



ENVIRONMENT & SUSTAINABILITY STRATEGY 2022

Our Roadmap to a More Sustainable Public Transport Network

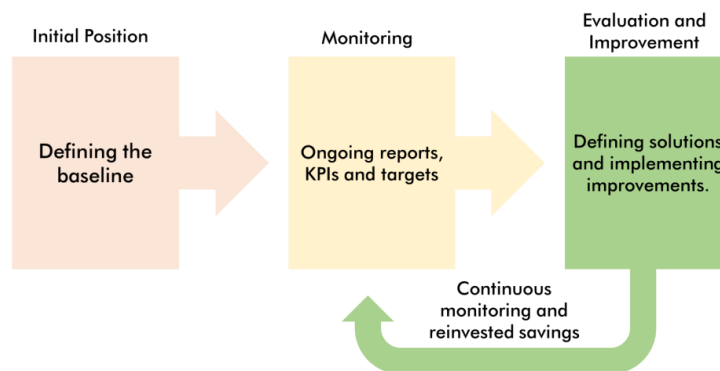
Executive Summary

Our vision is to continue to serve the North-East with the cleanest, greenest mode of transport. We want to put passengers first, helping passengers to make green choices whilst supporting our strong local communities. Nexus already provides the most sustainable mode of public transport in Tyne and Wear. This strategy sets out a case for change, challenging what Nexus does now and identifying attractive opportunities and proposals.

This strategy aims to deliver significant improvements to sustainability at Nexus, engraining it into the culture through policy, KPIs and project proposals.

The strategy focuses on reducing environmental impacts across four main themes, they are as follows: Greenhouse Gas Emissions, Waste Management, improving Biodiversity and Climate Resilience (i.e. preparing for the impacts of climate change). The strategy vision is as follows:

“Nexus is committed to protecting and enhancing the natural environment through minimising the environmental impact of our operations. We aim for ambitious reductions in greenhouse gas emissions whilst building a more resilient, reliable public transport network”



Based upon an analysis of our position versus competitors, industry leaders and other public transport operators, the main recommendations are as follows:

Initial Position

- Define the baseline - Emissions, Waste Volumes, Electricity Intensity,

Monitoring

- Commitment to a minimum annual reduction of 8% GHG emissions.
- Creation of annual internal and public reports relating to environmental performance.

Evaluation and Improvement

- **Recruit talent with a passion for sustainability**
- Creation of a **centralised “Sustainability Fund”** to provide investment for energy saving projects.
- Develop plans to **prioritise decarbonisation on each bus route we operate.**
- **Establish specification and locations for EV infrastructure and enable EV investment** by providing annual road fleet budgets over a 5-year period and ring-fence cost savings.
- Improving **station architecture to better consider “green” features.**
- Creation of a **Biodiversity Action Plan to enhance habitats** and a **Climate Adaptation Report to tackle key infrastructure vulnerabilities** associated with climate change.
- **Aim for Biodiversity Net Gain** on some major projects.

[For the full list of recommendations click here.](#)

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Chapter 1 - Introduction

1.1 Scope

This strategy sets out a case for change, challenging what Nexus does now and identifying attractive opportunities and proposals to improve the ongoing environmental performance of operations across the Nexus' estate. Significant improvements to sustainability at Nexus will be achieved, engraining it into the culture through policy, KPIs and project proposals.

Nexus recognises that one of the biggest environmental impacts it can have is through providing an alternative low carbon mode of transport, reducing emissions from private vehicles. Nexus also recognises that we have a corporate social responsibility to minimise the impact of our operations; being a provider of public transport does not exclude the expansion of our emissions from fair criticism. This will be considered in the strategy and how we can ensure that any future expansion has a net environmental gain.

Energy refers to the demand for and generation of energy in all its forms. The main forms of energy analysed will be chemical (e.g. combustible fuels) and electricity, other forms may be considered if required. Embodied energy from the procurement of materials will also be considered (the energy consumed by all the processes associated with the production). Due to its impacts, the aim of this strategy will always be to minimise the amount of energy Nexus consumes in its operations through energy saving and efficiency measures. In addition, a range of energy generating measures will be investigated.

The "environment" in this strategy refers to any pollution arising from Nexus' activities which is likely to have an adverse impact on the environment if not curtailed. This includes, but is not limited to, waste, water discharges, carbon emissions and any other activities which may damage biodiversity.

This strategy also aims to assist Nexus in the development of strategic plans to better assess how to minimise adverse impacts associated with climate change, through adaptation and risk assessment.

This strategy recognises that technological innovations can lead to significant cost savings that cannot be predicted or foreseen. The recommendations within are therefore proposed for implementation for a maximum of 6 years from publication (2028), it is however proposed that the strategy is refreshed in 2027/28, after 5 years.

Methodology

It's important to establish the base case before any recommendations are proposed for implementation. The base case aims to answer what we're doing now and how a range of stakeholders think we can improve. To build up this base case a range of sources will be used, these include meetings with heads of departments (HODs), carbon reports, utilities data and various other stakeholders. Information and proposals will then be investigated broadly in four categories, these are as follows:

- Carbon and energy reduction;
- Improve biodiversity;
- Minimise waste and promote the sustainable use of materials; and
- Climate change resilience.

Once the base case has been established, a range of case studies and other environmental strategies has been analysed to generate ideas and a long list of potential recommendations. Comparing other organisations against Nexus has provides us with areas of key development. These areas will be prioritised for improvement through recommendations.

Once a best example for each key development area has been established, heads of departments and the sponsor will be contacted to help assist in the development of realistic goals and timelines for implementation. Due to current funding constraints at Nexus, it may be necessary to prioritise recommendations based upon various levels of funding, allowing improvements to be made once funding is secured.

Vision; what will make the difference

Our vision is to continue to serve the North East with the cleanest, greenest mode of transport. We want to put customers first, helping customers to make green choices whilst supporting our strong local communities. Nexus already provides the most sustainable mode of public transport in Tyne and Wear, we must build on this success to continually improve environmental performance internally and externally by driving a strong modal shift to public transport.

Nexus aims to be a champion of sustainability through the implementation of stringent targets and innovative technologies. Engraining the environment in the heart of our culture and every decision is vital; environmental performance must remain to be a key indicator of Nexus' success. Nexus must also strike a balance between safety, performance and environmental outcomes. Utilisation of scarce resources such as energy and materials must be minimised, where possible, to streamline and optimise the efficiency of operations. Climate change poses significant risks across all sectors of society, with the challenge of decarbonisation being one of

the single greatest challenges to face humanity in recent history. Significant expenditure will be required to reduce emissions and ensure that our infrastructure is resilient enough to deal with the anticipated impacts of climate change.

The Nexus Corporate Vision is:

“Making public transport great for our environment, for our economy and for our communities”

This strategy will help to progress towards the following corporate objectives:

- ✓ Protect and enhance our services to make public transport an attractive choice.
- ✓ Exploit new technological improvements, to make public transport easier, simpler and more appealing.
- ✓ Develop a pipeline of capital projects for future funding opportunities.
- ✓ Develop plans to expand and enhance the Metro and local rail networks.
- ✓ Continue to modernise the Metro.
- ✓ Ensure our people have the skills to deliver our vision.

The Nexus Corporate Plan outlines Nexus’ vision for 2025; built around the five themes. Sustainability forms the fourth theme with the aim of *“becoming a sustainable organisation”*. This strategy will develop the strategic framework and recommendations to deliver the goals outlined with the Corporate Plan.

The vision for the Environment and Energy Strategy is:

“Nexus is committed to protecting and enhancing the natural environment through minimising the environmental impact of our operations. We aim for ambitious reductions in greenhouse gas emissions whilst building a more resilient, reliable public transport network”

Four areas of improvement have been developed to guide this vision; these have been used to assist in the recommendation of options and strategic drivers of change.








TABLE 1 - STRATEGY PILLARS

Nexus aims to deliver...			
<i>...a continued carbon and energy reduction.</i>	<i>... mapping and improving levels of fauna and flora.</i>	<i>...reduced waste and promote the sustainable use of materials</i>	<i>...plans to limit the impacts of climate change on our infrastructure.</i>
<u>Climate Mitigation</u>	<u>Biodiversity</u>	<u>Waste Management</u>	<u>Climate Resilience</u>

Key Performance Indicators

The KPIs below have been identified as being suitable to judge progress towards the delivery of the strategy's recommendations. Since the recommendations provide varied solutions, the KPIs are high level, providing maximum flexibility within an indicator of progress.

TABLE 2 - STRATEGY KPIs

KPI	Baseline	Goal	Change
<i>Annual Greenhouse Gas emissions (Scope 1+2) (see definition: Appendix B: Emission Scopes Definition)</i>	17587 tCO _{2e} (19/20)		
<i>Electricity intensity of the Metro (KWh/km)</i>	10.234 kWh/km 19/20	1% Annual Reduction	
<i>Total Natural Gas Used (m³)</i>	21412 m ³ (17-21, 4-year rolling)	25% reduction by 2030	
<i>Total waste volumes excluding passenger waste(t)</i>	156.3 tonnes (19/20)	REDUCE	
<i>Road fleet classified as ULEV (%)</i>	0%	10% by 2025	
<i>Designated protected areas for habitats owned by Nexus (m²)</i>	TBC ⁺	INCREASE	
<i>Biodiversity Index established through physical surveys.</i>	TBC ⁺	INCREASE	
<i>Delay minutes caused by significant weather events (storms, heatwaves etc.) over 5 year rolling periods.</i>	TBC ⁺	Maintain	Maintain

+ Baseline data will be completed once the strategy is completed and KPIs have been resourced.

Roles and responsibilities

This strategy is owned by the Transport Strategy directorate, Nexus. Key sections within Nexus, in terms of delivery and oversight of this strategy are as follows:

- Business Change & Technology
 - Support in the implementation of identified options.
- Safety and Assurance
 - Sponsor and development and delivery of options.
- Procurement
 - Assist in the development of options.
- Marketing, Media, and Communications
 - Promoting the strategy and environmental performance.
- Capital Delivery
 - Assist in the development of options
- Commercial
 - Assist in the development of options.
- Business Intelligence
 - Assist in the collection of data to support strategy development.
- Metro Infrastructure
 - Assist in the development and delivery of options.
- Learning
 - Assist in the teaching of staff.
- Corporate Planning
 - Engagement with environmental/net zero tasks forces at Councils

The Senior Leadership Team owner for the strategy is the Safety and Assurance Director, Nexus.

1.2 Interfaces and interdependencies

Relationship with other strategies, projects and business cases

The Energy and Environment Strategy interfaces with a range of external and internal strategies and policies in place or under development. They are as follows:

- National Strategies:
 - BEIS, The Clean Growth Strategy (2017);
 - BEIS, Leading on Clean Growth (2019);
 - DfT, Road to Zero (2018);
 - DfT, Decarbonising Transport - Setting the Challenge (2020);
 - DfT, Bus Back Better (2021); and
 - HM Treasury, Build Back Better (2020).
- Regional Strategies:
 - Transport North East, Transport Plan;
- Internal Strategies:
 - Ferry and Metro ISO 14001:2015 Certification;
 - Nexus, Corporate Business Plan;
 - Nexus, Electric Vehicles Policy;
- Relevant Legislation
 - Environmental Protection Act 1990
 - Environment Act 1995
 - Clean Neighbourhoods and Environment Act 2005
 - Natural Environment and Rural Communities Act 2006
 - SI 2019/1056 – The Climate Change Act 2008 (2050 Target Amendment) Order 2019
 - The Waste (England and Wales) Regulations 2011 (Waste Framework Directive)
 - The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
 - The Waste (Circular Economy) (Amendment) Regulations 2020

Governance and Managing Change

This strategy aims to embed a culture of environmental consideration within all areas of operations. To achieve this, it is vital that all departments are consulted in the development of strategy and embrace the recommendations as this is the most effective way for Nexus to deliver organisation change.

Nexus currently has the Head of Health & Safety Quality and Environment (Head of HSQE) and newly appointed HSQE Director who is directly responsible for environmental management. The Quality and Environment Manager deals with all Nexus areas on environmentally related issues, but more specifically Metro Operations and Ferry due to certified EMS. To improve the rollout of this strategy, it is proposed that Nexus would increase the level of resource dedicated to sustainability, this would provide the necessary resources to monitor, investigate and update the strategy. This would create a team dedicated to the rollout of decarbonisation and other significant environmental challenges across Nexus. This team would be responsible for overseeing and implementing the investment programme and managing any relevant budgets.

This strategy will seek to deliver ongoing improvements through the defining of the baseline, continuous monitoring, evaluation, and improvement (see Figure 1 overleaf). Monitoring will take the form of ongoing reports, KPIs and targets. Evaluation and improvement will define the solutions through feasibilities, business cases or research, it will also seek to implement any practical solutions.

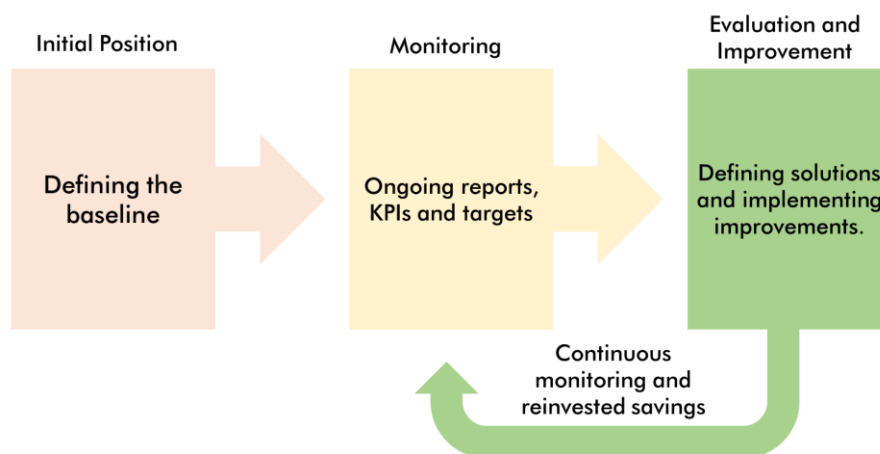


FIGURE 1 - BASELINE, MONITORING AND EVALUATION

Key decision makers across Nexus have been involved in the development of this strategy.

Chapter 2 - Delivering the Vision

2.1 Benchmarking

Greenhouse Gas Emissions

To measure performance in this area regular annual greenhouse gas emission reports must be produced. Scopes 1 & 2 (see Appendix B: Emission Scopes Definition) should be considered as a key KPI and should be targeted for a 10% annual reduction to 2026. Due to the rapid decarbonisation of the grid¹, KPIs for energy efficiency (i.e. kWh/pkm(or km) or gCO₂e/pkm(or km) should also be developed for benchmarking. The UK Government publishes emissions factors for a range of modal options with their relevant emissions factor², these can be used to benchmark our efficiency against comparative modal options (Table 1).

TABLE 3 - COMPARATIVE MODES AND THEIR ENERGY EFFICIENCY

Name of Network	Type of System	kWh/pkm
Sheffield Supertram	Tram	0.35
Tyne and Wear Metro	Light Rail	0.168
Glasgow Subway	Light Rail	0.164
West Midlands Metro	Tram	0.135
Docklands Light Rail (DLR)	Light Rail	0.113
London Tramlink	Tram	0.108
Manchester Metrolink	Tram	0.078
London Overground	Light Rail	0.078

The Community of Metros (CoMET and Nova) continues to be a powerful tool to benchmark Nexus' progress. For example, studies (from CoMET/Nova) highlighted that Nexus utilises significantly less electricity at stations (non-traction demand) compared with most in the group but highlighted that significant savings could be made through the implementation of a new fleet with regenerative braking (i.e. the new fleet in 23/24).

¹ National Grid (2020). *Future Energy Scenarios*. Available at: <https://www.nationalgrideso.com/document/173821/download>

² BEIS (2020). *Government greenhouse gas conversion factors for company reporting, Methodology Paper for Conversion factors*. Pg 64. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/901692/conversion-factors-2020-methodology.pdf

Waste Management

To measure performance of waste management policies, monthly waste quantities are being condensed down for benchmarking and analysis on a periodic basis. For future reporting waste quantities will be periodically reported and displayed at Nexus. Much of the waste that Nexus deals with comes from customers from waste bins at stations; Nexus has limited control over this waste. Significant waste also comes from capital delivery, maintenance programmes and Nexus offices.

Biodiversity

Baseline ecological surveys are to be conducted to establish the potential for, and the presence of, habitats and species within the railway environment. Further targeted surveys may be required if initial surveys identify the presence or suspected presence of protected species. These will help to classify the types of habitats we have (UK BAP Priority Habitats) and understand how to better maintain these, improving the quality and quantity of habitats available. Biodiversity indexing will be carried out on a periodic basis to establish the impacts of schemes. It is recommended that initial Biodiversity Indexing be carried out by competent 3rd party; once the index is established, it can be reviewed and updated in-house by appropriate department.

Climate Resilience

Measuring a baseline for climate resilience can be achieved through several individual measures, for this strategy the excess waiting time associated with “severe weather events” over 5-year rolling periods has been utilised. “Severe weather events” is defined as any disruption that has been caused on the network, due to any weather which has been classified as a “Red”, “Amber” or “Yellow” Met Office weather warning (see Figure 1 overleaf). The Met Office issues warnings for rain, thunderstorms, wind, snow, lightning, ice and fog. These warnings are given a colour depending on a combination of both the impact the weather may have and the likelihood of those impacts occurring³.

³ The Met Office (2020). *Weather Warnings Guide*. Available at: <https://www.metoffice.gov.uk/weather/guides/warnings/>

2.2 Summary of Case studies

Nexus – Internal Case Studies

Projects such as those discussed below can have significant impacts on the finances of Nexus, enabling further investment to be targeted towards environmental projects. This creates a virtuous circle of environmental investment, whereby costs are lowered freeing up more capital for “invest to save” business cases which further drives efficiency.

Howdon Depot

Howdon Sub-Depot following construction has been through a re-wilding programme to increase its green footprint. Wildflower seeds were cast throughout the sub-Depot footprint to encourage diverse growth. This is programmed for the broad casting of seeds to be repeated to encourage further growth. An area within the Depot boundaries has been fenced off specifically to encourage and improve on the breeding habits of the rare Dingy Skipper moth which was found to inhabit the site. The project was shortlisted for an environmental award by the Chartered Institute of Ecology and Environmental Management (CIEEM).

Depot Refurbishment

A significant refurbishment project of depot lighting was undertaken in 2012, the project consisted of new LED lighting and sensors at a cost of £138,000. The work was estimated to reduce electricity by 1.3 MWh annually, saving approximately £130,000. 715 tonnes of CO₂ were saved over the lifespan of the LEDs. The project was a success, with a payback of just 1.06 years and a 94% ROI.

Metrocar Energy Saving

The initial implementation of Metrocar efficiency began fleetwide in April 2013 involved the insertion of a minor electrical sub-circuit and switch. This would place the Metrocar in either summer or winter mode. In summer mode, the auxiliaries on the Metrocar would shut down in a timed manner following the removal of the driver’s key leaving only emergency lighting and stabling lighting illuminated. This isolated the Motor Alternator set, Compressor, Waste Heat motors and saloon lighting. Through analysis of the half hourly energy usage figures from Gosforth Sub Station at critical hours of the day (10.00 – 14.30 and 00.30 – 05.00), a great reduction in HVEC was observed. The reductions kept coming until the Metrocars were switched back into Winter mode in October of that year when a notable increase in HVEC from Gosforth Sub was noted. This initiative contributed to an approximate 4% reduction in HVEC through Gosforth Sub.

Single Car Running has been explored numerous times in Metro's history to potentially minimise energy demand, greenhouse gas emissions and achieve train maintenance savings; significantly reducing the environmental impact of our operations during quieter times. The proposal was expected to save an approx. maximum of approximately £171,000 of HV electricity annually (based upon 29 full days and 85 part-days) and significant maintenance savings (approx. £300k). The project was unfortunately not implemented due to significant performance risks. The project however showed Nexus' commitment to minimising environmental impact through innovative solutions.

Tunnel Fan Initiative

The Plant department, within Nexus Rail were involved in a subway climatology study which discovered that the natural airflow through the underground stations was stronger than the forced ventilation from the tunnel fans. This led to 6 tunnel ventilation fans (which had been running continuously for 30 years) being switched off, saving an estimated £110,000 per year in energy and 630 tonnes of CO₂. Significant savings were made through not replacing the assets, which were part of the ARP.

Biodiversity

Thameslink Programme, Delivering net gain outcomes for biodiversity

The Network Rail Thameslink Programme (TLP) was the first Network Rail Infrastructure Project to achieve 'net gain' outcomes for biodiversity. Its approach to deliver biodiversity net gain was named as a demonstration project by Defra and received wide acclaim, including from the Institute of Environmental Management and Assessment and from Natural England. The Thameslink Programme's approach to deliver biodiversity net gain has been rolled out to Network Rail Infrastructure Projects.

The key lessons learnt were:

- **Delivery of net gain biodiversity target on major infrastructure projects is possible**, however clear targets need to be agreed early.
- **The role of the Environment Manager is pivotal** to engaging leadership and wider programme teams on the business case for biodiversity net gain.
- **Application of the Defra biodiversity metric** was key to TLP being able to measure the delivery of its biodiversity net gain target in a robust and transparent way.
- **Users of the metric need to be experienced and competent** to be able to undertake a robust assessment and apply it appropriately to a railway environment.

- **Budgets and resources** are required to undertake the Defra metric and to engage local wildlife groups to meet the net gain target.
- **Clear policies, procedures and training are vital** to successfully deliver a biodiversity net gain target.
- **Biodiversity net gain should be embedded early** into contracts to prevent costly variations and/or budgeting constraints later.
- **Working with local wildlife groups has many benefits**
- **Local conservation/friends of groups should also be engaged** as they will play an active role in the design and delivery of the biodiversity offsets on site.

Biodiversity net gain provides a range of wider benefits that positively affects the Network R's ability to deliver its biodiversity commitments and its reputation with the local communities and stakeholders. For local wildlife groups, biodiversity offsets can help attract further funding although they must identify projects that align with good practice.

Network Rail, Biodiversity Action Plan

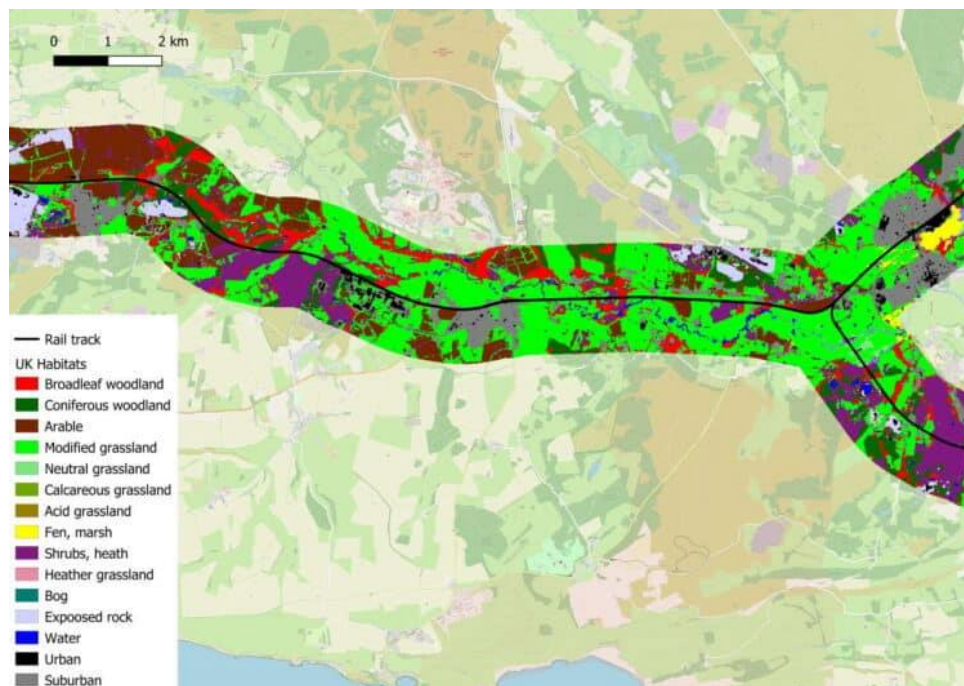


FIGURE 2 - BIODIVERSITY ACTION PLAN (NETWORK RAIL)

Network Rail has taken major steps to preserve and develop lineside biodiversity across all 53,000 hectares of land under their care.

Following an independent report regarding the land under Network Rail's management and biodiversity's within them, the Biodiversity Action Plan was formed. Detailed assessments of the

land and its biodiversity were made through imagery (satellites, aerial, trains) and some physical surveys to produce a comprehensive report on species, their locations, populations etc.

Combined with the UK Centre for Ecology & Hydrology's (UKCEH) knowledge and experience, Network Rail manage every area of land, reduce disease, promote rare species and much more. This information can also be used to protect biodiversity when working nearby by adapting schedules and methods to be less harmful.

ULEV Fleet

Nottingham City Council – ULEV

In January 2016 the Office for Low Emissions (OLEV) announced that Nottingham, partnered with Nottinghamshire County Council and Derby City Council, was one of four successful cities in securing funding for the Go Ultra Low City Programme nationally. As a result, £6.12m of funding has been made available to support measures across the Nottingham and Derby areas for a package of measures to support the uptake of Ultra-Low Emission Vehicles up to 2019/20.

Nottingham City Council developed a ULEV Procurement Framework to successfully procure the vehicles required. Due to the higher capital cost of these units, the annual procurement budget (£3m) was adjusted to £15m over a 5-year period, allowing for investment decisions to be made over a longer time period. Additionally, savings from fuel and tax were ring-fenced to further subsidise the higher cost of units.

Perhaps the most interesting development in Nottingham was that the large charging infrastructure requirements led to a weak business case for ULEV deployment. In response to this, an innovative solution was developed which enabled some employees to take home and charge the vehicles owned by Nottingham City Council. This was majority funded (75%) through the Government's Electric Vehicle Homecharge Scheme (EVHS) – with employees benefiting from free commuting and the reimbursement of charging costs through payslips.

Climate Resilience

Network Rail, Offering Rail Better Information Services.

Network Rail (NR) have been improving asset data, this can be used to better understand the vulnerability of each asset type to climate impacts. The asset information is held in a number of differing systems supported by a range of data maintenance and assurance procedures. Offering Rail Better Information Services (ORBIS), is a £325m programme to improve the collection, storage and use of asset information. The ORBIS programme has been created to deliver:

- Tools to capture, maintain and access high-quality asset data.
- The ability to join and view asset data in collaborative environments.
- Decision support tools to better manage the asset.
- Geo viewer and location data improvement to visualise the railway using image-capture techniques such as LIDAR, bird's eye and oblique photogrammetry.



FIGURE 3 - COLOUR-CODED RISK SCORE BANDS FOR TREES

This capability will provide data stewards with a new perspective of the railway that will highlight instances of inaccurate data previously not easily visible. The entire network has now been surveyed using LIDAR, and will provide detailed information of the assets, including the characteristics of lineside trees to inform vegetation management. Data will be available to support the reduction of risk of trees causing a derailment and causing damage to infrastructure in high winds; and reduce leaf fall impacts during autumn⁴.

Rail Safety and Standards Board, Tomorrow's Railway and Climate Change Adaptation Report

Funded by the Technology Strategy Leadership Group and Network Rail as part of the Future Railway programme, this Rail Safety and Standards Board (RSSB) project will provide knowledge for decision making and will promote step change in methods of working in the rail industry to reduce climate change impacts.

The programme, managed and coordinated by Arup, will address four main questions:

1. How is the UK climate and weather going to change in the future?
2. What are the impacts of climate change and extreme weather going to be on the British railway?

⁴ Network Rail (2015). *Climate Adaptation Report*. Available at: <https://www.networkrail.co.uk/wp-content/uploads/2019/05/Climate-Change-Adaptation-Report-2015-FINAL.pdf>

3. What is currently being done or could be done in the future to address the impacts of climate change and extreme weather?
4. How can we evaluate the cost and benefits of dealing with impacts of climate change and extreme weather?

The first phase of the work involved a comprehensive knowledge review and gap analysis. The second phase of work built upon this, helping to deliver a step change in the understanding of climate change, identifying appropriate, cost-effective and timely actions, and developing tools to aid climate change adaptation.

The decision-making tools and information provided by this project will influence the design and operation of the British railway. These tools include devices for financially evaluating climate adaptation investments, a geographic information system integrating new and existing data, and systems tools to provide insight into the interdependencies and interfaces between railway sub-systems⁵.

Financing Investment

Transport for London, Green Bonds

Green bonds raise funds for new and existing projects which deliver environmental benefits, and a more sustainable economy. 'Green' can include renewable energy, sustainable resource use, conservation, clean transportation, and adaptation to climate change.

Transport for London (TfL) embarked on their green bond journey some time before issuing its first green bond in April 2015, actively observing the rapidly expanding green bond market to see if it could be suitable for them. At issuance, TfL's green bond was a massive success with investors. The bond was oversubscribed by 50%, with the £400m offering receiving orders for £600m. Excitingly, the green label allowed for a larger size bond issuance with a better price than TfL would have otherwise achieved. Not only did the deal see a lot of investor demand, TfL also achieved greater international diversity than TfL generally gets. The green bond also ticked the box on promoting the environmental credentials of TfL.

Proceeds from this green bond will fund low carbon transport projects from TfL's business plan to 2021, including station and line upgrades on rail and Underground, low-emission hybrid buses and cycling improvements. Since TfL already had lots of eligible low-carbon projects planned, it was straightforward to link the proceeds to these projects. TfL will also report the

⁵ RSSB (2016). Tomorrow's Railway and Climate Change Adaptation. Available at: https://adaptationscotland.org.uk/download_file/view_inline/390

environmental impact of projects funded by the green bond in its annual Health, Safety and Environment report.

TfL's issuance has paved the way for other issuers to come to market with green bonds to fund low-carbon transport, especially urban rail, investments. Rail falls in line with the Climate Bonds Standard, an international standards and certification scheme overseen by investors representing \$34 trillion that sets criteria for the green bond market.

The Climate Bonds Standard makes all rail investments eligible for green bond issuance, given the evidence of a much lower emissions profile compared to other modes of travel. Rail infrastructure uses approximately 11 times less energy per transported unit than road, and every pound invested in rail infrastructure results in 3-10 times less CO₂ than for the equivalent dollar spent on road⁶.

Salix Finance and Nottingham City Council, The Recycling Fund

Despite the name, the Salix Finance Recycling Fund refers to funds which are invested into energy saving schemes; these funds are ring fenced and held by the public body where financial savings are reinvested year on year to fund further energy efficiency projects.

In partnership with Salix, Nottingham City Council used the Recycling Fund to deliver 222 energy efficiency projects. The fund was formed through a 50:50 contribution from Salix and the Council. Due to the council's excellent work the initial fund has been recycled over 2.3 times and has been used to fund over £3 million of energy efficiency projects. This includes LED lighting and heating projects across council offices, schools, leisure centres and museums.

This has helped the Council reduce their energy spend by an estimated £762,455 annually, which is more than the Council's initial £650,000 investment.

The City has a dedicated team who identify and deliver award-winning energy efficiency projects in line with their 2020 Energy Strategy. The council is leading by example, targeting a 44% reduction in carbon emissions from its operations against 2007 levels by 2020. The Recycling Fund has allowed the City to create a 5-year pipeline of future works and accelerate improvements. These projects have helped them exceed their carbon reduction targets.⁷

⁶ Climate Bonds (2017). *Case Study: Transport for London (TfL) Green Bond*. Available at: <https://www.climatebonds.net/files/files/Case%20study%20-%20TfL%20final.pdf>

⁷ Salix Finance (2019). *A case study on Nottingham City Council's Recycling Fund*. Available at: [Nottingham.indd \(salixfinance.co.uk\)](#)

Chapter 3 - The Strategic Context

This section sets out the local, regional and national policy context supporting the strategy and summaries the commercial, social and political drivers that have been considered in the delivery of this strategy.

3.1 National Policy Context

The UK was one of the first countries to recognise and act on the economic and security threats of climate change. The Climate Change Act, passed in 2008, committed the UK to reducing greenhouse gas emissions by at least 80% by 2050 when compared to 1990 levels⁸.

This strategy is also being published at a nationally significant time. The United Kingdom is set to host the 2021 United Nations Climate Change Conference (also known as COP26) in Glasgow; with all eyes of the world on the UK to provide leadership on the route to decarbonisation.

Leading up to this event, the UK Government has come under heightened scrutiny for its support of schemes that may potentially undermine the effectiveness of messaging at this global conference.



FIGURE 4 - SELECTION OF HEADLINES

Considering this, the UK Government has been a supporter of a recovery through a “green industrial revolution”⁹; setting the tone for how the United Kingdom can rebuild greener, after the economic damage induced by successive lockdowns, imposed in response to the ongoing COVID-19 pandemic.

⁸ Climate Change Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/27>

⁹ The Rt Hon Boris Johnson MP (2020). *PM outlines his Ten Point Plan for a Green Industrial Revolution*. Available at: <https://www.gov.uk/government/news/pm-outlines-his-ten-point-plan-for-a-green-industrial-revolution-for-250000-jobs>

The Prime Minister has produced a ten-point plan for a green industrial revolution which will create and support up to 250,000 British jobs. Covering clean energy, transport, nature and innovative technologies, the Prime Minister's blueprint will allow the UK to forge ahead with eliminating its contribution to climate change by 2050. The plan – which is part of the PM's mission to level up across the country - will mobilise £12 billion of government investment to create and support up to 250,000 highly-skilled green jobs in the UK, and spur over three times as much private sector investment by 2030⁹.

At the centre of his blueprint are the UK's industrial regions, including in the North East, which will drive forward the green industrial revolution and build green jobs and industries of the future.

Department for Business, Innovation & Skills

The Clean Growth Strategy (2017)

This strategy sets out our proposals for decarbonising all sectors of the UK economy through the 2020s. It explains how the whole country can benefit from low carbon opportunities, while meeting national and international commitments to tackle climate change.

This strategy includes a package of measures that will assist in the decarbonisation of the UK economy, those relevant to this strategy include:

- 1) Improving energy efficiency;
 - a) Provide £255 million of funding for energy efficiency improvements in England and help public bodies access sources of funding ([Phase 2 Public Sector Decarbonisation Scheme | Salix Finance](#)).
- 2) Extending heat networks;
- 3) Long-term deployment of carbon capture and storage;
- 4) Accelerating the shift to low carbon transport;
 - a) End the sale of new conventional petrol and diesel cars and vans by ~~2040~~ (update: brought forward to 2030 in the PM's Ten Point Plan for a *Green Industrial Revolution*)
- 5) Smart systems to reduce the cost of electricity storage, advance innovative demand response technologies.

Department for Transport

Road to Zero (2018)

The Road to Zero Strategy outlines how the government will support the transition to zero emission road transport and reduce emissions from conventional vehicles during the transition. This strategy includes a package of measures that will assist in the decarbonisation of the UK transport sector, those relevant to this strategy include:

1. Launching a £400 million Charging Infrastructure Investment Fund to help accelerate charging infrastructure deployment (already completed).
2. Increasing the grant level of the Workplace Charging Scheme from £300 per socket to 75% of the purchase and installation costs of a chargepoint capped at a maximum of £500 per socket.
3. Fulfilling a £48m ultra low emission bus scheme funding round to accelerate uptake and deployment of supporting infrastructure (*Find out more about Bus Strategy **Error! Reference source not found.***)
4. Setting out definitions of ultra-low and zero emission vehicles that local areas may adopt.

Transport Decarbonisation Plan (2021)

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 across every single mode of transport by 2050. The main measures relevant to this strategy are as follows:

1. £2 billion to be invested in walking and cycling over five years with the aim that half of all journeys in towns and cities will be cycled or walked by 2030.
2. Delivery of 4,000 new zero emission buses and the infrastructure needed to support them.
3. £4.8 billion Levelling-Up Fund will invest in infrastructure, including upgrading local transport.
4. £5 billion of funding to overhaul bus and cycle links for every region outside London (mix of existing active travel commitments and bus funding linked to Bus Service Improvement Plans)
5. Funding for City Region Sustainable Transport Settlements: a £4.2 billion investment in the transport networks of eight city region.

6. £90m Local Infrastructure Fund to support the rollout of larger on-street charging schemes and rapid charging hubs by Summer 2022.

HM Treasury

Build Back Better (2020)

Build Back Better sets out the government's plans to support growth through significant investment in infrastructure, skills and innovation, and to pursue growth that levels up the UK whilst enabling the transition to net zero. The UK Government aims to meet the strategy objectives through the following objectives:

1. Help achieve net zero via £12 billion of funding for projects through the Ten Point Plan for a Green Industrial Revolution.
2. Support investment through the new UK Infrastructure Bank which will 'crowd-in' private investment to accelerate our progress to net zero, helping to level up the UK. This will invest in local authority and private sector infrastructure projects, as well as providing an advisory function to help with the development and delivery of projects.

The UK Infrastructure Bank will pursue two central policy objectives through its interventions in the infrastructure market to:

- a. help tackle climate change, particularly meeting our net zero emissions target by 2050;
- b. support regional and local economic growth through better connectivity opportunities for new jobs and higher levels of productivity

Rail Industry

Network Rail (NR)

Network Rail published their plan to decarbonise rail in their "Traction Decarbonisation Network Strategy". In the report, preliminary recommendations for decarbonising the rail network, including over 7,000 miles of electrification by 2050, and a key role for zero carbon traction – including hydrogen and battery. Network Rail acknowledges that reducing carbon emissions in rail is vital, stating it will bring benefits directly to the rail industry and bring a ripple of subsequent benefits across the transport sector and wider economy. Given the level of infrastructure and rolling stock required to achieve traction decarbonisation on heavy rail, the level of capital investment required is significant.

A range of recommendations are made:

- Extensions to the rail network consider the need to operate using zero-carbon rolling stock.
- Procurement of diesel-only vehicles is only undertaken where there is clear strategic and economic rationale for doing so.
- Introduction of battery and hydrogen operations to embed experience.
- Continued support for projects and programmes which increase capacity.
- Use of a smooth and progressive programme of implementation.

Nexus fully supports these recommendations, with the Environment and Energy strategy aligning itself with the strategy.

Rail Safety and Standards Board (RSSB)

The RSSB published their final report for the Minister of Rail “Rail Industry Decarbonisation Taskforce” in July 2019. The report responds to the Minister for Rail’s challenge to the industry to remove “all diesel only trains off the track by 2040” and “produce a vision for how the rail industry will decarbonise.” The report recommends that the industry and government work together on a national strategy; in doing so rail can play a major role in contributing to the UK economy becoming net carbon zero by 2050, provided that the industry starts now.

To achieve this ambition, the final report makes five strategic recommendations:

- Targets – the industry, including government, should support the target of net zero carbon by 2050 as proposed by the Committee on Climate Change (CCC).
- Policy – the whole industry has responsibility to contribute to net zero carbon in a cost-effective manner. To facilitate this, the Government should set out clear, consistent and enabling policies.
- Industry structure – from the Williams Review we should have an industry structure which effectively enables, incentivises, monitors and regulates the route to net zero carbon.
- Delivery plan – each key constituent of the industry eg Network Rail, TOC, FOC, ROSCO etc, should publish a long-term plan to achieve interim and long-term targets towards rail decarbonisation in support of net zero carbon by 2050. These will be reviewed, monitored and regulated by a central body.
- Research and Development – the industry should set out clear 5-year periodic research plans to reduce technical and implementation uncertainties.

Nexus fully supports these recommendations, with the Environment and Energy strategy aligning itself with the Plan. Nexus aims to achieve Net Zero by 2050, with 5-year periodic reviews though updated plans for achieving our decarbonisation ambition.

3.2 Local Policy Context

The Strategic Economic Plan

The North East Local Enterprise Partnership (LEP) has produced a Strategic Economic Plan for the Tyne and Wear area and County Durham and Northumberland.

The strategy aims to drive economic growth in the North East while also bringing sector partners together to deliver at scale on national energy strategy.

The strategy identifies 13 themes where the North East can both contribute to national policy and bring more and better jobs to the region, ranging from low-emission transport to heat networks, and geothermal energy from old mine workings.

Nexus will play a vital role in the delivery of low-emission transport, with the Energy and Environment strategy setting the strategic vision and delivery of a carbon neutral public transport network.

Transport Plan

This North East Transport Plan sets out the transport priorities for our region up to 2035. The plan has the following vision and objectives;

1. Easier access to, education, skills, and higher value jobs;
2. Health levels at least equal to other regions in the UK;
3. Better connections from the North East to national and international destinations;
4. A transport network with improved environmental credentials including more sustainable journeys, better air quality and reduced carbon output;
5. A safer and more reliable integrated transport network which is more intuitive for customers with a sustainable cost base;
6. Direct job opportunities in the transport and infrastructure sectors; and
7. Enabling new development and housing sites and improving accessibility to existing communities.

Through the delivery of this strategy, Nexus will significantly improve our environmental position and the sustainability of public transport in this region.

North East Climate Emergency

Every council in the North East declared a climate emergency in 2019¹⁰; each with ambitious and wide-ranging plans to rapidly tackle emissions in their area.

Newcastle launched the first plans in the region to create a Clean Air Zone, pedestrianizing swathes of the city centre and replacement of the council's aging fleet with electric vehicles¹¹. Gateshead announced plans to work with the Woodland Trust to plant 10,000 trees and to extract renewable heat from the River Tyne and abandoned mine workings¹². Sunderland launched the UK's first EV rapid charging station and a new low-emission city centre shuttle service¹³.

In addition, various climate committees have been established in each local authority with a Net Zero Taskforce and Citizens' Assembly proposed across the North of Tyne combined authority¹¹.

Each local authority is delivering plans to decarbonise transport emissions in their area. Many are looking to Nexus to provide assurances that our services can be relied upon to assist in decarbonisation efforts, through the delivery of a modal shift away from private vehicles. Councils are also looking for assurances that we are also taking the necessary steps to deliver decarbonisation across our assets.

This strategy will set the vision and plan for improving environmental performance, ensuring that Nexus remains a crucial partner that can be relied upon within local plans for transport decarbonisation.

¹⁰ The Chronicle (2020). A 'climate emergency' has been declared in the North East - but has anything happened yet? Available at: <https://www.chroniclive.co.uk/news/north-east-news/north-east-climate-emergency-action-17602708>

¹¹ Newcastle City Council (2019). Climate Change. Available at: <https://www.newcastle.gov.uk/climatechange>

¹² Gateshead Council (2020). What Gateshead Council is doing. Available at: <https://www.gateshead.gov.uk/article/14171/What-Gateshead-Council-is-doing>

¹³ Sunderland City Council (2020). Low Carbon Framework. Available at: <https://www.sunderland.gov.uk/lowcarbon>

3.3 The Market and the Competition

Increased consumer awareness of environmental issues such as climate change¹⁴ has led to changes in consumer behaviour in most sectors. Transport emissions have yet remained virtually unchanged from 1990 despite significant improvements in vehicle efficiencies¹⁵. This suggests that the propensity for consumers to change travel behaviours based upon environmental considerations far exceed that of different sectors. Reliance of private vehicles has also increased over the pandemic, largely due to the perceived risks of COVID-19 transmission.

Growth of disruptive technology and innovation in transport may provide Nexus with the opportunity to reach new customers through improved access to services. However, significant risks remain around the potential for permanent loss of modal share.

Research by Nexus has shown that whilst our services are low-carbon source of transport, when compared to most modes, electric passenger vehicles typically produce less carbon per passenger-km¹⁶. Electric vehicles are projected to achieve 29 per cent annualised growth over the next ten years¹⁷ and may pose a significant risk if customers are unconvinced by the environmental case for public transport.

The Bus Strategy aims to revolutionise the UK Bus Network. It aims to deliver significant service improvements and rapid decarbonisation of services through the deployment of hydrogen and/or battery electric vehicles. The decarbonisation of the UK Bus Network will deliver significant improvements to customers whilst improving air quality in city centres.

Many local authorities have looked to introduce Clean Air Zones (CAZs) to improve air quality through the uptake of cleaner technologies; alternatively if private cars are targeted, they can be used to promote public transport usage. Due to the highly politically sensitive nature of such plans, some Local Authorities have shelved plans, opting instead for plans to impose charges on buses, HGVs, LGVs and Taxis. Such plans can increase the operation costs for bus operations and can lead to increased ticket costs, further incentivising the use of private cars. CAZs remain likely as a temporary solution until such time that ZEV account for a majority share of road vehicles.

¹⁴ Ipsos MORI (2020). *Ipsos Mori Issues Index – October 2020*. Available at: https://www.ipsos.com/sites/default/files/ct/news/documents/2020-11/issues-index_oct20-cati_v1_public_0.pdf

¹⁵ Department for Transport (2019). *Transport Statistics Great Britain: 2019*.

¹⁶ Nexus (2020). *Benchmarking the Metro (19/20)*

¹⁷ Deloitte (2019). *Electric Vehicle Trends*. Available at: <https://www2.deloitte.com/uk/en/insights/focus/future-of-mobility/electric-vehicle-trends-2030.html>

3.4 The Strategic Drivers for Change

The Economy

Of all sectors in the UK, Transport now accounts for the largest emissions of any sector, producing approximately 120 MtCO₂e - approximately 34% of UK emissions¹⁸. UK's total greenhouse gas emissions have fallen by 32% from 1990 to 2017, comparatively emissions from road transport have increased by 6% over the same period¹⁹.

The transition to a net zero economy presents a major opportunity for the UK to be a world-leading hub for jobs, businesses and exports in low carbon sectors.

Already there are almost 400,000 jobs in low carbon businesses and their supply chains across the country and low carbon exports are worth billions of pounds each year²⁰.

According to one estimate, the UK low-carbon economy could grow more than four times faster than the rest of the economy between 2015 and 2030 – delivering up to £170bn of exports and supporting up to 2 million jobs²¹.

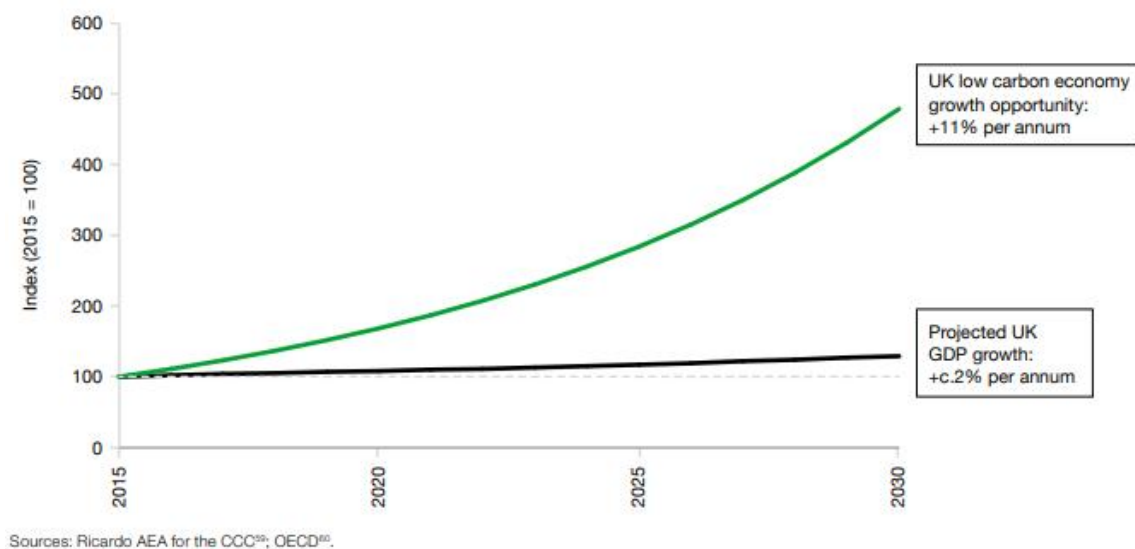


FIGURE 5 – THE LOW CARBON ECONOMY GROWTH OPPORTUNITY²¹

¹⁸ Department for Business, Energy and Industrial Strategy (2020). *2019 UK greenhouse gas emissions, provisional figures*.

¹⁹ ONS (2019). *Road transport and air emissions*.

²⁰ ONS (2019). *Low Carbon and Renewable Energy Economy Survey: 2017*. Available at: <https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/finalestimates/2017>.

²¹ Ricardo-AEA for the CCC (2017). *UK business opportunities of moving to a low-carbon economy*. Available at: <https://www.theccc.org.uk/publication/uk-energy-pricesand-bills-2017-report-supporting-research/>

One estimate found that for every \$1 million invested in renewables infrastructure or energy efficiency generates 7.49 and 7.72 full-time jobs respectively - this compares with only 2.65 in fossil-fuel infrastructure²².

In addition, The Climate Change Committee in their economic appraisal of the Sixth Carbon Budget state that, that completely decarbonising the UK economy by 2050 can be met at an annual cost of 1-2% of GDP to 2050. The actual impact, however, could 'be lower or even positive' because of ancillary benefits, including lower healthcare costs (due to improved air quality), lower extreme-weather risks and new industrial opportunities²³.

Overall, the increased level of economic output, as measured by GDP, creates demand for additional employment both in low-carbon jobs, and in the wider economy, as a result of increased GDP.

Globally significant work being carried out within the North East's energy sector is leading the way on delivering the government's Green Industrial Revolution plan, reinforcing the region's position to lead delivery on the UK's Net Zero agenda.

Gross Value Added (GVA) per capita in the region remains far below the average across England²⁴, economic growth and jobs from the UK's Net Zero agenda pose significant opportunities for the region. Nexus can further improve the image of the region through the delivery of a sustainable public transport network.

Climate Damages Will Be Very Costly

Inaction on climate change poses a significant threat to the global economy. The Intergovernmental Panel on Climate Change (IPCC) estimated that costs of damages from warming in 2100 for 1.5°C and 2°C were \$54 trillion and \$69 trillion, respectively²⁵.

It is widely recognised that the impacts of extreme weather and climate change permeate throughout society affecting both lives and livelihoods. UK flooding events in 2007 alone affected 55,000 homes, killed 13 people and cost the UK economy £3.2 billion making them "sufficient to be classified as a national disaster"²⁶.

²² Garrett-Peltier, Heidi (2017). *Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model*, *Economic Modelling*, Elsevier, vol. 61(C), pages 439-447.

²³ The Climate Change Committee (2020). *Economic impact of the Sixth Carbon Budget* (Cambridge Econometrics).

²⁴ ONS (2018). *Regional economic activity by gross value added (balanced), UK: 1998 to 2017*.

²⁵ IPCC (2019). *Impacts of 1.5°C of Global Warming on Natural and Human Systems*.

²⁶ Environment Agency (2010). *The costs of the summer 2007 floods in England*.

Metro is not immune to such events, suffering historically from flooding and landslips causing significant network disruption during extreme weather events.

Such events are fortunately rare but due to climate change, extreme weather is forecasted to become “more frequent” and “more extreme”. This is likely to also lead to “warmer and wetter winters” and “hotter and drier summers”²⁷.

The Climate Aware Consumer

Due to an increasing level of public awareness about environmental problems, our customers are increasingly asking what Nexus is doing to improve environmental credentials. Customers want to know how we’re performing and what we’re doing to further improve.

Nexus already has a strong environmental position based upon the inherent nature of light rail networks. However, significant improvements can yet still be made through the delivery of this strategy, further improving our environmental position over alternative modes of transport. By conveying these improvements and a modal comparison to our customers, they can make more informed decisions when considering the environmental impact of the mode of transport chosen for their journeys.

Greenwashing poses a significant risk to the successful delivery of an environmental strategy; Nexus must confront scepticism with honesty and transparency allowing our customers to make informed decisions without making exaggerated or deceitful claims, these will only erode trust.

Consumers are beginning to vote against unsustainable brands with their cash. Extensive research into U.S. consumers’ actual purchasing of consumer-packaged goods (CPG) found that 50% of growth from 2013 to 2018 came from sustainability-marketed products²⁸.

A study by Ernst & Young also discovered that “79% of consumers would choose a sustainable product over an unsustainable one if they were similar in all other ways” and that “56% of consumers are willing to pay slightly more for a product or service that is environmentally sustainable”²⁹. Further research by IBM found that the pandemic had affected nine of 10 people’s views on environmental sustainability, while 82% of consumers would pay more for environmentally friendly transportation option even if it costs more³⁰.

²⁷ Met Office (2018). *UK Climate Projections, 2018*.

²⁸ Center for Sustainable Business, NYU (2019). *Sustainable Share Index: Research on IRI Purchasing Data (2013 - 2018)*

²⁹ EY (2020). TMT customers care about sustainability: redefine your customer promise now. Available at: https://assets.ey.com/content/dam/ey-sites/ey-com/en_uk/topics/tmt/ey-uk-sustainability-research.pdf

³⁰ IBM (2021). *The sustainability bump*. Available at: <https://www.ibm.com/downloads/cas/RVXZZX3L>

Cost is undeniably the main factor that drives consumers spending decisions but this research shows that offering sustainability as part of your product offering can also stimulate demand.

Health and Wellbeing

In the UK, poor air quality is estimated to contribute to 40,000 early deaths per year³¹. The total cumulative cost to the NHS and social care of air pollution is estimated to reach a minimum of £5.37bn by 2035³². There is no safe level of exposure to air pollution. To compound this issue locally, people in the North East of England live shorter lives and have shorter healthy life expectancy. Based on national estimates, it is estimated that poor air quality is responsible for around 360 deaths each year across Tyneside local authority areas³¹.

Further analysis found that just a 17% reduction in NO₂ in Newcastle could prevent up to almost 20 deaths and save almost 60 days spent in Newcastle's hospitals due to respiratory conditions each year – this could prevent at least 4% of Newcastle's deaths associated with respiratory conditions each year³³

As a region with a world-leading natural and historical environment, it must be protected for future generations against harmful pollution levels. Making better decisions about transport provision can lead to a more sustainable (and therefore healthier) way of life in the North East for our residents, commuters, and visitors. The four North East Air Quality Management Areas (AQMAs) relating to Nitrogen Dioxide (NO₂) levels and associated Local Air Quality Action Plans (AQAPs) are present in Newcastle, Gateshead and South Tyneside.

Urbanisation is a potential threat to mental health and well-being. Cross-sectional evidence suggests that living closer to urban green spaces, such as parks, is associated with lower mental distress³⁴. The physical health, social and economic consequences of poor mental health are substantial. Compared to the general population, people with mental illness are more likely to have physical health conditions, a lower life expectancy, higher rates of health risk factors such as smoking, alcohol and drug misuse, and are more likely to experience social inequalities such as isolation, unemployment and homelessness or poor housing³⁵.

³¹PHE (2018). Associations of long-term average concentrations of nitrogen dioxide with mortality.

³² PHE (2018). Estimation of costs to the NHS and social care due to the health impacts of air pollution.

³³CBI Economics (2021). Breathing life into Newcastle. Available at: https://www.cleanairfund.org/wp-content/uploads/2021/04/12651_CAZ_Clean-Air-Fund_Newcastle.pdf

³⁴ White, M. P., Alcock, I., Wheeler, B. W., & Depledge, M. H. (2013). *Would you be happier living in a greener urban area? A fixed-effects analysis of panel data*. *Psychological science*, 24(6), 920–928. <https://doi.org/10.1177/0956797612464659>

³⁵ Public Health England (2018). *Health matters: reducing health inequalities in mental illness*.

Available at: <https://publichealthmatters.blog.gov.uk/2018/12/18/health-matters-reducing-health-inequalities-in-mental-illness/>.

Poor mental health is estimated to incur an economic and social cost of £105 billion a year in England, with treatment costs expected to double in the next 20 years³⁶

Biodiversity Under Threat

Many of our native plant and animal species are declining in abundance and diversity. The 2019 State of Nature Report showed that since 1970, 41% of the plant and animal species studied have declined by some measure (see Figure 6). For some groups, such as insect pollinators, these declines have been more marked. For example, since 1850, 23 bee and flower-visiting wasp species have become extinct in the UK. The reasons for the decline of these species are complex, but most experts agree it has resulted from a combination of human induced stresses. These range from habitat degradation and loss due to land use change, to pesticide and fertiliser use, pollution, the spread of non-native species and the impacts of climate change.

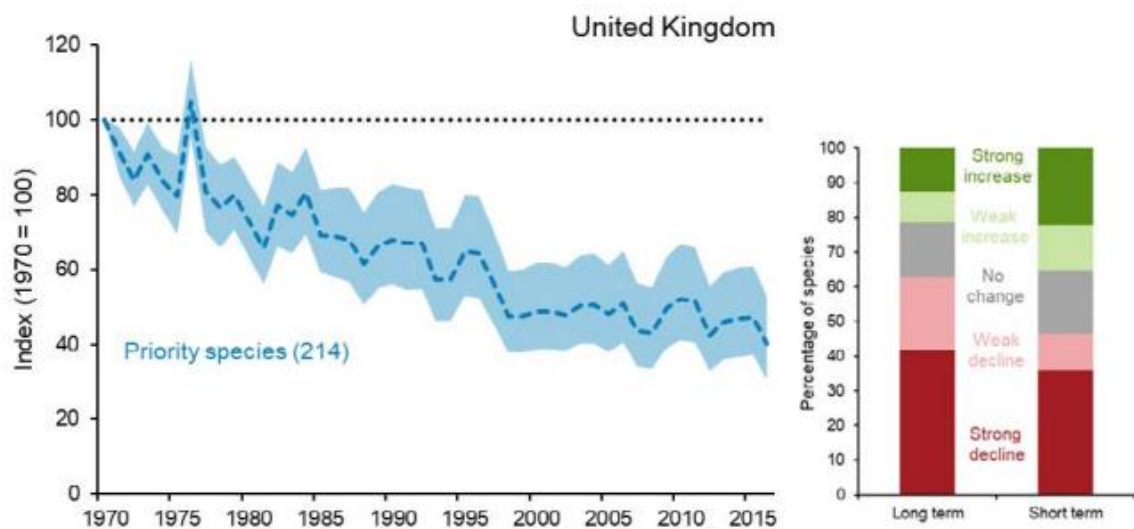


FIGURE 6 - CHANGE IN THE RELATIVE ABUNDANCE OF UK PRIORITY SPECIES (1970-2015)³⁷

Internal Efficiency

Nexus is unique in its position; increasing demand, in this instance customer journeys, is unlikely to increase levels of environmental impact due to the environmental costs of running the network being largely fixed and independent of additional passenger loadings. Due to this, one of the best ways to improve our environmental performance, is to stimulate a modal shift

³⁶ HM Government (2011). *No health without mental health. a cross-government outcomes strategy*. Available at: www.gov.uk/government/publications/no-health-without-mental-health-a-crossgovernment-outcomes-strategy

³⁷ Defra (2019). *UK Biodiversity Indicators 2019. C4a. Status of UK priority species – Relative abundance*

from private cars to public transport. This is contrary to most industries where demand is directly linked to consumption and thus stimulating demand is rarely truly sustainable.

Good environmental practices can improve business performance and reduce business costs by cutting the use of raw materials, energy, water and packaging. By targeting reductions in each of these areas over the lifetime of a project or scheme, strong invest to save cases can typically be justified with time horizons over short to long time periods. Such “cradle to grave” assessments of cost and emissions will almost certainly drive improvements in the operational efficiency of Nexus.

The CCC recently concluded that future cost savings from no longer having to buy oil and gas almost offsets the investment needed in low-carbon power, transport and home heating across the next three decades. The CCC analysis also found it is cheaper to transition to electric cars and vans than to continue with petrol and diesel vehicles³⁸.

Attracting and Retaining Talent

Becoming a more sustainable business can have a real impact on employees. A 2015 study indicated that businesses with a commitment to Corporate Responsibility (CR) could see productivity increases by 13% and turnover reductions by up to 50%. Yet, as the study also finds, it is not enough for companies to simply conduct CR programs; they must do them well. Companies that fully commit to doing CR are rewarded by their customers and investors, while those that are viewed as insincere or dabblers do not benefit from CR or may lose market share and customer loyalty³⁹.

Additionally, the COVID-19 pandemic has also been shown to have increased eagerness within Millennials and Gen Z to “make a positive impact”⁴⁰. This highlights how new generation employees pay considerable attention to the social impact that businesses have on the wider community. It is therefore important for millennials to find a business that aligns with their views and provides a platform for them to make a difference.

Further research found that nearly half of workers would accept a lower salary to work for an organisation that is socially and environmentally responsible³⁰.

³⁸ D. Carrington (2020). The Guardian, *Ending UK's climate emissions 'affordable', say official adviser*. Available at : <https://www.theguardian.com/environment/2020/dec/09/ending-uk-climate-emissions-affordable-net-zero-climate-change-committee>

³⁹ Babson College (2015). *Project ROI: Defining the Competitive and Financial Advantages of Corporate Responsibility and Sustainability*

⁴⁰ Deloitte (2021). *The Deloitte Global Millennial Survey 2020*

Environmental commitment will help to create a workforce that is proud, motivated and engaged. This will help Nexus to recruit and retain top talent, whilst also increasing productivity.

Acceleration of Trends due to COVID-19

Crises often have a transformative effect. While some developments turn out to be temporary, others prevail long after a crisis is over. Yet, rather than radically changing the world as we know it, COVID-19 has accelerated existing trends.

The digitalisation of everyday life, the trend toward more flexible work arrangements or the vulnerability of cities and high streets – all these developments were already under way prior to the outbreak of the virus; the pandemic only acted as a catalyst. The long-term implications of these trends are still largely unknown. It is clear however that at least in the medium term, patronage levels on public transport will remain below those levels seen before the pandemic.

The impact of the pandemic has meant fewer people travelling by public transport, and more people travelling by car and active travel models; road traffic levels have almost recovered fully with a 70-90% recovery for Metro and bus in region⁴¹. This may reflect people’s concerns over social distancing, a boom in the second-hand car market and central government requests to avoid using public transport where possible. These factors may persist as serious challenges to market recovery; in the longer term there is an opportunity to regain market share currently lost to cars by providing a product that is customer-focused, easy, economical to use and which positions itself as the market leader for environmental performance.

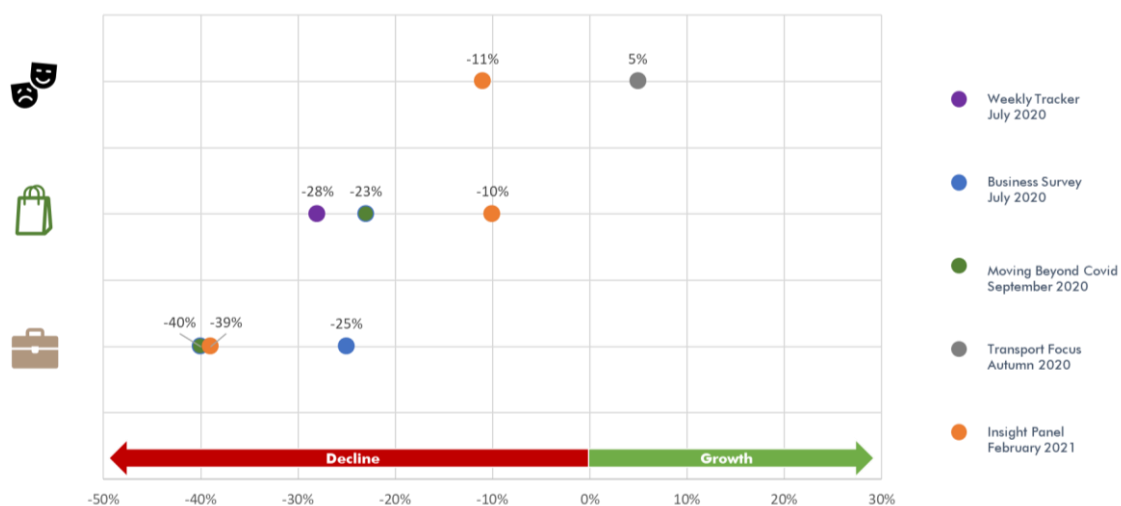


FIGURE 7 – PROJECTED FUTURE DEMAND CHANGE ON METRO, ON PRE-COVID LEVELS⁴²

⁴¹ Nexus (2021). *The Recovery Plan*.

⁴² Nexus (2021). *Patronage Update 08/04*.

Public transport must position itself to win new customers through delivering a product that is superior to that currently provided by private vehicles. Without gaining market share from private vehicles, public transport risks significant long-term patronage and revenue reductions.

Undoubtedly, the market has changed, with increased homeworking and growth in online shopping. As we emerge from the pandemic, it is likely that the number of trips across all modes will remain below that seen before the pandemic. Considering this, Nexus must actively target new customers to grow our patronage, this means developing plans and schemes to attract journeys from car and ensuring that Local Authorities have public transport at the heart of local green recovery plans.

Chapter 4 - Existing Offers

To assess a baseline of our performance, a survey was sent out to all Band 6 managers; it asked a range of questions across the four pillars of this strategy. Additional data has also been collected from a range of sources to build a better picture of how Nexus is currently performing.

Individual departments were also contacted to better understand how each were progressing towards decarbonising related to their department.

4.1 Reporting and Monitoring

Environmental reporting is currently compiled on an ad-hoc basis with no formal reporting requirements. Reports that are produced are completed in excel with a basic analysis of the data completed. Metro and Ferry have both achieved ISO 14001:2015, this requires Nexus to maintain documented evidence that our Environmental Management System (EMS) meet the required standard. Although there are clear requirements as to what kind of documentation Nexus must provide, how we operate and how we record evidence, it is not dictated by the standard.

Under the concession, frequent regular reporting was completed under the Metro Operations Sustainability Plan. This has continued for Metro only but has not been integrated into reporting completed by Nexus.

An ad-hoc approach is also taken to monitoring across the entirety of Nexus, with very few internal KPIs measuring our environmental performance.

Meters for electricity must be manually read, with many High Voltage (HV) stations not having a functioning meter. This can affect reporting and monitoring with many utility bills being based upon estimated usage amounts. In many cases, Nexus does not have the granularity of data it requires for analysis - this would provide a useful tool to highlight potential energy saving projects.

4.2 Greenhouse Gas Emissions

In the Tyne and Wear region, Metro is performing well environmentally. Based on average levels of occupancy, the Metro produces the second lowest emissions of any non-active form of transport, with electric vehicles coming first.

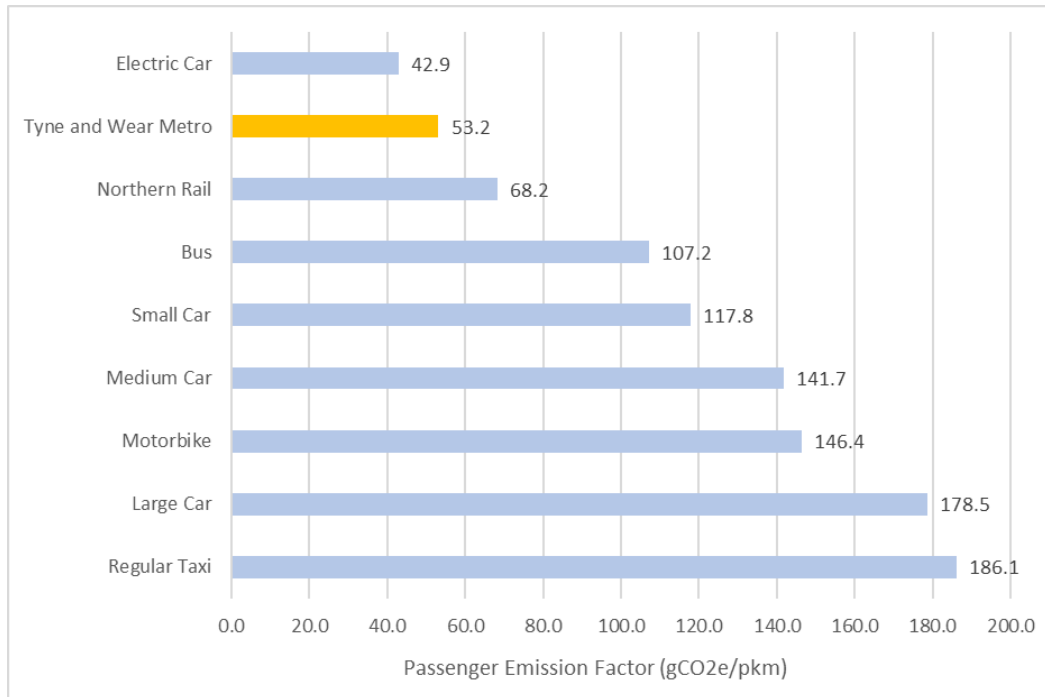


FIGURE 8 - EMISSIONS PER PASSENGER KM

Heating, Ventilation and Air Conditioning

Most estates offices and buildings are heated using natural gas boilers. Stations on the network, except for Park Lane, have no connection to the gas grid. All other heating, ventilation and air conditioning on the network comes from electricity.

TABLE 4 - NATURAL GAS EMISSIONS ASSOCIATED WITH EACH ESTATE (SCOPE 1 ONLY)

	Natural Gas (19/20) (kWh)	Emissions (tCO ₂ e)
NRHQ	550,961	101.31
Control Centre	256,609	47.18
Nexus House	81,831	15.05
Park Lane	56,653	10.42
Capital Delivery Unit	29,542	5.43
Ferry	15,085	2.77
TOTAL	990,681	182.16

Natural gas accounts for approximately 1.5% of our total emissions (Scopes 1, 2 & 3) and approximately 2.6% of our direct emissions (Scopes 1 & 2) (see *Appendix B: Emission Scopes Definition*) – these figures include the depot which has now had ownership and associated emissions passed on to Stadler. With this development, Nexus Rail Headquarters (NRHQ) now represents a significant proportion (56%) of our natural gas emissions.

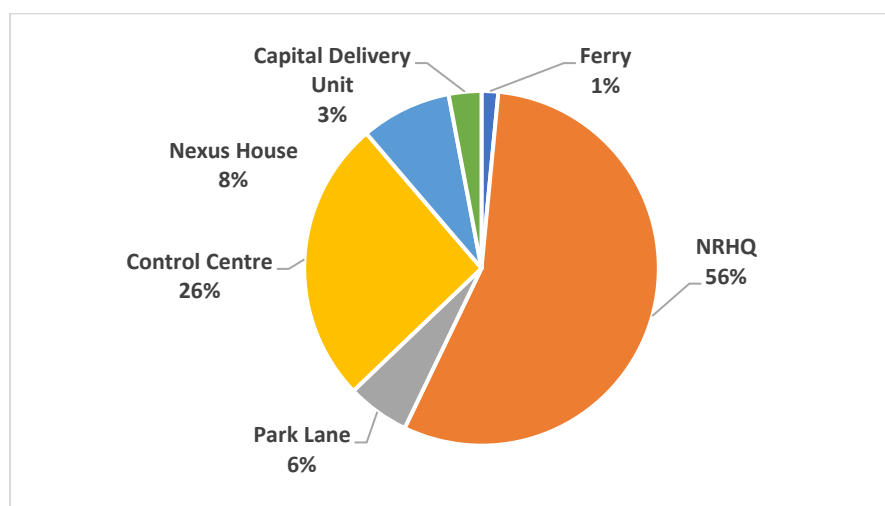


FIGURE 9 - PIE CHART OF NATURAL GAS EMISSIONS BY LOCATION

Shields Ferry

Two vessels operate the cross-Tyne route: the *Pride of the Tyne*, built in 1993, and the *Spirit of the Tyne*, built in 2007. The *Pride of the Tyne* has a capacity of 303 passengers for the daily crossing service and 240 passengers for private hire, while the *Spirit of the Tyne* can carry 200 passengers for any type of journey. Each vessel is driven by a Voith Schneider propeller unit powered by its own engine and gearbox, and electrical power is supplied by twin diesel engines; both engines use marine gas oil.

In 19/20, a total of 206,545 litres of marine gas oil were used on the Shields Ferry, accounting for 2% of our total emissions (Scopes 1, 2 & 3) and approximately 3.2% of our direct emissions (Scopes 1 & 2). The Shields Ferry has the highest level of emissions per passenger kilometre than any other mode of transport provided by Nexus; with passenger emissions 12 times higher than those on the Metro.

In accordance with ISO 14001:2015, improvements in the form of rev limiters and driver training have been implemented to help reduce emissions.

Road Fleet

Nexus owns a variety of different vehicles that best fit the nature of the jobs they are required to undertake. These range from a hatchback used to travel to external meetings not easily accessible by public transport, to road rail vehicles (RRVs) used during track maintenance. These contribute to a significant amount of Nexus' carbon footprint; accounting for 1.3%

The Electric Vehicles Policy was published committing to the procurement of electric vehicles and relevant infrastructure. Additionally, the transition to electric vehicles has been proven to be cost-effective over asset lifetime, with a gradual introduction of electric vehicles expected in coming years.

Despite this, no electric vehicles have been procured by Nexus to date. The main problem lies in the high capital cost required to purchase electric vehicles, this additional purchase cost is expected, in most cases, to be fully repaid based upon expected fuel savings. However, since fuel expenditure are considered "essential" these are paid regardless of other budgetary constraints. This budgetary mechanism at currently disincentivises the purchase of electric vehicles. Additionally, there is uncertainty surrounding the ability of Nexus infrastructure to deal with the additional electric loads from charging these vehicles that must be addressed.

Electricity

Electricity consumption at Nexus is enormous and one of the largest in the region. We consume approximately 65 GWh of electricity on an annual basis, – that’s enough electricity to power all the homes in Tynemouth for over 3 years (or 16,000 homes for a year).

Traction electricity (i.e. electricity for propulsion of Metrocars) accounts for approximately 83% of Nexus’ total electricity demand. The new fleet of Metrocars will bring about significant savings of approximately 30% due to more efficient running of machinery and the inclusion of regenerative braking & storage.

At stations, a wide range of sources of electricity demand exist, as seen in Figure 10 below.

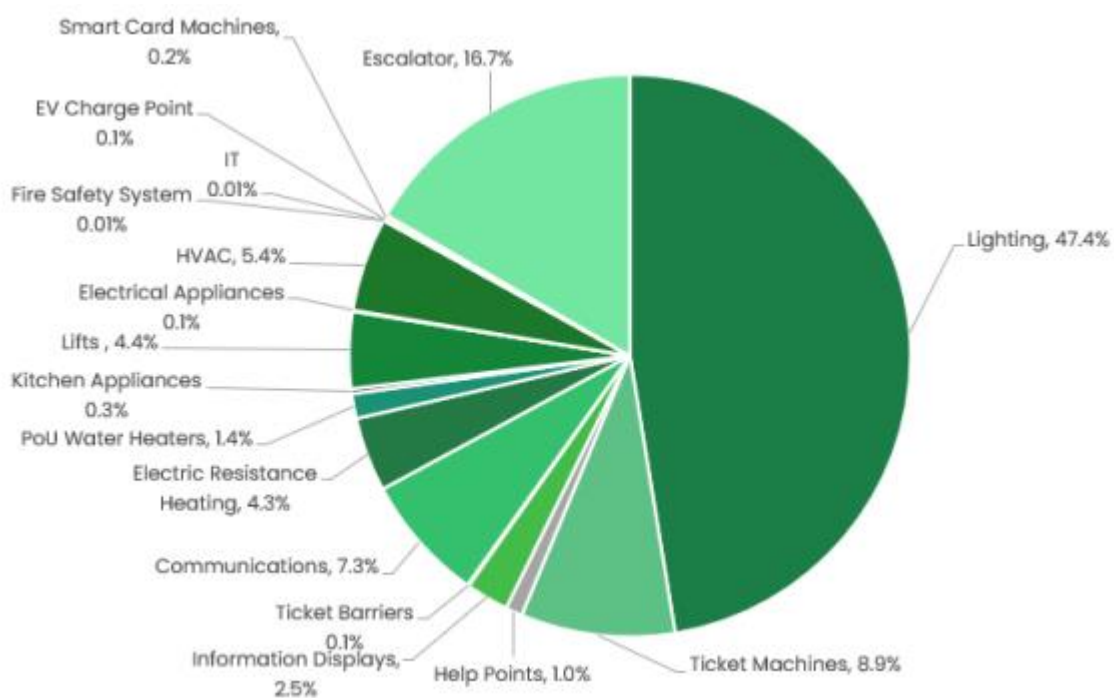


FIGURE 10 - ELECTRICITY CONSUMPTION AT STATIONS (LOW VOLTAGE ONLY)

The impacts of LED lighting and retiming programmes have been shown to be particularly effective at stations across the network, achieving in the region of 20-50% reductions. These schemes have been limited to date, with deployment of LED lighting at a limited number of stations. Such investments can have paybacks of almost a year, as seen in the LED lighting scheme at the Depot. Currently, due to separate budget holders, there is little incentive for individual departments to install energy saving features as these will increase projects costs. Investment in lift and escalator and replacements, which form part of the ARP, have saved large quantities of electricity across the network, accounting for a large proportion of a station’s energy demand.

The Future Energy Scenarios (FES) represent a range of different, credible ways to decarbonise the United Kingdom’s energy system as we strive towards the 2050 target. Over the next 5 years, the National Grid in their Future Energy Scenarios predict the following grid intensities⁴³.

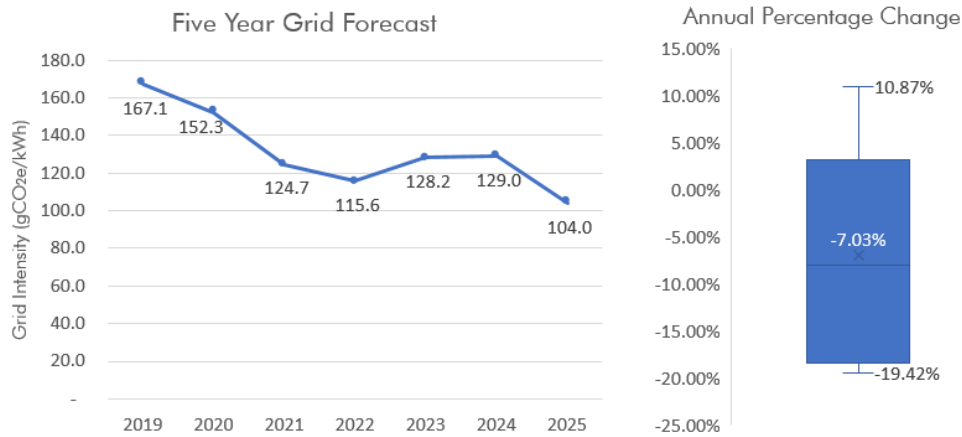


FIGURE 11 – 5-YEAR NATIONAL GRID PROJECTIONS⁴³

As seen in Figure 11 above, the National Grid are predicting a 7% average annualised reduction in the Carbon Intensity (gCO₂e/kWh) of the electricity network over the next 5 years. Nexus can expect to see significant carbon reductions due to the successive improvements in the emissions from purchased electricity. Combined with the new fleet, the “Do Nothing” scenario is likely to have significant carbon reductions, as seen below in Figure 12.

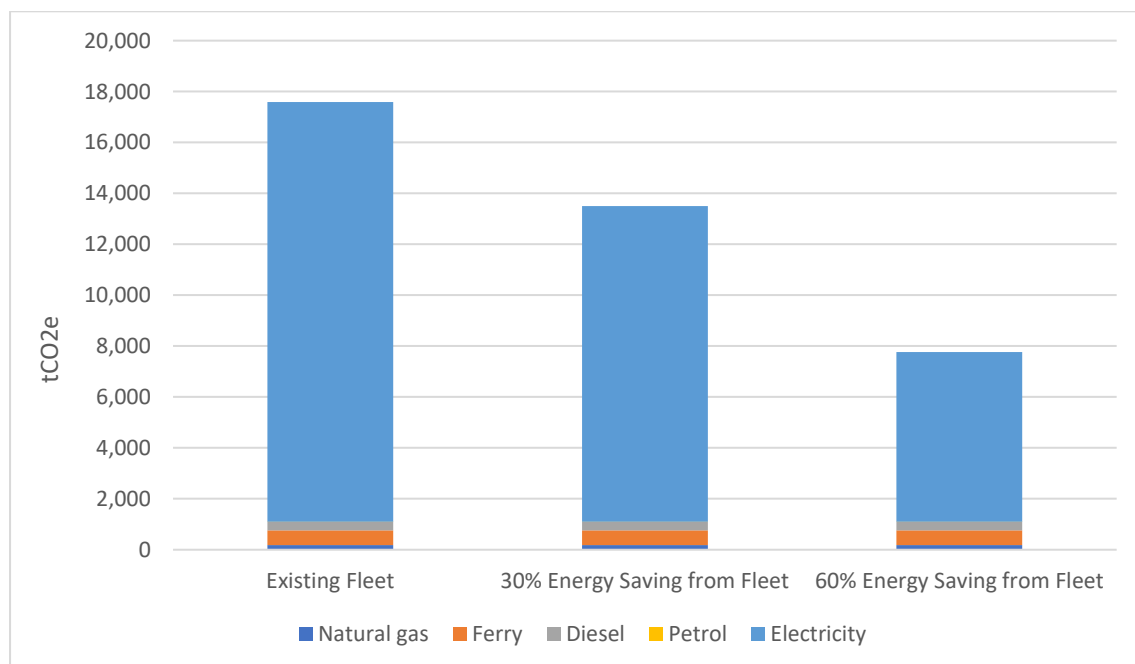


FIGURE 12 - IMPACT OF THE NEW FLEET ON GHG EMISSIONS (SCOPE 1 AND 2)

⁴³ National Grid (2020). *Future Energy Scenarios, data workbook*.

Scope 3 Emissions

Scope 3 emissions account for approximately 47% of Nexus' total emissions. These emissions are the result of activities from assets not owned or directly controlled by Nexus.

CAPITAL DELIVERY

Major projects and ongoing maintenance have a significant level of carbon emissions at Nexus. In the 19/20 carbon report, they're estimated to account for approximately a third of our total emissions - these were calculated using capital spends in each category of emissions areas with very limited accuracy.

Contractors are required to provide Environmental Management Plans as part of works deliveries. Additionally, newer buildings in Nexus estate have met high BREEAM (Building Research Establishment Environmental Assessment Method) standards.

BUSES

Currently buses contribute a significant amount to these emissions, secured services and rail replacement vehicles emitted approximately 3,000 tCO₂e in 19/20. Since Nexus does not have the necessary legal powers, Nexus specifies bus services that others operate through a concession agreement. This allows Nexus to determine vehicle specification, these are set to ensure good environmental standards, Euro 5 at present. Currently, contract terms are negotiated annually, primarily due to uncertainty surrounding certainty of future levy funding.

Rail replacement vehicles operate whenever there is planned disruption or significant unplanned disruption (e.g. OHLE failure). In both cases, the number 900 operates in the affected areas and ran by 3rd party operators. We specify that engines must be Euro 4 or better, on rare occasions this specification can't be met and is therefore temporarily scrapped.

Nexus also provides customers with Emergency Ticket Acceptance on commercial bus operators – Nexus has no control over the engine specifications of these operators.

In the event that scheduled engineering works are not completed on time, contingencies are regularly put in place through the booking an additional day of operation for the Rail replacement bus, the number 900. These services will sometimes operate as once a service is registered with the Traffic Commissioner it must run.

EMPLOYEE COMMUTING

As part of the employee benefit scheme of working at Nexus all staff, full-time and part-time, can travel free on buses, Metro, Shields Ferry and some local rail services in Tyne and Wear. Due to this, a significant proportion of the Nexus workforce travel to and from work on public

transport, with Nexus consistently achieving Gold for its high level of employee public transport commuting. Showers, lockers and cycle racks are available at some offices to promote active travel to work.

Nexus offices have significantly different levels of employee commuting by mode. Nexus House and South Shields Training Centre have no parking available, encouraging employees and visitors to use public transport, whilst NRHQ and Control Centre have free car parking.

Nexus last created a Travel Plan in 2015 which found that NRHQ had many more single-occupancy car journeys than other locations, 43% of respondents claimed that this was their chosen method of travel (See Figure 13). This is expected in part due to its location (800m from Metro) but it is also likely due free parking in the car park and vicinity. Nexus House has much lower levels of single-occupancy car journeys (<10%), with no free car parking available due to its city centre location.

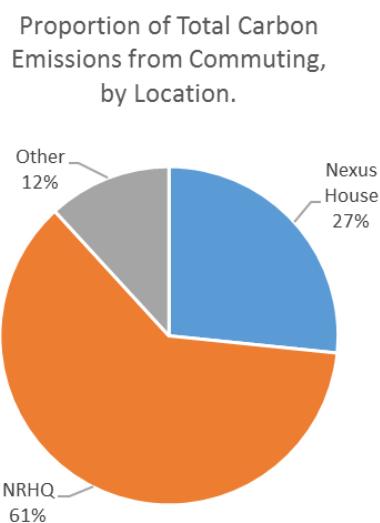
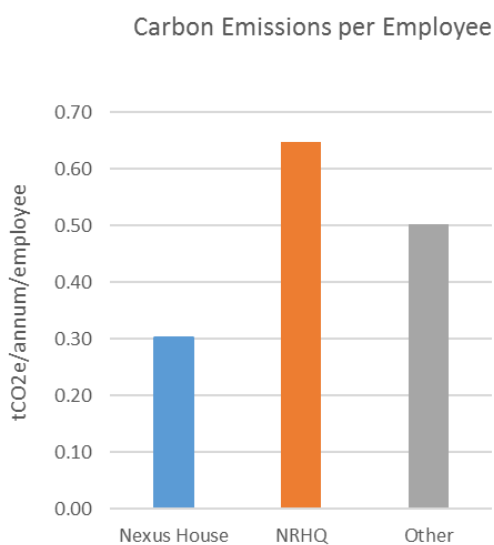
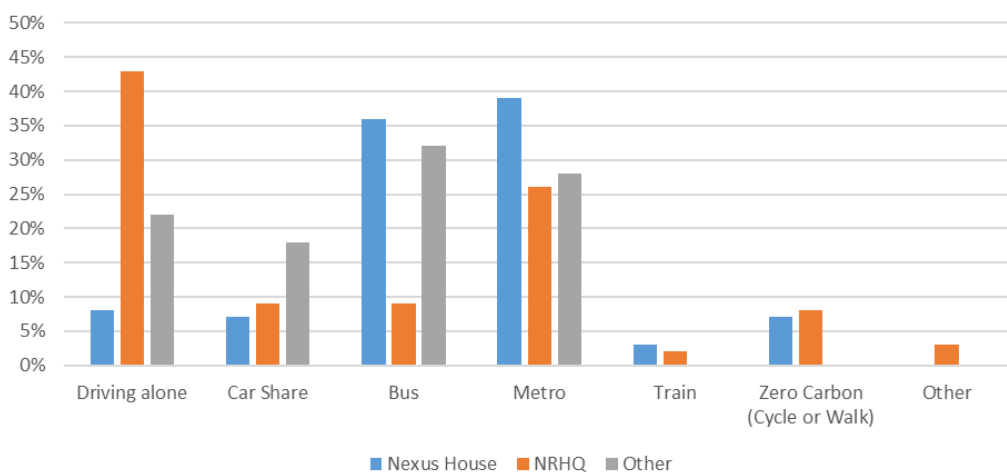


FIGURE 13 - COMMUTING STATISTICS AT NEXUS

BUSINESS TRAVEL

Where possible, Nexus employees use public transport for business travel. When this isn't possible, a fleet of vehicles are available to book. Additionally, a Brompton folding bike is available for use from Nexus House, use of this is limited. New facilities at the Nexus Learning Centre (South Shields) have been designed to limit requirements for business travel through the installation of e-conferencing technology. The ongoing COVID-19 pandemic is likely to have long-term implications for business travel, with employees likely to travel less to meetings, conferences and exhibitions. Nexus does not currently collect any data on business mileage of its staff, making the calculation of emissions difficult and inaccurate.

4.3 Waste Management

Nexus generates a large amount of waste through its operations, in 20/21 we produced approximately 180 tonnes of waste with 100% of this recycled or recovered (i.e. energy from waste). Waste volumes were down approximately 60% compared with waste volumes in the previous year (see Figure 14).

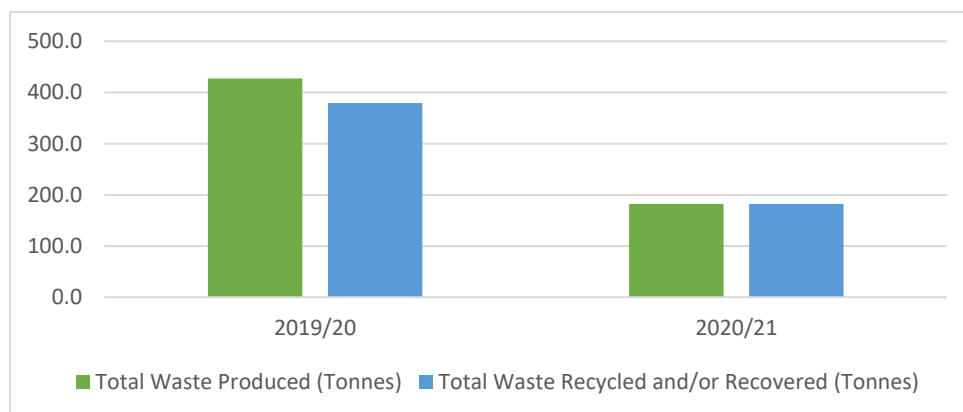


FIGURE 14 - WASTE VOLUMES

This change is largely due to a significant reduction in passengers travelling and more staff working from home, with waste volumes likely to increase significantly in 2021/22, due to this anomaly, 19/20 remains an important benchmark for future progress.

All waste is manually sorted by our contractor at their facility and is either recycled or recovered.

Currently, a range of measures are in place to minimise waste created throughout our operations. At Nexus Rail HQ, there are several enclosed skips for the disposal of a range of waste streams. The new Nexus Learning Centre has interactive boards at the facilities aim to minimise the amount of paper required during teaching and no single use plastic cups are provided at water fountains. Nexus encourages as little printing as practical with black and white chosen where possible.

4.4 Biodiversity

Lineside vegetation provides an important habitat for a wide range of wildlife. Currently we environmentally survey for nesting birds, bats, flora and fauna prior to works and again on the day of work. Tree removal is scheduled for winter, when this is not possible, pre work surveys are vital to ensuring that wildlife is not disrupted. Brush is left in certain areas to provide wildlife habitat. Additionally, we currently have an invasive weed (Japanese Knotweed/Hogweed) register and spray annually.

All the Off-Track team have extensive knowledge and experience as well as comprehensive training regarding vegetation management. The lineside vegetation work team are currently putting together the annual plan to tackle problematic vegetation across the system.

As part of the development of some projects, ecological surveys are often required legally in order to assess and minimise the impact of projects on the environment. For example, as a condition of planning at Howdon Depot, Nexus were required to fence off and plant native wildflower in an area to encourage and improve on the breeding habits of the rare Dingy Skipper moth, after they were found in a survey of the site.

The choice of plantings at the Nexus Learning Centre were chosen to encourage wildlife, with several bird boxes also present on site. Nexus historically had Two beehives that were established on vacant Metro property, in a pilot scheme as part of the “Beekeeping Project”. Howdon Satellite Depot has also been landscaped to promote biodiversity through the introduction of wildflower meadows.

4.5 Climate Resilience

Nexus are currently undertaking several projects to minimise the impact that future extreme weather impacts will have on our system, although no overarching plan exists.

The Asset Renewal Programme is currently undergoing a programme to upgrade drainage (1 in 50 year return interval) to minimise the likelihood and severity of future flooding events. Rail stressing has been undertaken on most of the network to mitigate against rail misalignment and/or buckling, this is a relatively rare problem, occurring when the rails expand in response to high temperatures. An extensive programme through the central corridor also saw the strengthening of embankments with toe retention, to mitigate against landslips.

Flooding was witnessed on the network due to heavy rainfall during the “Toon Monsoon” in 2012 (also known by “Thunder Thursday”). In response to this and other severe flooding events,

Nexus has previously joined working groups with the Councils and Northumbrian Water to look at lessons learnt and actions to prevent similar incidents occurring.

4.6 Brand Imaging

The perception of sustainability in Nexus' brand forms a minor but vital element in the delivery of this strategy. Our estates can be broadly split up into those older buildings, those that were constructed during the creation of the Metro with minimal changes in the last 15-20 years (e.g. Heworth, Monument, Control Centre, NRHQ) and newer estates those that have undergone significant refurbishments or rebuilds in the last 15 years (e.g. Haymarket, South Shields, Depot, Central).



FIGURE 15 - EXAMPLES OF NEXUS ESTATES

In recent years we have completed several renovations and rebuilds of existing or new buildings (Nexus Learning Centre). Sustainability played a major role in projects such as the South Shields Interchange, the new Depot (under construction) and the Nexus Learning Centre. These not only minimise the impact of our operations but also create a statement to our customers about the type of organisation we are progressing to become. Nexus is currently developing the *Accommodation Plan* to modernise and better utilise its existing estates, whilst assessing the viability of other potential buildings.

4.7 What change is required?

Greenhouse Gas Emissions

Nexus currently does not have a roadmap for how it plans to decarbonise any of its assets. In terms of monitoring, there is a lack of accountability and ownership of this issue by any one department with no official corporate reporting schedules. Additionally, environmental management systems (ISO 14001:2015) have been achieved for Metro and Ferry but is yet to be achieved for the entirety of Nexus.

Nexus is not aware of its scope 3 emissions upstream (i.e. emissions in our supply chain) and downstream (i.e. use and end-of-life of sold products) – see *Appendix B: Emission Scopes Definition*. We are also not aware of the size of our emissions from business travel and have inaccurate and/or historical data for many other emission streams such as employee commuting.

To date, inaction on emissions and environmental performance has been common. Nexus has often failed to exploit low-carbon government schemes aimed at the public sector (e.g. Salix Finance). Sustainability must become a priority in all decisions; there needs to be a shift change in the way that investment decisions are made and, in the attitudes, that Nexus colleagues are expected to possess. Major investment decisions should better consider the whole lifecycle carbon emission, aiming to follow the carbon reduction hierarchy (i.e. build nothing → build less → build smart → build efficiently).

There is a notable lack of joined up thinking in some areas. Existing business practices currently fail to correctly incentivise budget holders to invest in technologies that have sustainable benefit and invest to save business cases (e.g. energy saving measures, electric vehicles).

Numerous environmental related policies and strategies have been published prior to this, each offered viable solutions but in many cases were not delivered upon due to a lack of financial consideration and/or internal resource. HSQ&E have just one person resourced to deal with environmental issues, limited in their scope to provision of environmental guidance to overcome problems and complaints, and the continuing certification of the Ferry and Metro Operations EMS. A lack of resource to reduce utility use, combined with a multimillion-pound utilities spend is likely leading to Nexus missing out on significant cost savings. For reference, achieving a 5% reduction in electricity will save Nexus approximately £200,000 annually.

The Tyndall Centre report show that for the North East to make its fair contribution to delivering the Paris Agreement's commitment to staying “well below 2°C and pursuing 1.5°C” global temperature rise, then an immediate and rapid programme of decarbonisation is needed. At

2017 CO₂ emission levels, the North East will exceed the recommended budget available within 8 years from 2020. **To stay within the recommended carbon budget the North East will, from 2020 onwards, need to achieve average mitigation rates of CO₂ from energy of around -11.0% per year⁴⁴.** This will require that the North East rapidly transitions away from unabated fossil fuel use.

Waste Management

Currently, Nexus is performing relatively well in how it deals with waste (i.e. no waste to landfill). However, more can be done to streamline the volumes of waste produced through the implementation of policies. There is a notable lack of policies in most Nexus offices to minimise waste, improvements could be made to reduce printing waste. Nexus could do more to report on the various waste streams we have and the relevant quantities, conveying progress to Nexus colleagues could be an effective way to minimise waste streams.

Biodiversity

At lineside we correctly focus our management objectives on safety and performance. However, in future we need to consider the need to benefit biodiversity and the wider environment, bringing about a culture change within our organisation to view lineside vegetation as an asset, not a liability. Nexus must strike a balance between safety, performance and environmental outcomes.

Currently, Nexus has an ad-hoc approach to biodiversity, with individual projects having measures to improve biodiversity where planning has obligated us to.

Nexus first needs to establish a baseline to understand what types of habitats, animals and plants we have on our estates. Once this has been established an action plan can be developed about how Nexus can protect and enhance these habitats.

Climate Resilience

Nexus currently has several projects which aim to minimise the impacts of extreme weather on our system. At present, we do not fully understand where the largest infrastructure risks exist. Once these risks are quantified in magnitude and likelihood, prioritisation for future investment decisions can be made. Remote sensing solutions to monitor and highlight high risk locations before failure is likely to provide Nexus with improved safety and network resilience.

⁴⁴ Manchester University (2021). *The Tyndall Centre for Climate Change Research, Setting Climate Commitments for the North East*. Available at: <https://carbonbudget.manchester.ac.uk/reports/NE/>

Brand Imaging

Currently the 5th theme in the 2021-2035 business plan is “*Becoming a sustainable organisation*”; we must convey how we plan to achieve this goal to our customers through marketing streams, the attitudes possessed by Nexus colleagues and environmental demonstrations at stations and offices. Currently, the stark contrast between newer buildings and older buildings across our network can draw attention to those locations that lack any greenery. Nexus must aim to improve the amount of greenery at its estates and seek to minimise the impact of these buildings through sustainable architecture.

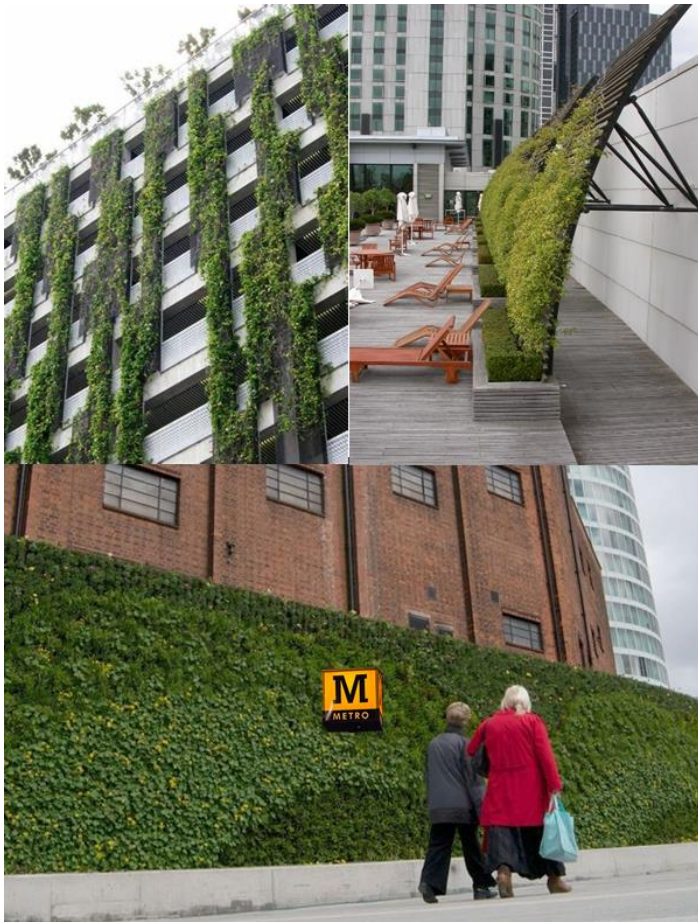


FIGURE 16 – MOCK-UP OF ENVIRONMENTAL DISPLAYS

What is the impact of not changing?

Greenhouse Gas Emissions

The Scenario in Figure 17 outlines the level of emissions (Scope 1 & 2) that Nexus would emit if we chose to do nothing. This assumes that emissions from natural gas, marine gas oil, diesel and petrol remain unchanged. It also assumes that reductions in electricity only come from implementation of the new fleet (estimated annual savings of 13.8 GWh between 2022 and 2026) with an additional 8% in mileage relating to Metro flow.

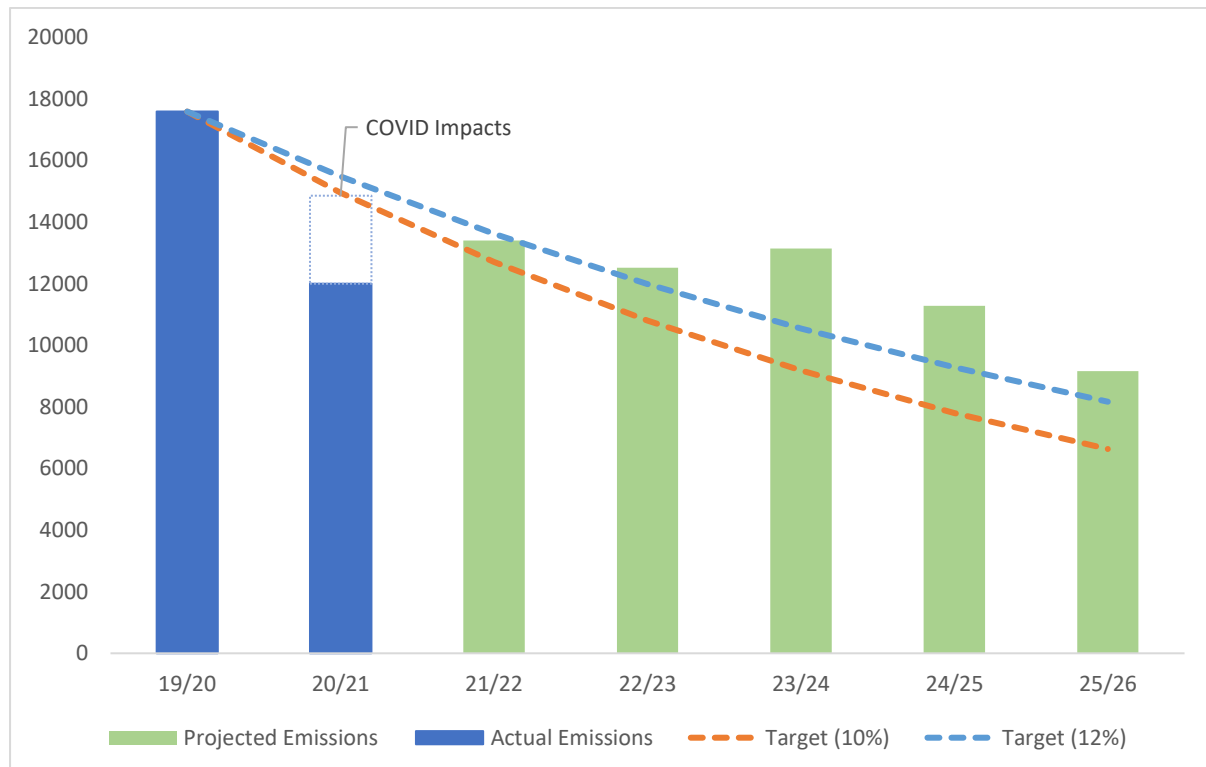


FIGURE 17 - THE "DO NOTHING" EMISSIONS PATHWAY

Under this pathway, Nexus is estimated to emit 89 ktCO₂e between 2019 and 2026; the Carbon Budget over this same period is 91.7 and 86.7 ktCO₂e for 10% and 12% mitigation respectively. It is therefore expected that Nexus will meet its 10% budget but exceed the 12% target by 2.3 ktCO₂e; this is despite significant energy savings achieved through the new fleet, the rapid decarbonisation of the National Grid and 2.8ktCO₂e savings from the Covid-19 pandemic.

Due to the cumulative nature of Carbon Budgets, this is a considerable breach of emissions. Our full Scope 1 & 2 Carbon Budget until 2050/2051 is approximately 170 ktCO₂, any exceedance of this budget can have a significant impact on the rate of decarbonisation required later. Failure to act now will require Nexus to decarbonise faster in the future, this may cost more money and damage Nexus' environmental reputation.

Nexus must cut emissions in half by 2026/2027 and they must be just 25% of what they are today by 2032/2033. The challenge to Nexus is an immense one but one that can be achieved through the delivery of the right policies and strategies.

Aiming for a higher benchmark now (i.e. 12% annual reduction) will provide Nexus with more time in the future to decarbonise areas of the business that are likely to be difficult and/or capital intensive. By locking in carbon savings today, these can be realised every year from then onwards, contributing to every successive year of emissions. Failure to act will likely be more costly in future, as more extreme measures are required to meet reduction targets.

At some point, Nexus must decarbonise its operations - whether this is voluntary or based solely upon the economic argument is a decision for Nexus and the JTC. Assuming the latter, whereby we only invest in these technologies when we are forced into them by Government legislation (i.e. the do-nothing scenario); large hidden risks and years of lost efficiency are expected.

As discussed, central Government is subsidising a range of low-carbon technologies to reduce their cost to make them competitive against their fossil fuel counterparts. Examples of these are plug-in grants applied to the cost of ULEV, Renewable Heat Incentive (RHI) applied to renewable heating and funding available to subsidise the cost of low-carbon buses through the Zero Emission Bus Regional Areas (ZEBRA) scheme.

Phases 1-3 of the Public Sector Decarbonisation Scheme (PSDS) have now completed; the scheme provided over £1bn of funding to fund heat decarbonisation and energy efficiency measures, it is likely a similar scheme will reopen in the future. Nexus did not apply for phases 1-3 due to lack of resource to provide technical requirements in the given timescales.

Costs of low carbon technologies are expected to fall rapidly, as are the levels of subsidies, likely becoming the taxations of the future.

Low-carbon technologies frequently have lower ongoing costs due to the lower rates of taxation versus fossil fuels. By failing to invest now, lower ongoing costs are not realised by Nexus and investment decisions in existing technologies are maintained. Older technologies are likely to suffer from increasing ongoing costs as taxation is further increased and become outdated and expensive to maintain.

Waste Management

Failure to change our current waste management practices is likely to cost Nexus financially; both due to wasted expenditure on resources (i.e. upstream) and additional costs for disposal

(i.e. downstream). Waste management is highly regulated and poor waste management processes may pose major legislative risks to Nexus.

Biodiversity

A variety of species of plants and animals in England and often their supporting features and habitats are protected. What you can and cannot do by law varies by species however Nexus currently does not fully understand which, if any, of these species/habitats are present on its infrastructure - this puts Nexus at increased likelihood of legislative and/or reputational risk.

Additionally, without awareness of any species/habitats across our estates, no meaningful improvements to biodiversity can be achieved and comprehensive action plans can't be developed. Thinking about biodiversity on a site by site basis can fail to consider the wider interactions in nature, through wildlife corridors, connected habitats and ecosystems.

Climate Resilience

Nexus infrastructure currently has some projects to improve our network resilience. Network Rail list 17 key climate change risks to rail infrastructure in their Climate Change Adaptation Report – Nexus will have similar climate change risks that should be managed. A wider adaptation plan to order future investment decisions has not been created with the current climate risks on our system unknown.

This poses significant operational and potentially legal risks to Nexus; if our infrastructure failed due to extreme weather, Nexus is likely to suffer from delays and in rare cases may lead to catastrophic failures such as derailment.

Tragedies such as those seen last year in the Stonehaven Derailment where a ScotRail train collided with a landslip, killing three people, are fortunately rare. There have been 12 similar derailments recorded since 2005 due to earthworks failure following heavy rain⁵, Nexus is not immune to such events potentially happening on its infrastructure due to extreme weather with regular monitoring and maintenance of embankments to minimise the likelihood of such events.

The costs to Great Britain railways of weather related disruption is estimated to be around £40m-50m each year (in delay and cancellation costs), the economic costs of track buckling are currently estimated at £4.8m each year; and are likely to double by 2020, quadruple by 2050, and be tenfold by 2080. Flooding in 2013 alone cost Network Rail around £12m in compensation and a further £15m in damage repairs⁵.

With all these costs likely to increase significantly with higher temperatures, higher precipitation and more frequent and severe adverse weather events.

Chapter 5 - Objectives and Options

This section sets out the objectives which will deliver the vision for the strategy as set out in *Vision; what will make the difference* and evaluates the options to deliver these objectives. The options are evaluated against how they deliver the objectives and how they support the wider local and regional public policy objectives, as set out in *Chapter 3 - The Strategic Context*. Risk associated with each option are identified.

An options appraisal report and risk register is appended in Appendix 4.

5.1 Objectives

Appraisal of Carbon Budget

All options must assist Nexus to achieve an annual 10% reduction in greenhouse emissions. This strategy recommends that Nexus seeks to deliver sustained reductions in our emissions, in line with the 11% annualised recommended for our region by the Tyndall Centre⁴⁴.

The following objectives will be used to assess the most suitable interventions (e.g. what source of emissions should Nexus tackle first) to meet the required carbon budget trajectory (*Table 5 - Appraisal of Carbon Mitigation Options*).

C1 - Initial Cost. Higher initial costs are likely harder to justify given the current budgetary constraints at Nexus; lower costs that deliver the objectives will therefore be prioritised.

C2 - Long-term Cost Savings. Options developed are likely to deliver a cost savings or be cost neutral in the medium to long-term.

C3 - Availability of Technology. This refers to the variety of choice Nexus has when choosing solutions, with the more suppliers the better.

C4 - Rate of Change Required. A faster rate of change will be harder to achieve, where possible, slower rates of change are therefore preferred.

C5 - Proven Technologies. Established technologies have lower operational risks and are therefore preferred.

C6 - Adheres to Carbon/Energy Hierarchy. When utilising funding, Nexus should first aim to improve efficiency before moving to cleaner fuels.

C7 - Achieves 10% Annual Carbon Reduction. This strategy recommends that Nexus seeks to deliver sustained reductions in our emissions, in line with the 11% annualised recommended for our region by the Tyndall Centre⁴⁴.

C8 - Improved Brand Image. Some options have impact negatively or positively on the brand image of Nexus and may have implications on patronage.

Appraisal of Interventions

The following objectives will be used to assess the most suitable interventions (e.g. what source of emissions should Nexus tackle first) to meet the required carbon budget trajectory (*Appendix A: Option Appraisal Table*).

A1 - Provide Nexus with the necessary skills and investment to deliver sustained improvements to environmental performance and operational efficiency. This strategy recommends that Nexus improves the level of investment in environmental resources to deliver this strategy and develop future projects.

A2 - Encourage project managers to consider more sustainable options for projects and their whole lifecycle costs, even when initial costs are higher. This strategy recommends that the options chosen should incentivise project managers to view investment decisions over their life. Investment in energy saving technologies increase project costs and as such there is currently little incentive for their inclusion in project specifications.

A3 - Target “using less” first by considering the hierarchy of waste/energy/carbon reduction. This strategy recommends that options should try to use less, as this is always the most sustainable option. We must consider if projects are essential in the first place before considering how to make such projects more “sustainable”. We must also try to use resources as efficiently as possible, minimising waste, energy and carbon as a result of our operations.

A4 - Prepare Nexus to have a wide range of prospective projects ready for external funding. External funding bids present major opportunities for the delivery of a more sustainable network, but it can take time create well developed proposals. This strategy recommends we seek to develop a wide range of projects to “shelve” for future funding opportunities.

A5 - Constant improvement in the accuracy of current and future reporting of environmental performance. This strategy recommends that as part of our corporate reporting, annual emissions, waste volumes and other environmental KPIs are reported annually – these must be accurate or risk undermining reliability. Steps should be undertaken to better understand our scope 3 emissions.

A6 – Assist Nexus to achieve 8-12% Annual Carbon Reduction. This strategy recommends that Nexus seeks to deliver sustained reductions in our emissions.

A7 - Deliver an enhanced natural environment for flora and fauna on all our estates. This strategy recommends that we should seek to improve biodiversity, harnessing our land assets to create habitats and spaces for nature to flourish.

A8 - Projects must strike a balance between safety, performance and environmental outcomes. This strategy has highlighted that safety and performance are often prioritised over environmental outcomes. Safety and performance must continue to play the leading role, but more consideration should be given to environmental considerations of project options.

A9 - Minimise the probability and severity of disruption due to extreme weather. This strategy recommends that Nexus seeks to better understand the impacts and the appropriate adaptation required to prepare its network for extreme weather events.

A10 - Enhance the perceptions of Nexus' environmental credentials to customers, non-users and colleagues. This strategy has highlighted this whilst Nexus is aiming to become a more sustainable organisation, more can be done to improve the environmental perception of the Nexus brand – this will be an important factor to attract and retain customers.

A11 - Foster a culture of environmental consideration. This strategy recommends that Nexus seeks to improve the working culture with environmental consideration becoming a key attribute expected from Nexus colleagues.

5.2 Options

This section sets out this options identified, including do nothing and evaluates their impact on the objectives set in section 4.1 and the wider public policy objectives.

Options identification

Options have been identified against each of the pillars of this strategy. These options have been developed based upon the case studies and research presented in this strategy. These options will be appraised later in this section based upon the objectives specified to develop the finalised list of options. These will be developed further through the recommendations and delivery plan.

Carbon Budget Appraisal

As part of the carbon budget development a range of options were assessed and analysed for their estimated carbon impacts. Once these were fully understood, a range of interventions could be developed to match the chosen carbon budget options.

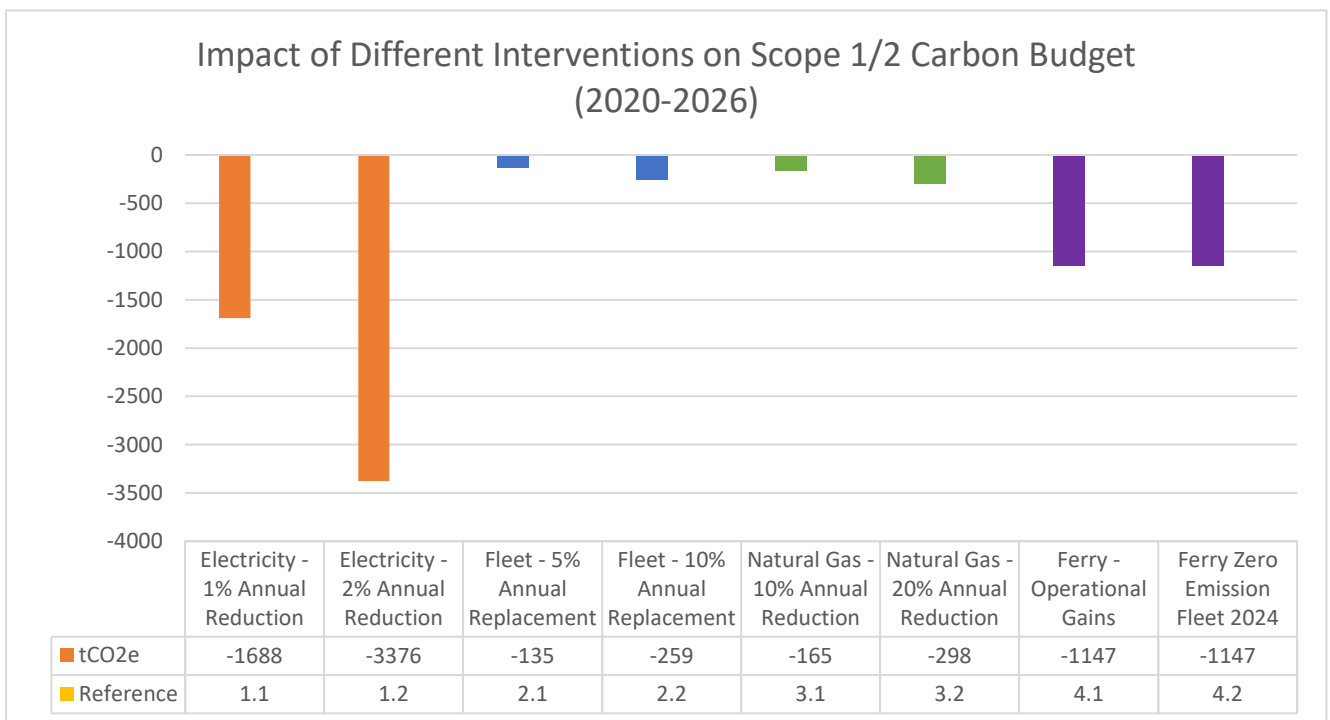


FIGURE 18 – IMPACT OF DIFFERENT INTERVENTIONS ON CARBON BUDGET (2020-2026)

Currently the “Do Nothing” option is expected to reduce our emissions, compared to the baseline, by approximately 26ktCO₂e with a further 2.4 ktCO₂e of mitigation required to achieve 12-15% annual reduction. The options developed detail a range of varied approaches that could be taken to meet our emission target.

OPTION 1 “DO MINIMUM” – STEADY PROGRESS

Interventions: 1.1 (1.7 ktCO₂e)

This option assesses the impact of doing the “minimum”. This has been modelled as a 1% annualised reduction in electricity across all estates, annually.

OPTION 2 – IMPROVING PROCESSES

Interventions: 1.2, 2.2 & 3.1 (3.8 ktCO₂e).

This option assesses the impact of improving processes to unlock carbon savings. This has been modelled as a 2% annualised reduction in electricity, 10% annualised EV uptake and 10% annual natural gas reduction.

OPTION 3 – EFFICIENCY GAINS

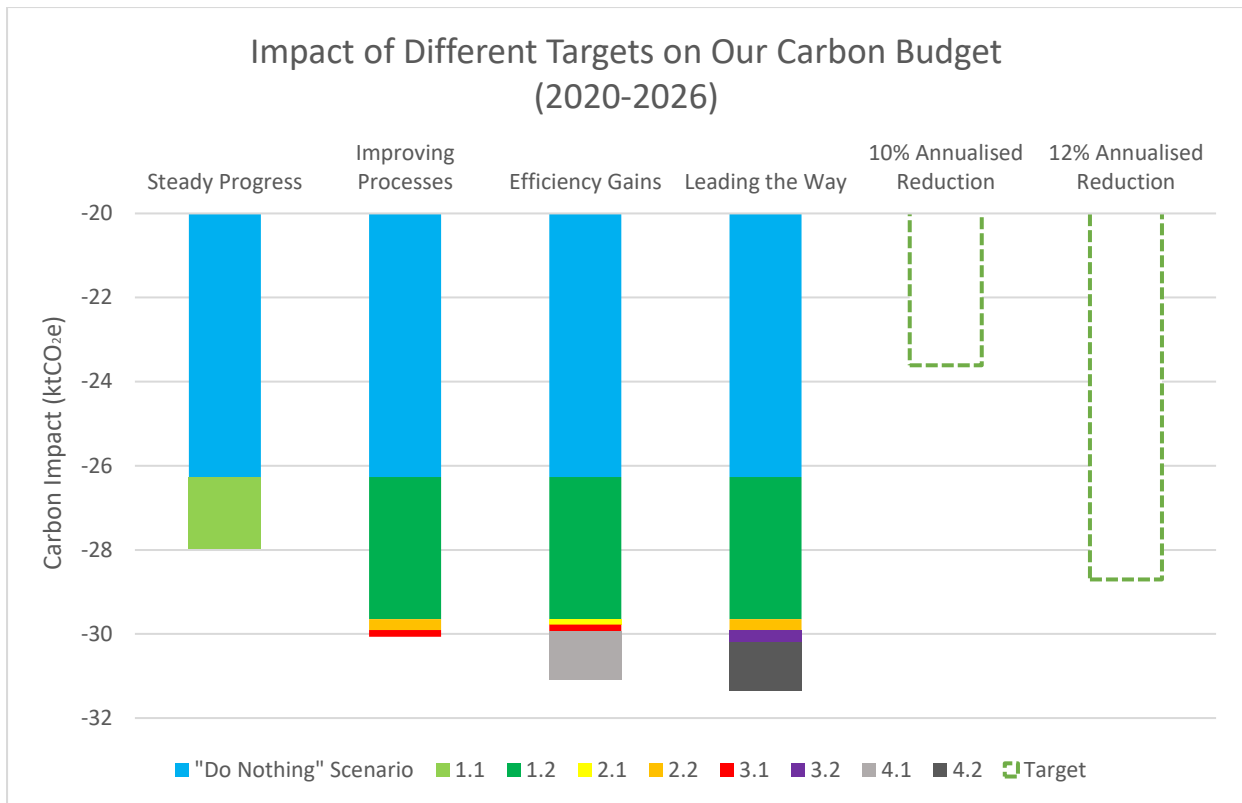
Interventions: 1.2, 2.1, 3.1 & 4.1 (4.8 ktCO₂e)

This option assesses the impact of improving efficiencies to unlock carbon savings. This has been modelled as a 2% annualised reduction in electricity, 5% annualised EV uptake, 10% annual natural gas reduction & operational changes to ferry to reduce idling emissions.

OPTION 4 – LEADING THE WAY

Interventions: 1.2, 2.2, 3.2 & 4.2 (5 ktCO₂e)

This option assesses the impact of making radical changes to how we operate, to unlock carbon savings. This has been modelled as a 2% annualised reduction in electricity, 10% annualised EV uptake, 20% annual natural gas reduction & zero emission ferry in 2024.



These options are appraised separately with options to meet each intervention (e.g. “10% annualised EV uptake) appraised in the following section.

General

1.1 INTRODUCTION OF ANNUAL ENVIRONMENTAL REPORTING.

Environmental reporting is primarily concerned with reporting an organisation’s environmental performance. Currently Nexus only reports internally to Metro Directors on Metro’s Environmental performance, the current report is limited in its scope and narrative. This option would enable Nexus to create an internal document to measure our performance over the last year across the business, looking at a variety of environmental KPIs, these will be built into the Corporate Business plan and reported to SLT weekly and TWSC quarterly. Additionally, this document could be altered to provide a public document, providing transparency and trust in our environmental credentials. Such a document would likely be published annually and prepared by the HSQ&E department, something which may be difficult due to the small environmental team.

Risks associated with this option include additional reputational risks due to environmental information sharing.

A. INTERNAL REPORTING

B. PUBLIC REPORTING AND INTERNAL REPORTING

1.2 COLLABORATE ACROSS THE NORTH EAST PUBLIC TRANSPORT SECTOR.

Collaboration across the North East public transport through sharing information and ideas. Through information sharing, current proposals could be shared – allowing for synergies between different projects to be explored. Such a working group may lead to additional opportunities for partnership and joined-up thinking on various environmental schemes. This collaboration would likely take the form of regular meetings with bus and train operators in the region.

1.3 DEVELOPMENT A NEW SUSTAINABILITY DEPARTMENT, DEPENDANT ON FUNDING

This strategy has highlighted that the Environmental team requires expansion if Nexus wishes to seriously tackle and improve environmental performance. “Environment” encompasses a huge number of distinct subjects, all of which are growing in their prevalence and complexity. This expansion would enable Nexus to recruit the individuals required to regularly report and analyse environmental data, whilst also being a crucial source of information to the business. Having such knowledge in the business is likely to be crucial to the delivery of ongoing improvements to environmental performance. Expansion would also enable Nexus to deliver high quality projects and headline figures, providing Nexus with cost savings and marketing opportunities. They could also highlight and develop potential applications for environmental funding, something Nexus has sometimes failed to utilise in the past (e.g. Salix Finance PSDS).

The alternative to this option would be outsource everything, likely to a consultancy, which higher comparative costs expected. Alternatively, Nexus could restructure the HSQ&E department, although this is likely to take away resources from Health and Safety Quality, a decision that is likely to be unacceptable given the high risks of the railway environment.

Chapter 7 - Delivery Action Plan provides which outputs from this strategy can be completed without this team, most actions within the plan are likely to be difficult to complete without additional external (consultancy) or internal support.

1.4 CREATION OF A RECYCLING FUND.

A Recycling Fund would aim to increase capital investment in energy-efficient technologies across Nexus. It is proposed that the funds would be ring-fenced with capital provided Nexus, to be spent on energy-saving projects with paybacks up to 10 years. The financial savings delivered by the projects are returned to the fund allowing further spending on front line services, hence the term ‘Recycling Fund’. Individual Recycling Funds, managed by Salix

Finance, range from £100,000 to over £1 million. Since Salix Finance are no longer accepting applications, the fund would likely be managed by the environmental team. Anyone managing a project able to apply for funding for projects through the submission of an application form. By Nexus managing the entirety of the fund, there could be more flexibility in the criteria of eligible schemes.

1.5 IMPLEMENTATION OF AN ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) ACROSS NEXUS.

Currently Nexus have achieved ISO 14001:2015 for both the Ferry and Metro, this option would seek for Nexus to achieve an EMS across all our operations – likely ISO 14001:2015. An EMS serves as a tool, or process, to improve environmental performance through design, pollution control and waste minimisation, training, reporting, and the setting of goals. An EMS would provide Nexus with a systematic way of managing environmental affairs, minimising risks associated with environmental compliance. Additionally, the EMS would help to develop, implement, manage, coordinate and monitor environmental policies on a more frequent basis; this would be vital to ongoing environmental performance as the Energy and Environment Strategy is only due to be published every 5 years.

1.6 SEEK TO INCREASE GREEN INFRASTRUCTURE AT STATIONS AND OFFICES.

Green infrastructure refers to features such as green roofs, green walls, beehives and wildflower verges. These green features at stations and offices will not only improve our environmental credentials but also act as an environmental display to customers. They could improve the sense of place at stations/offices, making them more pleasant and less harsh. Each feature in public areas could be accompanied with information panels that explain what it is and how it helps nature. This would not only highlight the environmental work that Nexus is completing but also acting as an educational resource. These elements of green infrastructure are likely to be of commercial interest to the private sector, with the potential for sponsorships and/or partnerships.

Greenhouse Emissions

2.1 INVEST IN LOW CARBON SOLUTIONS;

The following options refer to direct investment from Nexus (seeking external where possible) to transition away from the combustion of fossil fuels.

A. FEASIBILITY STUDIES TO DECARBONISE ASSETS.

Feasibility studies are required to better understand how Nexus will decarbonise areas such as the Ferry, Buses and heating. Currently, there are plans to decarbonise all off these assets in the future with no technical understanding of the options available.

B. SIGNIFICANT INVESTMENT IN EVS AND THEIR INFRASTRUCTURE AT STATIONS AND OFFICES.

Before Nexus begins to invest in EVs, the charging infrastructure must be reliable and easily accessible - limited EV charging infrastructure currently exists at offices and stations. As a result, currently Nexus owns no EVs despite the EV policy being implemented in August 2019. This option would seek for Nexus to highlight and specify the requirements for EV charging infrastructure and then to ensure that these sites met the necessary specification. Rapidly charging multiple EVs can require high energy requirements that may require significant upgrades to existing infrastructure; this is particularly significant at car parks where many cars may be charging at any one time. It would be recommended that Nexus breaks down these works based upon priority, focussing first on the essential charging infrastructure that Nexus requires to begin operating an EV fleet.

It has been shown by Nexus that the economic argument for EVs make sense. Despite this, we are yet to procure any units, largely due to their higher initial purchase cost. Based upon this, it is proposed that it is agreed that a percentage of the new road fleet is EV, with the Finance Department agreeing the additional uplift on these units, over the equivalent diesel/petrol units. The percentage procured should be agreed in advance with the budget reviewed on an annual basis.

C. MOVE OFFICES TO LOW-CARBON HEATING.

Currently most Nexus buildings are heated using natural gas with no proposals to decarbonise heating systems. Opportunities may exist at some locations (e.g. District Energy at Nexus House) that are yet to be fully explored, due to the onset on the pandemic.

2.2 TRIALS TO CHANGE BEHAVIOURS;

These options refer to solutions that aim to change attitudes and behaviours.

A. REMOVAL OF FREE PARKING FOR STAFF.

Currently car parking is free at all offices where it is available. Due to this, a large percentage of Nexus colleagues drive to/from work, contributing in part to Nexus' emissions. This option would seek to remove parking or introduce a permit/pay and display system to minimise private car usage. Free parking could be provided to those who car share or who drive an ULEV. This option is likely to be highly contentious with staff, an alternative option may therefore be to replace existing parking with EV only charging spaces.

B. CAR-FREE DAYS.

Every year on or around 22 September, cities across the world celebrate World Car-Free Day, encouraging motorists to give up their cars for a day. The event highlights the numerous benefits of going car-free to citizens—including reduced air pollution and the promotion of walking and cycling in a safer environment. Nexus could seek to encourage commuters to consider not using their private car on this day, if their journey can be completed by public transport.

C. COMPETITIONS AND TEAM PROJECTS.

Competitions/projects can be an effective and engaging way to make people think about sustainability. These could be awards/prizes for the department who use the least amount of paper or cycled/walked to work the most. To encourage environmental awareness, departments could be given a full year to design and implement a new sustainability practice, with the best idea winning prizes.

2.3 COMPULSORY TENDER REQUIREMENTS FOR ALL CONTRACTORS.

The UK's Crown Commercial Service has issued Guidance on social and environmental aspects of public procurement carried out under the Public Contracts Regulations 2015. This Guidance states that “award criteria may include environmental and / or social aspects”, allowing for Nexus to consider environmental/social factors during specification, award criteria and contract conditions. If Nexus were to consider a minimum compulsory environmental standard for contractors, it must be prepared for the potential for higher costs and/or lower standards, as these lose weighting in the appraisal of submissions.

2.4 CARBON APPRAISAL FOR ALL MAJOR PROJECTS.

Carbon appraisals assess the whole lifetime carbon cost of projects. This option would seek for Nexus to better consider the level of carbon emit/offset due to changes to factors such as: energy consumption, modal changes, embodied carbon etc. By looking over the lifetime of a project, from cradle to grave, Nexus can better assess project options and their relevant carbon impacts. Carbon appraisal is likely to increase initial project costs, over the project's lifespan these addition costs are likely to be partially/fully recovered due to lower resource utilisation – research suggests that embodied emissions from buildings can be lowered by 20-30% without any additional costs.

2.5 QUANTIFY SOURCES OF EMISSIONS IN OUR SUPPLY CHAIN.

Currently, the major sources of emissions in our supply/value chain are largely unknown. Quantifying these emissions through understanding the volumes, and origin of source materials we procure will allow Nexus to better understand where our emissions are most significant. This

will crucially enable us to reduce consumption of these materials and, if possible, seek more sustainable suppliers.

Waste Management

3.1 COMMIT TO ZERO WASTE TO LANDFILL.

Any waste that currently cannot be recycled is sent to be recovered through an energy from waste contract (Refuse Derived Fuel) and thus no waste is sent to landfill.

3.2 SEEK TO MINIMISE ALL UNNECESSARY WASTE.

Waste should be minimised at all levels to reduce the impact of Nexus' operations; environmental benefits are born upstream in our supply chain through lower resource utilisation and downstream, through lower waste volumes to be recycled or recovered. Elimination of demand must be the primary goal, followed by the reducing the quantity of resources required and then seeking to change materials and sources to more sustainable sources.

3.3 PUBLICISE WASTE MANAGEMENT PERFORMANCE.

This option would seek for Nexus to calculate waste volumes by type and origin – these would then be publicised on the Nexus website. By providing transparency in the waste volumes that we produce, due to the likelihood of heightened scrutiny from the public, there is likely to be more incentive for leaders at Nexus to focus on waste management performance.

3.4 ALWAYS CONSIDER REFURBISHMENT BEFORE REBUILD.

Renovation projects often have significantly lower environmental impacts than demolition and rebuild and should therefore be prioritised. When this is not possible, largely due to structural/age related issues, a high recycling rate of materials should be integrated into project plans at an early stage. One such example of this has been displays at the construction on the new fleet depot, with Volker Fitzpatrick achieving a very high recycling rate throughout the depot rebuild.

Biodiversity

4.1 CREATION OF A BIODIVERSITY ACTION PLAN (BAP).

This BAP would aim to the detail a vision and a set of principles that provide a framework for biodiversity conservation across our estates. By identifying priority habitats and species on our estate, threats and issues could be highlighted with steps to mitigate them; Nexus already has several ecological appraisals completed from large projects (e.g. Metro Flow), these could be expanded upon to achieve this. The BAP would also take advantage of the conservation

community within the North East and encourage a partnership approach to biodiversity conservation and sharing of best practice across the region. By delivering the BAP, Nexus can deliver biodiversity conservation and enhancement (net gain) as an essential element of sustainable development, reinforcing the commitments made to improve biodiversity in this strategy.

4.2 WORK CLOSELY WITH LOCAL ENVIRONMENTAL GROUPS AND COMMUNITIES.

Collaboration with local environmental groups could provide Nexus with a host of benefits when integrating biodiversity into estates and projects. Environmental groups can help to not only deliver improvements through volunteers but can also provide advice on how best to protect local flora and fauna. By working closely with these groups, it shows that Nexus is engaged with local communities – listening and acting upon concerns they may have.

4.3 AIM FOR BIODIVERSITY NET GAIN ON MAJOR PROJECTS.

When applying biodiversity net gain principles, Nexus would be encouraged to bring forward schemes that provide an overall increase in natural habitat and ecological features; This would be an active conscious decision, not because we must as a condition of planning.

The aim of Biodiversity Net Gain is to minimise losses of biodiversity and help to restore ecological networks. Standard ecology reporting to inform planning applications (Ecological Impact Assessments) typically include consideration of biodiversity losses and gains, but it is not standard practice to calculate a numerical value.

To demonstrate a percentage (%) increase, an ecologist would need to run a metric/calculation. This would be informed by measurements of pre-development habitats and application of criteria such as habitat quality and will result in a pre-development 'score'. The ecologist would then identify any losses of habitats or new habitats that will be created as part of the development and apply multipliers to account for certainty of and timescales for establishment which will result in a post development score. DEFRA has developed its own Biodiversity Metric (currently version 2.0) but other local tools are occasionally available and indeed may be required to be applied by local policy.

By implementing the Biodiversity Metric into all major projects at an early state, net gain for biodiversity can be integrated into the project specification, improving the levels of biodiversity as a result of major projects.

Climate Resilience

5.1 DEVELOPMENT OF A PLAN TO IDENTIFY AND COMBAT CLIMATE RISKS.

By developing a plan to combat climate risks, Nexus would better understand and quantify the risks associated with climate change on its infrastructure. Such a plan would ensure that infrastructure is able to better withstand and recover faster from the impacts of future weather conditions. Consequently, it is likely that Nexus would have improved performance and safety during extreme weather whilst also provide financial savings through reduced repair and/or compensation payments. Improving resilience to such events is key to enhancing the reputation and trust in Nexus' ability to manage the impacts of weather events.

5.2 IMPROVED COLLABORATION WITH LANDOWNERS AND OTHER STAKEHOLDERS

Flooding represents a major risk to the Metro with landowners having a significant influence on the levels of surface water runoff onto Nexus estates. Poor land management can lead to large quantities of surface water flowing on to Metro tracks and it is likely that some historical flooding was exacerbated or due to this. Whilst drainage return interval specifications on Metro are high, flows from a larger than anticipated catchment, can easily lead to systems breaching and the flooding infrastructure. Upgrading drainage is expensive and limitations of the railway environment often mean there are challenges in doing so.

By engaging with adjacent landowners at high-risk locations, Nexus can seek to invest in sustainable urban drainage systems (SuDS) to intercept flows before they reach our estate. A range of features such as swales and detention basins can provide a powerful way to minimise the risk of flooding.

5.3 QUANTIFY THE POTENTIAL COSTS OF CLIMATE CHANGE ON OUR INFRASTRUCTURE.

Currently the quantified value of climate risks are largely unknown. Without understanding the value of these potential risks, it is difficult for Nexus to currently deliver investment decisions to make our network more resilient. This option would seek for Nexus to quantify and classify climate risks by severity. Once these are better understood, Nexus will be in a better position to invest in preventative measures which minimise any significant climate risks.

Summary of the options considered

General

1.1 Introduction of Annual Environmental Reporting

- a. Public Reporting
- b. Internal Reporting

1.2 Collaborate across the North East Public Transport Sector.

1.3 Development of business case for a new Sustainability Department

1.4 Creation of a Recycling Fund.

1.5 Implementation of an Environmental Management System throughout Nexus.

1.6 Seek to Increase Green Infrastructure at Stations and Offices.

Greenhouse Emissions

2.1 Invest in Low Carbon Solutions;

- a. Feasibility Studies to Decarbonise All Assets.
- b. Significant Investment in EVs and their Infrastructure at Stations and Offices.
- c. Move Offices to Low-Carbon Heating.

2.2 Trials to Change Behaviours;

- a. Removal of Free Parking for Staff.
- b. Car-free days.
- c. Competitions and Team Projects

2.3 Compulsory Tender Requirements for All Contractors.

2.4 Carbon Appraisal for All Major Projects.

2.5 Better Understand Emissions in Our Supply Chain.

Waste Management

3.1 Commit to Zero Waste to Landfill.

3.2 Seek to Minimise All Unnecessary Waste.

3.3 Publicise Waste Management Performance.

3.4 Always Consider Refurbishment Before Rebuild.

Biodiversity

4.1 Creation of a *Biodiversity Action Plan*.

4.2 Work Closely with Local Environmental Groups and Communities.

4.3 Aim for Biodiversity Net Gain on Major Projects.

Climate Resilience

5.1 Development of a Plan to Identify and Combat Climate Risks.

5.2 Improved Collaboration with Landowners and Other Stakeholders

5.3 Quantify the Potential Costs of Climate Change on Our Infrastructure.

Options appraisal

Table 5 and 6 overleaf Summarise the options and impact on objectives

TABLE 5 - APPRAISAL OF CARBON MITIGATION OPTIONS

Description		DOUBLE WEIGHT		C3 Availability of Technology.	C4 Rate of Change Required.	C5 Proven Technologies.	C6 Adheres to Carbon/Energy Hierarchy.	C7 Achieves 10% Reduction	C8 Improve Brand Image	SCORE
		C1 Initial Cost.	C2 Long- term Cost Savings.							
Do Nothing	N/A	☑☑☑	N	N	☑☑☑	N	N	☑	N	10
Option 1	1.1	☑☑☑	☑	☑☑☑	☑☑	☑☑	☑☑☑	☑	N	19
Option 2	1.2, 2.2 & 3.1	☑☑	☑☑☑	☑☑	☑	☑☑	☑☑☑	☑☑	☑☑	22
Option 3	1.2, 2.1, 3.1 & 4.1	☑	☑☑☑	☑☑	☑	☑☑	☑☑☑	☑☑	☑☑	20
Option 4	1.2, 2.2, 3.2 & 4.2	N	☑☑	☑	N	N	N	☑☑☑	☑☑☑	11

TABLE 6 - SCORING FOR LONG-LIST OF OPTIONS

Option	Score (Max = 33)
1.5 Implementation of an Environmental Management System Across Nexus.	27
1.3 Additional Sustainability resource	26
b. Significant Investment in EVs and their Infrastructure at Stations and Offices.	20
4.1 Creation of a Biodiversity Action Plan.	20
1.4 Creation of a Recycling Fund.	19
2.4 Environmental Appraisal for All Major Projects.	19
a. Internal and Public Reporting	17
b. Internal Reporting	17
3.4 Always Consider Refurbishment Before Rebuild.	17
5.1 Development of a Plan to Identify and Combat Climate Risks.	17
a. Feasibility Studies to Decarbonise All Assets.	16
2.5 Quantify Sources of Emissions in Our Supply Chain.	16
3.3 Publicise Waste Management Performance.	16
1.6 Seek to Increase Green Infrastructure at Stations and Offices.	15
c. Move Offices to Low-Carbon Heating.	15
3.2 Seek to Minimise All Unnecessary Waste.	15
4.2 Work Closely with Local Environmental Groups and Communities.	14
4.3 Aim for Biodiversity Net Gain on Major Projects.	14
c. Competitions and Team Projects.	13
1.2 Collaborate Across the North East Public Transport Sector.	12
5.3 Quantify the Potential Costs of Climate Change on Our Infrastructure.	12
5.2 Improved Collaboration with Landowners and Other Stakeholders	11
a. Removal of Free Parking for Staff.	9
3.1 Commit to Zero Waste to Landfill.	9
b. Car-free days.	7
2.3 Compulsory Tender Requirements for All Contractors.	7

Chapter 6 - Conclusions and Recommendations

6.1 Conclusions

The internal and market research undertaken has shown that there are significant opportunities and risks that Nexus should be better considering. The main conclusions from this strategy are as follows:

1. Currently Nexus has minimal resources to deliver meaningful improvements to environmental performance. This is a significant lost opportunity and risk for several reasons, including, but not limited to:
 - a. *Potential for large savings due to high utilities spend;*
 - b. *Increasing awareness about environmental issues with our customers;*
 - c. *Growing complexity of the environmental legislative landscape; and*
 - d. *Decarbonising all assets is a complex process with ownership of the issue required.*
2. In terms of improving environmental performance, Nexus is currently acting “business as usual”, with little to no ongoing measuring of performance.
3. Current budgetary structures do not incentivise the correct behaviours. There are little to no incentives for Project Managers to procure elements that have strong business cases but higher initial capital costs.
4. Existing processes hold back necessary investment decisions that reduce resource utilisation. The reconfiguration of incentives is required for Nexus to meet the environmental and sustainability ambitions set out by Nexus in its 2025 Corporate Plan.
5. Capital costs and payback periods of low-carbon technologies continue to fall as the technologies mature – many of these now represent strong invest to save opportunities to lower ongoing costs.
6. Decarbonisation is a feat that Nexus must achieve – we can choose to act now or wait for legislation to force Nexus into action. Failure to tackle emissions now is not an option.

6.2 Recommendations

Based on the findings from this strategy, the following actions are recommended. These actions are to be implemented over the next 5-year period to 2027 with the delivery detailed within the delivery action plan (see *Chapter 7 - Delivery Action Plan*), these recommendations are all subject to securing available funding.

- 1. Improve measuring and reporting across all environmental and climate related factors, including the development of new annual reporting.**

For the improvement of environmental outcomes across Nexus, a baseline must first be created with continuous reporting thereafter.

- 2. Develop feasibilities to understand the challenges and options available for decarbonisation.**

Targeting future investment requires Nexus to understand the potential options for decarbonisation.

- 3. Prioritise investment in energy saving projects with a strong invest to save case.**

Invest to save business cases help Nexus to reduce ongoing costs associated with utilities, more should be done to ensure these money saving projects are better funded going forward.

- 4. Ensure that the environmental impacts/costs of projects and schemes are fully considered.**

Introduction of additional procedures when assessing projects to ensure that environmental impacts (e.g. carbon, biodiversity, air quality and noise) are considered early in the stage gate process. Schemes aim to mitigate these impacts even when planning does not stipulate that it is necessary to be granted permission.

- 5. Mitigate and continually minimise the environmental impacts of Nexus operations.**

Annual plans and proposals to continually improve environmental outcomes.

- 6. Increase financial and human resources available for the improvement of environmental outcomes.**

More resources are required to take ownership and oversee the delivery of proposals and plans; through both additional sustainability roles across Nexus and more finance to tackle the issue.

Chapter 7 - Delivery Action Plan

Head of Sustainability actions have been split into two categories, those which can be completed currently with the internal resource and those which cannot currently be completed, without external support, given the current levels of internal resource and/or knowledge.

Theme	Action	Requires additional Sustainability resource?	Owner	Deadline
1. Reporting, Appraisal and Procurement	1.1 – Develop a timeline for the annual environmental reports, including annual greenhouse gas emissions reports (SCOPE 1+2) with a list of actions to improve SCOPE 3 for the following reporting year.	Partially, limited existing resource to deliver reports.	Head of Corporate Planning and Safety and Assurance Director	2023/24 onwards
	1.2 – Integrate existing EMS for Ferry and Metro into one EMS for entirety of Nexus' operations.	Yes, unless outsourced.	Safety and Assurance Director	By 2023/24
	1.3 – Commit <u>publicly</u> to a 10% minimum annual reduction of Greenhouse Gas emissions.	Partially, limited capability to achieve with existing resource.	Safety and Assurance Director and Customer Services Director	During 2022/23
	1.4 – Introduce an environmental framework for major projects that considers relevant elements of biodiversity, carbon impacts, waste management. Introduce requirements early in the stage gate to ensure that projects have assessed viability on environmental grounds.	Likely outsourced	Head of Corporate Planning and Major Projects Director	During 2023/24

	1.5a – Development of feasibility and plan to decarbonise HVAC	No	HVAC - Head of Corporate Planning	During 2022/23
	1.5b - Development of feasibility and plan to decarbonise Ferry. Ferry feasibility is ongoing with CLEANFERRY and HVO projects.		Ferry – Head of Customer Service Operations & Head of Corporate Planning	
	1.6 – Updated Environment and Energy Strategy for 2027-2032	No	Head of Corporate Planning & Safety and Assurance Director	Published April 2027
2. Culture Change	2.1 – Assess environment and sustainability knowledge through the recruitment process for most roles.	No	People and Culture Director	During 2022/23
	2.2 – Develop a staff training module to improve Energy Awareness.	No		
	2.3 – Develop a range of annual department competitions for sustainability.	Yes	Safety and Assurance Director	During 2023/24 and ran annually
3. Utilities	3.1 – Creation of the “Sustainability Fund” or similar, with the scoping/development of the fund and prioritising funding based on the energy hierarchy and ROI.	Yes	Safety and Assurance Director	During 2024/25
	3.2 – Seek to transition to a 100% renewable utilities tariff.	No	Safety and Assurance Director & Head of Finance.	During 2024/25
	3.3 – Introduction of sub-meters at all stations fed with HV to better understand our energy usage at stations and losses in the OHL, aligned with the new fleet’s energy monitoring capabilities.	No	Metro Infrastructure Director	During 2024/25

4. Fleet Management	4.1 – Undertake a full assessment of the options to better understand requirements for charging an all-electric fleet and establish the relevant cost of infrastructure. With investment in Driver Efficiency Measures through improved tracking of drivers and vehicles.	Partially, would be enhanced.	Head of Infrastructure Delivery	During 2022/23
	4.2 – Develop plans to understand the challenges and opportunities of decarbonising each bus route we operate		Head of Commercial	During 2023/24
5. Customer Experience	5.1 – Update station specification to include optional “green architecture” such as green walls/roofs, trees, plantings, and low management vegetation (e.g. wildflower plantings) with educational resources to explain the benefits to local wildlife to customers.		Head of Corporate Planning	During 2022/23
	5.2 – Marketing campaign to highlight the steps being taken by Nexus to minimise our environmental impact	Partially, requires data/analysis to be provided.	Head of Marketing, Communication and Information	During 2024/25
6. Waste Management	6.1 – For projects seeking to demolish and rebuild an asset, a “Do Refurbishment” option should always be considered, alongside the “Do Nothing” option, with high rates of recycling (>50%) specified on all projects.	No	Major Projects Directors	During 2023/24
7. Biodiversity	7.1 – Creation of a Biodiversity Action Plan and standardised biodiversity benchmark across all major projects.	Yes, limited technical knowledge in this area – potential to be outsourced.	Safety and Assurance Director	During 2025/26

	7.2 – Engage with local environmental groups and communities to help to deliver and design biodiversity projects.		Head of Marketing Comms and Information and Safety and Assurance Director	During 2026/27
	7.3 – Strive for Biodiversity Net Gain, with some major projects receiving net gain certification.		Major Projects Director and Safety and Assurance Director	During 2026/27
8. Climate Resilience	8.1 - Creation of a Climate Change Adaptation Report		Head of Engineering and Safety and Assurance Director	During 2025/26
	8.2 – Develop a plan to work with adjacent landholders at high-risk locations to minimise flooding and/or runoff.	No	Head of Engineering	During 2024/25

Year by Year Delivery Plan

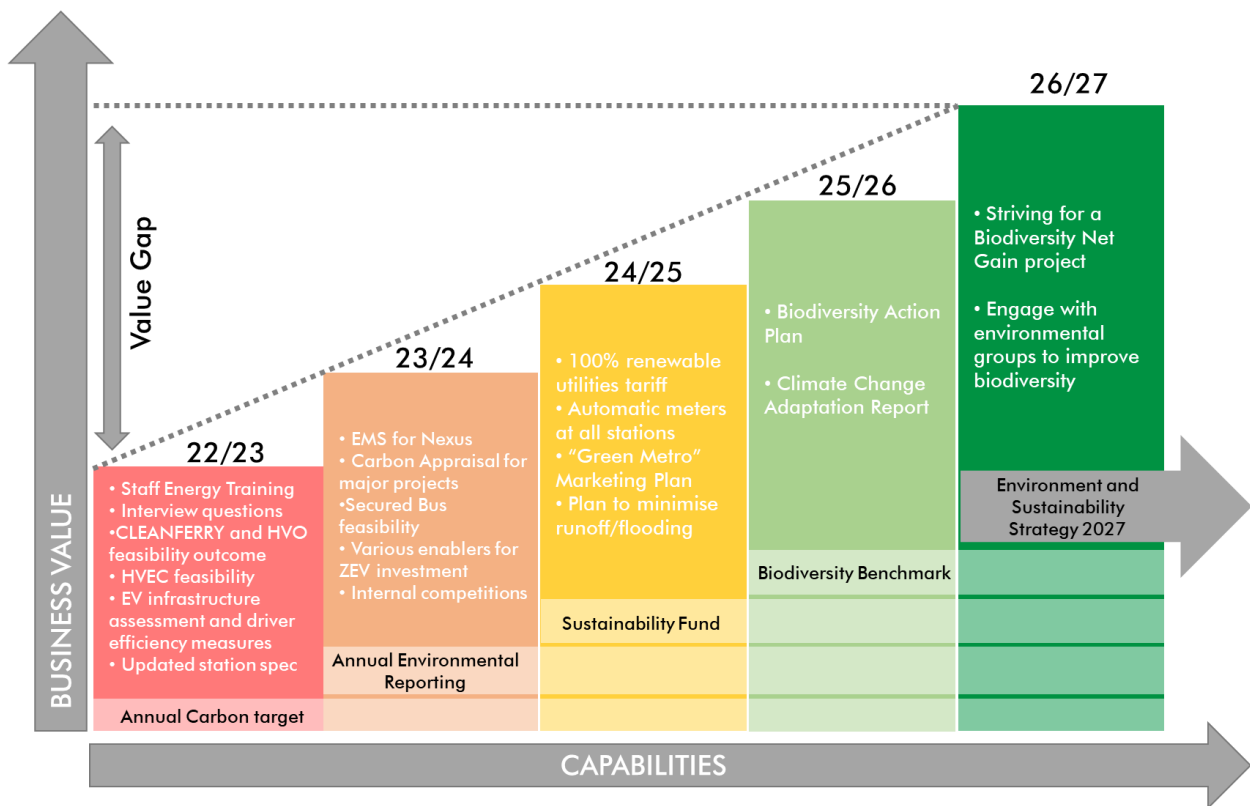


FIGURE 19 - MATURITY MODEL FOR DELIVERY PLAN

2022/23

1.3 – Commit publicly to an 10% minimum annual reduction of Greenhouse Gas emissions.

1.5a – Development of feasibility and plan to decarbonise HVEC.

1.5b – Development of feasibility and plan to decarbonise the Ferry, awaiting outcome of CLEANFERRY.

2.1 – Assess environment and sustainability knowledge through the recruitment process for all role.

2.2 – Develop a staff training module to improve Energy Awareness.

4.2 – Undertake a full assessment of the options to better understand requirements for charging an all-electric fleet and establish the relevant cost of infrastructure. With investment in Driver Efficiency Measures through improved tracking of drivers and vehicles.

5.1 – Update station specification to include optional “green architecture” such as green walls/roofs, trees, plantings, and low management vegetation (e.g. wildflower plantings) with educational resources to explain the benefits to local wildlife to customers.

2023/24

1.1 – Develop a timeline for the annual environmental reports, including annual greenhouse gas emissions reports (SCOPE 1+2) with a list of actions to improve SCOPE 3 for the following reporting year.

1.2 – Integrate existing EMS for Ferry and Metro into one EMS/QMS for entirety of Nexus’ operations.

1.4 – Introduce an environmental framework for major projects that considers relevant elements of biodiversity, carbon impacts, waste management. Introduce requirements early in the stage gate to ensure that projects have assessed viability on environmental grounds.

2.3 – Develop a range of annual department competitions for sustainability.

4.1 – Approval of the annual fleet budget to be provided over an extended period (e.g. 3 to 5-year fleet budget), providing more flexibility to invest in higher cost vehicles. Combine fleet procurement, fuel, maintenance, and road tax budgets into a single budget. Ring-fence annual savings from fuel and road tax for procurement of electric vehicles.

4.3 – Develop plans to understand the challenges and opportunities of decarbonising each bus route we operate.

6.1 – For projects seeking to demolish and rebuild an asset, a “Do Refurbishment” option should always be considered, alongside the “Do Nothing” option, with high rates of recycling (>50%) specified on all projects.

2024/25

3.1 – Creation of the “Sustainability Fund” or similar, with the scoping/development of the fund and prioritising funding based on the energy hierarchy and ROI.

3.2 – Seek to transition to a 100% renewable utilities tariff.

3.3 – Introduction of meters at all stations fed with HV to better understand our energy usage at stations and losses in the OHL, aligned with the new fleet’s energy monitoring capabilities.

5.2 – Marketing campaign to highlight the steps being taken by Nexus to minimise our environmental impact

8.2 – Develop a plan to work with adjacent landholders at high-risk locations to minimise flooding and/or runoff.

2025/26

7.1 – Creation of a Biodiversity Action Plan and standardised biodiversity benchmark across all major projects.

8.1 - Creation of a Climate Change Adaptation Report

2026/27

7.2 – Engage with local environmental groups and communities to help to deliver and design biodiversity projects.

7.3 – Strive for Biodiversity Net Gain, with some major projects receiving net gain certification.

Drafting and creation of Energy and Environment 2027, with publication in March 2027.

7.1 Project List

Project Name	Potential Source of Funding	Proposed year
<i>Feasibility Studies for Decarbonising HVEC And Road Fleet</i>	Internal Funding (Corporate Planning)	2022/23
<i>Staff Training Module for Energy Awareness</i>	Internal Funding	2022/23
<i>Driver Efficiency Measures</i>	Internal Funding	2022/23
<i>Decarbonising HVEC and Improving Energy Efficiency</i>	Salix Finance or Internal	2023/24
<i>Ultra-Low Emission Ferry Propulsion</i>	Clean Maritime Demonstration Competition or Internal Funding	2023/24
<i>High Voltage Sub-Meter Installation</i>	Salix Finance or Internal Funding	2024/25
<i>Sustainability Fund for Investment in Energy Saving Projects</i>	Salix Finance or Internal Funding	2024/25
<i>100% Renewable Utilities Tariff</i>	Internal Funding	2024/25
<i>Biodiversity Action Plan</i>	Internal Funding	2025/26
<i>Climate Change Adaptation Report</i>	Internal Funding	2025/26
<i>Achieve Biodiversity Net Gain on a Major Project</i>	Internal Funding	2026/27

7.2 Internal business change and implications for other policy areas

Strategy actions and recommendations will result in changes and improvements to the way Nexus operates.

Internal Business Change

Increased weighting to environmental impacts during project development – environmental considerations must take a higher precedence in the appraisal of options, will likely lead to higher project costs.

Better consideration of whole lifecycle costs – initial costs do not consider the ongoing costs; these are poorly considered at this stage.

Reconfiguration of some budgets – budgets for shared resources (e.g. printing) need to be configured to incentivise budget holders.

Significant expansion of environmental resource at Nexus – improved environmental support for projects and corporate reporting to properly tackle environmental issues.

Centralised fund for environmental “Invest to Save” projects – applications to the fund (managed by HSQE) to allow for investment in projects with a clear case for financial savings over the short/medium term (typically less than 10 years).

Measuring biodiversity on estates and projects – understanding the biodiversity on our estates with PMs now expected to show how a project will impact on levels of fauna and flora.

Longer-term contracts for the busiest bus routes – potential risks associated with longer term contracts, allows for terms to include requirements for ZEV.

Environmental marketing – campaign developed by the marketing team to highlight efforts made by Nexus to tackle a range of environmental issues.

Ongoing corporate reporting - schedule of internal annual reports relating to environmental performance to be delivered and shared across Nexus.

Staff attitudes to environmental issues – staff understand and take on some responsibility for tackling and highlighting environmental challenges.

External Business Change

Better working relationships between Nexus and environmental groups – collaboration with external organisations to see how we can improve our performance.

Improved station environment – investment in improving “green architectural” at stations/offices to improve the journey experience.

Improved awareness of Nexus’ environmental performance - transparency of environmental performance through publishing of our environmental report annually, marketing campaigns and information boards at stations.

7.3 Monitoring and Evaluation Plan

KPI	Baseline	Goal	20/21	21/22	22/23	23/24	24/25	25/26
Total Greenhouse Gas emissions since 19/20 (Scope 1+2)	17,587 tCO ₂ e (19/20)	10% annual reduction + previous years	33,416	47,661	60,483	72,022	82,407	91,753
Electricity intensity of the Metro (KWh/km)	10.234 kWh/km (19/20)	1% annual reduction	10.13	10.03	9.93	9.83	9.73	9.64
Total Natural Gas Used (m ³)	21,412 m ³ (17-21, 4-year rolling)	25% reduction by 2030	20,930	20,459	19,999	19,549	19,109	18,679
Total waste volumes excluding passenger waste (t)	156.3 tonnes (19/20)	1% annual reduction	154.74	153.19	151.66	150.14	148.64	147.15
Road fleet classified as ULEV (%)	0%	10% by 2025	0%	0%	0%	4%	10%	15%
Delay minutes caused by significant weather events (storms, heatwaves etc.) over 5 year rolling periods.	TBC*	Maintain	MAINTAIN					
Designated protected areas for habitats owned by Nexus (m ²)	TBC ⁺	INCREASE						
Biodiversity Index established through physical surveys.	TBC ⁺	INCREASE						

7.4 Stakeholder Consultation Plan

Stakeholder	Activity	Internal or external	Power high/Low	Interest high/low	RACI	Strategy
Customers	Consumer of information	External	low	high	Consulted	Keep Informed
Head of Finance	Producer of information	Internal	high	high	Responsible	Manage Closely
Corporate Procurement Manager	Producer of information	Internal	low	high	Responsible	Keep Informed
Head of Commerical	Producer of information	Internal	high	high	Responsible	Manage Closely
Head of Health & Safety Quality and Environment	Disseminator of information	Internal	high	high	Accountable	Manage Closely
Marketing Manager	Consumer of information	Internal	low	high	Informed	Keep Informed
Public Affairs Manager	Communicators of information	Internal	low	high	Informed	Keep Informed
Quality and Environment Manager	Disseminator of information	Internal	low	high	Informed	Keep Informed
Head of Engineering	Producer of information	Internal	low	low	Consulted	Monitor
Local Politicians	Elected officials	External	high	low	Informed	Keep Satisfied
Transport operators	Provider of transport services	External	high	high	Consulted	Manage Closely
Front Line Staff	Communicators of information	Internal	low	high	Consulted	Keep Informed
Transport Focus Pressure Groups	Industry watchdog	External	high	low	Consulted	Keep Satisfied
	Pressure Group	External	low	low	Consulted	Monitor

Appendices

Appendix A: Option Appraisal Table

	A1 Provide Nexus with the necessary skills and investment to deliver improvements to environmental performance and operational efficiency.	A2 Encourage project managers to consider more sustainable options for projects and their whole lifecycle costs	A3 "Using less" first by considering the hierarchy of waste/energy/carbon reduction.	A4 Prepare Nexus to have a wide range of prospective projects ready for external funding.	A5 Constant improvement in the accuracy of current and future reporting of environmental performance.	A6 Assist Nexus to achieve an annual 10-12% reduction in greenhouse emissions.	A7 Deliver an enhanced natural environment for flora and fauna on all our estates.	A8 Projects must strike a balance between safety, performance, and environmental outcomes.	A9 Minimise the probability and severity of disruption due to extreme weather.	A10 Enhance the perceptions of Nexus' environmental credentials to customers, non-users and colleagues.	A11 Foster a culture of environmental consideration.	TOTAL
1.1 Annual Environmental Reporting												
a. Public Reporting	2	2	N	1	3	1	1	1	N	3	3	17
b. Internal Reporting	2	2	N	1	3	1	2	1	N	2	3	17
1.2 Collaborate Across the North-East Public Transport Sector.	3	N	N	1	N	1	1	3	N	N	3	12
1.3 Development of an Environment and Sustainability capability	3	2	N	2	3	3	2	2	1	2	3	23
1.4 Creation of a Recycling Fund.	3	3	3	2	N	3	N	N	N	2	3	19
1.5 Environmental Management System Across Nexus.	1	2	3	3	3	1	2	3	1	2	3	24
1.6 Increase Green Infrastructure at Stations and Offices.	N	N	2	1	N	2	3	N	1	3	3	15
2.1 Invest in Low Carbon Solutions;												
a. Feasibility Studies to Decarbonise All Assets.	3	1	2	3	N	3	N	2	N	2	N	16
b. EVs and their Infrastructure at Stations and Offices.	2	1	3	3	N	3	N	2	N	3	3	20
c. Move Offices to Low-Carbon Heating.	N	N	1	3	N	3	N	3	N	3	2	15
2.2 Trials to Change Behaviours;												
a. Removal of Free Parking for Staff.	N	N	N	N	N	2	N	1	N	3	3	9
b. Car-free days.	N	N	N	N	N	1	N	1	N	2	3	7
c. Competitions and Team Projects.	N	2	N	2	N	2	N	2	N	2	3	13
2.3 Compulsory Tender Requirements for All Contractors.	N	1	N	N	N	1	2	N	N	2	1	7
2.4 Carbon Appraisal for All Major Projects.	2	3	3	N	3	2	N	1	N	2	3	19
2.5 Quantify Sources of Emissions in Our Supply Chain.	3	2	N	2	3	3	N	N	N	2	1	16
3.1 Commit to Zero Waste to Landfill.	N	N	3	N	N	N	N	1	N	3	2	9
3.2 Seek to Minimise All Unnecessary Waste.	N	1	3	2	N	1	N	2	N	3	3	15
3.3 Publicise Waste Management Performance.	2	1	2	N	2	1	N	2	N	3	3	16
3.4 Always Consider Refurbishment Before Rebuild.	N	3	3	N	N	2	1	2	N	3	3	17
4.1 Creation of a Biodiversity Action Plan.	2	1	N	3	2	N	3	3	1	3	2	20
4.2 Work Closely with Local Environmental Groups and Communities.	3	3	N	N	N	N	3	-1	1	3	2	14
4.3 Aim for Biodiversity Net Gain on Major Projects.	2	3	N	N	N	N	3	N	N	3	3	14
5.1 Development of a Plan to Identify and Combat Climate Risks.	3	N	N	3	3	N	N	3	3	2	N	17
5.2 Improved Collaboration with Landowners and Other Stakeholders	1	N	N	N	N	N	2	3	2	2	1	11
5.3 Quantify the Potential Costs of Climate Change on Our Infrastructure.	3	N	N	2	N	N	N	3	2	2	N	12

Appendix B: Emission Scopes Definition

Scope 1 (Direct)	Scope 2 (Indirect)	Scope 3 (Indirect)
<ul style="list-style-type: none"> • Fuel combustion • Company vehicles • Fugitive emissions (leaks and other irregular releases of gases) 	<ul style="list-style-type: none"> • Purchased electricity, heat and steam 	<ul style="list-style-type: none"> • Purchased goods and services • Business travel • Employee commuting • Waste disposal • Use of sold products • Transportation and distribution (up- and downstream) • Investments • Leased assets and franchises

Appendix C: IMS Version Control

Preparation and Approval		
Prepared by (Author): The author is responsible for ensuring the accuracy of technical content and compliance with Nexus' documentation management requirements.	Matthew Godwin (name)	08 June 2022 (date)
	Business Development Officer (job title & Directorate)	 (signature)
Validated by (Owner): The owner is the Director/Head of Service responsible for the document and is usually the Head of Discipline: they validate its content to ensure it is fit for purpose and meets Nexus corporate requirements and business needs.	Ian Willetts (name)	1 July 2022 (date)
	Safety and Assurance Director (job title & Directorate)	 (signature)
Approved by (on behalf of Nexus): Level 1 & Level 2 documents are approved by the Chief Operating Officer (COO) or their nominee. Level 3 documents are approved by the sponsoring Director or Head of Service.	Martin Kearney (name)	1 st July 2022 (date)
	Chief Operating Officer (job title & Directorate)	 (signature)

Revision Log			
Issue	Revision	Date	Description of changes
1.0	1.0	30/03/22	Initial Issue following SLT approval
1.0	1.1	08/06/22	Minor amendments to Delivery Action Plan owners.

Review Date (date when this document next requires review)	
Date:	01/01/2025

Involvement of functions

The 'RACI' (Responsible/Accountable/Consult/Inform) table below identifies those Directorates, functions and key stakeholders involved in the preparation and approval of this document:

RACI activities for this document	Nexus Directorates/functions and key stakeholders														
	Directorates/functions									Stakeholders					
	Chief Operating Officer	Safety & Assurance	People & Culture	Finance & Resourcing	Major Projects	Customer Services	Metro Infrastructure	Metro Operations	Legal	Trade Unions	Transport North East	Network Rail	TOC/FOCs	Local/Central Government	Customers
Drafting of the documentation	C	A	R	C	C	C	C	C	C	N/A	I	N/A	N/A	N/A	C
Verification of the document	A	R	R	C	C	C	C	C	C	I	N/A	N/A	N/A	N/A	N/A
Approval of the document	R	A	A	R	C	C	C	C	A	I	N/A	N/A	N/A	N/A	N/A
Release of the document	I	R	I	I	I	I	I	I	I	I	N/A	N/A	N/A	N/A	N/A

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