

Net zero highways: our 2030 / 2040 / 2050 plan



NET ZERO HIGHWAYS

Our 2030 / 2040 / 2050 plan

An ambitious programme putting roads at the heart of Britain's net zero future

Roads will be a vital part of zero carbon travel

- Most journeys are made by road
- Road travel will decarbonise fast, but there is more to do
- A net zero Britain will still travel by road in 2050
- Investment in Britain's roads supports a thriving net zero economy

This plan is based on strong science and evidence. It aligns with:

- The 1.5°C reduction goal of the Paris Agreement
- The UK's commitment to be a net zero economy by 2050
- Government's Decarbonising Transport: A Better, Greener Britain (2021) and Industrial Decarbonisation Strategy
- The Committee on Climate Change's sixth carbon budget

Building on existing progress

- 95% of our network is within 20 miles of an electric chargepoint today
- We have been measuring the carbon footprint of our schemes for 30 years
- We are Britain's largest builder of cycleways having completed 150 schemes in the past five years
- We are part of a wider transport system that supports inter-modal travel

THREE STRONG COMMITMENTS - BACKED BY IMMEDIATE AND SUSTAINED ACTION



CORPORATE EMISSIONS

Net zero by 2030



MAINTENANCE & CONSTRUCTION EMISSIONS

Net zero by 2040



ROAD USER EMISSIONS

Net zero by 2050

Net zero for our own operations by 2030

Covering our own energy and travel. Actions include:

- ▶ We have bought certified, renewable electricity for our network lighting and operations since 2020
- ▶ We will replace 70% of our road lighting with LEDs by 2027
- ▶ Our non-traffic officer vehicles will be 100% electric by 2027, with traffic officer vehicles to be 100% electric by 2030
- ▶ We will plant at least 3 million trees by 2030
- ▶ We will reduce our corporate emissions by 75% by 2025 when compared to a 2017/18 baseline

Net zero for maintenance and construction by 2040

Covering emissions from making and transporting the materials used to maintain our network. Actions include:

- ▶ Launch a zero carbon construction innovation programme
- ▶ Develop a near-zero plan for each of our procurement categories by the end of 2022
- ▶ Design and build the first net-zero major road enhancement scheme, open by 2035
- ▶ Increase capacity on existing roads by roll out of our digital roads vision
- ▶ We will follow a trajectory of 0-10% reduction by 2025, 40-50% by 2030, 70-80% by 2035 and net zero by 2040 against a 2020 baseline

Net zero carbon travel on our roads by 2050

Covering emissions from users of our network. Actions include:

- ▶ We will publish our proposed approach to zero carbon HGV trials by the end of 2022
- ▶ We will publish a blueprint for EV charging services on our roads by 2023
- ▶ Integrate a strong modal shift programme in Road Period 3 (RP3) building on our work to date
- ▶ We are planning for a trajectory of 31-26 MtCO₂e by 2025, 25-15 MtCO₂e by 2030, 20-7 MtCO₂e by 2035, 8-3 MtCO₂e by 2040, 5-1 MtCO₂e by 2045 and net zero by 2050 against a 33 MtCO₂e 2020 baseline

OUR MAIN FOCUS IS ON CUTTING EMISSIONS

- Net zero for us means focussing on cutting greenhouse gas emissions to zero or near zero rather than offset
- We will take immediate action, with an ambition for major investment in the third road period (RP3) and beyond to deliver transformative action
- Reducing emissions to net zero is a journey. Over time new solutions will become available and the path will become clearer. This plan provides a snapshot of what we intend now. We will use a process of continual improvement to refine our course into the future



A417, The Missing Link, Gloucestershire

Road travel provides a convenient, low cost and practical way to travel to see family, to work and to deliver goods around the UK. With almost nine out of ten passenger miles travelled by road and 79% of freight goods moved by road, Britain's roads are an integral part of our economy and wider transport system.

This is why we will take fast action to lead the drive for net zero road transport. Even with huge investment in other transport and ways of working, most journeys will still be made by road in 2050. For Britain to be a net zero greenhouse gas economy, our roads have to be net zero too.

In our net zero plan we set out how we will take fast action across our own operations, we will lead decarbonisation of England's highways construction and we will support making every journey on our network emission free.

We do this because our customers and our people expect us to lead. Because government has committed the UK to being a net zero economy by 2050. And because our leadership will help avoid dangerous climate change and support Britain's growth.



Nick Harris
Chief Executive Officer



Dipesh Shah
Chairman

The Strategic Road Network (SRN) has a key role in net zero Britain

Today roads are seen by many to work against the ambitions of a zero carbon economy. Yet to deliver a net zero economy, our roads have to be net zero too. This is why:

Britain relies on roads today

Many see cars as a problem, but roads and cars are an integral part of our transport system. 80% of families own a car today, almost nine out of ten passenger miles are travelled by road and 79% of freight goods move by road ([Transport Statistics Great Britain: 2020](#)). Road travel provides a convenient, low cost and practical way to travel to see family, to travel to work and to deliver goods around the UK.

Road travel will decarbonise fast

Road travel represents a higher carbon way to travel in the UK today, this is changing fast. Already, government has indicated that sale of new petrol and diesel cars will be phased out by 2030. The Government's Decarbonising Transport: A Better, Greener Britain (2021) puts Britain on a trajectory to do the same for heavy goods vehicles from 2040. The future of road travel is a zero carbon one, powered by renewable electricity, hydrogen and biofuels.

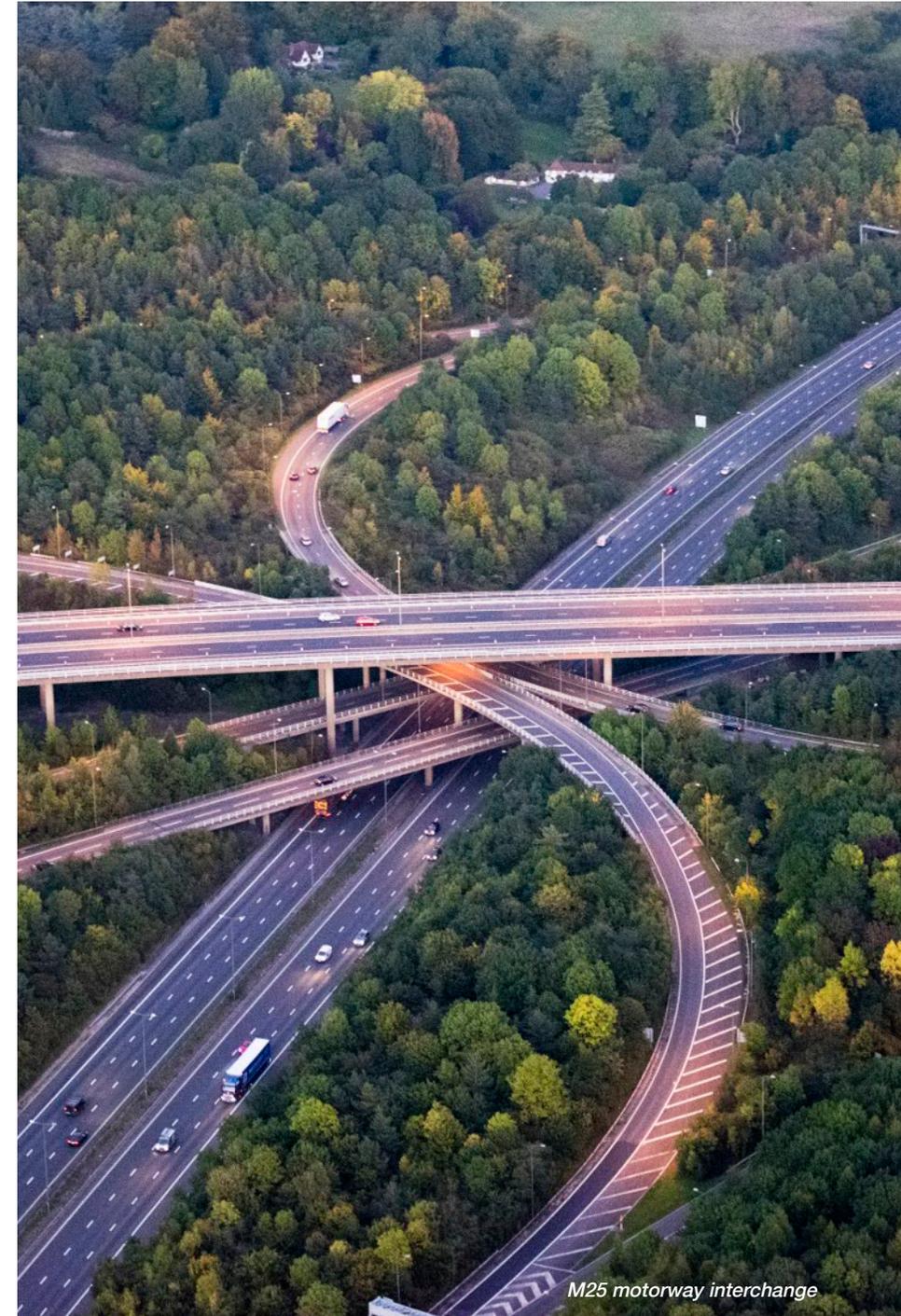
A net zero Britain will still travel by road in 2050

We support investment in all zero carbon transport options, however, investment in other forms of transport, such as rail, will make only a limited impact on how Britain moves. HS2 will take between 1 and 3% of traffic off the SRN, for example. This is why The Committee on Climate Change forecasts that traffic levels will be higher than today in 2050, even taking account of the ambitious actions in its Sixth Carbon Budget which we support.

Investment in Britain's roads supports a thriving net zero economy

Today every £1 investment in the strategic road network returns over £2 to the economy. Our roads directly support sectors which employ 7.4 million people in the UK and contribute £314 billion in Gross Value Added to the economy. The industries that rely on the road network are expected to grow by 35% by 2030, which will generate an additional £110 billion of UK growth.

This plan aims to ensure our roads support the social and economic goals of our nation, while making sure we do so in an environmentally sound way.



National Highways commits to achieving net zero greenhouse gas emissions for our strategic road network

WE WILL TAKE FAST ACTION IN 3 AREAS:



CORPORATE EMISSIONS

Net zero by 2030

Net zero for our own operations by 2030

This area covers energy used to light and power our network, travel by our traffic officers, and the energy used in our offices and other travel. We also include the carbon locked up in trees and plants on our motorway verges in this target.



MAINTENANCE & CONSTRUCTION EMISSIONS

Net zero by 2040

Net zero for our maintenance and construction activities by 2040

This target covers the greenhouse gases emitted in making the materials we use to keep our network in good condition. This includes cement, steel and asphalt. We also include the transport of materials to where we use them and emissions from construction on our sites.



ROAD USER EMISSIONS

Net zero by 2050

Net zero carbon travel on our roads by 2050

The largest source of emissions comes from the vehicles driving on our network. Government has set its trajectory for net zero road transport by 2050. This is a rapid transition with up to a 55% reduction in emissions by 2030 and up to a 90% reduction in emissions by 2040. Our plan will enable this transition by providing the infrastructure needed for zero carbon motoring on the Strategic Road Network.

We have developed a plan that is ambitious and which responds to the recommendations made by other key organisations:

- Our plan supports the Government's Decarbonising Transport: A Better, Greener Britain (2021) and Industrial Decarbonisation Strategy
- It meets the challenge laid down by international organisation, Science Based Targets initiative (SBTi), to have credible and ambitious net zero targets that limit climate change to 1.5°C
- Our timescales for net zero action align with the recommendations made in the UK's Committee on Climate Change sixth Carbon Budget
- Our actions have carefully considered recommendations from other leading organisations such as the UK's Climate Assembly to the National Infrastructure Commission
- We have looked carefully at other large government agencies' plans for climate action, seeking to align with these where appropriate

Our three targets give us the long term ambition for each decade and we will take fast action in all three areas immediately. Our plan gives clear direction and action in each area from 2021, building on existing progress and continuing through the rest of our current road period and beyond.

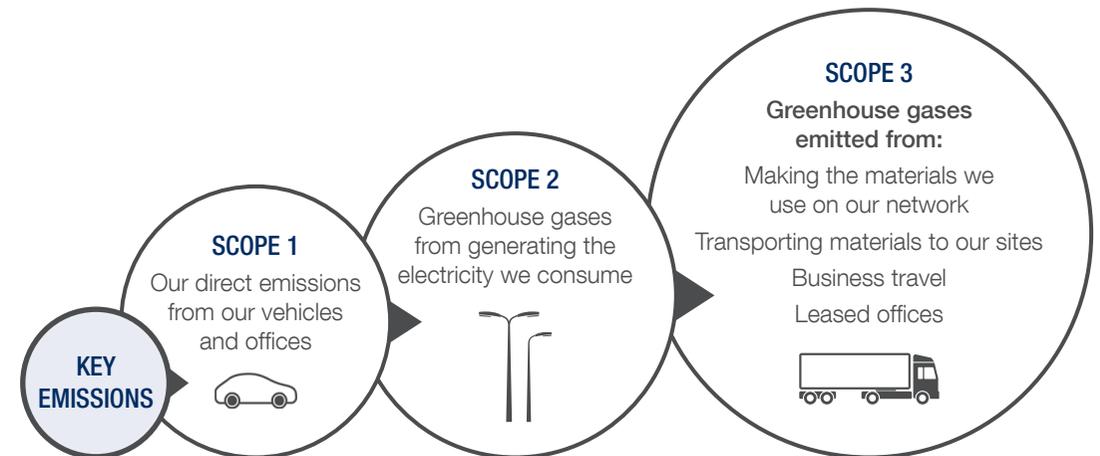
Our targets are set in line with: The 1.5°C goal of the Paris Agreement

We have defined our carbon measurement and targets with reference to [The Greenhouse Gas Protocol Corporate Standard](#), [Value Chain \(Scope 3\) Standard](#) and scope 2 guidance as well as the [Science Based Targets' SBTi Criteria and Recommendations](#).

The Greenhouse Gas (GHG) Protocol refers to three types of emissions. **Scope 1** includes direct emissions from our own vehicles and fuels used on our sites. **Scope 2** includes indirect emissions from our electricity use. **Scope 3** includes up and downstream emissions in the value chain outside an organisation's own operations.

In following the GHG Protocol our SBTi-aligned targets cover emissions from our own operations, maintenance and construction activities. We have also gone over and above the GHG Protocol methodology to include a target for zero carbon travel in this plan, while not including this within the formal scope of our SBTi-aligned targets.

The Greenhouse Gas Protocol standards



Traffic Officer on the M6, West Midlands

What do we mean by net zero?

Our net zero approach is informed by Science Based Targets' draft [Net Zero Criteria](#), due to be finalised later in 2021.

For National Highways, 'net zero' means cutting our Scope 1, 2 and 3 emissions in absolute terms by a minimum of 4.2% each year from a 2020 baseline. This is in line with the 1.5°C ambition of the Paris Agreement.

We will focus on emissions reduction, aiming to be zero or near zero carbon for our operations and the materials we purchase.

From 2029 (for our own operations) and 2039 (for maintenance and construction) we will offset the small amount of residual emissions to deliver our net zero targets. We will aim to lock up these residual emissions on or near to our roads and open spaces, for example, by planting trees on our roadside verges.

We have set a net zero, rather than a carbon neutral goal to keep our focus on emissions reduction and innovation to get to close to near zero schemes. Carbon neutral targets, in contrast, do not necessarily require action on carbon reduction before offset.



A66, Cumbria, North West

Our indicative roadmap

While our 2030-40-50 targets drive this plan, we also have developed an interim trajectory, shown here. These will drive immediate action and provide an indicator of progress.

Net zero corporate



CORPORATE EMISSIONS
Net zero by 2030

<p>2020 – We buy 100% of our electricity via a certified renewables tariff</p> <p>2022 – Develop our renewables roll out plan and submit planning for our first pilot site</p> <p>2022 – Zero carbon memoranda agreed with our landlords</p>	<p>75% reduction in emissions compared to 2017/18</p> <p>2025 – 75% of our light fleet switched to electric or hybrid</p> <p>2027 – 70% of our lights network switched to LED</p> <p>2027 – light fleet is 100% electric excluding traffic officer vehicles</p>	<p>100% Our corporate emissions are net zero without purchased offsetting</p> <p>2030 – Light fleet including traffic officer vehicles is 100% electric vehicles</p> <p>2030 – Generate at least 10% of our electricity from renewables on our estate</p> <p>2030 – Plant at least 3 million trees since 2021</p>	<p>2040 – 100% electric or hydrogen heavy vehicles</p>
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Net zero construction and maintenance



MAINTENANCE & CONSTRUCTION EMISSIONS
Net zero by 2040

<p>2022 – Implement and certify a construction carbon management system</p> <p>2022 – Our specifications Manual of Contracts Documents of Highways Works (MCHW) have integrated net zero thinking</p> <p>2022 – Launch a zero carbon materials innovation programme</p> <p>2022 – Develop a 2040 zero carbon road map for concrete, asphalt and steel</p>	<p>0-10% reduction in emissions compared to 2020</p> <p>2025 – Our specifications Design Manual for Roads and Bridges (DMRB) integrate net zero thinking</p> <p>2025 – Our Tier 1 and Tier 2 suppliers have certified carbon management systems</p> <p>2025 – Commission a long term delivery partner to design a major net zero road scheme</p>	<p>40-50% reduction in emissions compared to 2020</p> <p>2030 – Only zero carbon plant on our sites and site cabins</p>	<p>70-80% reduction in emissions compared to 2020</p> <p>2035 – First major scheme that aims to be net zero constructed</p>	<p>100% Our schemes are net zero, and where there are residual emissions, these will be offset using robust certified ‘removal’ offsets</p> <p>2040 – Zero carbon HGVs deliver to our sites</p>
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Net zero road user



ROAD USER EMISSIONS
Net zero by 2050

<p>2020 – 33 MtCO₂e annual emissions from road users</p> <p>2020 – 95% of the SRN is within 20 minutes of a rapid charger</p> <p>2021 – We are continuing to equip our traffic officers with the tools to recover EVs</p> <p>2021 – Implement our remodelling trials</p> <p>2023 – Support to ‘project rapid’ delivering £950 million of charging infrastructure at MSAs</p>	<p>2025 – emissions reduced to between 31-26 MtCO₂e</p> <p>2025 – By end of road period explore options for further freight demonstrators</p> <p>2025 – Explore the potential to work with partners to practically demonstrate the EV charging services blueprint</p> <p>2025 – Investigate energy storage to support EV charging at MSAs</p>	<p>2030 – emissions reduced to between 25-15 MtCO₂e</p>	<p>2035 – emissions reduced to between 20-7 MtCO₂e</p>	<p>2040 – emissions reduced to between 8-3 MtCO₂e</p>	<p>2045 – emissions reduced to between 5-1 MtCO₂e</p>	<p>100% The network will be net zero</p>
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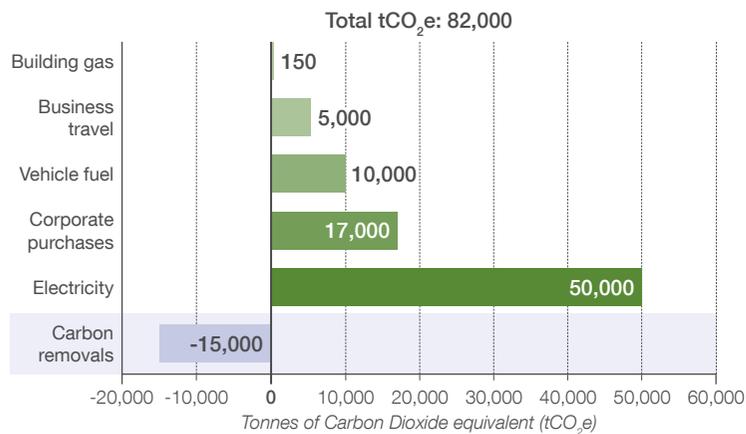
ACTION AREA 1

Cutting our direct carbon emissions

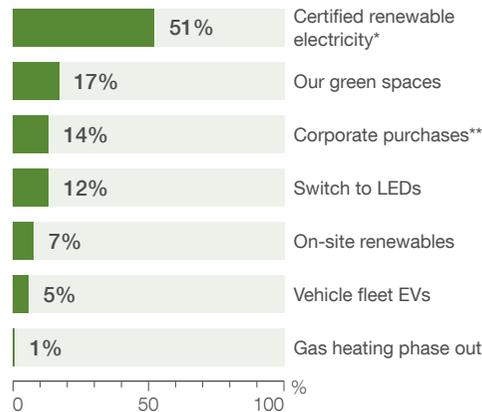
COVERING OUR NETWORK LIGHTING, ROADSIDE EQUIPMENT, TRAVEL AND OFFICES

Our first ambition is to eliminate emissions from all of our own operations. Together, these led to 82,000 tonnes of CO₂e during 2020, projected to fall to 50,000 tonnes CO₂e in 2030 without direct action. In 2020 we achieved our commitment to only buy 100% certified renewable electricity. Our focus is now generating more of our energy on our own sites, decarbonising our travel and increasing the removal of carbon on our own sites.

Where our emissions come from today



Key actions to deliver net zero



* Including grid de-carbonisation and energy efficiency measures.

** Including business travel, commuting, purchases and waste.

N.B. The total exceeds 100% due to the carbon removed by our green spaces.

Our trajectory to net zero



Our target is to be net zero for our corporate emissions by 2030



100% electricity bought by a **certified renewable tariff** from 2020



75% of our **cars and vans electric or hybrid** by 2025



75% reduction in corporate emissions by 2025, compared to 2017/18 baseline



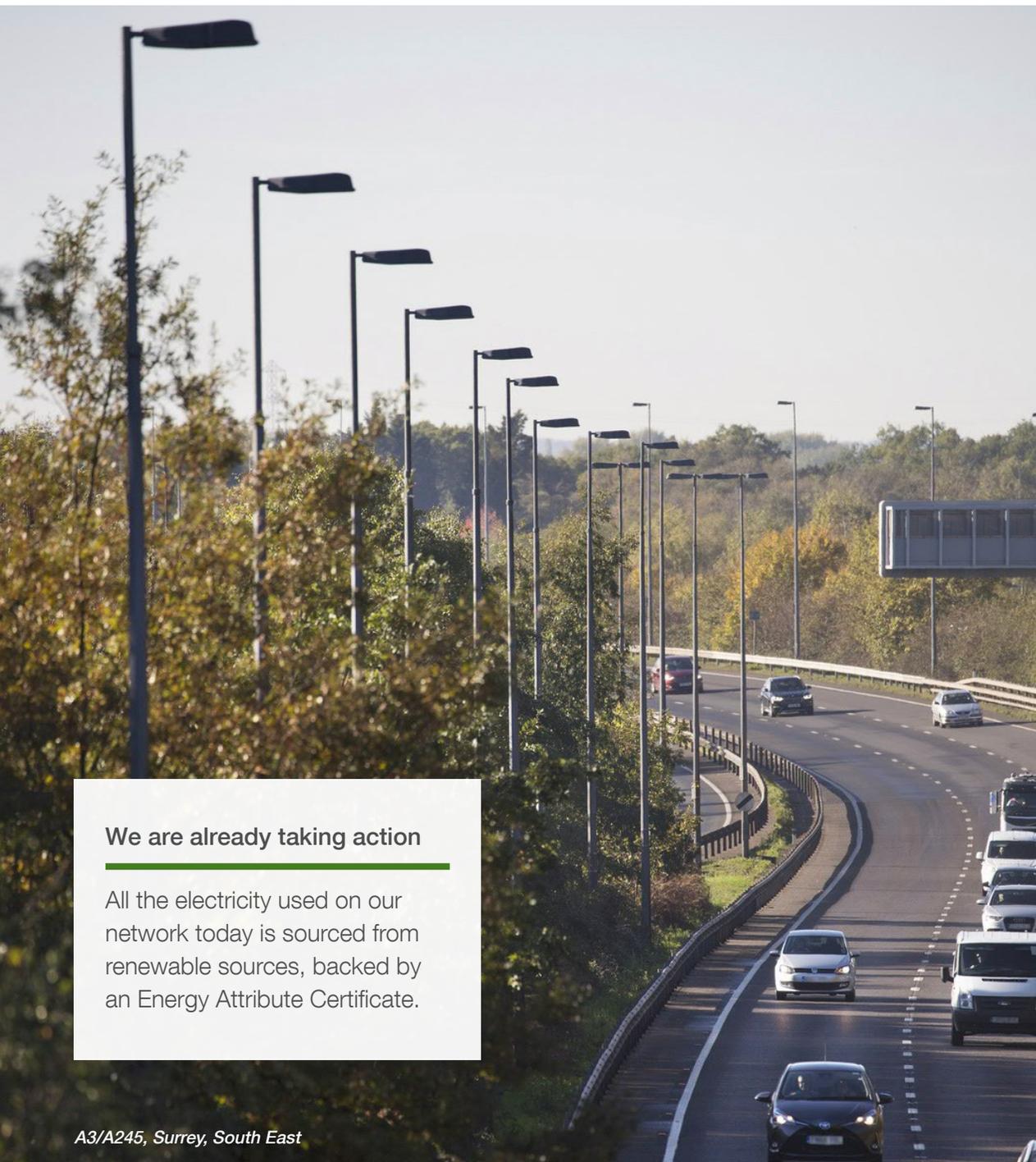
Switch 70% of our **network lights to LED** by 2027



Plant at least 3 million trees on or near our land by 2030



Aim to generate 10% of our **electricity from renewable sources** on, or near to, our own sites by 2030



We are already taking action

All the electricity used on our network today is sourced from renewable sources, backed by an Energy Attribute Certificate.

A3/A245, Surrey, South East

NETWORK ENERGY USE

Energy used to light and run our road network accounts for 50% of our emissions today. Our energy demand is forecast to slightly grow over the coming road periods as we roll out digital solutions across our network. In 2020 we contracted to buy all of our electricity from a certified renewable tariff. We hold the Energy Attribute Certificate for this electricity. Our focus now is on energy efficiency and generating more of our own energy on our sites.

We will take the following actions:

- Retrofit the lights on our network with low energy, LED, lighting. We have set a target for 70% of the lighting on the network to be LED by 2027
- Develop a plan to deploy solar panels on the network. Commission our first pilot site by 2024 and roll out further generation across our network. We aim to generate 10% of energy from renewable sources on or near to our sites by 2030 subject to suitable site availability

We already purchase **renewable energy** to power our operations, reducing our carbon footprint and supporting the development of renewables in the UK. However, we see this as part of a hierarchy of actions for decarbonising electricity as follows;

1. Energy efficiency measures to reduce the amount of electricity we consume
2. Generation of our own renewable electricity on site to reduce reliance on the electricity grid
3. The purchase of renewable electricity generated by others



Traffic Officer, National Highways

OUR FLEET AND TRAVEL

National Highways' owned fleet is mainly our traffic officer and winter fleet. In addition, our people travel in their own vehicles and on public transport in the course of their work.

We will take the following actions:

- By 2027 100% of our non traffic officer light vehicles will be electric, and by 2030 the traffic officer vehicles will also be electric. Traffic officer vehicles will become 100% electric 3 years after other vehicle because electric vehicles that meet the safety requirements required, are not expected to be available in 2027. We have also set an interim target of 75% of the fleet to be electric or hybrid by 2025. Our approach and speed of fleet changeover will be based on the market availability of suitable vehicles, the whole life greenhouse gas footprint of different fuel options and when existing vehicles reach the end of their leases
- Our fleet management team will seek annual reports from our suppliers on the availability of low carbon heavier vehicles such as gritters and snow blowers. We aim to have changed all our gritter fleet over to hydrogen or electricity by 2040
- We will reduce the carbon footprint from other travel by using technology to introduce new ways of working. We will update our travel policy to discourage flying and incentivise low carbon travel options. In addition we will update our expense policy to pay only for low carbon emission business travel (EV, Rail, and bus/coach) from 2026

MANAGING OUR ROADSIDE GREEN SPACES

Our green space removes around 15,000 tonnes of carbon from the atmosphere each year as well as providing a haven for wildlife.

We will take the following actions:

- Set out how we will manage our green space for carbon removal, renewable generation, safety and biodiversity in an **Environmental Sustainability Strategy** we publish every road period and in our five year Delivery Plans
- Plant at least an additional 3 million trees by 2030

We are already taking action

We have been working with organisations across the UK to increase biodiversity and lock up carbon on our network. Our Green Ribs project in the South West of England saw 13,000 new trees planted in 2019/20.

Managing our green estate to achieve multiple objectives

We aim to manage our green estate to achieve the best outcome for biodiversity, air quality, noise, carbon, landscape integration, visibility of signs and safety. This is a balancing act. What is optimal for safety is not always optimal for carbon lock up, for example.



*A30, dual carriageway,
Cornwall, South West*



National Traffic Officer Centre (NTOC)

SITES AND CORPORATE PURCHASES

This element of our carbon footprint covers emissions from our sites, and third party organisations on our behalf. It includes for example, emissions from energy used in our offices and depots, emissions from energy used on third party road contracts and in the motorway service areas that we lease to operators. It also includes emissions from energy in leased offices where our landlord pays the bill and to produce the non-road maintenance materials we buy, such as deicing salt.

We will take the following actions:

- We will aim to agree zero carbon memoranda with the owners of our leased offices by 2022
- We will switch the heating for our owned estate to renewable sources by 2030
- We will aim to reduce the overall size of our estate by one third by 2027, making the most of new, flexible and agile ways of working

Aligning our corporate carbon target with Greening Government Commitments

As well as our longer term, Science Based targets, we have also worked with Department for Transport to agree our share of their Greening Government Commitments.

We will reduce our corporate emissions by 75% by 2025 using the Greening Government Commitment methodology. Government uses a 2017/18 baseline.



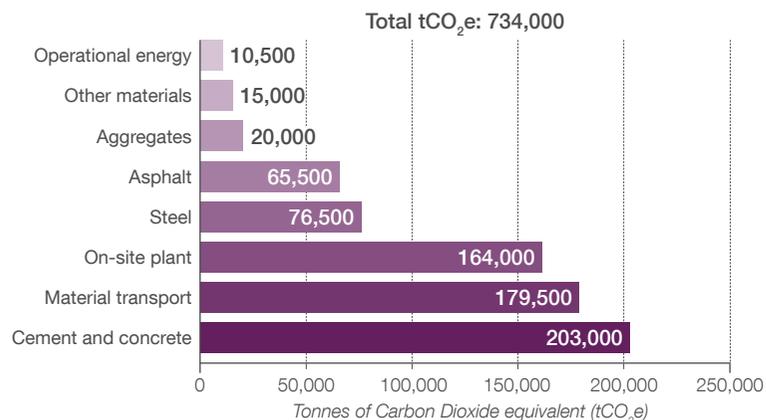
ACTION AREA 2

Cutting emissions from maintenance and construction

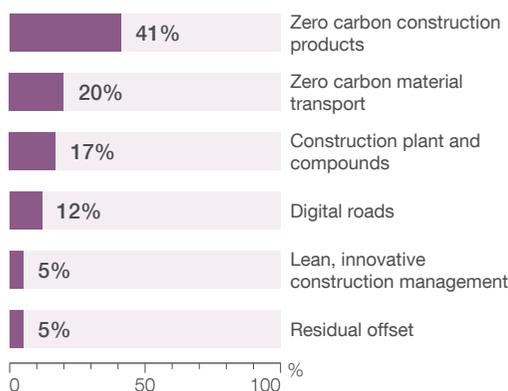
COVERING THE MANUFACTURE, TRANSPORT AND USE OF MATERIALS SUCH AS ASPHALT, CEMENT, CONCRETE AND STEEL ON OUR NETWORK

We are one of the UK's largest buyers of construction materials, used to keep our road network in good condition and ready for the future. The emissions from the maintenance and construction of our network led to emissions of around 734 thousand tonnes of CO₂e during 2020, which are projected to fall to around 350,000 tonnes in 2040 with no additional action from us. We have a significant opportunity to catalyse Britain's construction industry to deliver the Committee on Climate Change's call for the construction industry to be largely decarbonised by 2040. We will focus on the asphalt, cement and steel sectors. We will use a carbon management system to embed approaches that minimise emissions, including lean construction practices and the principles of the circular economy. We will also use digital technologies to increase the capacity of our existing network minimising new construction.

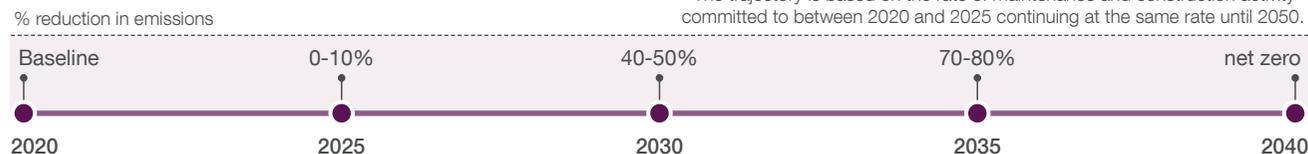
Where our emissions come from today



Key actions to deliver net zero



Our trajectory to net zero*



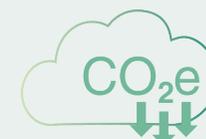
Our target to be net zero for our maintenance and construction activities by 2040 is the most ambitious of any large infrastructure organisation in the UK today



A near zero construction roadmap by the end of 2022



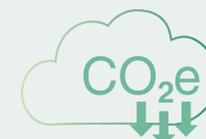
Net zero part of MCHW and DMRB by the end of 2022 and 2025



0-10% reduction by 2025 compared to 2020*



UK's first near zero road scheme starts in 2025 – opening by 2035



40-50% reduction by 2030 compared to 2020

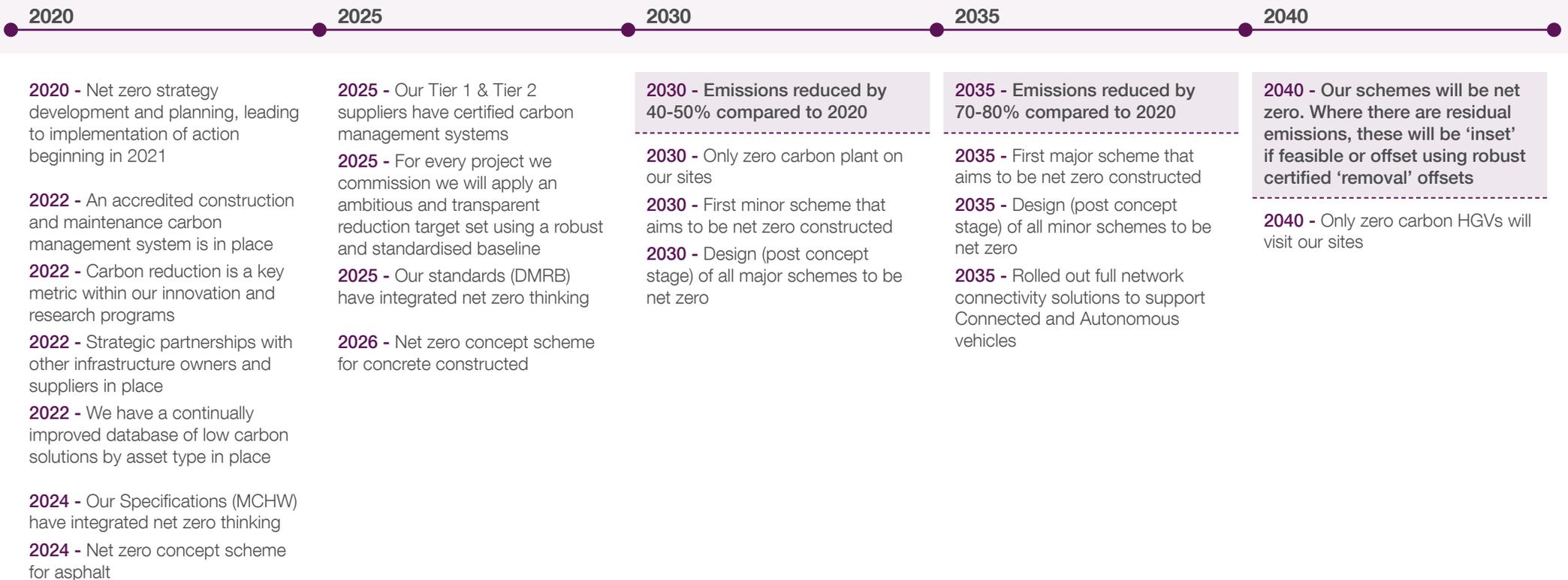


All construction plant and compounds zero emissions by 2030

* We expect to be constructing more in 2025 than today, but will be doing so in a more carbon efficient way.

OUR TARGET FOR MAINTENANCE AND CONSTRUCTION CARBON IS THE MOST AMBITIOUS OF ANY INFRASTRUCTURE ORGANISATION. WE WILL TAKE IMMEDIATE AND SUSTAINED ACTION

Timeline of key targets



DIGITAL ROADS

From variable speed limits today to the long term potential of Connected Autonomous Vehicles (CAVs), technology will increase the safe capacity of roads. The Department for Transport forecasts that CAVs will improve capacity by improved traffic management and also better use of road space. This means more people can travel on our existing network, cutting the need to build new roads even while network demand grows.

We will take the following actions:

- Finalise our Digital Roads vision in 2021
- From 2023, make digital roads an integral part of Road Period 2 delivery in 2021, and build this into Road Period 3 and beyond
- Continue to share our experience and learn from other roads authorities' progress

We are already taking action

We are investing £8.1 million with the Department for Transport to lead the first real-world operational trial of platooning vehicles on UK roads.



Busy travel looking west on the M42 motorway, West Midlands



Ouse Bridge (M62), Yorkshire

We are already taking action

Our updated **Design Manual for Roads and Bridges** provides clear requirements to assess and report on the climate impacts of our operation, maintenance and construction projects.

LEAN, INNOVATIVE CONSTRUCTION MANAGEMENT

Applying strong carbon management processes across our construction and maintenance operations can cut material use, waste and support innovation. Our lean way of working provides a good framework for continual improvement, which will embed long term solutions, such as the principles of the circular economy and natural capital.

We will take the following actions:

- Implement our **Operational Excellence 2025 Strategy** which is already identifying practical ways to work more efficiently, cut journeys and reduce material use
- Implement a carbon management process accredited to the PAS2080 methodology
- Require our supply chain to implement PAS2080 and to set a SBTI-1.5°C aligned target for the services they provide to us
- Integrate net zero into our purchasing decisions from 2022 and our standard contracts and design codes from 2025
- Apply a transparent reduction target to each scheme using a robust and standardised baseline from 2025
- Integrate whole life carbon reduction into our Project Control Framework and asset management processes

ZERO CARBON CONSTRUCTION PRODUCTS

Our main construction products are asphalt, cement, concrete and steel. There are currently some lower carbon construction products and approaches available, such as asphalt recycling, and the use of waste plastics in surfacing, that follow the principles of the circular economy, and in the 2021 update to our standards that requires lower temperature asphalt across our network. However, there is no clear view on how each of our core products will meet the Committee on Climate Change's target for near zero construction by 2040. We want to create far more transparency and clarity on what might be available when, what it can be used for, and how we will get there.

We want to lead the industry in creating that roadmap and in playing a key role in delivering near zero/net zero construction for asphalt, cement and steel by 2040.

To do this we will:

- Work with our suppliers in the construction industry to develop and agree roadmaps to net zero for all of our key construction products based on the ambitions set out in this document. Where we can, we will work with peers, to align our goals to provide consistency to the supply chain. This will give us an understanding of what products are available today, what the pipeline of new materials is going to be, providing delivery confidence and industry certainty
- Use our Lower Thames Crossing scheme as a key project to test low carbon innovation and approaches
- Trial new materials and approaches on our roads in a safe way
- Support manufacturers and work with them and government to help develop and implement a credible carbon capture and storage solution for hard to decarbonise materials providing market surety
- Provide clear direction to our design and construction partners on the materials we will need and the carbon content of these. This will give our supply chain surety to grow capacity and capability in zero carbon products

We are already taking action

Our recent upgrade of the A14 between Cambridge and Huntingdon used low carbon cement in kerbs, drainage and fill. Low carbon cement can be up to 80% lower carbon compared to ordinary Portland Cement.

Carbon Capture and Storage (CCS)

Currently large scale CCS in the UK is at the planning stage, and therefore there is some uncertainty about its future role. Our approach to zero carbon construction products and CCS, is to substitute for non CCS zero carbon materials where possible. However, we still expect to require materials such as steel and cement that are hard to decarbonise (although in smaller quantities). We will provide market surety for CCS versions of these materials, where industry road maps indicate they will come to market.

A14, Cambridge to Huntingdon, South East

CONSTRUCTION PLANT AND COMPOUNDS

Availability of zero emission construction machinery is increasing as manufacturers innovate, and as more cities, local authorities and infrastructure providers specify this for their schemes. We have already made a commitment to accelerate the roll out of zero emission equipment on our schemes in the second road period and are developing a strategy to deliver this at the moment.

As part of this plan we will:

- Work with our supply chain to trial zero emission plant on our schemes over the second and third road periods
- Provide long term signalling to our suppliers, and mandate the use of zero emission construction plant on our schemes from 2030
- Mandate the use of zero emission construction compounds, created with renewable energy, on our schemes from 2030

TRANSPORTING MATERIALS TO OUR SITES

The transport of materials to our sites is currently the second largest source of construction and maintenance emissions at 24%. We will promote the trial and uptake of zero emission HGVs across the UK through our purchasing power.

We will:

- Work with our supply chain to be part of upcoming zero emission HGV trials
- Encourage our supply chain partners to use the lowest form of feasible and available transport
- Mandate the use of zero emission deliveries to our schemes from 2040 within the UK



Construction work at the M1 (Junction 19), East Midlands

WE ARE ALREADY TAKING ACTION ON LOW CARBON MAINTENANCE AND CONSTRUCTION

A590 – carbon neutral road improvement scheme

The recently completed A590 road resurfacing scheme in Cumbria was the UK's first carbon neutral minor works scheme. Carbon neutral construction is a step towards our net zero ambitions, and we were proud to reduce emissions by 40% compared to a typical scheme before then offsetting the remaining emissions using high quality schemes.

To do this we took the following actions:

- Early collaboration between the construction team to share ideas and to model carbon potential savings
- We re-used the road planings in the new road surface. This reduced new material use and truck movements
- We used solar powered generators to provide energy for site lighting, signage, CCTV and catering facilities. We also used electric vehicles on the scheme



A590, High and Low Newton Bypass, Cumbria



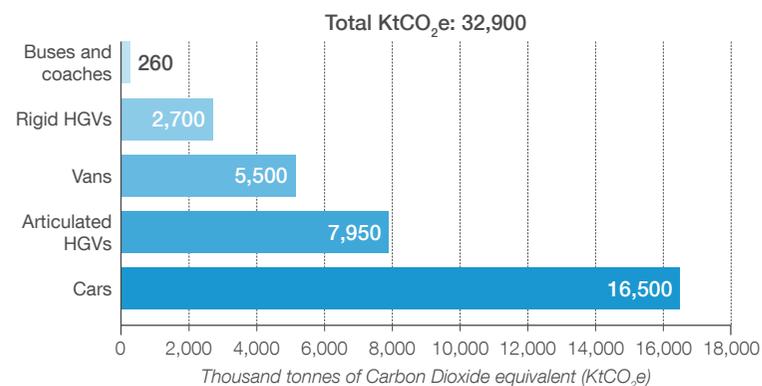
ACTION AREA 3

Net zero carbon travel on our roads

COVERING EMISSIONS FROM THE VEHICLES USING THE STRATEGIC ROAD NETWORK

We have set an ambition for all of our customers to be travelling using net zero transport by 2050 in line with the UK Climate Change Act. Many of the actions that will deliver this ambition are out of our direct control, but that does not mean we cannot play our part. Our priorities are to help roll out solutions to decarbonise HGVs, and support the uptake of electric cars and vans. We will also continue our work integrating the SRN with other transport modes, whilst working to improve the efficiency of the network.

Where our emissions come from today



Our trajectory to net zero*

Estimated million tonnes of Carbon Dioxide equivalent (MtCO₂e) emissions



* In line with the DfT's Decarbonising Transport: A Better, Greener Britain (2021).

Our target for every journey on our network to be zero carbon by 2050



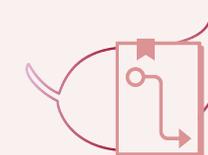
Present a **report** to government on **global HGV technology trials** and our proposals for **UK trials** in 2022



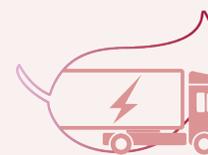
Publish a blueprint for **EV charging services and energy storage** by 2023



Publish a **plan** to **improve public transport on the SRN** in 2023 and implement through RP3



Report in 2023 how we can **help reduce empty lorry movements**



Have a preferred **investment plan for HGV charging** by 2028, for RP4 implementation



Emissions reduced to between **20-7 MtCO₂e** by 2035

ZERO CARBON HGVS

33% of emissions from the Strategic Road network currently come from Heavy Goods Vehicles. The DfT's Decarbonising Transport: A Better, Greener Britain (2021) phases out non-zero emissions trucks from 2040. There are a number of potential alternative fuels and techniques under consideration, including hydrogen, batteries and in-road charging networks.

We will take the following actions:

- Use our well-established network and relationship with national strategic road authorities to share the lessons and insights from global HGV charging trials in Spring 2022. We will annually report on global progress and lessons from global trials and roll out of zero emissions trucks
- Recommend a first tranche of zero carbon HGV trials to DfT that meet the requirements of freight operators, meet safety standards and build on existing trials already taking place across the world by the end of 2022
- By 2023 report to Government on how National Highways can help to reduce empty lorry movements
- Continue to support government's zero emissions HGV trials and developing policy on zero carbon HGVS during this road period (2025)
- Recommend a preferred solution for HGVS and investment plan for implementation in the fourth road period
- Incentivise our supply chain to be early adopters of zero carbon HGV technologies by only supplying our construction sites with zero carbon vehicles from 2040



HGVs on M6, West Midlands

THERE ARE FOUR MAIN OPTIONS FOR HGV DECARBONISATION



	BATTERIES	HYDROGEN	ABOVE GROUND ELECTRIC SYSTEMS	INDUCTIVE ELECTRIC ROAD SYSTEMS
How they work	Trucks run on batteries and with refuelling coinciding with safety halts, deliveries and stops	Trucks run on hydrogen, refuelling as today	Lines, such as catenary network, provide electric power to trucks	Trucks charge with in-road induction charging
Advantages	<ul style="list-style-type: none"> Less expensive to install Can drive anywhere between charges Already used for some specific freight applications. Further concept models coming to market 	<ul style="list-style-type: none"> Less expensive to install Short refuelling time 500-1000km between fuels today Can drive anywhere between charges High demand means scaling capacity is expected 	<ul style="list-style-type: none"> Well developed technology used by rail today Allows long distance travel In trial in Europe today Most energy efficient solution Maximises load space on vehicles 	<ul style="list-style-type: none"> Allows long distance travel In trial in Europe Maximises load space on vehicles
Challenges to overcome	<ul style="list-style-type: none"> Battery innovation is needed to reduce size and increase range to be a competitive option Will need a network of ultra rapid fast chargers 	<ul style="list-style-type: none"> Not all hydrogen is zero carbon No hydrogen at scale today in the UK Vehicle cost is high today Energy efficiency from 'windmill to wheel' is lower than other options 	<ul style="list-style-type: none"> Expensive to install Disruption during installation Reliability if the wires are damaged Safety concerns Will need international standards for fleet to drive across Europe Unknown renewal and maintenance requirements Infrastructure would be limited to HGVs Vehicles will need two fuel sources to drive off the network 	<ul style="list-style-type: none"> Expensive to install Disruption during installation Less energy efficient Unknown renewal requirements today Vehicles will need two fuel sources to drive off the induction network

ZERO CARBON CARS AND VANS

UK regulation will phase out the sale of new petrol and diesel vehicles from 2030 and hybrid vehicles from 2035. This will lead to a rapid transition in Britain's car and van fleet, bringing rapid reductions in greenhouse gas emissions as well as fast improvements in air quality near to our busier roads. We have invested in charging points so that for 95% of the time, drivers are always no more than 20 miles from a charging point on our SRN. In the future, the Office for Zero Emission Vehicles' Project RAPID will increase the number of Rapid charging points at our Motorway Service Areas (MSA). This aims to provide at least 6 open access 150-350KW capable charges at each MSA by 2023.

We will take the following actions:

- Work with government and the private sector to set out a clear proposition by 2023 for EV charging on our network. This will cover both customer need and the infrastructure required to deliver this
- We are continuing to equip our traffic officers with the tools to recover EVs
- Support delivery of robust energy storage at MSAs by 2023
- Launch a demonstrator service area for an EV charging showcase site to show how charging can combine with a break at MSAs in 2025

We are already taking action

We have met our commitments that 95% of England's motorways and A-roads are within 20 miles of a charge point, but we will need many more as the UK's fleet rapidly decarbonises.

Emissions from road travel will come down fast

The DfT's Decarbonising Transport: A Better, Greener Britain (2021) shows that emissions from the vehicles using our network will decrease rapidly into the 2030's.

Providing a service to our electric vehicle customers

We are getting our network ready for electric vehicle customers.

Motorway service areas will need more electric vehicle charging stations as demand grows. Customers tell us they do not want to have to wait a long time to charge, they want to do this comfortably. Above all they want the confidence that the charging network is reliable.

On the road we are also getting our traffic officer fleet ready to be able to safely support and, where necessary, recover electric vehicles in a safe way. EVs are generally more reliable than petrol and diesel vehicles, but they have some different requirements for towing and, of course the fuel is different.

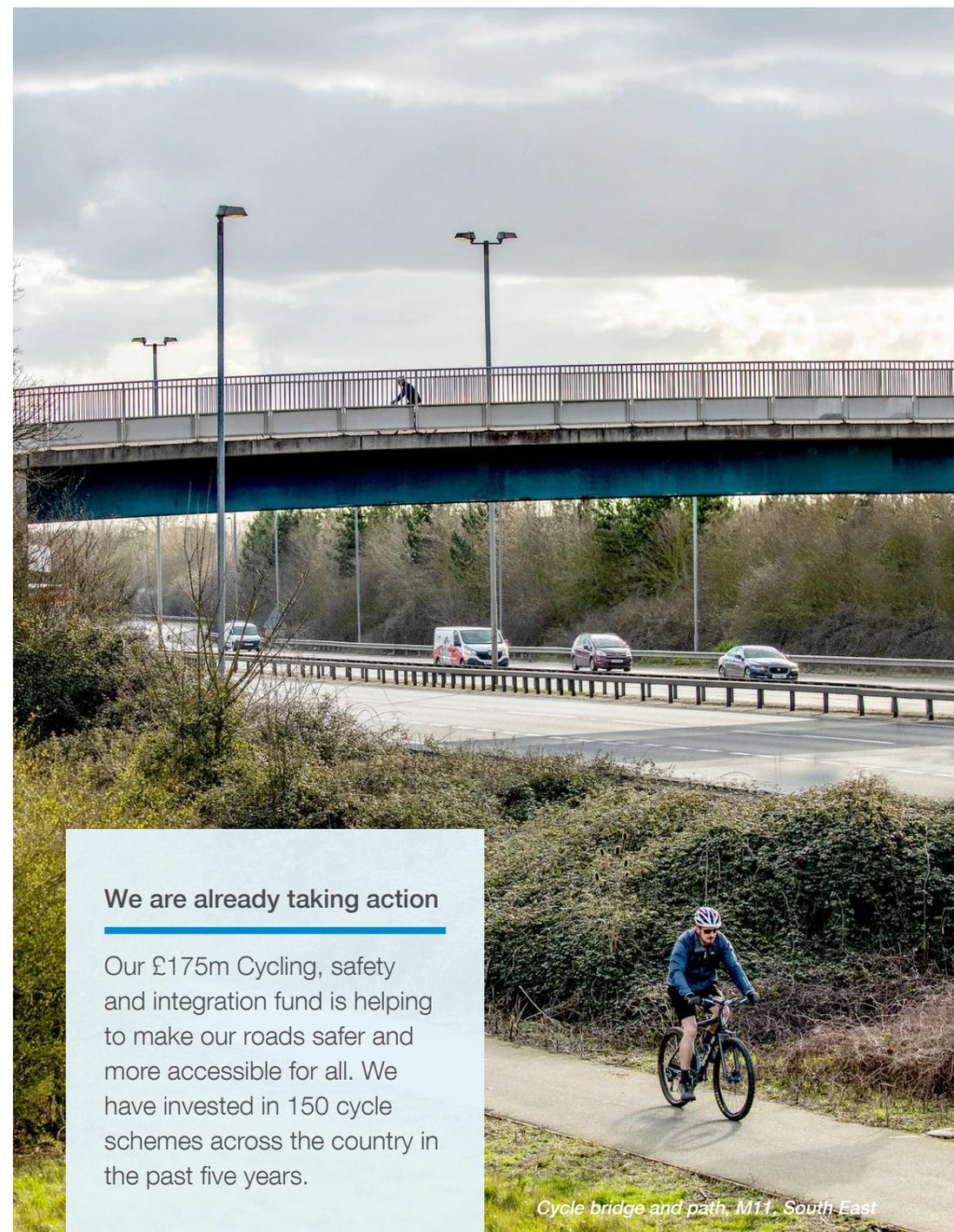
MODAL SHIFT AND OTHER ACTIONS

We also support other actions recommended by Committee on Climate Change on modal shift and managing the demand as these will help reduce the growth in traffic on our network.

We will take the following actions:

- Integrate net zero into our statutory consultee responses to planning applications from 2022
- Work with the sub-national transport bodies to agree priorities and actions to support delivery of our net zero strategies by 2022
- Develop and implement a programme to improve public transport operations on the SRN, promotion of walking and cycling, and measures to reduce the need to travel
- Implement a comprehensive plan to reduce, remode and retime journeys in the third road period
- Work with HS2 to provide good access to their new stations, such as our £280m investment to increase capacity on the M42 near Solihull. Work with Network Rail to increase freight and passengers on rail as part of the updates of our 18 [Route Strategies](#)
- Deliver our RP2 commitment to make the SRN more accessible for walkers, cyclists and horseriders. For example, the A30 scheme near Honiton and upgrading the Whitemare Pool cycleway on the A19

Modal shift will help cut emissions from our network in the short and medium term. By 2050, however, the transition to zero carbon vehicles will mean that the carbon impact of modal shift will be small. We also fully recognise that modal shift brings a wider range of benefits.



We are already taking action

Our £175m Cycling, safety and integration fund is helping to make our roads safer and more accessible for all. We have invested in 150 cycle schemes across the country in the past five years.

Cycle bridge and path, M11, South East

Climate action supports our wider environmental ambitions

Taking fast action on emissions, managing our roadside verges and cutting construction waste are all part of this net zero plan. These actions also bring big benefits to our other environmental priorities: improving air quality, biodiversity and our ambitions on the circular economy, and therefore support our [Environmental Strategy](#) and our wider [Sustainable Development Strategy](#).

Climate action is already one of Government's key social value priorities. Our leadership can also support other priorities such as recovery from Covid 19, tackling economic inequality, and wellbeing.

AIR QUALITY

Fossil free vehicles and construction plant emit less nitrogen oxides and fine particulates. This supports the goals of our [Air Quality Strategy](#).

BIODIVERSITY

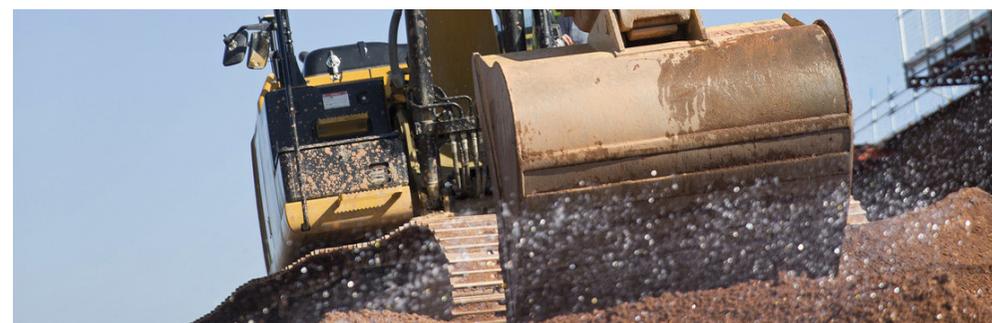
Our roadside verges are home to huge amounts of wildlife. Managing these verges and our other open spaces for both carbon lock up and biodiversity supports our commitment in our [Biodiversity Plan](#) to have no net loss of biodiversity by the end of 2025.

CIRCULAR ECONOMY

Cutting waste – from modular, flexible designs on our network to reducing waste on our construction sites – cuts carbon and improves material efficiency.

CLIMATE RESILIENCE

Even with fast action to cut emissions, higher levels of greenhouse gases in the atmosphere are already leading to more extreme weather – from heavier downpours, more frequent heatwaves, and sea level rise. Read more in our [Climate Adaptation Risk Assessment](#) which we are updating now.



Living and breathing our carbon ambitions

Strategies are nothing without strong implementation. Delivery of our plan will require strong collaboration, culture and embedding throughout our organisation and supply chain.

OUR CULTURE AND SKILLS

Putting carbon as a key part of every decision we take across the organisation will require significant culture change and for us to give our people new skills. We will take the following actions:

- Conduct a skills needs assessment and launch a zero carbon skills programme in 2022
- Give our leaders the knowledge and confidence to talk and exemplify low carbon leadership
- Communicate our net zero plan effectively through the company and keep all our teams up to date
- Put carbon as an integral part of people and performance management

PARTNERSHIPS

To deliver our maintenance and construction ambitions we will work closely with our supply chain and other UK and global infrastructure providers, to deliver faster net zero action, share progress and develop common standards. To deliver on our road user ambitions, we will work with the DfT and local transport authorities, to support the uptake of zero carbon vehicles, facilitate modal shift, and efficiently manage traffic. This means that together the UK can deliver its net zero commitments faster and, globally, we can accelerate the decarbonisation of road travel across the world.

OUR SUPPLIERS

We can only deliver our net zero ambitions with the support and involvement of our supply chain. We will work closely with them to deliver our net zero commitments and will also set clear targets for all.

Our immediate asks for our suppliers are to:

- Set a 1.5°C-aligned Science Based Target for their operations and the products and services which they supply to us
- Implement a strong carbon management system aligned to PAS2080 ahead of the third road period
- Develop a strong net zero innovation pipeline to deliver these commitments and support our net zero journey

ADVOCACY FOR CLIMATE LEADERSHIP

As a large, government-funded company we have strong influence and will use this to call for fast and effective climate leadership across government, business and international partnerships. As well as our own activities, we will be an advocate in support of the Paris Agreement goals and for ambitious national and regional climate policy.



Distribution warehouse, freight transportation

Governance, data and disclosure

Our plan is underpinned by a commitment to strong governance, gathering clear, robust data and reporting our performance in an open way.

GOVERNANCE

Our Board takes overall accountability for the management of our corporate risks, including climate change. We will appoint an Executive Board member to have responsibility for delivery of our net zero plan. Our central carbon team provides day-to-day coordination of our carbon performance, with clear actions and governance devolved to each directorate.

DATA

We have gathered strong data on our carbon performance for many years. We have carried out a review of current data systems and will develop a plan to upgrade our processes, systems and assurance, which will be complete for the end of 2024.

REPORTING

We will publish an annual report covering our progress and performance.



National Highways ecological survey, Cumbria

If you need help accessing this or any other National Highways information, please call 0300 123 5000 and we will help you.



*This image: Wild flowers on the A30, Cornwall, South West
Cover image: Domestic wild species on the A2, Kent, South East*

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