national highways

Net Zero
Data improvement plan update
December 2024

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Executive Summary

Our plans to achieve our net zero targets rely on accurate data. We use this data to measure our carbon emissions, to make forecasts about future emissions and to help us plan the delivery of our actions to achieve net zero.

When creating our Net Zero Plan we made use of the data that we had already collected. We had processes in place to measure our corporate carbon through our greening government commitments, construction carbon through our major projects process and our construction and maintenance performance indicator.

When developing our Net Zero Plan we knew that data was one of the critical elements that would contribute towards its success and enable us to achieve our targets. We knew that improvements would be necessary and committed to review our current data systems and develop a Data Improvement Plan to upgrade our processes, systems and assurances.

Since the publication of our Net Zero Plan in 2021, we have worked to:

- Solidify the fundamentals, by ensuring that we are consistently measuring against agreed standards and making best use of the data sources we have
- Check our progress by monitoring our performance and external validation of our plans.
- Further enable and improve implementation of Net Zero Plan actions, through use of digital tools and techniques
- Lay the foundations for the future, by reviewing our governance and preparing for greater digitisation.

We continue to make improvements to our data, but there is always more that we can do. We see this as something that will continue to progress throughout the whole of our net zero journey, as we continue to work with new data sources or use data in different ways to gain new insights.

Our next priorities are:

- Continue to develop our corporate carbon KPI so that the way we measure the performance of our business fully supports our Net Zero Plan through the Road Investment Strategy (RIS) 3 period.
- Continued digitisation of our construction and maintenance carbon process, through new tools to estimate carbon baselines and the measurement of carbon outturns.
- Realising the benefits of digitising our construction and maintenance carbon processes, including developing a new Key Performance Indicator for the RIS 4 period that will properly test our activities to reduce construction and maintenance carbon.
- Continuing to review and improve our use of data across our Net Zero Plan.

1 Introduction

Following the publication of our Net Zero Plan in 2021, we identified areas where we can continue to improve the quality of the data we rely on to understand our progress, identify new opportunities and optimise the implementation of the actions in the Net Zero Plan.

The Net Zero Plan is underpinned by a commitment to 'strong governance, gathering clear, robust data and reporting our performance in an open way' and this update describes how we continue to review our data systems to develop a robust Data Improvement Plan to upgrade our processes, systems and assurance. It describes our approach, what we have achieved so far and our focus areas for the future.

1.1 Background

Prior to the launch of our Net Zero Plan, we already had processes in place to collect carbon data and have gathered strong data on our carbon performance for many years.

We achieved significant milestones, such as introducing our corporate carbon Performance Indicator (PI) at the start of RIS1 and Key Performance Indicator (KPI) from 2021 onwards, measuring the carbon impact of our corporate activities, in line with our responsibility as part of the Greening Government commitments.

Similarly, we have been collecting data on carbon emissions from our supply chain construction and maintenance contractors since 2008/09 through our carbon accounting tool. This process has allowed us to build up a database of carbon emissions for the construction and maintenance activities undertaken on our road network. The emphasis on monitoring and reducing carbon emissions has continued through RIS 2, including the introduction of a performance indicator for supply chain carbon emissions.

This data formed the starting point for us to develop our Net Zero Plan.

1.2 Our Net Zero Plan

In 2021 we published our Net Zero Plan, which can be read here: https://nationalhighways.co.uk/media/uxjpf0b1/net-zero-highways-our-2030-2040-2050-plan.pdf

The development of our Net Zero Plan was based on a thorough analysis of the available data which involved a comprehensive review of all our activities to create a baseline of our carbon emissions across three areas:

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. Our net zero target is to be *"Net zero for our own operations by 2030".*

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. Our net zero target is to be *"Net zero for our maintenance and construction activities by 2040".*

Road User: Emissions generated by vehicles using the strategic road network. Our net zero target is to be *"Net zero carbon travel on our roads by 2050".*

From this baseline we were able to develop a Net Zero Plan to reduce our emissions over time through the implementation of specific actions and we committed to publishing an annual carbon footprint that can be compared to this baseline to monitor our progress. Our Net Zero Plan is underpinned by a commitment to strong governance, gathering clear, robust data and reporting our performance in an open way.

Our latest progress update can be found here: https://nationalhighways.co.uk/our-work/environment/net-zero-highways-progress-report-2023-2024/

1.3 The importance of data

We know that data is a critical enabler to achieving net zero. We need to be confident of our baseline position and of measuring our annual footprint so that we can monitor progress and so that we will know when we have achieved net zero.

We don't just need to be confident ourselves, we also need to be able to demonstrate this to others. This means that our data must be correctly collected and processed with a strong assurance process in place that allows others to verify that our numbers are correct.

As part of developing our Net Zero Plan, we understood that the data we were using was not perfect. Over time we would learn more about where our emissions come from and exactly what contributes to them.

We knew that there would be developments across industry that we could learn from. We also knew that we would make changes to business processes over time that would change what we need to measure or how we need to measure it. We identified that improving data would be an enabler for delivering other actions in an effective and proportional way.

Therefore, we committed to improving our data as part of the Net Zero Plan, by reviewing our data and developing a comprehensive Data Improvement Plan.

This update describes how we have worked to meet this commitment.

1.4 Challenges

Across the organisation there were varying levels of maturity of net zero accounting and data capture processes. Building on from the existing carbon data systems and with the inception of the Net Zero Plan, the need to expand and improve this data has been much more widely recognised. Some of the challenges include:

- Carbon emissions are rarely directly measured and this measurement relies on making use of activity (e.g. litres of fuel, kgs of cement) or spend data. This data is typically

collected for management or financial reasons and has not always been in a form that is useful for carbon accounting.

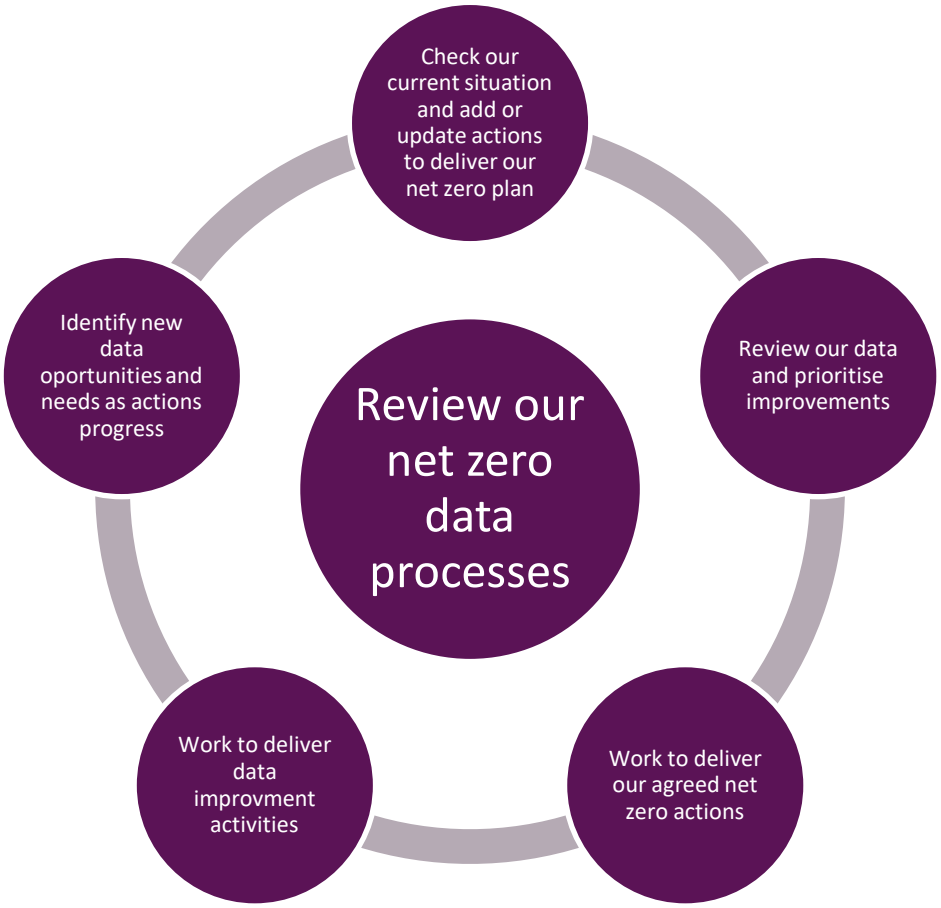
- Much of the data we need is collected from various parts of the business for different reasons and has since become an important part of how we measure our carbon footprint. We have had to challenge ourselves in some areas to improve the frequency or rigour of data collection to meet our new needs.
- Best practice for carbon measurement and accounting has evolved over time. The measurement of emissions for our Net Zero Plan has been aligned to the Greenhouse Gas Protocol and Science Based Target Initiative (SBTi) approach to carbon accounting and target setting, which are the most globally accepted methods for measuring and reducing carbon emissions. The requirements of a standard influences the types and methods of data collection and our approach has been refined to meet these.

In particular, Scope 3 emissions are difficult to quantify. This scope of emissions is specified by the Greenhouse Gas Protocol and refers to indirect emissions that occur in the upstream or downstream activities of an organisation. They are split into 15 discrete categories. There are multiple methods for calculating emissions in each category and the best approach is affected by organisational goals, data availability and data quality. The SBTi recognise the challenges this presents and are in the process of reviewing their guidance to allow for a more effective approach to Scope 3 emissions.

2 Our approach to improving data and our progress so far

We know that the only way to make the progress needed towards net zero is to be led by data, to make the right choices and to monitor how our actions are taking effect.

We have worked to make data improvement part of our process of managing our Net Zero Plan. Our approach has been pragmatic; we use the best data available to us to make decisions, while in parallel working to improve the quality of our data and exploring new data opportunities as they arise during our net zero journey.



Over the past three years we have been following this approach. We have been working to make incremental improvements to our data and reviewing our longer-term needs and developing a forward Data Improvement Plan.

We work across the whole organisation to monitor, govern, and identify areas that require prioritisation. In parallel, we make use of the strength of knowledge within the different areas of our business, allowing those who are closest to the subject of a priority area to make improvements in their areas of responsibility.

We have considered the following when prioritising improvements and developing our Data Improvement Plan:

- Committing to a recognised standard (the GHG protocol) and external verification from the Science Based Targets initiative (SBTi).
- Updating our carbon management system, as part of achieving PAS2080 certification, requiring a clearer view of our data and reporting needs for construction and maintenance activities.
- Reviewing the quality of the data sources that we rely on and identifying where improvement is necessary to increase confidence or to provide more granular or timely information to help us plan our actions.
- Identifying opportunities to make the collection of net zero data tie directly into our company governance, such as reviewing our corporate KPIs.
- Using digitisation to reduce manual work and improve the quality and efficiency of data collection.

- Working with our business and supply chain to emphasise the importance of data to achieving our net zero commitments.
- Prioritising intelligently, making improvements quickly when possible, without taking attention away from our longer-term priorities.

Since the publication of our Net Zero Plan, we have made good progress in improving our data across four areas:

2.1 Solidifying the fundamentals

Our first priority for data following the inception of our Net Zero Plan was to solidify the fundamentals, ensuring that we make the best use of the data we have on all our activities to understand our carbon footprint and consistently measure this against agreed standards.

2.1.1 Case Study: Updating our baseline

Our original carbon baseline was based upon a 2020 calendar year. In 2023, we decided to update our baseline to reporting by financial year (April to March) instead of calendar year (January to December) for the following reasons:

1. To align with other National Highways reporting on a financial year basis, so our carbon performance could be reported alongside financial performance.
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 Net Zero Plan in July 2021, we had improved data available, with increased granularity about our sources of emissions, allowing a more useful view of where we can see the benefits to reduce them.
4. It is considered best practice for organisations to continually review and update their Net Zero Plans.

Updating our baseline in this way and reporting progress against it increased the robustness of our carbon reporting.

2.1.2 Case Study: Certification of our Carbon Management System

In December 2022, National Highways became the first major roads organisation in the world to achieve PAS2080:2016 certification (subsequently updated to PAS2080:2023) for our carbon management system (CMS). This is the gold standard of carbon management for infrastructure developers and asset owners.

The CMS sets out the process of managing carbon for construction and maintenance at National Highways. Prior to development of the CMS, carbon management was being carried out in some parts of our organisation but the approach and quality varied from one team to another and was not consistently documented.

The CMS provides a consistent overarching approach to managing whole life carbon throughout the project lifecycle.

It informs our data needs by:

- Providing guidance on carbon factors
- Setting out requirements in terms of carbon data scope and inclusions/exclusions.

- Addresses uncertainty in baselining and setting out the rules for when re-baselining can be carried out for schemes.
- Defines the tools that must be used for baselining, estimating and reporting on schemes.

This provides us with confidence that we are using data robustly, with a consistent approach to setting baselines and targets, estimating, monitoring and reporting.

2.2 Checking our progress

We continue to check our progress, by monitoring our performance and seeking external validation of our plans.

We have continued to publish annual updates showing our progress against the Net Zero Plan and use this to monitor our progress against our planned trajectory to net zero, considering both our own progress and the information we have about the progress of industry and our supply chain towards net zero.

2.2.1 Case Study: External Validation by the Science Based Target initiative

Science Based Target initiative (SBTi) is the world's only corporate net-zero target setting framework. Achieving approval of net zero targets by the SBTi gives confirmation that a company's net zero targets align with the latest climate science.

In June 2024, National Highways had our corporate and construction and maintenance net zero targets validated by the SBTi. At the time of validation, we were one of only three companies worldwide involved in the 'Ground Transportation – Highways and Railtracks' sector to have net zero targets validated by SBTi.

Validation of our targets was a data led process. We provided SBTi with an evidence base to demonstrate that our corporate and our construction and maintenance baselines align with Greenhouse Gas Protocol carbon accounting standards, and that our plans to reduce our emissions are credible and based on robust data.

2.3 Enabling and improving implementation

We have worked to identify and take opportunities to further enable or improve the implementation of our Net Zero Plan actions through use of digital tools and techniques.

2.3.1 Case Study: Major Projects Carbon Dashboards

Major Project Schemes are required to calculate a baseline of their expected carbon emissions at the 'Option Selection' stage. This baseline is then used to set a reduction target, dependent on the expected year of construction.

To provide greater insight and to promote data improvement, a dashboard was produced capturing the information from all relevant schemes in one location, including baseline, target, forecast emissions and actual carbon returns. This information allows the Major Projects team to understand key contributing projects and any potential outliers and to report any concerns in a timely and effective manner. Furthermore, the dashboard allows clear tracking of progress of both carbon reduction and data improvement, most notably completeness of data which had historically been a challenge to track.

2.3.2 Case Study: LED lighting survey

In year 2023/24, the lighting on the strategic road network made up 58% of electricity usage across our estate. In the net zero plan we committed to *"replace 70% of our road lighting with LEDs by 2027."*[1]

In the past we knew that there were some inconsistencies between how we recorded our lighting assets, how the electricity use from them was billed, and in some cases, what had historically been constructed in past decades, especially for parts of the network which may have been based on old paper records. To meet our commitments, we needed to improve the data we have on our lighting assets.

To achieve this, we commenced a National Asset Inventory survey. By using image capture and analytics we can efficiently survey our entire estate. A comprehensive data governance framework for the task provides more confidence in the results in a way that a more manual process could not easily deliver, with each step of the process being fully assured. The survey of the whole strategic road network will confirm the location of road lighting columns and the presence of LED or non-LED lights.

This data will be used to update the asset inventories and will provide more accurate data on lighting quantities, energy use and carbon.

We will also use the updated dataset to more effectively plan the replacement of non-LED lights with more efficient LED lights. This replacement will reduce the cost and carbon emissions of our lighting assets, fulfil our commitment made in the net zero plan and ensure we follow our energy reduction hierarchy by prioritising energy efficiency measures to reduce the amount of electricity we consume.

2.3.3 Case Study: Cost and Carbon Estimating tool

We are developing a new digital tool that we will use to estimate both the cost and carbon impact of future schemes during the early design process. This tool will allow users to enter information required for cost and carbon estimates into one place and provide the outputs required for both cost and carbon assessments, using a digital platform.

This will improve the consistency between schemes by ensuring assumptions are consistent and that a common library of emission factors is used. It will increase the efficiency of the estimation process, allowing our estimators to work more quickly and accurately. It will allow us to update our estimation process more quickly using learning from schemes that are delivered.

Most significantly, it will allow us to manage our estimates more effectively at a portfolio level, and more thoroughly understand where proposed scheme options may require trade-offs between cost and carbon.

Development is well underway with deployment, training and embedment of the first module (product and construction emissions) within our Major Projects Directorate in progress, with a staggered launch of further modules (to cover whole life assessment) across the directorates planned to incorporate training required.

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[1] An LED luminaire produces light using light-emitting diodes (LEDs). LED lights are significantly more energy-efficient than equivalent incandescent and fluorescent lights.

2.4 Foundations for the future

We have also worked to lay the foundations for the future, by reviewing our governance and preparing for more substantive digitisation.

2.4.1 Case Study: Continued development of corporate carbon KPI

During RIS 2, our corporate emissions are reported using two different methods:

- Our net zero plan reporting found within our 2023/24 annual reporting is calculated in accordance with the Greenhouse Gas (GHG) Protocol Corporate Standard and the Science Based Target initiative (SBTi) guidance.
- Our Corporate Carbon Road Investment Strategy (RIS) 2 Key Performance Indicator (KPI) is calculated following the Greening Government Commitment methodology.

The differences between the two methodologies can be found in the Appendix of our Net zero Data method statement September 2023: https://nationalhighways.co.uk/media/l0alzkqf/external-methods-statement-september-2023.pdf

We are developing a new KPI for the Road Investment Strategy (RIS) 3 period, we propose to align with the net zero plan reporting methodology.

2.4.2 Case Study: Strengthening our carbon returns process

In our review of our carbon management system, we identified that the process of collecting carbon returns from suppliers could be improved. At present, returns are collected using a spreadsheet tool, which allows us to review the carbon impact of the work that our suppliers are doing. These carbon returns are collated and then used to produce our carbon footprint.

We have committed to developing a new digital process that will improve the efficiency of providing carbon returns and the process of assuring the data collection process for National Highways staff. This will make our carbon information more accurate to help us make informed decisions and interventions at the right time to help deliver our Net Zero 2040 target.

3 Our plans to continue to improve our data

We are still delivering and refining our Data Improvement Plan which will help us make better decisions and report our progress clearly. Our key data focus areas are informed by the work we have done so far and our priorities which are linked to the urgency of achieving our three net zero goals. We are committed to work on these focus areas, while continuing to monitor, review, prioritise and improve our data processes and data quality. This will stand us in good stead to enable the best delivery of our net zero plan actions.

3.1 Corporate Carbon Data

We have made significant process in refining our understanding of our corporate carbon footprint.

Our focus will be to complete development of the corporate carbon Key Performance Indicator (KPI) for the Road Investment Strategy (RIS) 3 period. This will provide us with consistent reporting of our corporate carbon footprint across all our reporting channels and provide the right level of visibility of progress at the top levels of our organisation and to our stakeholders.

This will allow us to continually review the success of our actions and make any adjustments necessary to ensure we reach our 2030 target.

3.2 Construction and Maintenance Carbon Data

We have set in place the foundations for significant improvement to the maturity of our construction and maintenance carbon data process. The most significant focus of our next set of data activities will be delivering this transformation.

Building on the success of introducing PAS 2080, we are working to develop new digital tools and assurance processes, to allow data to be gathered and analysed more quickly and with increased levels of confidence.

This will involve:

- Developing and delivering our digital carbon return tool for our supply chain to improve efficiency of collection, ensuring that whole-life carbon is captured consistently and enhance assurance.
- Continuing to deploy our new cost and carbon estimating tool across our business, gaining the benefits of more efficient and accurate carbon estimates across all stages of construction and maintenance.
- Integrating our digital tools so that the most up to date cost and carbon data is available so that we can quickly review the carbon intensity of all our activities.

Building on these digital tools, we will develop a new Construction and Maintenance KPI for our organisation that will be ready for the RIS 4 period. This will make use of the information from our digitised tools to provide a measure of performance that will align to our net zero goals and drive performance between 2030 and our 2040 target. It will:

- Represent a single source of truth for our overall performance on our construction and maintenance net zero journey
- Make use of new digital tools and processes to ensure data quality
- Align to the net zero plan and SBTi validated target
- Bring Construction and Maintenance reporting into consistent KPI governance
- Help us drive the right behaviours from our suppliers

3.3 Road User Carbon Data

Road user emissions reporting differs from the other metrics and is reliant on the use of transport models to create an output at the whole strategic road network level. A number of improvements have been explored to the reporting methodology ranging from switching to a simpler sample-based approach, using monitoring data from the network to give an annual estimate of changes in traffic flows and emissions to a ‘hybrid’ option where real-world monitoring data is used to adjust the traffic flow and speed data produced by the modelling.

There are trade-offs to be considered for all alternative methods and work is ongoing to explore and develop options.

We will continue to refine our approach to measuring road user emissions as data sources become available and modelling best practices evolve.

3.4 Metric Data

We will continue to develop our process for managing progress across our net zero plan actions, gathering all relevant metrics together to improve our understanding of activities and better target our resources to ensure actions are delivered as efficiently as possible.

3.5 Continuous Improvement

As our work continues to improve data quality, we will update our predictions for future emissions to include these data improvements, so we can keep track of progress towards our goals. We will continue to identify areas for potential improvement and prioritise these for future iterations of our data improvement plan.

3.6 Roadmap

The following roadmap shows how we will deliver in the short, medium and longer term.

Area	**Short term**	**Medium Term**	**Long term**
Continuous improvement and management of data	Deploy a digital platform for managing progress of all actions across our net zero plan.	Continue to review all our data and identify new opportunity for improvement as we deliver our actions.	Ensure that net zero data continues to be a core part of our long-term data digital and technology strategy, so that we have confidence that our data is well governed, high quality, and is providing the maximum possible value.
Corporate	Finalise plans for the RIS3 period based on the best available data.	A corporate carbon KPI for RIS3 is being developed to align to the net zero plan.	Monitor and actively manage progress towards our net zero target, meeting our 2030 corporate target and then keeping to it from 2030 to 2050.
Construction and Maintenance	Development of digital tools including continuing of Cost and Carbon estimating tool rollout and	Integrated digital cost and carbon platform, allowing predicted and actual cost and carbon to be compared consistently across the	Robust KPI that will hold national highways to account in driving reduction in carbon across the RIS 4 period.

	development of actual carbon tool.	national highways portfolio. Development of the new KPI.	
Road User	Review current data approach.	Develop an action plan for road user data.	Data improvement plan in place to collect and manage the data that will be needed to reach net zero between 2030 and 2050.

4 Next Steps

We will continue to deliver our net zero plan to reach our net zero targets, making the best use of data so that we can monitor progress, make the best decisions on how to implement our actions and are held accountable for our performance.

This update represents our progress at a point in time; we have made progress we are proud of and have data improvement plans in place to continue our important data journey. We are committed to continuing to progress our data improvement plan and hold ourselves accountable for delivery, providing us with greater ability and confidence in managing our net zero plan. We will also continue to actively look for more opportunities to improve our data as we find new data needs or as new tools become available.

We are also going to look at how we can further develop key members of our staff through training, to build on our organisation skills and ensure readiness for the digital transformation.

We are prepared to challenge ourselves, be ready to adapt and, when any data improves, we will adjust our data improvement plans. We will do this transparently and responsibly, knowing that as our data improves this will help us to make better targeted interventions. Ultimately, this will increase our confidence in effectively achieving our net zero goals.

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