

Net zero highways

Data method statement

September 2023

Introduction

This document outlines the methods that we have used to develop the 2019/2020 baseline and carbon reduction trajectory for the NZP and associated updates¹. This method statement provides an update to the previous version and details out the key changes and challenges and covers the three following areas of carbon emissions:



Corporate: Emissions from our own operations, this covers emissions sources such as office energy requirement, network lighting, and corporate purchases, for example office supplies and gritting salt for the network.



Construction and Maintenance: Emissions from our capital works supply chain. This includes emissions 'embodied' in materials, emissions from the transport of materials to and from site, and the use of construction plant, for both new construction and maintenance activities. In addition, this category also includes energy use where the supply chain is managing sections of the network under Design Build Finance Operate contracts.



Road User: Emissions generated by vehicles using the strategic road network. These emissions are not required to be included within National Highway's Carbon footprint, as they fall outside of the minimum boundary as defined by the GHG protocol corporate standard². However, this has been included as we have some influence over emissions from Road users.

National Highways has undertaken a re-baselining of the carbon footprint that underpins the Net Zero Plan (NZP) from a calendar year of 2020 to a financial year of 2019/2020. This forms part of our commitment to review "our current data systems and identify actions to improve the collection and use of data" as detailed in the NZP. The re-baselining has been undertaken for the following reasons:

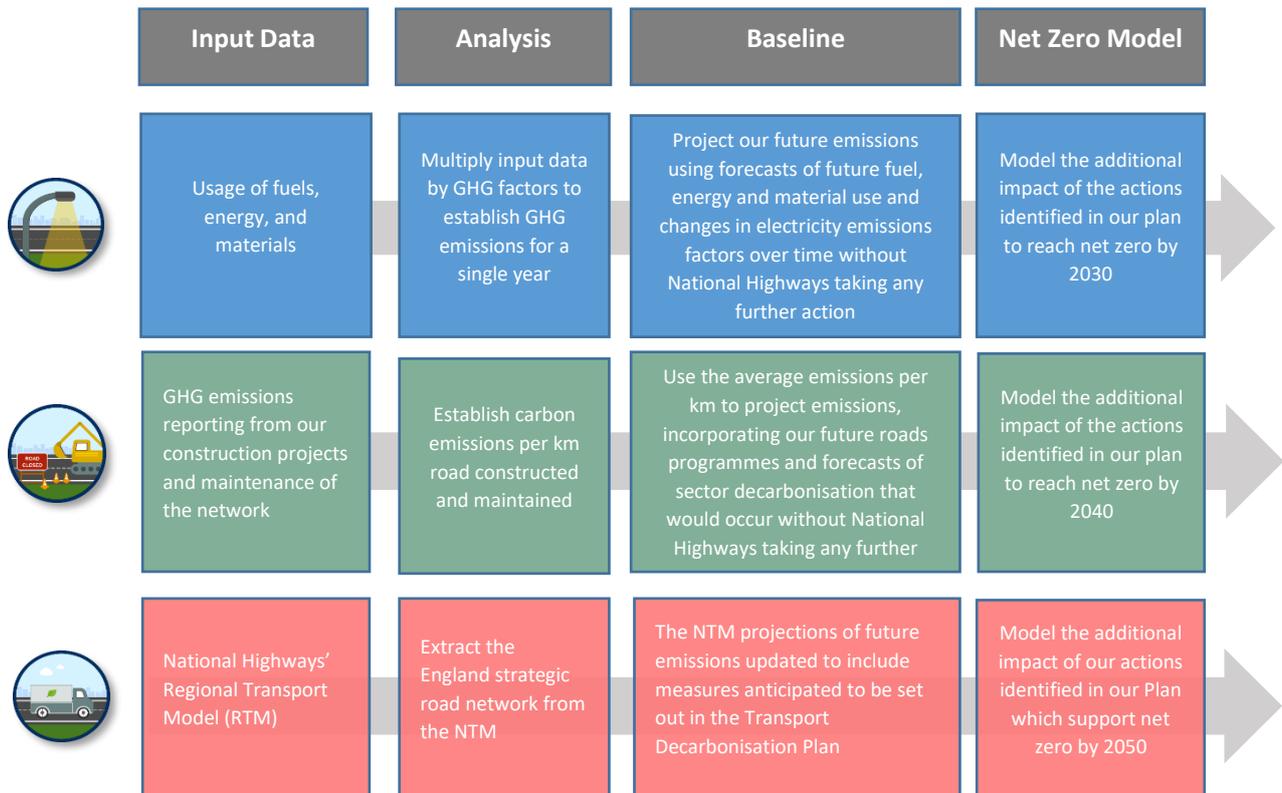
1. To align with other National Highways reporting on a financial year basis;
2. 2020 was a Covid year and 2019/2020 is, therefore, considered to be more representative of a 'typical' year;
3. Since the publication of the NZP in July 2021, improved data has become available; and
4. It is considered best practice for organisations to continually review and update their Net Zero Plans.

Due to carrying out this re-baselining activity the data published in the 2020 NZP and 2020/2021 Annual Progress Update is not comparable to the 2019/2020 and 2022/2023 data published within the 2022/2023 Annual Progress Update.

¹ National Highways's Net Zero Carbon Plan 2030-2040-2050 [net-zero-highways-our-2030-2040-2050-plan.pdf](#)

² GHG Protocol Corporate Standard. [Corporate Standard | Greenhouse Gas Protocol \(ghgprotocol.org\)](#)

Overview of Data, Methods and Outputs



Corporate

Net Zero Plan Baseline 2019/2020

Scope and Data

Our corporate emissions are reported according to the GHG Protocol Corporate Standard² and as we are setting a net zero target this must also follow the SBTi Guidance³, which has been used to determine which Scope 3 emissions sources to include and exclude. Additional details on the difference between the NZP and the Greening Government Commitments can be found in the Appendix.

The key data was collected and collated from teams responsible for key activities within National Highways. This baseline was supplemented by additional data and estimates (based on available information and industry emission factor benchmarks to gauge materiality) to ensure full coverage of our corporate emissions for the SBTi Net Zero scope, as summarised below:

Scope 1

- Building Heating – Fuel type and fuel usage/quantity (kWh, litre);
- Light Vehicle – Vehicle type and vehicle travel distance (miles, km); and
- Heavy Vehicle – Vehicle type and vehicle mileage (miles, km).

Scope 2

- Strategic Road Network (SRN) network electricity use – Electricity generation source and electricity usage/quantity (kWh); and
- Estates electricity use – Electricity generation source and electricity usage/quantity (kWh).

Scope 3 (estimated where based on available information and industry emission factor benchmarks to gauge materiality)

- Corporate purchases – Financial spend data, quantity of goods purchased (Salt, IT Equipment, Vehicle Procurement, Employee Services, and Professional Services, Business Trip Accommodation, Subsistence, and Parking).
- Fuel and energy related activities – Fuel and Energy type, and fuel and energy usage/quantity (kWh, Litre)
- Waste generated in operations – Waste type and waste quantity (tonne)
- Business Travel - Vehicle Type, and vehicle travel distance (miles, km);
- Employee Commuting and Homeworking– Commuter Type and commuter distance.
- Upstream Leased Assets – Data centre energy type and usage, and landlord controlled energy supplies and cooling (estimated).
- Downstream Leased Assets – Motorway Service Area energy type and energy usage/quantity.

Carbon Removals and Offsets:

- Carbon Sequestration from Forestry – Habitat type and habitat area. estimated 8,000 hectares of forest based on our geographic information system (GIS) data and

³ Science Based Targets initiative [Net-Zero - Science Based Targets](#)

application of Woodland Carbon Code calculator method to estimate tCO₂/year absorbed.

Calculation Methodology

To help us understand where we needed to focus our actions a baseline of historic and future GHG emissions was constructed by multiplying the input data by GHG emissions factors. Emission factors were collected from industry standard databases including but not limited to UK Government Greenhouse gas reporting: Conversion Factors, Bath ICE, Association of issuing bodies. Emissions are reported in carbon dioxide equivalent emissions (CO₂e).

External Factors Modelling

DEFRA GHG Reporting Guidance⁴ was used for historical emissions factors for electricity and other fuels. BEIS long-run marginal forecasts are used for grid electricity emission to account for grid decarbonisation. WebTAG Databooks used to provide changes in vehicle efficiency. Incorporation of carbon reduction trajectories for key industries including, hospitality, vehicle manufacturing, data centres, motorway service area providers, and rail travel.

Methodology Assumptions

For the corporate baseline year, 2019/2020, some data was unavailable; the following assumptions were made based on industry benchmarks and professional judgement;

Emissions Source	Assumption
Building Cooling (F-Gas)	1% of office energy

To forecast from the 2019/2020 baseline required some assumptions as follows;

- Additional mileage would be driven by our vehicles as new vehicles are added to the fleet;
- DBFO operational electricity usage was included from the contract end date when emissions move from maintenance and construction to corporate; and
- Forestry sequestration estimated based on our GIS data and Woodland Carbon Code, however this was then rounded down to 15,000 tCO₂e to account for uncertainty.

Limitations

- Independent assurance activity is still being defined and will be introduced as part of our update for 23/24 progress report; and
- There is limited metering of our network electricity usage and estimation has been used. This is an area for ongoing validation.
- There is currently limited understanding on the impact of the digitisation and effect on data centre requirements.
- There is currently limited understanding on the impact of electric charging facilities on National Highways estate and Motorway Service Areas.

Action Quantification

In addition to the reductions in carbon emissions expected in the baseline, primarily due to the decarbonisation of the electricity grid, our net zero plan includes the implementation of actions to

⁴ DEFRA [Guidance on how to measure and report your greenhouse gas emissions - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/guidance-on-how-to-measure-and-report-your-greenhouse-gas-emissions)

further reduce our emissions. This was modelled to understand the impact of these actions and include:

- Light and Heavy Vehicle Fleet – The transition of our own fleet to electric vehicles, and the use of electric vehicles for business travel;
- Building Heating – gradual switch away from gas to renewable sources by 2030;
- Network Electricity – the switch to LEDs for our lighting;
- Network Electricity and Building Electricity – Green energy tariffs/Power Purchase Agreements (PPAs) – credit in net emissions reporting for zero carbon electricity sources;
- Business Travel – implementation of a travel hierarchy and transition to zero emission travel where possible; and
- Corporate Purchases – policies to monitor and reduce emissions in this category.

Limitations

- Carbon removal from forestry sequestration is significant and is estimated. Independent assurance sources are being considered and will form part of the future method statement.

Annual Progress Update 2022/2023

The following provides any updates made to the Scope and Data, Calculation Methodology, and Action Quantification and any associated assumptions and limitations made.

Scope and Data

No updates to the underlying scope and data have been required during the 2022/2023 Annual Progress Update.

Calculation Methodology

External modelling factors including grid decarbonisation, and vehicle efficiency have been updated to reflect the latest published figures. Updated emission factors have also been used reflecting the latest published figures.

Where data is now available to replace additional mileage assumptions this has been updated.

Action Quantification

No updates to the underlying scope and data have been required during the 2022/2023 Annual Progress Update.

Maintenance and Construction

Scope and Data

Emissions from our construction and maintenance supply chain covers the manufacture, transport and use of materials such as asphalt, cement, concrete and steel on our network.

The following key data sources have been used:

1. Construction and maintenance supply chain National Highways Carbon Tool⁵ outputs from financial years 2011-12 to 2021-22;
2. Major Project scheme pipeline from 2013 to 2030, covering RIS3; and,
3. Major Project Environmental Statements.

Baseline

The principal data source for the baseline is the carbon returns that construction and maintenance supply chain create using the National Highways Carbon Tool. Where the carbon returns were not complete or sufficiently robust, we supplemented this with the GHG emissions data declared within the project's Environmental Statements or we have calculated GHG emissions using the projects material bill of quantities. The resultant dataset was compiled and summarised by contract type, project type, material type and emissions source. The following section sets out how we used this data to model future performance to create a baseline. The baseline has been created for the 2019/20 financial year.

Major Projects Baseline Forecast

The carbon impact of construction is dependent on what is built, so we needed a measure of the average carbon efficiency of construction to compare performance over time (and between different projects), and to produce forecasts.

In order to establish a measure of carbon efficiency the total carbon impact (tCO₂e) was divided by the total major projects length (lane km). This gives a carbon intensity indicating the carbon emissions per lane km (tCO₂e/lane km). See below.

$$\frac{\sum \text{Carbon impact from major projects}}{\sum \text{Lane km from major projects}} = \text{Carbon impact per lane km}$$

This analysis was carried out for each category of major project deliverable:

- Widening
- Junctions
- Complex Infrastructure Projects (CIPs)
- Smart Motorway⁶

⁵ Carbon emissions calculation tool: National Highways [Carbon emissions calculation tool: Highways England - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

⁶ All Smart Motorway and ALR Retrofits have been cancelled. Emissions provided by the supply chain have been included in the model, but these are no longer included in our forecasting.

- Bypass
- All Lane Running (ALR) Retrofit⁶

An overall average for performance was calculated across all project categories. To forecast future emissions a five-year rolling average was applied. The CIPs were added discreetly on top of the rolling average as this project type is built on an ad hoc basis due to their size. This also allows for future CIPs to be added to the model as they arise.

Maintenance Contracts

There are two primary types of maintenance contract that we have, regional area maintenance and DBFO contracts.

Both contracts have the same sources of maintenance GHG emissions with the exception of operational energy usage, such as lighting and variable message signs, which is only included for DBFO contracts. Operational energy usage for all other parts of the SRN outside of the DBFO contract is included within our corporate scope of GHG emissions. DBFO operational energy use has been estimated based on the average from other areas of the network currently under National Highway's control.

Baseline Decarbonisation

A baseline level of decarbonisation is expected to occur without the specific actions set out in the National Highways Net Zero Carbon Plan. This includes the following:

- Decarbonisation by material sectors which have publicly announced a net zero by 2050 pathway. The sectors are:
 - Concrete and cement⁷; and,
 - Steel⁸.
- The use of lower temperature asphalt.
- The decarbonisation of transport and plant through the transition to electric power.

Total Construction and Maintenance Emissions Baseline

The combined construction and maintenance supply chain emissions baseline was summarised by source of emissions set out below based on the average split across all contract types:

- On site plant;
- DBFO operational energy;
- Material transport;
- Materials:
 - Concrete;
 - Cement;
 - Steel;
 - Asphalt;
 - Aggregates;
 - and other.

⁷ MPA UK Concrete and Cement Industry Roadmap to Beyond Net Zero (2020) available online: https://www.thisisukconcrete.co.uk/TIC/media/root/Perspectives/MPA-UKC-Roadmap-to-Beyond-Net-Zero_October-2020.pdf

⁸ Energy Transitions Commission, Mission Possible: Reaching net-zero carbon emissions from harder-to-abate sectors (2018) available online: https://www.energy-transitions.org/wp-content/uploads/2020/08/ETC-sectoral-focus-Steel_final.pdf

Assumptions

- The total carbon emissions for each project have been applied evenly over the total years of construction.
- The 5-year (2015-2019 inclusive) average carbon footprint for maintenance and the DBFO contract works has been used and remains constant to 2050.
- All DBFO operational electricity will return under the control of National Highways after the contract end years.

Limitations

- Not all suppliers are currently reporting their National Highways Carbon Tool data correctly e.g., mis-reporting, late reporting or not reporting. To address this bill of quantity data and Environmental Statement carbon assessments were used to supplement the data and fill in gaps, as required.
- A location based⁹ approach has been taken to estimating the GHG emissions for the operational electricity use by DBFO contracts using grid average emission factors. Therefore, this does not consider DBFO contracts using green energy tariffs. The future decarbonisation of the grid has been taken into consideration using the UK Government Green Book¹⁰ greenhouse gas emission factors.

Action Quantification

In addition to the reductions in carbon emissions expected in the baseline, we will be implementing additional measures that are in the net zero plan to reduce construction and maintenance emissions. A forecast was modelled to demonstrate the impact of these actions. Full details of this modelling can be found in the Supporting Data Spreadsheet^{Error! Bookmark not defined.}. The key actions modelled in our net zero scenario are:

- Requirement for net zero plant on our sites by 2030;
- Requirement for net zero HGVs on our sites by 2040;
- Increase capacity on our network due to digital roads (1% by 2030, 8% by 2040 and 17% by 2050 of increased capacity)^{Error! Bookmark not defined.}; and
- Carbon efficiencies (2.5% from 2020 to 2040 and 10% from 2020 to 2030)¹¹.

Assumptions

- All materials, plant and HGVs decarbonise following the CCC 6th Carbon Budget Manufacturing and Construction trajectories.
- HGVs are fully decarbonised by 2040 due to National Highways policy commitment.

⁹ A location-based method reflects the average emissions intensity of grids on which energy consumption occurs (using mostly grid-average emission factor data). GHG Protocol, Scope 2 Guidance (2015): accessed online at: https://ghgprotocol.org/sites/default/files/Scope2_ExecSum_Final.pdf

¹⁰ Department for Business, Energy & Industrial Strategy, IAG spreadsheet toolkit for valuing changes in greenhouse gas emissions (2019): accessed online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/873679/toolkit-for-valuing-changes-greenhouse-gas-emissions.xlsx

¹¹ A 2.5% carbon efficiency rate has been applied pre sector decarbonisation as the savings from building nothing and building less are primarily covered by the savings from smart motorways and digital roads. A 10% carbon efficiency rate has been applied post sector decarbonisation as the build smart and build efficiently construction measures will be taking place as a result of the PAS 2080 framework and ways of working being implemented across the Highways England supply chain. The potential carbon saving percentage was developed using the estimate percentage saving Anglian Water have achieved since implementing and working to PAS 2080 across their alliance.

Limitations

- The CCC 6th Carbon Budget Manufacturing and Construction decarbonisation trajectories were used and therefore projections include additional carbon saving impacts from the manufacturing sector.
- The projections do not disaggregate plant and transport from materials which may differ in their decarbonisation trajectories, but have been assumed will broadly align.

C&M Range Summary

To produce the final figures that were used in Our 2030 / 2040 / 2050 net zero plan, we took the final reduction trajectory that was quantified by combining the baseline and the actions quantification. Using this we calculated the percentage reduction compared to 2019 for 2025, 2030, and 2035. To account for the uncertainty associated with this trajectory, we applied a 10% range to these figures based on professional judgement.

Road Users

Policy Background

The DfT's plan to accelerate the decarbonisation of transport, the Transport Decarbonisation Plan (TDP), sets out in detail what government, business and society will need to do to deliver the significant emissions reduction needed across all modes of transport, putting us on a pathway to achieving carbon budgets and net zero emissions by 2050.

Therefore, many of the actions that will deliver the ambition for net zero road user emissions by 2050 are being pursued by the DfT and 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.

Scope and Data

For the purposes of the National Highways Net Zero Plan road user GHG emissions are the carbon dioxide emissions (CO₂) released at the tailpipe from vehicles travelling on the SRN.

The primary sources of data for road user emissions on the SRN are outputs from National Highways' five regional transport models (RTMs), with additional data taken from the DfT's National Transport Model (NTM) which has been used to model the impact of the TDP. We use modelled data as there is not sufficient actual data to provide an accurate and repeatable measure of emissions across the SRN.

The five RTMs cover the full SRN and model traffic flows and speeds. They model how these are impacted by new investment, policy changes and changes in travel demand. They draw on an extensive range of demand data and are adapted to reflect a range of background scenarios defined by DfT (and reflecting the TDP), considering the major factors affecting future patterns of travel.

The RTMs provide us with the most reliable estimates of the total carbon emissions (tonnes of CO₂) from the SRN. To understand how this split by fleet (car, light goods vehicles, rigid heavy goods vehicles, articulated heavy goods vehicles and public service vehicles), we use the NTM.

The NTM is a DfT model which produces forecasts of road traffic growth, vehicle tailpipe emissions, congestion and journey times. Like the RTMs, NTM provides a systematic means of comparing the national consequences of alternative transport policies against a range of background scenarios which take into account the major factors affecting future patterns of travel.

Baseline

Our methodology has been updated from previous reports and has been used to calculate the 2019/20 baseline and estimates to 2022/3. Previously, our estimates were based solely on NTM data. By combining the RTM and NTM data we improve the accuracy and ensure a consistent approach between how we estimate annual road user emissions and forecast changes from future investments. We are currently updating the baseline to 2050 using this new method.

Method

Annual estimates of road user emissions are derived from RTM data on forecast annual traffic volumes and total CO₂ emissions (calculated based on traffic flows, speeds and traffic composition). These are taken from each model and combined to provide totals for the SRN.

To provide the split of emissions between modes (cars, vans, HGVs, etc), we use the proportions from an SRN (England) specific extract of the NTM.

Assumptions

- The baseline assumes an increase in vehicle km travelled on the SRN over time. This includes an approximately 40% increase in car vehicle km travelled on the SRN between 2020 and 2050.
- Traffic and emissions figures for 2020/21 to 2024/25 have been adjusted to reflect the lasting impact of COVID 19 on travel, in line with recommendations from DfT.
- The baseline assumes an increase in vehicles that are zero emission at the tailpipe over time. For cars this will primarily be battery electric vehicles (BEVs) and for heavier duty vehicles this could include BEVs, electric road enabled vehicles or hydrogen powered vehicles.
- The proportion of zero emission vehicles is based on professional judgement of the anticipated impact of key policies such as the ban on new diesel or petrol cars and vans from 2030, and a future ban on diesel or petrol HGVs, which has been assumed to be in 2040 for the purposes of analysis.
- A rapid uptake of BEV cars and vans over the next decade has been assumed, with 80% zero emission by 2035.
- A rapid uptake of zero emission HGVs has been assumed to take place from 2035 onwards with 75% zero emission by 2045.
- It has been assumed that almost all vehicles on the network in 2050 will be zero emission at the tailpipe.
- The NTM is aligned with the data and assumptions in the DfT TAG Databook and OBR latest GDP forecast¹².
- In line with the TAG Databook, the NTM assumes progressively lower carbon associated with electricity through to 2050 but that there are residual emissions from electricity generation. Therefore there are still small residual carbon emissions from vehicles that are zero emission at the tailpipe.

Action Quantification

Whilst government policy is expected to drive the transition to a net zero vehicle fleet on the road network, there are actions we can take to support the transition or increase the rate of transition. To help prioritise which actions we should focus our efforts on, the potential carbon emission reduction was estimated for key actions. Some actions we have included in our net zero plan were not included in this analysis because the potential impact of some actions could not be disaggregated from existing government policy and initiatives.

Research was previously undertaken to determine the likely emissions reductions achievable by potential actions. The emissions reduction assumptions were applied to the NTM data to estimate in each year between 2021 and 2050 what the emissions reduction would be.

¹² DfT TAG Databook. <https://www.gov.uk/government/publications/tag-data-book>

Assumptions

A number of assumptions were made in order to apply emissions reductions to the NTM data. The assumed impact on each action or group of actions of reducing emissions as well as the reference sources these assumptions are based on is set out in Table 6.1.

Table 1: Assumptions and reference sources for each action considered

Action / Action Group	Impact Assumptions	Reference
70 mph speed Limit compliance by cars and LGVs	2% emissions reduction across cars and LGVs	CCC Report and European Environment Agency ¹³
60 mph speed Limit compliance by cars and LGVs	7% emissions reduction across cars and LGVs	CCC Report ^{Error! Bookmark not defined.} and European Environment Agency ^{Error! Bookmark not defined.}
Economical and efficient driving by cars and LGVs	8% emissions reduction across 20% of cars and LGVs	CCC Report ^{Error! Bookmark not defined.}
Economical and efficient driving by rigid HGVs	13% emissions reduction, 50% take up	Energy Saving Trust ¹⁴ , CCC Report ^{Error! Bookmark not defined.} and Professional judgement
Economical and efficient driving by articulated HGVs	22% emissions reduction, 50% take up	Energy Saving Trust, CCC Report and Professional judgement
Improved logistics by rigid HGVs	10% emissions reduction	Energy Saving Trust, CCC Report and Professional judgement
Improved logistics by articulated HGVs	11% emissions reduction	Energy Saving Trust, CCC Report and Professional judgement
Demand reduction through modal shift	1% emissions reduction across cars and HGVs	CCC Report and Professional judgement
Smoother road surface	Assume 2% emissions reduction on 5% of km travelled across the network	Fuelsave Project ¹⁵ and Professional judgement

Limitations

Whilst reference sources were found for the potential emissions saving from these potential actions, the extent of uptake and impact across the SRN has been largely based on professional judgement.

Comparing Road and Rail

Method

To help provide context for SRN road user emissions with the wider transport network over time a comparison was made between SRN car travel and national rail travel. The 2020 UK GHG emissions conversion factors¹⁶ were identified for transporting 1 tonne of goods 1 km for both road and rail, as well as for transporting passengers by rail.

¹³ European Environment Agency 2020. Available online: [Do lower speed limits on motorways reduce fuel consumption and pollutant emissions? — European Environment Agency \(europa.eu\)](https://www.eea.europa.eu/en/press-releases/2020/04/04)

¹⁴ Energy Saving Trust. Available online: <https://energysavingtrust.org.uk/service/subsidised-ecodriving-training/>

¹⁵ Ramboll Fuelsave Project. Available online: <https://ramboll.com/digital-mobility-lab/modelling/fuelsave>

¹⁶ Department for Business, Energy & Industrial Strategy (BEIS) Greenhouse gas reporting: conversion factors 2020. Available online: [Greenhouse gas reporting: conversion factors 2020 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/432222/ggr-conversion-factors-2020.pdf)

For comparison with transporting passengers by road, the NTM value for total emissions for cars was divided by the total km travelled by cars. The resultant emissions by car per km was then divided by an average car occupancy of 1.6¹⁷ to identify the emissions per person per km for travel on the SRN.

A dataset was then created for how the emissions per tonne/km and passenger/km would change between 2021 and 2050 for both road and rail. This was based on professional judgement of the forecast emissions reduction over time as anticipated to be within the TDP.

To produce the final figures that were used in Our 2030 / 2040 / 2050 net zero plan, we took the baseline trajectory for 2025, 2030, 2035, 2040 and 2045. We then generated ranges based on the DfT's transport decarbonisation plan¹⁸, using the data in the final document. This provided ranges of carbon reduction for each vehicle type by year. This was applied to our baseline data for the SRN providing ranges for the expected rate of road user decarbonisation.

¹⁷ The DfT 2020. Available online: [Vehicle mileage and occupancy - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

¹⁸ <https://www.gov.uk/government/publications/transport-decarbonisation-plan>

Appendix

National Highways separately reports its GHG emissions to the Department for Transport (DfT) as part of the UK Greening Government Commitment (GGC), which uses a slightly different approach to carbon accounting to provide consistency with other government bodies reporting requirements. As a result of these differences, the emissions reported vary slightly between this document and our Corporate Annual Report. More detail on the differences in scope and methodology is presented in the table below.

Approach	National Highways Annual Report (GGC approach)	Net Zero Annual Progress Update (GHG Protocol approach)
Method	DfT reporting guidance	Science Based Target Initiative Net Zero for Corporations guidance
Green tariffs – PPAs and Energy Attribute certificates (that track electricity back to source)	Can be counted in some circumstances where additionality is proven	Can be counted
Corporate indirect emissions (scope 3)**	Only business travel	Covers full corporate Scope 3*
Removing carbon from the atmosphere	Can be shown alongside gross figure (without) as a net figure	Forestry on the soft estate and third part removal offset included
Forecast Net Zero year	2030 with forestry, excluding Scope 3, excluding green tariffs	2030 with forestry, including Scope 3, including green tariffs
Emission factors	BEIS	Same basis
Network electricity	2019/20 actual baseline with adjustments for smart motorways, LED retrofit and DBFO handback	Same basis
Solar PV	Estimate of potential by 2030	Same basis
Forestry offset	Estimate based on 7,000 hectares	Same basis
HE Fleet	Gradual switch to EV	Same basis

* There are a number of other emissions related to grid electricity T&D losses, business travel, staff commuting and Scope 3 corporate supplies (e.g. grit salt, leased assets, IT services, office supplies, office waste disposal).

** For definition of scopes see GHG protocol [\[Link\]](#)