will review our standards to make sure that they reflect our environmental sustainability priorities. We will also work with the RSSB to do the same for Railway Group Standards.
2. We will make sure that our Governance for Railway Investment Projects process (GRIP) incorporates environmental sustainability risks and opportunities throughout; from options generation to sustainable design.
3. We will challenge our supply chain to be more sustainable working in partnership, so our environmental sustainability objectives are addressed early in procurement and embedded throughout. Environmental sustainability will be weighted appropriately in all procurement activities.
4. We will develop action plans for all parts of the business to deliver activities aligned with the priorities in this strategy and regional contexts.



An organisation enabled to succeed



4. Engagement

We cannot deliver this strategy alone. It is important to us to create strong partnerships across the industry and with supply chain, local authorities, relevant agencies and interest groups. Working with others will help us innovate, create efficiencies and deliver projects targeted to devolved administrations and local communities. We want to be easy to engage with and dependable for our key stakeholders.

Passengers and the public have told us that they want to see the railways do more to support our environment. If the public have more information about what we are doing to be more sustainable, they will feel better able to make green choices. As such, we are committed to sharing our progress, information on our contribution to society and the good news stories we have when delivering our priorities.



Our commitments:

1. We will commit to involving interest groups and community leaders in our activities, fostering innovation and collaboration.
2. We will actively look for opportunities to partner with our customers and neighbours to deliver environmental sustainability improvements for the whole railway.
3. We will update our website, annually, with progress towards our ambitions. We will share our progress with stakeholders including local, national and social media.
4. We will work with passenger and freight train companies, ROSCOs and our supply chain to develop solutions to environmental sustainability challenges together.

66

41 %

of our regular passengers believe the railways make a positive contribution to society.

An organisation enabled to succeed



5. Technology

New technology and innovation will be critical to our ability to deliver our ambitions. We can be innovative within our organisation and working with our partners across the industry. If we signal to the market that we want new solutions to our challenges, our supply chain will respond so we can make even greener and cleaner choices.

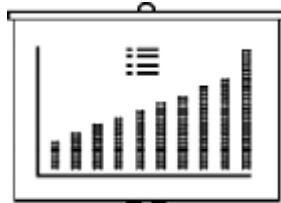
Our appetite to embrace new technology will mean we can make some of the biggest improvements to people's lives, for example getting hydrogen trains onto our network. Throughout our plans we have identified areas where we want to implement new technology and we will create the organisational culture and market environment to allow this to happen.

Our commitments:

1. We will use our research and development fund to advance innovative projects and new technologies to support this Strategy.
2. We will create a culture that encourages and supports innovation amongst our workforce including running competitions or creating 'hoppers' where colleagues can suggest new approaches to our challenges.
3. We will proactively encourage innovation in the supply chain through sending clear signals to the market on our level of ambition early on, using outcome-based specifications in procurement, setting up an 'innovation challenge competition' and streamlining our product acceptance process.
4. Working with passenger and freight operators, the supply chain and other industry partners, we will make sure we are able to be innovative and embrace new technologies that are aligned with this strategy.



An organisation enabled to succeed



6. Measurement

Passengers and the public want to know how we are currently affecting their environment and we should be open and transparent about our performance. To improve our performance, we also need to know more about where we are starting from and where we want to get to.

When we start any project, where relevant, we define how we will measure success and what key performance indicators are required. These indicators will need to align to information and datasets that already exist so we can create a complete baseline.

Whilst we currently generate a lot of data and information which tracks performance in different parts of our business it doesn't always tell us how we are performing overall. Our data and key performance indicators also need to paint a picture for our leaders and the public. We need to review our current measures, which are often tactical, and focus on a set that provide a strategic, top-down, view of performance.

Our commitments:

1. We will establish a clear picture of how we are performing and impacting people and the environment (2020 baseline) and we will have the tools in place to do this efficiently.
2. Across our detailed plans we will create stretching and measurable targets, plotting our progress against the baseline. We will make sure our targets are in line with our priorities.
3. Transparency is important to us; we will share our baseline, targets and current performance annually with the public, and we will actively encourage scrutiny and challenge of our work.
4. Our leadership teams will review our targets periodically to make sure we are challenging ourselves and being ambitious. We will use our data and information to provide internal assurance of progress against our priorities.



BB

North West & Central (NW&C)

We have a passion in NW&C to be the instinctive industry leader for the environment and sustainability, delivering a cleaner, greener transport corridor throughout the Region.

We will achieve this by working in collaboration with our stakeholders and partners to develop compelling business cases to electrify the Chiltern and Snow Hill routes, whilst supporting our operating partners to use alternative energy sources such as battery or hydrogen on appropriate routes.

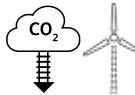
We will invest in our buildings and fleet to drive down energy use and carbon production through reduced consumption and increased efficiency. Using the power of all our teams, we will also reduce our impact on the communities that we serve creating opportunities for increasing biodiversity and improving air quality.



Definitions



Definitions



Low-emission Railway

Greenhouse gases, generated by human activity like burning fossil fuels, contribute to global warming. These greenhouse gases are commonly referred to as carbon emissions. Achieving ‘net zero’ carbon means getting a balance between the emissions we create and those we eliminate or offset for example, through planting trees. Emissions are measured and reported across these three categories:

- Scope 1 emissions are those we directly emit. These will include fuel for machinery on site, our cars and vans (fleet) and things like air conditioning leaks in office buildings.
- Scope 2 emissions are indirect emissions created during the production of energy purchased by us, for example, to use in our stations, signalling systems and offices. We can influence the impact we have on scope 2 emissions by purchasing lower carbon energy and generating our own renewable energy.

- Scope 3 emissions relate to sources that we do not necessarily control but have influence over. For example, emissions associated with the materials we buy, business travel, and supply chain activity which we can influence through our procurement processes including how we engage with our suppliers and contractors. Scope 3 emissions also include the electricity we buy and the diesel used to power trains (traction energy).

“Air quality” is the term given to the mix of component particulates, molecules and gases in the air derived from sources like diesel combustion engines. These can significantly reduce air quality in areas where they are released, leading to negative effects on health like an increased risk of respiratory diseases.

A reliable railway resilient to climate change

“Climate change adaptation” is action taken to improve the resilience of assets, networks and systems to future weather conditions. This means avoiding, minimising or mitigating the impact of more severe or frequent adverse and extreme weather events and gradual or erratic changes in weather patterns due to climate change.

The fact that many of our railway assets date back to Victorian times causes challenges when dealing with the impacts of weather. We can face challenges keeping lines running smoothly when the weather is particularly bad which can cause delays. We term this ‘adverse weather’ as opposed to extreme weather where storms, widespread flooding, extended heatwaves or snow can shut down parts of the railway.



Improved biodiversity of plants and wildlife

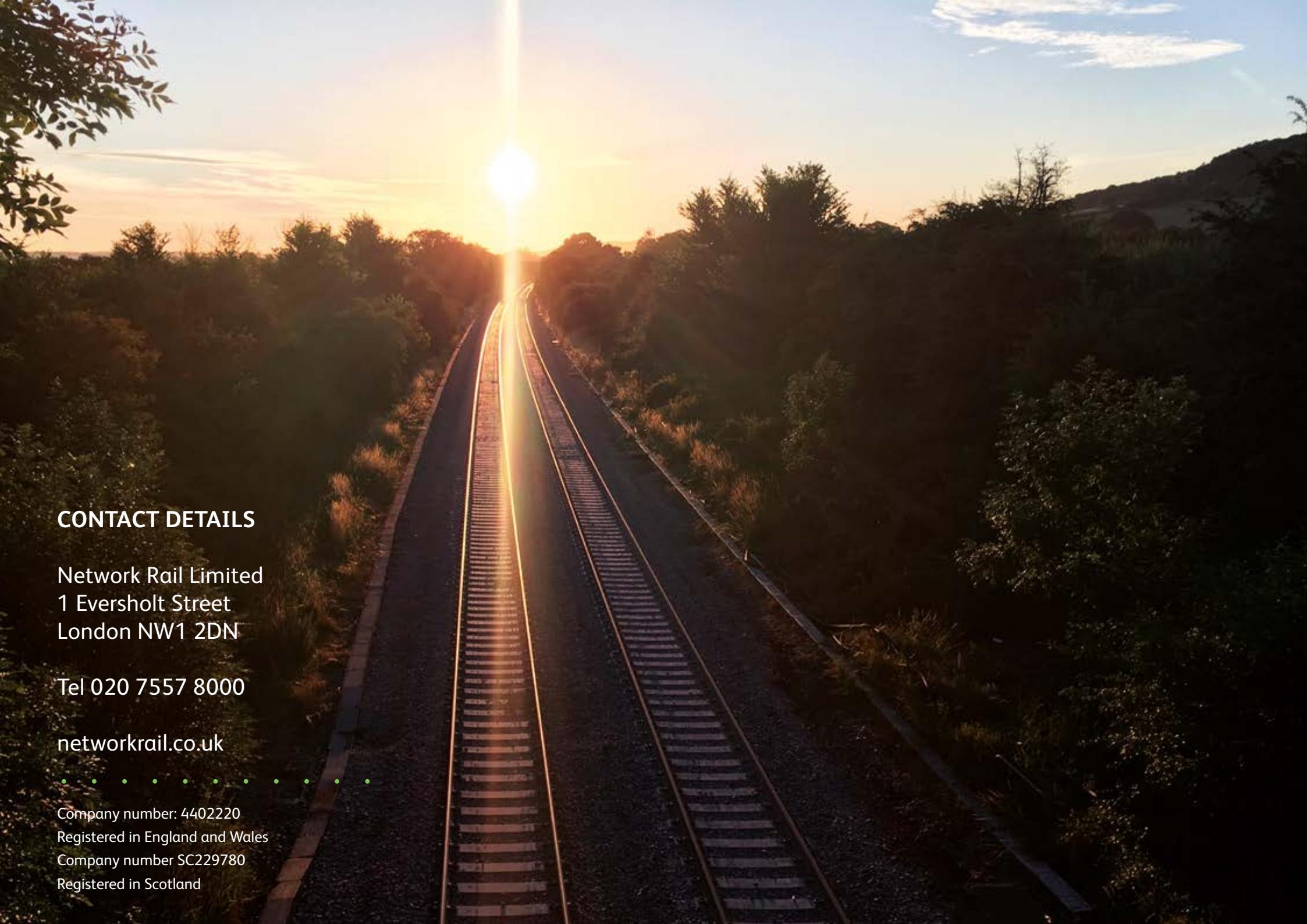
“Biodiversity” is the measure of the variety of plants and animals in the natural environment. A good level of biodiversity on land and in lakes, rivers and oceans, means it is more likely it is that a wide variety of different species of plants and animals will survive and thrive in the future. Biodiversity helps habitats and ecosystems provide essential services for people including amongst other things carbon storage, clean air and food. It also underpins people’s wellbeing and is valued for its intrinsic worth. The increasing loss of biodiversity from human activities is severely affecting the places and economies in which people live and work.

The term “no net loss” means that if biodiversity is affected in one area, it must be balanced by a gain in another area, so there is no overall loss of biodiversity. Biodiversity net gain means that any loss to biodiversity must be compensated for by a bigger improvement in biodiversity elsewhere, ideally close to the site of loss.



Minimal waste and the sustainable use of materials

A “circular economy” seeks to move away from ‘take-make-dispose’ and towards a system of designing out waste, keeping products and materials in use as long as possible, reusing, recycling and repurposing materials at the end of their life rather than throwing them away, and reducing the over-extraction of finite natural resources.



CONTACT DETAILS

Network Rail Limited
1 Eversholt Street
London NW1 2DN

Tel 020 7557 8000

networkrail.co.uk



Company number: 4402220

Registered in England and Wales

Company number SC229780

Registered in Scotland